

Academic Improvement at APW Elementary School

Guidelines

APW Central School District
PK-5 Elementary School Sample Core Classroom Schedule
Implementation of the Instructional Core Program

Instructional Block	Learning Standards	Time	Instructional Tools and Resources	What Students and Teachers Do
Reading	Common Core Standards: Foundational Reading	120 minutes	NYS Common Core Curriculum Units ADAPTED and use of: • Textbooks • Trade books • Other materials	<ul style="list-style-type: none"> Teachers engage students in word work related to foundational literacy (learning to read) content and skills. Students develop phonemic awareness, phonics, and reading fluency
	Common Core Standards: Reading	Please refer to Grade Level Instructional Diets	NYS Common Core Curriculum Units ADAPTED and use of: • Textbooks • Trade Books • Reading Street • My Sidewalks	<ul style="list-style-type: none"> Teachers model the reading strategies to students and provide support while reading. Students are actively engaged in discussion around texts Teachers provide opportunities for review and practice of new skills presented Teachers meet with small groups of students to target specific reading skills (e.g., word work, comprehension)
Writing	Common Core Standards: Writing/Language		NYS Common Core Curriculum Pacing & Units ADAPTED	<ul style="list-style-type: none"> Teachers engage in writing with students and model writer's craft and strategies throughout the writing process Students generate, draft, revise, and edit writing pieces

APW Central School District
PK-5 Elementary School Sample Master Schedule
Implementation of the Instructional Core Program

Instructional Block	Learning Standards	Time	Instructional Tools and Resources	What Students and Teachers Do
Mathematics	Common Core Standards: Math	80 minutes	NYS Common Core Curriculum Pacing & Units ADPATED and use of: • Other relevant curriculum materials	<ul style="list-style-type: none"> Teachers engage students in development of number sense and models and monitors problem-solving strategies and supports conceptual and practical understanding of mathematical standards Students engage in constructivist problem-solving mathematical activities and tasks requiring the use of key fluencies Teachers engage students in 21st century inquiry-based science learning Students engage in inquiry-based science “labs” and tasks based on standards (including state-regulated health instruction) Students interact with scientific informational texts
Science	NYS Science Standards and Common Core Literacy for Science (And National Science Standards)	40 minutes	APW Curriculum for Science and Health (based on National Science Standards)	
Social Studies	NYS Social Studies Standards and Common Core for History	40 minutes	APW Curriculum and use of: NYS Scope and Sequence for Social Studies	<ul style="list-style-type: none"> Teachers engage students in historical understanding of and making connections among movements, trends, events, people, etc. Students engage in the study of primary and secondary source information texts, discussions and debates regarding current and historical events, etc.

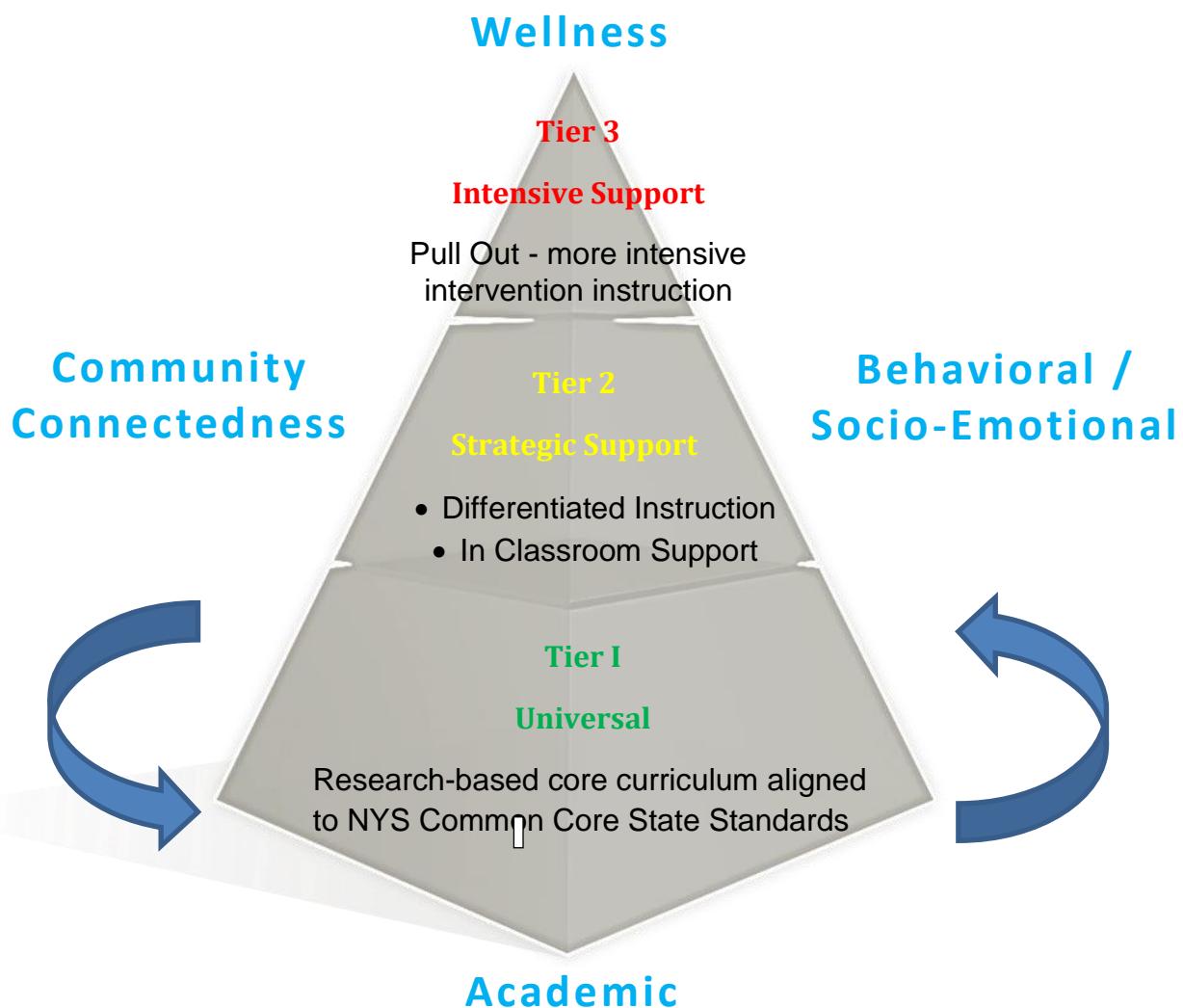
RESPONSE TO INTERVENTION

Response to Intervention (RTI) Defined

Response to Intervention integrates assessment and intervention within a multi-level prevention system to maximize student achievement. With RTI, schools can use data to identify students at risk for poor learning outcomes, monitor student progress, provide evidence-based interventions and adjust the intensity and nature of those interventions depending on a student's responsiveness, and identify students with learning disabilities (NCRTI, 2010).

RTI - A Multi-Tiered Prevention Framework

RTI serves as a multi-tiered prevention framework/model with increasing levels or tiers of instructional support. Within the Altmar Parish Williamstown Central School District a three-tiered model is used. The graphic presented below provides a visual illustration of the district's RTI model. Further information for each tier follows the graphic.



Tier One: Appropriate Instruction

Tier 1 is identified as the core instruction program provided to all students. Research-based instruction and positive universal behavioral supports are part of the core program. The APW core program (Tier 1) should minimally include:

- Research-based core curriculum aligned to NYS Common Core State Standards
- Appropriate instruction and research-based instructional interventions that meets the needs of at least 80 percent of all learners. Appropriate instruction in reading means scientific research-based reading programs that include explicit and systematic instruction in reading foundational skills (print concepts, phonological awareness, phonics, word recognition) vocabulary development, reading fluency and reading comprehension strategies. Appropriate instruction in mathematics means research-based instruction programs that include instruction in problem solving, arithmetic skills and fluency, conceptual knowledge/number sense, and reasoning ability to apply mathematics to real life situations and contexts.
- Differentiated, flexible groups determined by universal screening and progress monitoring data (refer to Section 3) for application of skills, re-teaching, additional practice and/or challenge activities

Core Curricular Daily Instructional Time Allotments (K-6)

- It is expected that daily instructional time be devoted to each of the four core content areas, English Language Arts, Mathematics, Science and Social Studies. These daily time allotments should continue for the entire school year.
- It is suggested that at the elementary levels, ELA be delivered in a best practice model of approximately 110 minutes. An additional 30 minutes to the literacy block is used to implement needed literacy interventions to support students specific literacy needs
- Progress monitoring in English and Mathematics should occur at regular intervals and should be conducted BY THE CLASSROOM TEACHER
- It is recommended that universal screening administered three times per year BY THE CLASSROOM TEACHER.
- Use of benchmark data and curriculum based measures to inform instruction should occur daily
- Summative assessment should be utilized to determine student mastery and grades
- Consistent communication with parents regarding student progress and academic needs is critical
- Parents of all students should be notified of school-wide screening results

Considerations for Appropriate Instruction:

- **Culturally Responsive Instruction** - Being a Culturally Responsive Educator means that one is aware, sensitive and actively integrating the culture of one's students into daily lessons and interactions. A culturally responsive teacher embodies various characteristics, the most important being caring, engaging and seeks high expectations from his/her students. In regards to the RTI pyramid of intervention, Culturally Responsive teaching is for 100% of the student population, or is integrated in Tier I. Teachers who embrace its philosophies and practices may experience fewer misunderstandings of student behaviors that may inappropriately move preventative actions into Tiers II and III of RTI. Providing linguistic and cultural relevance to student learning and building authentic relationships is the core of Culturally Responsive Teaching
- **Students with Disabilities** -- Appropriate core instruction for students with disabilities must be consistent with the student's Individualized Educational Plan (IEP).

Tier Two: Supplemental Intervention

Tier 2 supplemental instructional intervention is provided **in addition to, and not in place of**, the standards-based curriculum received in Tier 1. The intervention focus is on the areas of student need or weakness that are identified in the screening, assessment or progress monitoring of student progress in core instruction (Tier 1). The determination of which interventions will be provided to an individual student is made either by a problem-solving process or a standard treatment protocol. Tier 2 instruction is typically delivered in a small group (recommended maximum of 9 students) of students often arranged according to similar instructional needs. The recommended length of time a student spends in the second tier of intervention will vary up to approximately twenty weeks depending on such factors as the skill and the level of the student's responsiveness to the intervention. Approximately 10 percent of students in a particular grade level should be provided Tier 2 intervention. In cases when the number of students not meeting standards exceeds 10%, it is recommended that schools utilize contextual norms to prioritize students who require additional instruction beyond differentiation in the core instruction.

Tier 2 should minimally include:

- Alignment to Tier 1 core curriculum with supplemental supports
- Research-based instructional materials selected to match student need based on progress monitoring and other data
- Direct, Scaffolded instruction
- Frequent opportunities for students to apply their thinking
- Small, homogenous groups
- Three days per week minimum
- 20-30 minutes per session
- 4 week intervals for up to 20 weeks
- Group size up to 9 students with size of group dependent on program/strategy recommendations
- Progress monitoring at a minimum of every two weeks
- Periodic fidelity checks are required to ensure that the delivery of instruction was provided in the way it was intended.

Tier Three: Intensive Intervention

Tier 3 intervention is designed for those students who demonstrate insufficient progress in Tier 2. Tier 3 is typically for approximately one to five percent of students in a grade level who require more intensive intervention instruction in addition to their core instruction. This tier provides greater individualized instruction in a smaller group setting (with a maximum of 5 students) with more time, duration and more frequent progress monitoring.

Tier 3 should minimally include:

- An intensive intervention program aligned with Tier 1 core curriculum
- Research-based instructional materials to meet individualized needs
- Individual or small homogeneous groups
- Group size is a maximum of 5 students; size dependent on program or strategy recommendations.
- Five day per week
- 30-60 minutes per sessions that may be conducted outside of regular classroom instruction
- 6 week intervals up to 20 weeks
- Weekly progress monitoring
- Periodic fidelity checks are required to ensure that the delivery of instruction was provided in the way it was intended.

If the student is determined to be making substandard progress in such areas of study, instruction shall be provided that is tailored to meet the student's individual needs with increasingly intensive levels of targeted intervention and instruction.

School districts must provide written notification to parents when a student requires an intervention beyond that which is provided to the general education classroom. Such notification shall include: information about the performance data that will be collected and the general education services that will be provided; strategies for increasing the student's rate of learning; and the parents' right to request an evaluation by the Committee on Special Education to determine whether the student has a disability.

A RTI process as described above will meet the section 117.3 requirements to ensure a student's progress toward meeting the State's standards.

English Language Arts Core Instructional Program

English Language Arts and Literacy Core Program

Teachers in Grades K-5 will continue to use *the NYS Common Core Curriculum Resources ADAPTED* as our core instructional program. This means that teachers will draw from both the new NYS curriculum as well as existing resources to deliver literacy instruction that is systematic and explicit, purposeful, and rigorous.

Phonics/Foundational Skills: Teachers should consider a specialized program as their core phonics program in order to address phonemic awareness, phonics, and vocabulary. As we continue our work in aligning our core program to the Common Core Learning Standards, we will produce pacing guides and instructional guidance documents to support implementation of the CCLS Reading Foundational Standards.

Whole Group Reading Instruction: The time that is typically spent using text books will now incorporate the CCLS Reading Comprehension Units. Reading should guide students through the higher order comprehension skills highlighted in the CCLS. Within each unit, the reading standards and skills should be broken down into teaching points. These teaching points should be taught through read-aloud focused lessons. Teachers should use think-alouds to model the teaching point within a given text (or part of a text) and should also provide students with opportunities to try out the new learning within the context of the read aloud. That is, students will not only watch the teacher model the teaching point, but they will also be asked to think, talk, or write responses to the text.

The length of reading lessons varies by grade, but the lessons should take no more than 20-30 minutes including vocabulary instruction. Our commitment to daily comprehension instruction via shared text (read aloud) ensures that all students have opportunities to meet the demands of these new standards.

Vocabulary: When a teacher chooses to use a text other than what is contained in the Modules as the anchor text for read-aloud/think-aloud instruction, appropriate vocabulary words should be selected based on student needs as well as on criteria for choosing Tier 2 vocabulary words. If few words are selected carefully and instruction is explicit and appropriately sequenced, then students should be able to successfully access both the vocabulary words taught through the whole group read-aloud instruction as well as vocabulary words introduced and taught during small group instruction.

Small Group Reading Instruction: Teachers should think about using weekly planners to guide their work with students in small groups (centers). Reinforcement of CCLS standards and additional instruction targeting grade level key fluencies should be emphasized.

Writing: Writing topics should be designed by teachers and should reflect the increased emphasis on writing instruction evident in the Common Core Learning Standards. Writing units should be organized by writing type (argument, informational, and narrative) and will eventually be placed along corresponding reading units (e.g., when students are studying characters in fiction, they will be writing narratives). Each writing unit will be developed and will have a rubric aligned to the CCLS; this rubric will guide students through the writing process: generating ideas, drafting, revising, and editing.

Similar to the reading comprehension units, the writing standards and skills should be broken down into teaching points. These teaching points should be conveyed through daily 10-15 minute lessons in which the teacher quickly models the new writing strategy and students have a short opportunity for guided practice. After the short writing lesson, students will always have time to work independently on their writing, while teachers offer support to individuals or small groups. The CCLS emphasize the importance of volume and independence, so it's critical that we provide our students with writing time each day to build stamina and skill.



At this time, no new text book series will be purchased. Current text books, Big Books, or recommended titles from the CCLS curriculum units can be used with these instructional units. Teachers should use their best judgment and the APW developed reading lists to determine which texts will be most effective in delivering instruction that leads students to mastery of daily learning objectives (teaching points).

Please refer to the attached Elementary School Schedule as well as APW Recommended Instructional Diets for time guidelines and additional information.

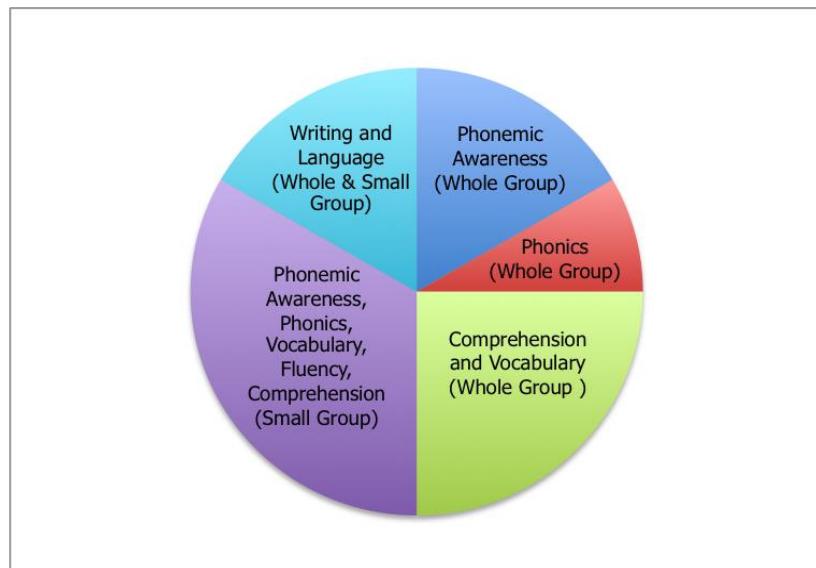
APW English Language Arts
Recommended Instructional Diets
Grades K-5

The English Language Arts recommended instructional diets depicted below are designed to:

- 1) Illustrate the best practices for dedicated instructional time in all of the key components of reading and writing (as defined in the Common Core Learning Standards),
- 2) Provide recommendations regarding the relative instructional time/focus for each component, and
- 3) Communicate key fluencies in each grade level that require instructional emphasis.

The instructional diets below are *not intended to be rigid time frames*, but are research-based, grade level appropriate components of literacy that should be used to guide planning and delivery of instruction. (Highlighting indicates key fluencies for the grade level.)

Kindergarten Instructional Diet



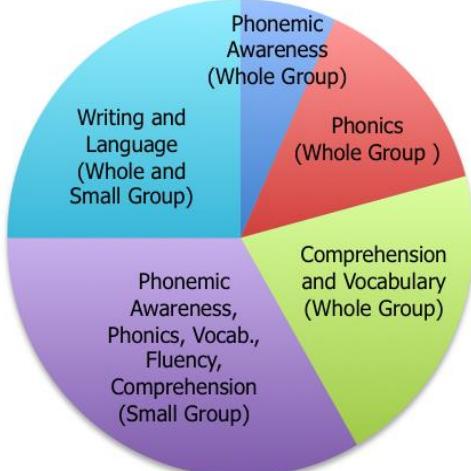
Approximate Instructional Minutes per Day:

Phonemic Awareness and Phonics--
Whole Group 30 minutes

Comprehension and Vocabulary—
Whole Group 30 minutes

Additional Phonemic
Awareness/Phonics, Vocabulary,
Comprehension, Fluency—
Small Group 40 minutes

Writing and Language—
Whole and/or Small Group 20 minutes

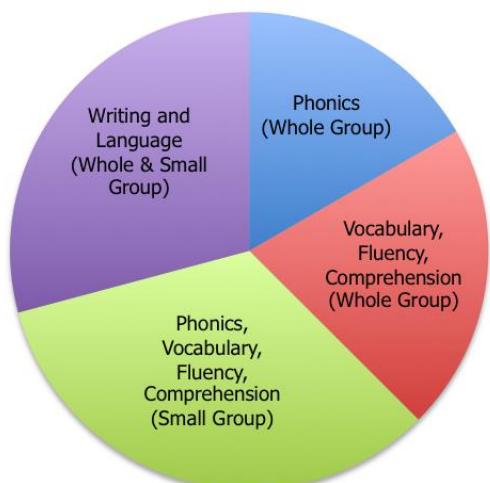
Grade 1 Instructional Diet**Approximate Instructional Minutes per Day:**

Phonemic Awareness and Phonics—
Whole Group 25 minutes

Comprehension and Vocabulary—
Whole Group 25 minutes

Additional Phonemic
Awareness/Phonics, Vocabulary,
Comprehension, Fluency—
Small Group 40 minutes

Writing and Language—
Whole and/or Small Group 30

Grade 2 Instructional Diet**Approximate Instructional Minutes per Day:**

Phonics--
Whole Group 20 minutes

Vocabulary, Fluency, Comprehension—
Whole Group 25 minutes

Phonics, Vocabulary, Fluency,
Comprehension—
Small Group 40 minutes

Writing and Language—
Whole and/or Small Group 35 minutes

Grades 3-5 Instructional Diet**Approximate Instructional Minutes per Day:**

Word Study--
Whole Group 15-20 minutes

Vocabulary, Fluency,
Comprehension—
Whole Group 20-25 minutes

Word Study, Vocabulary, Fluency,
Comprehension—
Small Group 40 minutes

Writing and Language—
Whole and/or Small Group 40 minutes

Standards for English Language Arts & Literacy

The K–5 standards define what students should understand and be able to do by the end of each grade. They correspond to the College and Career Readiness (CCR) anchor standards below by number. The CCR and grade-specific standards are necessary complements—the former providing broad standards, the latter providing additional specificity—that together define the skills and understandings that all students must demonstrate.

Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.
6. Assess how point of view or purpose shapes the content and style of a text.

Integration of Knowledge and Ideas

7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Range of Reading and Level of Text Complexity

10. Read and comprehend complex literary and informational texts independently and proficiently.

Responding to Literature

11. Respond to literature by employing knowledge of literary language, textual features, and forms to read and comprehend, reflect upon, and interpret literary texts from a variety of genres and a wide spectrum of American and world cultures.

UNPACKED Reading Standards for Literature K–5

The following standards offer a focus for instruction each year and help ensure that students gain adequate exposure to a range of texts and tasks. Rigor is also infused through the requirement that students read increasingly complex texts through the grades. Students advancing through the grades are expected to meet each year's grade-specific standards and retain or further develop skills and understandings mastered in preceding grades.

Kindergartners:	Grade 1 students:	Grade 2 students:
<i>Key Ideas and Details</i>		
1. With prompting and support, ask and answer questions about key details in a text.	1. Ask and answer questions about key details in a text.	1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
2. With prompting and support, retell familiar stories, including key details.	2. Retell stories, including key details, and demonstrate understanding of their central message or lesson.	2. Recount stories, including fables and folktales from diverse cultures, and determine their central message, lesson, or moral.
3. With prompting and support, identify characters, settings, and major events in a story.	3. Describe characters, settings, and major events in a story, using key details.	3. Describe how characters in a story respond to major events and challenges.
<i>Craft and Structure</i>		
4. Ask and answer questions about unknown words in a text.	4. Identify words and phrases in stories or poems that suggest feelings or appeal to the senses.	4. Describe how words and phrases (e.g., regular beats, alliteration, rhymes, repeated lines) supply rhythm and meaning in a story, poem, or song.
5. Recognize common types of texts (e.g., storybooks,	5. Explain major differences between books that tell stories and books that give information, drawing on a wide reading of a range of text types.	5. Describe the overall structure of a story, including describing how the beginning introduces the story and the ending concludes the action.
6. With prompting and support, name the author and illustrator of a story and define the role of each in telling the story.	6. Identify who is telling the story at various points in a text.	6. Acknowledge differences in the points of view of characters, including by speaking in a different voice for each character when reading dialogue aloud.

UNPACKED Reading Standards for Literature K–5 – cont.

Kindergartners:	Grade 1 students:	Grade 2 students:
<i>Integration of Knowledge and Ideas</i>		
7. With prompting and support, describe the relationship between illustrations and the story in which they appear (e.g., what moment in a story an illustration depicts).	7. Use illustrations and details in a story to describe its characters, setting, or events.	7. Use information gained from the illustrations and words in a print or digital text to demonstrate understanding of its characters, setting, or plot.
8. (Not applicable to literature)	8. (Not applicable to literature)	8. (Not applicable to literature)
9. With prompting and support, compare and contrast the adventures and experiences of characters in familiar stories. a. With prompting and support, students will make cultural connections to text and self.	9. Compare and contrast the adventures and experiences of characters in stories. a. With prompting and support, students will make cultural connections to text and self.	9. Compare and contrast two or more versions of the same story (e.g., Cinderella stories) by different authors or from different cultures.
<i>Range of Reading and Level of Text Complexity</i>		
10. Actively engage in group reading activities with purpose and understanding.	10. With prompting and support, read prose and poetry of appropriate complexity for grade 1.	10. By the end of the year, read and comprehend literature, including stories and poetry, in the grades 2–3 text complexity band proficiently, with scaffolding as needed at the high end of the range.
<i>Responding to Literature</i>		
11. With prompting and support, make connections between self, text, and the world around them (text, media, social interaction).	11. Make connections between self, text, and the world around them (text, media, social interaction).	11. Make connections between self, text, and the world around them (text, media, social interaction).

UNPACKED Reading Standards for Literature K–5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Key Ideas and Details</i>		
1. Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers	1. Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.	1. Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
2. Recount stories, including fables, folktales, and myths from diverse cultures; determine the central message, lesson, or moral and explain how it is conveyed through key details in the text.	2. Determine a theme of a story, drama, or poem from details in the text; summarize the text.	2. Determine a theme of a story, drama, or poem from details in the text, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize the text.
3. Describe characters in a story (e.g., their traits, motivations, or feelings) and explain how their actions contribute to the sequence of events.	3. Describe in depth a character, setting, or event in a story or drama, drawing on specific details in the text (e.g., a character's thoughts, words, or actions).	3. Compare and contrast two or more characters, settings, or events in a story or drama, drawing on specific details in the text (e.g., how characters interact).
<i>Craft and Structure</i>		
4. Determine the meaning of words and phrases as they are used in a text, distinguishing literal from non-literal language.	4. Determine the meaning of words and phrases as they are used in a text, including those that allude to significant characters found in mythology (e.g., Herculean).	4. Determine the meaning of words and phrases as they are used in a text, including figurative language such as metaphors and similes.
5. Refer to parts of stories, dramas, and poems when writing or speaking about a text, using terms such as chapter, scene, and stanza; describe how each successive part builds on earlier sections.	5. Explain major differences between poems, drama, and prose, and refer to the structural elements of poems (e.g., verse, rhythm, meter) and drama (e.g., casts of characters ,settings, descriptions, dialogue, stage directions) when writing or speaking about a text.	5. Explain how a series of chapters, scenes, or stanzas fits together to provide the overall structure of a particular story, drama, or poem.
6. Distinguish their own point of view from that of the narrator or those of the characters.	6. Compare and contrast the point of view from which different stories are narrated, including the difference between first- and third-person narrations.	6. Describe how a narrator's or speaker's point of view influences how events are described. a. Recognize and describe how an author's background and culture affect his or her perspective.

UNPACKED Reading Standards for Literature K–5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Integration of Knowledge and Ideas</i>		
7. Explain how specific aspects of a text's illustrations contribute to what is conveyed by the words in a story (e.g., create mood, emphasize aspects of a character or setting)	7. Make connections between the text of a story or drama and a visual or oral presentation of the text, identifying where each version reflects specific descriptions and directions in the text.	7. Analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text (e.g., graphic novel, multimedia presentation of fiction, folktale, myth, poem).
8. (Not applicable to literature)	8. (Not applicable to literature)	8. (Not applicable to literature)
9. Compare and contrast the themes, settings, and plots of stories written by the same author about the same or similar characters (e.g., in books from a series).	9. Compare and contrast the treatment of similar themes and topics (e.g., opposition of good and evil) and patterns of events (e.g., the quest) in stories, myths, and traditional literature from different cultures.	9. Compare and contrast stories in the same genre (e.g., mysteries and adventure stories) on their approaches to similar themes and topics.
<i>Range of Reading and Level of Text Complexity</i>		
10. By the end of the year, read and comprehend literature, including stories, dramas, and poetry, at the high end of the grades 2–3 text complexity band independently and proficiently.	10. By the end of the year, read and comprehend literature, including stories, dramas, and poetry, in the grades 4–5 text complexity band proficiently, with scaffolding as needed at the high end of the range.	10. By the end of the year, read and comprehend literature, including stories, dramas, and poetry, at the high end of the grades 4–5 text complexity band independently and proficiently. .
<i>Responding to Literature</i>		
11. Recognize and make connections in narratives, poetry, and drama to other texts, ideas, cultural perspectives, personal events, and situations. a. Self-select text based upon personal preferences.	11. Recognize, interpret and make connections in narratives, poetry, and drama, to other texts, ideas, cultural perspectives, personal events and situations. a. Self-select text based upon personal preferences.	11. Recognize, interpret, and make connections in narratives, poetry, and drama, to other texts, ideas, cultural perspectives, eras, personal events, and situations. a. Self-select text to develop personal preferences regarding favorite authors. b. Use established criteria to categorize, select texts and assess to make informed judgments about the quality of the pieces.

UNPACKED Reading Standards for Informational Text K–5

Kindergartners:	Grade 1 students:	Grade 2 students:
<i>Key Ideas and Details</i>		
1. With prompting and support, ask and answer questions about key details in a text.	1. Ask and answer questions about key details in a text.	1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
2. With prompting and support, identify the main topic and retell key details of a text.	2. Identify the main topic and retell key details of a text.	2. Identify the main topic of a multiparagraph text as well as the focus of specific paragraphs within the text.
3. With prompting and support, describe the connection between two individuals, events, ideas, or pieces of information in a text.	3. Describe the connection between two individuals, events, ideas, or pieces of information in a text.	3. Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.
<i>Craft and Structure</i>		
4. With prompting and support, ask and answer questions about unknown words in a text.	4. Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.	4. Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.
5. Identify the front cover, back cover, and title page of a book.	5. Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text.	5. Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently.
6. Name the author and illustrator of a text and define the role of each in presenting the ideas or information in a text.	6. Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.	6. Identify the main purpose of a text, including what the author wants to answer, explain, or describe.
<i>Integration of Knowledge and Ideas</i>		
7. With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts).	7. Use illustrations and details in a text to describe its key ideas.	7. Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.
8. With prompting and support, identify the reasons an author gives to support points in a text.	8. Identify the reasons an author gives to support points in a text.	8. Describe how reasons support specific points the author makes in a text.
9. With prompting and support, identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).	9. Identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).	9. Compare and contrast two or more versions of the same story (e.g., Cinderella stories) by different authors or from different cultures.
<i>Range of Reading and Level of Text Complexity</i>		
10. Actively engage in group reading activities with purpose and understanding.	10. With prompting and support, read prose and poetry of appropriate complexity for grade 1.	10. Compare and contrast the most important points presented by two texts on the same topic.

UNPACKED Reading Standards for Informational Text K–5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Key Ideas and Details</i>		
1. Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.	1. Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.	1. Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
2. Determine the main idea of a text; recount the key details and explain how they support the main idea.	2. Determine the main idea of a text and explain how it is supported by key details; summarize the text.	2. Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
3. Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.	3. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.	3. Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
<i>Craft and Structure</i>		
4. Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.	4. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.	4. Determine the meaning of general academic and domain specific words and phrases in a text relevant to a grade 5 topic or subject area.
5. Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.	5. Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text	5. Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts.
6. Distinguish their own point of view from that of the author of a text.	6. Compare and contrast a firsthand and secondhand account of the same event or topic; describe the differences in focus and the information provided.	6. Analyze multiple accounts of the same event or topic, noting important similarities and differences in the point of view they represent.

UNPACKED Reading Standards for Informational Text K–5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Integration of Knowledge and Ideas</i>		
7. Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).	7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.	7. Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
8. Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).	8. Explain how an author uses reasons and evidence to support particular points in a text.	8. Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).
9. Compare and contrast the most important points and key details presented in two texts on the same topic.	9. Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.	9. Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.
<i>Range of Reading and Level of Text Complexity</i>		
10. By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 2–3 text complexity band independently and proficiently.	10. By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4–5 text complexity band proficiently, with scaffolding as needed at the high end of the range.	10. By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 4–5 text complexity band independently and proficiently.

UNPACKED Reading Standards: Foundational Skills K–5

These standards are directed toward fostering students' understanding and working knowledge of concepts of print, the alphabetic principle, and other basic conventions of the English writing system. These foundational skills are not an end in and of themselves; rather, they are necessary and important components of an effective, comprehensive reading program designed to develop proficient readers with the capacity to comprehend texts across a range of types and disciplines. Instruction should be differentiated: good readers will need much less practice with these concepts than struggling readers will. The point is to teach students what they need to learn and not what they already know—to discern when particular children or activities warrant more or less attention.

Kindergartners:	Grade 1 students:
Print Concepts	
1. Demonstrate understanding of the organization and basic features of print. <ul style="list-style-type: none"> a. Follow words from left to right, top to bottom, and page by page. b. Recognize that spoken words are represented in written language by specific sequences of letters. c. Understand that words are separated by spaces in print. d. Recognize and name all upper- and lowercase letters of the alphabet. 	1. Demonstrate understanding of the organization and basic features of print. <ul style="list-style-type: none"> a. Recognize the distinguishing features of a sentence (e.g., first word, capitalization, ending punctuation).
Phonological Awareness	
2. Demonstrate understanding of spoken words, syllables, and sounds (phonemes). <ul style="list-style-type: none"> a. Recognize and produce rhyming words. b. Count, pronounce, blend, and segment syllables in spoken words. c. Blend and segment onsets and rimes of single-syllable spoken words. d. Isolate and pronounce the initial, medial vowel, and final sounds (phonemes) in three-phoneme (consonant-vowel-consonant, or CVC) words.* (This does not include CVCs ending with /l/, /r/, or /x/.) e. Add or substitute individual sounds (phonemes) in simple, one-syllable words to make new words. 	2. Demonstrate understanding of spoken words, syllables, and sounds (phonemes). <ul style="list-style-type: none"> a. Distinguish long from short vowel sounds in spoken single-syllable words. b. Orally produce single-syllable words by blending sounds (phonemes), including consonant blends. c. Isolate and pronounce initial, medial vowel, and final sounds (phonemes) in spoken single-syllable words. d. Segment spoken single-syllable words into their complete sequence of individual sounds (phonemes).

*Words, syllables, or phonemes written in /slashes/refer to their pronunciation or phonology. Thus, /CVC/ is a word with three phonemes regardless of the number of letters in the spelling of the word.

UNPACKED Reading Standards: Foundational Skills K–5 – cont.

Kindergartners:	Grade 1 students:	Grade 2 students:
<i>Phonics and Word Recognition</i>		
<p>3. Know and apply grade-level phonics and word analysis skills in decoding words.</p> <ul style="list-style-type: none"> a. Demonstrate basic knowledge of one-to-one letter-sound correspondences by producing the primary sound or many of the most frequent sounds for each consonant. b. Associate the long and short sounds with common spellings (graphemes) for the five major vowels. c. Read common high-frequency words by sight (e.g., the, of, to, you, she, my, is, are, do, does). d. Distinguish between similarly spelled words by identifying the sounds of the letters that differ. 	<p>3. Know and apply grade-level phonics and word analysis skills in decoding words.</p> <ul style="list-style-type: none"> a. Know the spelling-sound correspondences for common consonant digraphs. b. Decode regularly spelled one-syllable words. c. Know final -e and common vowel team conventions for representing long vowel sounds. d. Use knowledge that every syllable must have a vowel sound to determine the number of syllables in a printed word. e. Decode two-syllable words following basic patterns by breaking the words into syllables. f. Read words with inflectional endings. g. Recognize and read grade-appropriate irregularly spelled words. 	<p>3. Know and apply grade-level phonics and word analysis skills in decoding words.</p> <ul style="list-style-type: none"> a. Distinguish long and short vowels when reading regularly spelled one-syllable words. b. Know spelling-sound correspondences for additional common vowel teams. c. Decode regularly spelled two-syllable words with long vowels. d. Decode words with common prefixes and suffixes. e. Identify words with inconsistent but common spelling-sound correspondences. f. Recognize and read grade-appropriate irregularly spelled words.
<i>Fluency</i>		
<p>4. Read emergent-reader texts with purpose and understanding.</p>	<p>4. Read with sufficient accuracy and fluency to support comprehension.</p> <ul style="list-style-type: none"> a. Read grade-level text with purpose and understanding. b. Read grade-level text orally with accuracy, appropriate rate, and expression on successive readings. c. Use context to confirm or self-correct word recognition and understanding, rereading as necessary. 	<p>4. Read with sufficient accuracy and fluency to support comprehension.</p> <ul style="list-style-type: none"> a. Read grade-level text with purpose and understanding. b. Read grade-level text orally with accuracy, appropriate rate, and expression on successive readings. c. Use context to confirm or self-correct word recognition and understanding, rereading as necessary.

UNPACKED Reading Standards: Foundational Skills K–5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Phonics and Word Recognition</i>		
5. Know and apply grade-level phonics and word analysis skills in decoding words. <ol style="list-style-type: none">Identify and know the meaning of the most common prefixes and derivational suffixes.Decode words with common Latin suffixes.Decode multisyllable words.Read grade-appropriate irregularly spelled words.	5. Know and apply grade-level phonics and word analysis skills in decoding words. <ol style="list-style-type: none">Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.	5. Know and apply grade-level phonics and word analysis skills in decoding words. <ol style="list-style-type: none">Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.
<i>Fluency</i>		
6. Read with sufficient accuracy and fluency to support comprehension. <ol style="list-style-type: none">Read grade-level text with purpose and understanding.Read grade-level prose and poetry orally with accuracy, appropriate rate, and expression on successive readings.Use context to confirm or self-correct word recognition and understanding, rereading as necessary.	6. Read with sufficient accuracy and fluency to support comprehension. <ol style="list-style-type: none">Read grade-level text with purpose and understanding.Read grade-level prose and poetry orally with accuracy, appropriate rate, and expression on successive readings.Use context to confirm or self-correct word recognition and understanding, rereading as necessary.	6. Read with sufficient accuracy and fluency to support comprehension. <ol style="list-style-type: none">Read grade-level text with purpose and understanding.Read grade-level prose and poetry orally with accuracy, appropriate rate, and expression on successive readings.Use context to confirm or self-correct word recognition and understanding, rereading as necessary.

College and Career Readiness Anchor Standards for Writing

The K–5 standards for writing define what students should understand and be able to do by the end of each grade. They correspond to the College and Career Readiness (CCR) anchor standards below by number. The CCR and grade-specific standards are necessary complements—the former providing broad standards, the latter providing additional specificity—that together define the skills and understandings that all students must demonstrate.

Text Types and Purposes

1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Range of Writing

10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences

Responding to Literature

11. Develop personal, cultural, textual, and thematic connections within and across genres as they respond to texts through written, digital, and oral presentations, employing a variety of media and genres

UNPACKED Writing Standards K–5

The writing standards K–5 offer a focus for instruction each year to help ensure that students gain adequate mastery of a range of skills and applications. Each year in their writing, students should demonstrate increasing sophistication in all aspects of language use, from vocabulary and syntax to the development and organization of ideas, and they should address increasingly demanding content and sources. Students advancing through the grades are expected to meet each year's grade-specific standards and retain or further develop skills and understandings mastered in preceding grades.

Kindergartners:	Grade 1 students:	Grade 2 students:
<i>Text Types and Purposes</i>		
1. Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book (e.g., My favorite book is . . .)	1. Write opinion pieces in which they introduce the topic or name the book they are writing about, state an opinion, supply a reason for the opinion, and provide some sense of closure.	1. Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section.
2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.	2. Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.	2. Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.
3. Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.	3. With guidance and support from adults, focus on a topic, respond to questions and suggestions from peers, and add details to strengthen writing as needed	3. Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order, and provide a sense of closure
<i>Production and Distribution of Writing</i>		
4. (Begins in grade 3)	4. (Begins in grade 3)	4. (Begins in grade 3).
5. With guidance and support from adults, respond to questions and suggestions from peers and add details to strengthen writing as needed.	5. With guidance and support from adults, respond to questions and suggestions from peers and add details to strengthen writing as needed.	5. With guidance and support from adults and peers, focus on a topic and strengthen writing as needed by revising and editing.
6. With guidance and support from adults, explore a variety of digital tools to produce and publish writing, including in collaboration with peers.	6. With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.	6. With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

UNPACKED Writing Standards K–5 – cont.

Kindergartners:	Grade 1 students:	Grade 2 students:
<i>Research to Build and Present Knowledge</i>		
7. Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).	7. Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions).	7. Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).
8. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.	8. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.	8. Recall information from experiences or gather information from provided sources to answer a question.
9. (Begins in grade 4)	9. (Begins in grade 4)	9. (Begins in grade 4)
<i>Range of Writing</i>		
10. (Begins in grade 3)	10. (Begins in grade 3)	10. (Begins in grade 3).
<i>Responding to Literature</i>		
11. Create and/or present a poem, dramatization, art work, or personal response to a particular author or theme studied in class, with support as needed.	11. Create and present a poem, dramatization, art work, or personal response to a particular author or theme studied in class, with support as needed.	11. Create and present a poem, narrative, play, art work, or personal response to a particular author or theme studied in class, with support as needed.

UNPACKED Writing Standards K–5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Text Types and Purposes</i>		
<p>1. Write opinion pieces on topics or texts, supporting a point of view with reasons.</p> <ul style="list-style-type: none"> a. Introduce the topic or text they are writing about, state an opinion, and create an organizational structure that lists reasons. b. Provide reasons that support the opinion. c. Use linking words and phrases (e.g., because, therefore, since, for example) to connect opinion and reasons. d. Provide a concluding statement or section. 	<p>1. Write opinion pieces on topics or texts, supporting a point of view with reasons and information.</p> <ul style="list-style-type: none"> a. Introduce a topic or text clearly, state an opinion, and create an organizational structure in which related ideas are grouped to support the writer's purpose. b. Provide reasons that are supported by facts and details. c. Link opinion and reasons using words and phrases (e.g., for instance, in order to, in addition). d. Provide a concluding statement or section related to the opinion presented. 	<p>1. Write opinion pieces on topics or texts, supporting a point of view with reasons and information.</p> <ul style="list-style-type: none"> a. Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose. b. Provide logically ordered reasons that are supported by facts and details. c. Link opinion and reasons using words, phrases, and clauses (e.g., consequently, specifically). d. Provide a concluding statement or section related to the opinion presented.
<p>2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</p> <ul style="list-style-type: none"> a. Introduce a topic and group related information together; include illustrations when useful to aiding comprehension. b. Develop the topic with facts, definitions, and details. c. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information. c. Provide a concluding statement or section.. . 	<p>2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly</p> <ul style="list-style-type: none"> a. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension. b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. c. Link ideas within categories of information using words and phrases (e.g., another, for example, also, because). d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Provide a concluding statement or section related to the information or explanation presented. 	<p>2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</p> <ul style="list-style-type: none"> a. Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension. b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. c. Link ideas within and across categories of information using words, phrases, and clauses (e.g., in contrast, especially). d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Provide a concluding statement or section related to the information or explanation presented.

UNPACKED Writing Standards K–5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Text Types and Purposes</i>		
<p>3. Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.</p> <ul style="list-style-type: none"> a. Establish a situation and introduce a narrator and/or characters; organize an event sequence that unfolds naturally. b. Use dialogue and descriptions of actions, thoughts, and feelings to develop experiences and events or show the response of characters to situations. c. Use temporal words and phrases to signal event order. d. Provide a sense of closure. 	<p>3. Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.</p> <ul style="list-style-type: none"> a. Orient the reader by establishing a situation and introducing a narrator and/or characters; organize an event sequence that unfolds naturally. b. Use dialogue and description to develop experiences and events or show the responses of characters to situations. c. Use a variety of transitional words and phrases to manage the sequence of events. d. Use concrete words and phrases and sensory details to convey experiences and events precisely. e. Provide a conclusion that follows from the narrated experiences or events. 	<p>3. Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.</p> <ul style="list-style-type: none"> a. Orient the reader by establishing a situation and introducing a narrator and/or characters; organize an event sequence that unfolds naturally. b. Use narrative techniques, such as dialogue, description, and pacing, to develop experiences and events or show the responses of characters to situations. c. Use a variety of transitional words, phrases, and clauses to manage the sequence of events. d. Use concrete words and phrases and sensory details to convey experiences and events precisely. e. Provide a conclusion that follows from the narrated experiences or events.
<i>Production and Distribution of Writing</i>		
<p>4. With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose. (Grade-specific expectations for writing types are defined in standards 1–3 above.)</p>	<p>4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)</p>	<p>4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.) a. Produce text (print or nonprint) that explores a variety of cultures and perspectives.</p>

UNPACKED Writing Standards K–5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
5. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grade 3)	5. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grade 4.)	5. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grade 5.)
6. With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others.	6. With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.	6. With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.
<i>Research to Build and Present Knowledge</i>		
7. Conduct short research projects that build knowledge about a topic	7. Conduct short research projects that build knowledge through investigation of different aspects of a topic.	7. Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic
8. Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.	8. Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.	8. Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.
9. (Begins in grade 4)	9. Draw evidence from literary or informational texts to support analysis, reflection, and research. <ol style="list-style-type: none"> Apply grade 4 Reading standards to literature (e.g., “Describe in depth a character, setting, or event in a story or drama, drawing on specific details in the text [e.g., a character’s thoughts, words, or actions].”). Apply grade 4 Reading standards to informational texts (e.g., “Explain how an author uses reasons and evidence to support particular points in a text”). 	9. Draw evidence from literary or informational texts to support analysis, reflection, and research. <ol style="list-style-type: none"> Apply grade 5 Reading standards to literature (e.g., “Compare and contrast two or more characters, settings, or events in a story or a drama, drawing on specific details in the text [e.g., how characters interact]”). Apply grade 5 Reading standards to informational texts (e.g., “Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point[s]”).

UNPACKED Writing Standards K-5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Range of Writing</i>		
10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline- specific tasks, purposes, and audiences.	10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline specific tasks, purposes, and audiences.	10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline specific tasks, purposes, and audiences.
Responding to Literature		
11. Create and present a poem, narrative, play, art work, or personal response to a particular author or theme studied in class.	11. Create and present a poem, narrative, play, art work, or literary review in response to a particular author or theme studied in class	11. Create and present an original poem, narrative, play, art work, or literary critique in response to a particular author or theme studied in class a. . Recognize and illustrate social, historical, and cultural features in the presentation of literary texts.

College and Career Readiness Anchor Standards for Speaking and Listening

The K–5 standards for speaking and listening define what students should understand and be able to do by the end of each grade. They correspond to the College and Career Readiness (CCR) anchor standards below by number. The CCR and grade-specific standards are necessary complements—the former providing broad standards, the latter providing additional specificity—that together define the skills and understandings that all students must demonstrate.

Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

Presentation of Knowledge and Ideas

1. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
2. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
3. Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

UNPACKED Speaking and Listening Standards K-5

The following standards for K-5 offer a focus for instruction each year to help ensure that students gain adequate mastery of a range of skills and applications. Students advancing through the grades are expected to meet each year's grade-specific standards and retain or further develop skills and understandings mastered in preceding grades.

Kindergartners:	Grade 1 students:	Grade 2 students:
<i>Comprehension and Collaboration</i>		
1. Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups <ul style="list-style-type: none"> a. Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion). b. Continue a conversation through multiple exchanges. c. Seek to understand and communicate with individuals from different cultural backgrounds. 	1. Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. <ul style="list-style-type: none"> a. Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion). b. Build on others' talk in conversations by responding to the comments of others through multiple exchanges. c. Ask questions to clear up any confusion about the topics and texts under discussion. d. Seek to understand and communicate with individuals from different cultural backgrounds.. 	1. Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. <ul style="list-style-type: none"> a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). b. Build on others' talk in conversations by linking their comments to the remarks of others. c. Ask for clarification and further explanation as needed about the topics and texts under discussion. d. Seek to understand and communicate with individuals from different cultural backgrounds.
2. Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.	2. Ask and answer questions about key details in a text read aloud or information presented orally or through other media.	2. Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
3. Ask and answer questions in order to seek help, get information, or clarify something that is not understood.	3. Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.	3. Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

UNPACKED Speaking and Listening Standards K–5 – cont.

Kindergartners:	Grade 1 students:	Grade 2 students:
<i>Presentation of Knowledge and Ideas</i>		
4. Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.	4. Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.	4. Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.
5. Add drawings or other visual displays to descriptions as desired to provide additional detail.	5. Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.	5. Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.
6. Speak audibly and express thoughts, feelings, and ideas clearly.	6. Produce complete sentences when appropriate to task and situation.	6. Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification

UNPACKED Speaking and Listening Standards K–5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Comprehension and Collaboration</i>		
<p>1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.</p> <ul style="list-style-type: none"> a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). c. Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others. d. Explain their own ideas and understanding in light of the discussion. e. Seek to understand and communicate with individuals from different cultural backgrounds. 	<p>1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.</p> <ul style="list-style-type: none"> a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b. Follow agreed-upon rules for discussions and carry out assigned roles. c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others. d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion. e. Seek to understand and communicate with individuals from different perspectives and cultural backgrounds. 	<p>1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.</p> <ul style="list-style-type: none"> a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b. Follow agreed-upon rules for discussions and carry out assigned roles. c. Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others. d. Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions. e. Seek to understand and communicate with individuals from different perspectives and cultural backgrounds. f. Use their experience and their knowledge of language and logic, as well as culture, to think analytically, address problems creatively, and advocate persuasively.
<p>2. Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.</p>	<p>2. Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.</p>	<p>2. Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.</p>
<p>3. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.</p>	<p>3. Identify the reasons and evidence a speaker provides to support particular points.</p>	<p>3. Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.</p>

UNPACKED Speaking and Listening Standards K-5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Presentation of Knowledge and Ideas</i>		
4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.	4. Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.	4. Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
5. Create engaging audio recordings of stories or poems that demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.	5. Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.	5. Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
6. Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.	6. Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation.	6. Adapt speech to a variety of contexts and tasks, using formal English when appropriate to task and situation.

College and Career Readiness Anchor Standards for Language

The K–5 standards for language define what students should understand and be able to do by the end of each grade. They correspond to the College and Career Readiness (CCR) anchor standards below by number. The CCR and grade-specific standards are necessary complements—the former providing broad standards, the latter providing additional specificity—that together define the skills and understandings that all students must demonstrate.

Conventions of Standard English

1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Knowledge of Language

3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

Vocabulary Acquisition and Use

4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.
5. Demonstrate understanding of figurative language, word relationships and nuances in word meanings.
6. Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.

UNPACKED Language Standards K–5

The following standards for grades K–5 offer a focus for instruction each year to help ensure that students gain adequate mastery of a range of skills and applications. Students advancing through the grades are expected to meet each year's grade-specific standards and retain or further develop skills and understandings mastered in preceding grades. Beginning in grade 3, skills and understandings that are particularly likely to require continued attention in higher grades as they are applied to increasingly sophisticated writing and speaking are marked with an asterisk (*).

Kindergartners:	Grade 1 students:	Grade 2 students:
<i>Conventions of Standard English</i>		
<ol style="list-style-type: none">1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.<ol style="list-style-type: none">a. Print many upper- and lowercase letters.b. Use frequently occurring nouns and verbs.c. Form regular plural nouns orally by adding /s/ or /es/ (e.g., dog, dogs; wish, wishes).d. Understand and use question words (interrogatives) (e.g., who, what, where, when, why, how).e. Use the most frequently occurring prepositions (e.g., to, from, in, out, on, off, for, of, by, with).f. Produce and expand complete sentences in shared language activities.	<ol style="list-style-type: none">1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.<ol style="list-style-type: none">a. Print all upper- and lowercase letters.b. Use common, proper, and possessive nouns.c. Use singular and plural nouns with matching verbs in basic sentences (e.g., He hops; We hop).d. Use personal, possessive, and indefinite pronouns (e.g., I, me, my; they, them, their; anyone, everything).e. Use verbs to convey a sense of past, present, and future (e.g., Yesterday I walked home; Today I walk home; Tomorrow I will walk home).f. Use frequently occurring adjectives.g. Use frequently occurring conjunctions (e.g., and, but, or, so, because).h. Use determiners (e.g., articles, demonstratives).i. Use frequently occurring prepositions (e.g., during, beyond, toward).j. Produce and expand complete simple and compound declarative, interrogative, imperative, and exclamatory sentences in response to prompts	<ol style="list-style-type: none">1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.<ol style="list-style-type: none">a. Use collective nouns (e.g., group).b. Form and use frequently occurring irregular plural nouns (e.g., feet, children, teeth, mice, fish).c. Use reflexive pronouns (e.g., myself, ourselves).d. Form and use the past tense of frequently occurring irregular verbs (e.g., sat, hid, told).e. Use adjectives and adverbs, and choose between them depending on what is to be modified.f. Produce, expand, and rearrange complete simple and compound sentences (e.g., The boy watched the movie; The little boy watched the movie; The action movie was watched by the little boy).

UNPACKED Language Standards K–5 – cont.

Kindergartners:	Grade 1 students:	Grade 2 students:
<i>Conventions of Standard English</i>		
2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. <ol style="list-style-type: none">Capitalize the first word in a sentence and the pronoun I.Recognize and name end punctuation.Write a letter or letters for most consonant and shortvowel sounds (phonemes).Spell simple words phonetically, drawing on knowledge of sound-letter relationships.	2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. <ol style="list-style-type: none">Capitalize dates and names of people.Use end punctuation for sentences.Use commas in dates and to separate single words in a series.Use conventional spelling for words with common spelling patterns and for frequently occurring irregular words.Spell untaught words phonetically, drawing on phonemic awareness and spelling conventions.	2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. <ol style="list-style-type: none">Capitalize holidays, product names, and geographic names.Use commas in greetings and closings of letters.Use an apostrophe to form contractions and frequently occurring possessives.Generalize learned spelling patterns when writing words (e.g., cage → badge; boy → boil).Consult reference materials, including beginning dictionaries, as needed to check and correct spellings.
<i>Knowledge of Language</i>		
3. (Begins in grade 2)	3. (Begins in grade 2)	3. Use knowledge of language and its conventions when writing, speaking, reading, or listening. <ol style="list-style-type: none">. Compare formal and informal uses of English.

UNPACKED Language Standards K–5 – cont.

Kindergartners:	Grade 1 students:	Grade 2 students:
<i>Vocabulary Acquisition and Use</i>		
<p>4. Determine or clarify the meaning of unknown and</p> <ul style="list-style-type: none">a. multiple-meaning words and phrases based on kindergarten reading and content.b. Identify new meanings for familiar words and apply them accurately (e.g., knowing duck is a bird and learning the verb to duck).c. Use the most frequently occurring inflections and affixes (e.g., -ed, -s, re-, un-, pre-, -ful, -less) as a clue to the meaning of an unknown word.	<p>4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 1 reading and content, choosing flexibly from an array of strategies.</p> <ul style="list-style-type: none">a. Use sentence-level context as a clue to the meaning of a word or phrase.b. Use frequently occurring affixes as a clue to the meaning of a word.c. Identify frequently occurring root words (e.g., look) and their inflectional forms (e.g., looks, looked, looking).	<p>4. Determine or clarify the meaning of unknown and multiple meaning words and phrases based on grade 2 reading and content, choosing flexibly from an array of strategies.</p> <ul style="list-style-type: none">a. Use sentence-level context as a clue to the meaning of a word or phrase.b. Determine the meaning of the new word formed when a known prefix is added to a known word (e.g., happy/unhappy, tell/retell).c. Use a known root word as a clue to the meaning of an unknown word with the same root (e.g., addition, additional).d. Use knowledge of the meaning of individual words to predict the meaning of compound words (e.g., birdhouse, lighthouse, housefly; bookshelf, notebook, bookmark).e. Use glossaries and beginning dictionaries, both print and digital, to determine or clarify the meaning of words and phrases.

UNPACKED Language Standards K–5 – cont.

Kindergartners:	Grade 1 students:	Grade 2 students:
<i>Vocabulary Acquisition and Use</i>		
<p>5. With guidance and support from adults, explore word relationships and nuances in word meanings.</p> <ul style="list-style-type: none"> a. Sort common objects into categories (e.g., shapes, foods) to gain a sense of the concepts the categories represent. b. Demonstrate understanding of frequently occurring verbs and adjectives by relating them to their opposites (antonyms). c. Identify real-life connections between words and their use (e.g., note places at school that are colorful). d. Distinguish shades of meaning among verbs describing the same general action (e.g., walk, march, strut, prance) by acting out the meanings. 	<p>5. With guidance and support from adults, demonstrate understanding of word relationships and nuances in word meanings.</p> <ul style="list-style-type: none"> a. Sort words into categories (e.g., colors, clothing) to gain a sense of the concepts the categories represent. b. Define words by category and by one or more key attributes (e.g., a duck is a bird that swims; a tiger is a large cat with stripes). c. Identify real-life connections between words and their use (e.g., note places at home that are cozy). d. Distinguish shades of meaning among verbs differing in manner (e.g., look, peek, glance, stare, glare, scowl) and adjectives differing in intensity (e.g., large, gigantic) by defining or choosing them or by acting out the meanings. 	<p>5. Demonstrate understanding of word relationships and nuances in word meanings.</p> <ul style="list-style-type: none"> a. Identify real-life connections between words and their use (e.g., describe foods that are spicy or juicy). b. Distinguish shades of meaning among closely related verbs (e.g., toss, throw, hurl) and closely related adjectives (e.g., thin, slender, skinny, scrawny).
<p>6. Use words and phrases acquired through conversations, reading and being read to, and responding to texts</p>	<p>6. Use words and phrases acquired through conversations, reading and being read to, and responding to texts, including using frequently occurring conjunctions to signal simple relationships (e.g., because).</p>	<p>6. Use words and phrases acquired through conversations, reading and being read to, and responding to texts, including using adjectives and adverbs to describe (e.g., When other kids are happy that makes me happy).</p>

UNPACKED Language Standards K–5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Conventions of Standard English</i>		
<p>1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.</p> <ul style="list-style-type: none"> a. Explain the function of nouns, pronouns, verbs, adjectives, and adverbs in general and their functions in particular sentences. b. Form and use regular and irregular plural nouns. c. Use abstract nouns (e.g., childhood). d. Form and use regular and irregular verbs. e. Form and use the simple (e.g., I walked; I walk; I will walk) verb tenses. f. Ensure subject-verb and pronoun-antecedent agreement.* g. Form and use comparative and superlative adjectives and adverbs, and choose between them depending on what is to be modified. h. Use coordinating and subordinating conjunctions. i. Produce simple, compound, and complex sentences. 	<p>1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.</p> <ul style="list-style-type: none"> a. Use relative pronouns (who, whose, whom, which, that) and relative adverbs (where, when, why). b. Form and use the progressive (e.g., I was walking; I am walking; I will be walking) verb tenses. c. Use modal auxiliaries (e.g., can, may, must) to convey various conditions. d. Order adjectives within sentences according to conventional patterns (e.g., a small red bag rather than a red small bag). e. Form and use prepositional phrases. f. Produce complete sentences, recognizing and correcting inappropriate fragments and run-ons.* g. Correctly use frequently confused words (e.g., to, too, two; there, their).* 	<p>1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.</p> <ul style="list-style-type: none"> a. Explain the function of conjunctions, prepositions, and interjections in general and their function in particular sentences. b. Form and use the perfect (e.g., I had walked; I have walked; I will have walked) verb tenses. c. Use verb tense to convey various times, sequences, states, and conditions. d. Recognize and correct inappropriate shifts in verb tense.* e. Use correlative conjunctions (e.g., either/or, neither/nor).

UNPACKED Language Standards K–5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Conventions of Standard English</i>		
<p>2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.</p> <ul style="list-style-type: none"> a. Capitalize appropriate words in titles. b. Use commas in addresses. c. Use commas and quotation marks in dialogue. d. Form and use possessives. e. Use conventional spelling for high-frequency and other studied words and for adding suffixes to base words (e.g., sitting, smiled, cries, happiness). f. Use spelling patterns and generalizations (e.g., word families, position-based spellings, syllable patterns, ending rules, meaningful word parts) in writing words. g. Consult reference materials, including beginning dictionaries, as needed to check and correct spellings. 	<p>2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.</p> <ul style="list-style-type: none"> a. Use correct capitalization. b. Use commas and quotation marks to mark direct speech and quotations from a text. c. Use a comma before a coordinating conjunction in a compound sentence. d. Spell grade-appropriate words correctly, consulting references as needed. 	<p>2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.</p> <ul style="list-style-type: none"> a. Use punctuation to separate items in a series.* b. Use a comma to separate an introductory element from the rest of the sentence. c. Use a comma to set off the words yes and no (e.g., Yes, thank you), to set off a tag question from the rest of the sentence (e.g., It's true, isn't it?), and to indicate direct address (e.g., Is that you, Steve?). d. Use underlining, quotation marks, or italics to indicate titles of works. e. Spell grade-appropriate words correctly, consulting references as needed.
<i>Knowledge of Language</i>		
<p>3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.</p> <ul style="list-style-type: none"> a. Choose words and phrases for effect.* b. Recognize and observe differences between the conventions of spoken and written standard English. 	<p>3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.</p> <ul style="list-style-type: none"> a. Choose words and phrases to convey ideas precisely.* b. Choose punctuation for effect.* c. Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion). 	<p>3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.</p> <ul style="list-style-type: none"> a. Expand, combine, and reduce sentences for meaning, reader/listener interest, and style. b. Compare and contrast the varieties of English (e.g., dialects, registers) used in stories, dramas, or poems

UNPACKED Language Standards K–5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Vocabulary Acquisition and Use</i>		
<p>4. Determine or clarify the meaning of unknown and multiple meaning word and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.</p> <ul style="list-style-type: none"> a. Use sentence-level context as a clue to the meaning of a word or phrase. b. Determine the meaning of the new word formed when a known affix is added to a known word (e.g., c. agreeable/disagreeable, comfortable/uncomfortable, d. care/careless, heat/preheat). e. Use a known root word as a clue to the meaning of an unknown word with the same root (e.g., company, companion). f. Use glossaries or beginning dictionaries, both print and digital, to determine or clarify the precise meaning of key words and phrases. 	<p>4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.</p> <ul style="list-style-type: none"> a. Use context (e.g., definitions, examples, or restatements in text) as a clue to the meaning of a word or phrase. b. Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., telegraph, photograph, autograph). c. Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases. 	<p>4. Determine or clarify the meaning of unknown and multiple meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.</p> <ul style="list-style-type: none"> a. Use context (e.g., cause/effect relationships and comparisons in text) as a clue to the meaning of a word or phrase. b. Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., photograph, photosynthesis). c. Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.
<p>5. Demonstrate understanding of word relationships and nuances in word meanings.</p> <ul style="list-style-type: none"> a. Distinguish the literal and nonliteral meanings of words and phrases in context (e.g., take steps). b. Identify real-life connections between words and their use (e.g., describe people who are friendly or helpful). c. Distinguish shades of meaning among related words that describe states of mind or degrees of certainty (e.g., knew, believed, suspected, heard, wondered). 	<p>5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.</p> <ul style="list-style-type: none"> a. Explain the meaning of simple similes and metaphors (e.g., as pretty as a picture) in context. b. Recognize and explain the meaning of common idioms, adages, and proverbs. c. Demonstrate understanding of words by relating them to their opposites (antonyms) and to words with similar but not identical meanings (synonyms). 	<p>5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.</p> <ul style="list-style-type: none"> a. Interpret figurative language, including similes and metaphors, in context. b. Recognize and explain the meaning of common idioms, adages, and proverbs. c. Use the relationship between particular words (e.g., synonyms, antonyms, homographs) to better understand each of the words.

UNPACKED Language Standards K–5 – cont.

Grade 3 Students:	Grade 4 students:	Grade 5 students:
<i>Vocabulary Acquisition and Use</i>		
6. Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and temporal relationships (e.g., After dinner that night we went looking for them).	6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., quizzed, whined, stammered) and that are basic to a particular topic (e.g., wildlife, conservation, and endangered when discussing animal preservation).	6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).

Standard 10: Range, Quality, and Complexity of Student Reading K–5

Measuring Text Complexity: Three Factors

- Qualitative evaluation of the text: Levels of meaning, structure, language conventionality and clarity, and knowledge demands
- Quantitative evaluation of the text: Readability measures and other scores of text complexity
- Matching reader to text and task: Reader variables (such as motivation, knowledge, and experiences) and task variables (such as purpose and the complexity generated by the task assigned and the questions posed)

Range of Text Types for K–5

Students in K–5 apply the Reading standards to the following range of text types, with texts selected from a broad range of cultures and periods

Literature		Informational Text	
Stories	Dramas	Poetry	Literary Nonfiction and Historical, Scientific, and Technical Texts
Includes children's adventure stories, folktales, legends, fables, fantasy, realistic fiction, and myth	Includes staged dialogue and brief familiar scenes	Includes nursery rhymes and the subgenres of the narrative poem, limerick, and free verse poem	Includes biographies and autobiographies; books about history, social studies, science, and the arts; technical texts, including directions, forms, and information displayed in graphs, charts, or maps; and digital sources on a range of topics

Texts Illustrating the Complexity, Quality, and Range of Student Reading K-5 (EXAMPLES)

Grades	Literature: Stories, Drama, Poetry	Informational Texts: Literary Nonfiction and Historical, Scientific, and Technical Texts
K ¹	<ul style="list-style-type: none"> ▪ Over in the Meadow by John Langstaff (traditional) (c1800)* ▪ A Boy, a Dog, and a Frog by Mercer Mayer (1967) ▪ A Story, A Story by Gail E. Haley (1970)* ▪ Pancakes for Breakfast by Tomie DePaola (1978) ▪ Kitten's First Full Moon by Kevin Henkes (2004)* 	<ul style="list-style-type: none"> ▪ My Five Senses by Aliki (1962)** ▪ Truck by Donald Crews (1980) ▪ I Read Signs by Tana Hoban (1987) ▪ What Do You Do With a Tail Like This? by Steve Jenkins and Robin Page (2003)* ▪ Amazing Whales! by Sarah L. Thomson (2005)*
1 ¹	<ul style="list-style-type: none"> ▪ "Mix a Pancake" by Christina G. Rossetti (1893)** ▪ Mr. Popper's Penguins by Richard Atwater (1938)* ▪ Little Bear by Else Holmelund Minarik, illustrated by Maurice Sendak (1957)** ▪ Frog and Toad Together by Arnold Lobel (1971)** ▪ Hi! Fly Guy by Tedd Arnold (2006) 	<ul style="list-style-type: none"> ▪ A Tree Is a Plant by Clyde Robert Bulla, illustrated by Stacey Schuett (1960)** ▪ Starfish by Edith Thacher Hurd (1962) ▪ Follow the Water from Brook to Ocean by Arthur Dorros (1991)** ▪ From Seed to Pumpkin by Wendy Pfeffer, illustrated by James Graham Hale (2004)* ▪ How People Learned to Fly by Fran Hodgkins and True Kelley (2007)*
2-3	<ul style="list-style-type: none"> ▪ "Who Has Seen the Wind?" by Christina G. Rossetti (1893) ▪ Charlotte's Web by E. B. White (1952)* ▪ Sarah, Plain and Tall by Patricia MacLachlan (1985) ▪ Tops and Bottoms by Janet Stevens (1995) ▪ Poppleton in Winter by Cynthia Rylant, illustrated by Mark Teague (2001) 	<ul style="list-style-type: none"> ▪ A Medieval Feast by Aliki (1983) ▪ From Seed to Plant by Gail Gibbons (1991) ▪ The Story of Ruby Bridges by Robert Coles (1995)* ▪ A Drop of Water: A Book of Science and Wonder by Walter Wick (1997) ▪ Moonshot: The Flight of Apollo 11 by Brian Floca (2009)
4-5	<ul style="list-style-type: none"> ▪ Alice's Adventures in Wonderland by Lewis Carroll (1865) ▪ "Casey at the Bat" by Ernest Lawrence Thayer (1888) ▪ The Black Stallion by Walter Farley (1941) ▪ "Zlateh the Goat" by Isaac Bashevis Singer (1984) ▪ Where the Mountain Meets the Moon by Grace Lin (2009) 	<ul style="list-style-type: none"> ▪ Discovering Mars: The Amazing Story of the Red Planet by Melvin Berger (1992) ▪ Hurricanes: Earth's Mightiest Storms by Patricia Lauber (1996) ▪ A History of US by Joy Hakim (2005) ▪ Horses by Seymour Simon (2006) ▪ Quest for the Tree Kangaroo: An Expedition to the Cloud Forest of New Guinea by Sy Montgomery (2006)

* Read-aloud ** Read-along

1 Children at the kindergarten and grade 1 levels should be expected to read texts independently that have been specifically written to correlate to their reading level and their word knowledge. Many of the titles listed above are meant to supplement carefully structured independent reading with books to read along with a teacher or that are read aloud to students to build knowledge and cultivate a joy in reading.

New York State English Language Arts Curriculum

Grades Prek-2 broken into two strands:

- **Listening and Learning Strand** - consists of a series of read-alouds organized by topics (called domains), many of which are informational in nature. The goal of the Listening and Learning Strand is for students to acquire language competence through listening, specifically building a rich vocabulary, and broad knowledge in history and science by being exposed to carefully selected, sequenced, and coherent read-alouds.
- **Skills Strand** - teaches the mechanics of reading—students are taught systematic and explicit phonics instruction as their primary tool for decoding written English. By the end of grade 2, students have learned all of the sound-spelling correspondences in the English language and are able to decode written material they encounter. In addition to phonics, students also are taught spelling, grammar, and writing during the Skills Strand.

The two strands are taught separately, but complement each other, building the requisite decoding and comprehension skills that comprise fluent, mature reading. The teaching of the two strands, however, need not be correlated; i.e., educators may provide instruction and practice in a given unit of the skills strand as needed, while moving on to new topics and anthologies in the Listening and Learning Strand.

Grades 3-12:

- Curricula includes six modules that focus on reading, writing, listening, and speaking in response to high-quality texts. Each module is intended to last a quarter of a school year; the addition of two extra modules allows for teacher choice throughout the year.
- Modules will sequence and scaffold content that is aligned to the CCLS for ELA & Literacy and the PARCC Frameworks.
- Each module will culminate in an end-of-module performance task, aligned to the PARCC Frameworks, which can provide information to educators on whether students in their classrooms are achieving the standards.
- Modules may include several units and each unit may include a set of sequenced, coherent progressions of learning experiences that build knowledge and understanding of major concepts.
- Include daily lesson plans, guiding questions, recommended texts, scaffolding strategies, examples of proficient student work, and other classroom resources.

SAMPLE PLANS

Successful readers develop good reading strategies that help them read fluently and to read for meaning. In kindergarten through fifth grade classrooms, effective habits of literacy begin to be developed through the adapted implementation of the NYS Common Core Curriculum Units. This guidebook serves to communicate how these pieces can work together to help students develop habits of literacy that will support their learning as they engage in a rigorous instructional program that is more closely aligned to the CCLS

ALIGNED TO COMMON CORE

Kindergarten Sample Plan for Teachers**Grade Kindergarten: Unit 2, Lesson 1****My Senses Are Amazing: What Are the Five Senses?****Long-Term Targets:**

- I can participate in a conversation of four to five turns with my peers and adults. (SL.K.1)
- I can ask and answer questions about a read aloud. (SL. K. 3)

Big Ideas for the Unit:

- Readers will follow Protocols to work together in small and whole group settings.
- Readers will ask and answer questions about a read aloud.
- Readers will practice daily the routines and expectations for in school reading and out of school reading.
- Readers will take responsibility for their own learning.
- Readers will share ideas about read alouds.
- Readers will respond to read alouds orally and through drawing.
- Readers will use strategies to make meaning of read alouds.

In addition to required assessments, readers' progress can be evaluated by using any of the following available assessments: Teacher observation.

Literacy Components	Teaching Points	Differentiation
Phonics Word Study <ul style="list-style-type: none">• Phonemic Awareness		
Vocabulary Practice Define/Example/Ask Routine Vocabulary Strategies	Words: amazing, harm, sight, smell, taste, touch	Provide nonlinguistic symbols

Build Student Interest	Five photos demonstrating senses	
Comprehension Skills and Strategies <ul style="list-style-type: none">• Pair and whole group discussion	<ul style="list-style-type: none">• Answer in complete sentences• Use new vocabulary	Model Think Aloud Strategy; Anchor chart with pictures of senses
Writing <ul style="list-style-type: none">• Review Good Writing Habits• Match drawing to pictures	Draw pictures to match senses (saw , heard, smelled, and felt)	Provide pictures to match to senses
Protocols <ul style="list-style-type: none">• Review protocols	Think-Pair-Share	
Closing: <ul style="list-style-type: none">• Review of learning targets	Think/Pair /Share Respond to questions	
Additional Teaching Points to address throughout the Unit: Routines for in school and out of school reading <ul style="list-style-type: none">• Choosing and reading appropriate level books• Engaging in independent and partner reading• Actively listen and follow along during first readings of read alouds.• Actively listen to read-alouds		

Grade 1 Sample Plan for Teachers**Grade 1: Unit 1, Lesson 1****Different Lands, Similar Stories: Classic Folktales****Language Arts Objectives:**

- I can carry on and participate in a conversation over at least six turns, staying on topic with my peers and adults. (SL.1.1)
- I can ask and answer questions about the read aloud.(SL. 2)

Big Ideas for the Unit:

- Readers will follow Protocols to work together and respond in group settings.
- Readers will ask and answer questions about a read aloud.
- Readers will practice daily the routines and expectations for in school reading and out of school reading.
- Readers will take responsibility for their own learning.
- Readers will share ideas about text.
- Readers will respond to text orally or in writing.
- Readers will use strategies to make meaning of text.

In addition to required assessments, readers' progress can be evaluated by using any of the following available assessments: Sequencing story and teacher observation.

Literacy Components	Teaching Points	Differentiation
Phonics Word Study <ul style="list-style-type: none">• Review Letters/Sounds		
Vocabulary Practice Define/Example/Ask Routine Vocabulary Strategies	Words: cherished, (p.2), delay, sly(p. 5), gratitude (p.29), anxious (p.18)	Provide nonlinguistic symbols
Build Student Interest	Show book covers for the versions of Little Red Riding Hood	

Comprehension Skills and Strategies <ul style="list-style-type: none">• Pair and whole group• Close Reading/Listening of text• Discussion	Use of complete sentences Use of new vocabulary	Modeling Think Aloud Strategy;
Writing <ul style="list-style-type: none">• Review Good Writing Habits• Review Left to Right	Draw something that is cherished and write sentence to describe (p.10); Sequence illustrations/Story sentences (p.11);	
Protocols <ul style="list-style-type: none">• Review protocols	Think-Pair-Share Active Listening	
Closing: <ul style="list-style-type: none">• Review of learning targets.	Respond to questions in complete sentences	
Additional Teaching Points to address throughout the Unit: Routines for in school and out of school reading <ul style="list-style-type: none">• Choosing and reading appropriate level books• Engaging in independent and partner reading• Actively listen and follow along during first close readings or read alouds.		

Grade 2 Sample Plan for Teachers**Grade 2: Unit 1, Lesson 1****Susan B. Anthony: Fighter for Freedom and Equality****Language Arts Objectives:**

- I can carry on and participate in a conversation over at least six turns, staying on topic initiating comments or responding to a partner's comments, with my peers and adults. (L.2.3)
- I can make predictions prior to and during a read aloud, based on the title, pictures, and/or text, and then compare the actual outcomes to predictions. (L.2.12)

Big Ideas for the Unit:

- Readers will follow Protocols to work together and respond in group settings.
- Readers will ask and answer questions about a read aloud.
- Readers will practice daily the routines and expectations for in school reading and out of school reading.
- Readers will take responsibility for their own learning.
- Readers will share ideas about text.
- Readers will respond to text orally or in writing.
- Readers will use strategies to make meaning of text.

In addition to required assessments, readers' progress can be evaluated by using any of the following available assessments: Teacher observation.

Literacy Components	Teaching Points	Differentiation
Phonics Word Study <ul style="list-style-type: none">• Review Letters/Sounds		
Vocabulary Practice Define/Example/Ask Routine Vocabulary Strategies	Words: equal rights (p.3), movement (p.13), petition (p.17); vote (p.20); women's rights (p.18)	Provide nonlinguistic symbols
Build Student Interest	Introduce book and give brief background of Susan B. Anthony (Rochester history).	

Comprehension Skills and Strategies <ul style="list-style-type: none">• Make Predictions• Pair and whole group discussion• Close Reading/Listening of text	Review Predictions Use of complete sentences Use of new vocabulary	Modeling Think Aloud Strategy;
Writing <ul style="list-style-type: none">• Review Good Writing Habits		
Protocols <ul style="list-style-type: none">• Review protocols	Think-Pair-Share Active Listening	
Closing: <ul style="list-style-type: none">• Review of core content objectives.	Respond to questions in complete sentences	
Additional Teaching Points to address throughout the Unit: Routines for in school and out of school reading <ul style="list-style-type: none">• Choosing and reading appropriate level books• Engaging in independent and partner reading• Actively listen and follow along during first close readings or read alouds.		

Grade 3 Sample Plan for Teachers

Grade 3: Unit 1, Lesson 1		
Talking with My Peers: Carousel of Reading Superheroes around the World		
Long-Term Targets:		
Literacy Components	Teaching Points	Differentiation
Phonics Word Study <ul style="list-style-type: none"> • Six Syllable Types • Multisyllabic Word Strategies 		
Vocabulary Practice Define/Example/Ask Routine Vocabulary Strategies	Words: question, conversation, power(p.1); notice, wonder, norms, record, details (p.2); quote (p.5)	Provide nonlinguistic symbols
Review of Genres/Story Structure		
Comprehension Skills and Strategies <ul style="list-style-type: none"> • Use of T-Chart to organize thinking • Pair and whole group discussion 	I Notice – I Wonder	Effective Grouping; Anchor chart of Question words
Writing <ul style="list-style-type: none"> • Review Good Writing Habits • Formulate questions that will clarify text 	Read quotes and write questions about text	
Protocols <ul style="list-style-type: none"> • Review protocols from Appendix 1 	Think-Pair-Share Carousel	

Closing: <ul style="list-style-type: none">• Group share of main ideas for unit based on what was seen and read.<ul style="list-style-type: none">○ Module Guiding Questions	<ul style="list-style-type: none">• How do people around the world access reading and books?• How does reading give us power?	Post sentence frames Clarify the term “power” in context Model Exit Ticket
Additional Teaching Points to address throughout the Unit: <p>Routines for in school and out of school reading</p> <ul style="list-style-type: none">• Choosing and reading appropriate level books• Engaging in independent and partner reading• Actively listen to read-alouds		

Grade 4 Sample Plan for Teachers**Grade 4: Unit 1, Lesson 1****Launching the Mystery: What's That Symbol?****Long-Term Targets:**

- I can explain what a text says using specific details from the text. (RI.4.1)
- I can engage effectively in a collaborative discussion.(SL.4.4)

Big Ideas for the Unit:

- Readers will follow Protocols to work together and respond in group settings.
- Readers will ask and answer questions about a text.
- Readers will practice daily the routines and expectations for in school reading and out of school reading.
- Readers will take responsibility for their own learning.
- Readers will share ideas about text.
- Readers will respond to text through writing.
- Readers will use strategies to make meaning of text.

In addition to required assessments, readers' progress can be evaluated by using any of the following available assessments: Development and use of graphic organizers and teacher observation.

Literacy Components	Teaching Points	Differentiation
Phonics Word Study <ul style="list-style-type: none"> • Six Syllable Types • Multisyllabic Word Strategies 		
Vocabulary Practice Define/Example/Ask Routine Vocabulary Strategies	Words: details, contribute, discussion, notice, wonder (p.3), constitution (p.5), confederacy, rivals, miracle, “set about”, vanished(p.6), warring, suspicious, wampum, Iroquois, nations, symbolized, Haudenosaunee (video)	Provide nonlinguistic symbols (p.11)
Build Student Interest	Video “The Iroquois Confederacy”	Use English subtitles;

<p>Comprehension Skills and Strategies</p> <ul style="list-style-type: none"> • Use of 'note-catcher' to organize thinking • Pair and whole group discussion – record answers • Close Reading of text • Discussion 	<p>I Notice – I Wonder</p>	<p>Modeling; Scaffolded chart (p.13); Draw instead of write answers; provide sentence starters for Think-Pair-Share (p.14)</p>
<p>Writing</p> <ul style="list-style-type: none"> • Review Good Writing Habits • Use and develop graphic organizer to keep ideas organized. 	<p>Complete graphic organizer</p>	
<p>Protocols</p> <ul style="list-style-type: none"> • Review protocols from Appendix 1 	<p>Think-Pair-Share Cold Call Fist to Five</p>	
<p>Closing:</p> <ul style="list-style-type: none"> • Review of learning targets. 	<p>Fist to Five</p>	
<p>Additional Teaching Points to address throughout the Unit:</p> <p>Routines for in school and out of school reading</p> <ul style="list-style-type: none"> • Choosing and reading appropriate level books • Engaging in independent and partner reading • Actively listen and follow along during first close readings. • Provide information on database found at www.novelnewyork.org 		

Grade 5 Sample Plan for Teachers**Grade 5: Unit 1, Lesson 1****Building Background Knowledge on Human Rights: Close Reading of Article 1 of the Universal Declaration of Human Rights (UDHR)****Long-Term Targets:**

- I can effectively engage in a discussion with my peers. (SL.5.1)
- I can summarize portions of a text when reading or listening to information being presented. (SL.5.2)
- I can determine the meaning of content words or phrases in an informational text. (RI.4)

Big Ideas for the Unit:

- Readers will follow Protocols to work together and respond in group settings.
- Readers will ask and answer questions about a text.
- Readers will practice daily the routines and expectations for in school reading and out of school reading.
- Readers will take responsibility for their own learning.
- Readers will share ideas about text.
- Readers will respond to text through writing.
- Readers will use strategies to make meaning of text.

In addition to required assessments, readers' progress can be evaluated by using any of the following available assessments: Vocabulary notebooks, exit tickets and teacher observation.

Literacy Components	Teaching Points	Differentiation
Phonics Word Study <ul style="list-style-type: none">• Six Syllable Types• Multisyllabic Word Strategies		
Vocabulary Vocabulary Strategies Vocabulary Notebooks	Words: first, struggle, compliment, group (p.1), follow, participate, define(p.3), criteria, skills, rights (p.5), define, summarize, primary sources(p.4), United Nations Frayer Model (p.8, 18)	Allow students to draw pictures to represent words (p.3) Frayer Model (p.19)

Build Student Interest	Define “Human Rights”	Partner ELL student with student who speaks L1
Comprehension Skills and Strategies <ul style="list-style-type: none"> • Text Structure Review • Small group discussion – record answers on anchor chart • Close Reading of text • Paraphrase • Discussion • Use of note-catcher 	Universal Declaration of Human Rights (UDHR) Turn and Talk “Close Readers Do These Things” anchor chart	Provide in L1(p.4); Narrow the number of focus questions; Use vocabulary in context; Limit writing – encourage discussion, drawing
Fluency <ul style="list-style-type: none"> • Multiple reading of text 	Read aloud Article 1	
Writing <ul style="list-style-type: none"> • Review Good Writing Habits • Use graphic organizer to keep ideas organized. 	Complete graphic organizer	Provide non-linguistic representations (p.7, p. 21)
Protocols <ul style="list-style-type: none"> • Review protocols from Appendix 1 	Group Norms Fist to Five	
Closing: <ul style="list-style-type: none"> • Exit ticket. 	“Human rights are”	Provide written learning targets (p.20)
Additional Teaching Points to address throughout the Unit:		
<p>Routines for in school and out of school reading</p> <ul style="list-style-type: none"> • Choosing and reading appropriate level books • Engaging in independent and partner reading • Actively listen and follow along during first close readings. 		

Mathematics

Core Instructional

Program

Elementary Mathematics and Core Program

Providing high quality, highly effective instruction and equal access to academic opportunities is the most important service we can provide our students. Ensuring that all students have comparable academic programming options will be the primary driver for many of the programmatic changes for the 14 -15 school year. As the district continues to build an infrastructure that better supports all schools, we will realize the promise of offering engaging instructional opportunities via rigorous curriculum and content and consistent academic programming for every child, in every classroom, every day.

Core Mathematics Curriculum

Teachers in Grade K-5 will use the ADAPTED Common Core Curriculum Units as a base for our work. We aimed to significantly narrow and deepen the scope and content of how time and energy is spent in the math classroom. This increased focus allows each student to think, practice, and integrate each new idea into a growing structure. As teachers plan they should account for the following lesson components and instructional shifts.

Fluency:

The Common Core Learning Standards explicitly call for fast and accurate computation. Fluency is best addressed through short daily routines such as timed fact test, mental math exercises and Number Talks. Students in the elementary grades should spend approximately 25 minutes a week practicing the following crucial fluencies. The table to the right is the end of year fluency expectations required by the Common Core Learning Standards. Teachers are encouraged to identify additional fluencies that will aid in mastery of the standards.

Grade	Required Fluency	Key Area of Focus
K	Add/subtract within 5	Addition and subtraction – concepts, skills, and problem solving
1	Add/subtract within 10	
2	Add/subtract within 20 Add/subtract within 100 (paper and pencil)	
3	Multiply/divide within 100 Add/subtract within 1,000 (paper and pencil)	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
4	Add/subtract within 1,000,000	
5	Multi-digit multiplication	

Conceptual Understanding:

Teachers must support the development of deep conceptual understanding, not just algorithms and answer-getting, in their students. Class time should be structured to support students' ability to access concepts from a number of perspectives. Teachers are encouraged to use a variety of instructional strategies to build mathematical knowledge so students see math as more than a set of discrete procedures. Teacher should spend the majority of class time – approximately 150 minutes a week – developing conceptual understanding.

Application:

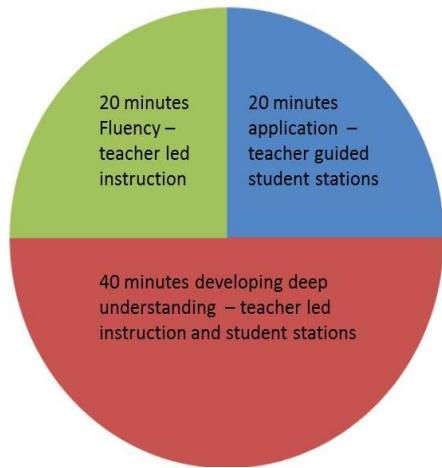
Students demonstrate deep conceptual understanding of core math concepts by applying them to new situations. Teachers must devote time for students to use math and choose the appropriate procedure for application without prompting. Mathematics classes should establish a connection between math and the real world. Solving problems in context is what will build strong mathematicians. Students should spend 50 minutes a week applying the math they've learned.

APW Mathematics
Recommended Instructional Diets
Grades K-5

The Mathematics recommended instructional diets depicted below are designed to:

- 1) Illustrate the requirement for dedicated instructional time in all of the key components of fluency, deep understanding and application (as defined in the Common Core Learning Standards),
- 2) Provide recommendations regarding the relative instructional time/focus for each component, and
- 3) Communicate key concepts in each grade level that require instructional emphasis.

The instructional diets below are *not intended to be rigid time frames*, but are research-based, grade level appropriate components of mathematics that should be used to guide planning and delivery of instruction. (Highlighting indicates key fluencies for the grade level.)

Approximate Instructional Minutes per Day K-5**Approximate Instructional Minutes per Day:**

20 minutes Fluency – teacher led instruction

40 minutes developing deep understanding - teacher led instruction and student stations

20 minutes application- teacher guided student stations

Kindergarten Instructional Diet

- Key Concept: Representing and comparing whole numbers, including using sets of objects

Grade 1 Instructional Diet

- Key Concepts: Developing understanding of addition and subtraction and strategies within 20, including developing understanding of place value

Grade 2 Instructional Diet

- Key Concepts: Developing fluency of addition and subtraction, including extending understanding of place value

Grade 3 Instructional Diet

- Key Understandings: Developing understanding of multiplication and division and strategies within 100, also developing understanding of fractions

Grade 4 Instructional Diet

- Key Understanding: Developing fluency of multi-digit multiplication and developing understanding of dividing to find quotients involving multi-digit dividends, also developing understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; developing understanding of geometric properties

Grade 5 Instructional Diet

- Key Understanding: Developing fluency of addition and subtraction of fractions, also developing understanding of multiplication and division of fractions, including decimals to one-hundredth

Grade 6 Instructional Diet

- Key Understanding: connecting ratio and rate; using concepts of ratio and rate to solve problems; completing understanding of division of fractions and extending the notion of number to the system of rational numbers

Standards for Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council’s report Adding It Up: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one’s own efficacy).

1. Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

2. Reason abstractly and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

Standards for Mathematical Practice – cont.**3. Construct viable arguments and critique the reasoning of others.**

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

4. Model with mathematics.

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5. Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge.

Standards for Mathematical Practice – cont.

When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

6. Attend to precision.

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

7. Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y .

Standards for Mathematical Practice – cont.**8. Look for and express regularity in repeated reasoning.**

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

How to Read the Grade Level Standards

Standards define what students should understand and be able to do.

Clusters summarize groups of related standards. Note that standards from different clusters may sometimes be closely related, because mathematics is a connected subject.

Domains are larger groups of related standards. Standards from different domains may sometimes be closely related

These Standards do not dictate curriculum or teaching methods. For example, just because topic A appears before topic B in the standards for a given grade, it does not necessarily mean that topic A must be taught before topic B. A teacher might prefer to teach topic B before topic A, or might choose to highlight connections by teaching topic A and topic B at the same time. Or, a teacher might prefer to teach a topic of his or her own choosing that leads, as a byproduct, to students reaching the standards for topics A and B.

What students can learn at any particular grade level depends upon what they have learned before. Ideally then, each standard in this document might have been phrased in the form, “Students who already know A should next come to learn B.” But at present this approach is unrealistic—not least because existing education research cannot specify all such learning pathways. Of necessity therefore, grade placements for specific topics have been made on the basis of state and international comparisons and the collective experience and collective professional judgment of educators, researchers and mathematicians. One promise of common state standards is that over time they will allow research on learning progressions to inform and improve the design of standards to a much greater extent than is possible today. Learning opportunities will continue to vary across schools and school systems, and educators should make every effort to meet the needs of individual students based on their current understanding.

Kindergarten Mathematics – Unpacked Standards

In Kindergarten, instructional time should focus on two critical areas: (1) representing and comparing whole numbers, initially with sets of objects; (2) describing shapes and space. More learning time in Kindergarten should be devoted to number than to other topics.

1. Students use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set; counting out a given number of objects; comparing sets or numerals; and modeling simple joining and separating situations with sets of objects, or eventually with equations such as $5 + 2 = 7$ and $7 - 2 = 5$. (Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required.) Students choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away.
2. Students describe their physical world using geometric ideas (e.g., shape, orientation, spatial relations) and vocabulary. They identify, name, and describe basic two-dimensional shapes, such as squares, triangles, circles, rectangles, and hexagons, presented in a variety of ways (e.g., with different sizes and orientations), as well as three dimensional shapes such as cubes, cones, cylinders, and spheres. They use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes.

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning

Grade K Overview

Counting and Cardinality

- Know number names and the count sequence.
- Count to tell the number of objects.
- Compare numbers.

Operations and Algebraic Thinking

- Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

Number and Operations in Base Ten

- Work with numbers 11–19 to gain foundations for place value

Measurement and Data

- Describe and compare measurable attributes.
- Classify objects and count the number of objects in categories.

Geometry

- Identify and describe shapes.
- Analyze, compare, create, and compose shapes.

Counting & Cardinality**K.CC****Know number names and the count sequence.**

1. Count to 100 by ones and by tens.
2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

Count to tell the number of objects.

4. Understand the relationship between numbers and quantities; connect counting to cardinality.
 - a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
 - b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
 - c. Understand that each successive number name refers to a quantity that is one larger.
 - d. Develop understanding of ordinal numbers (first through tenth) to describe the relative position and magnitude of whole numbers.
5. Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.

Compare numbers.

6. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.¹
7. Compare two numbers between 1 and 10 presented as written numerals.

¹ Include groups with up to ten objects.

Operations & Algebraic Thinking**K.OA****Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.**

1. Represent addition and subtraction with objects, fingers, mental images, drawings¹, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
3. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).
4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
5. Fluently add and subtract within 5.

¹ Drawings need not show details, but should show the mathematics in the problem. (This applies wherever drawings are mentioned in the Standards.)

Number & Operations in Base Ten**K.NBT****Work with numbers 11-19 to gain foundations for place value.**

1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Measurement & Data**K.MD****Describe and compare measurable attributes.**

1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
2. Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.

Classify objects and count the number of objects in each category.

3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.¹

¹Limit category counts to be less than or equal to 10.

Geometry**K.G****Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).**

1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.
2. Correctly name shapes regardless of their orientations or overall size.
3. Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).

Analyze, compare, create, and compose shapes.

4. Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/“corners”) and other attributes (e.g., having sides of equal length).
5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
6. Compose simple shapes to form larger shapes. For example, “Can you join these two triangles with full sides touching to make a rectangle?”

Grade 1 Mathematics – Unpacked Standards

In Grade 1, instructional time should focus on four critical areas: (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths as iterating length units; and (4) reasoning about attributes of, and composing and decomposing geometric shapes.

1. Students develop strategies for adding and subtracting whole numbers based on their prior work with small numbers. They use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths), to model add-to, take-from, put-together, take-apart, and compare situations to develop meaning for the operations of addition and subtraction, and to develop strategies to solve arithmetic problems with these operations. Students understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two). They use properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties (e.g., “making tens”) to solve addition and subtraction problems within 20. By comparing a variety of solution strategies, children build their understanding of the relationship between addition and subtraction.
2. Students develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10. They compare whole numbers (at least to 100) to develop understanding of and solve problems involving their relative sizes. They think of whole numbers between 10 and 100 in terms of tens and ones (especially recognizing the numbers 11 to 19 as composed of a ten and some ones). Through activities that build number sense, they understand the order of the counting numbers and their relative magnitudes.
3. Students develop an understanding of the meaning and processes of measurement, including underlying concepts such as iterating (the mental activity of building up the length of an object with equal-sized units) and the transitivity principle for indirect measurement. Students should apply the principle of transitivity of measurement to make indirect comparisons, but they need not use this
4. Students compose and decompose plane or solid figures (e.g., put two triangles together to make a quadrilateral) and build understanding of part-whole relationships as well as the properties of the original and composite shapes. As they combine shapes, they recognize them from different perspectives and orientations, describe their geometric attributes, and determine how they are alike and different, to develop the background for measurement and for initial understandings of properties such as congruence and symmetry

Mathematical Practice

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning

Grade 1 Overview**Operations and Algebraic Thinking**

- Represent and solve problems involving addition and subtraction.
- Understand and apply properties of operations and the relationship between addition and subtraction.
- Add and subtract within 20.
- Work with addition and subtraction equations.

Measurement and Data

- Measure lengths indirectly and by iterating length units.
- Tell and write time and money.
- Represent and interpret data.

Number and Operations in Base Ten

- Extend the counting sequence.
- • Understand place value.
- • Use place value understanding and properties of operations to add and subtract.

Geometry

- Reason with shapes and their attributes.

Operations & Algebraic Thinking**1.OA****Represent and solve problems involving addition and subtraction**

1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Understand and apply properties of operations and the relationship between addition and subtraction.

3. Apply properties of operations as strategies to add and subtract. Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)
4. Understand subtraction as an unknown-addend problem. For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8. Add and subtract within 20.

Add and subtract within 20.

5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2)
6. Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).

Work with addition and subtraction equations

7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.
8. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = ? - 3$, $6 + 6 = ?$.

Number & Operations in Base Ten**1.NBT****Extend the counting sequence.**

1. Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Understand place value.

1. Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:
 - a. 10 can be thought of as a bundle of ten ones — called a “ten.”
 - b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
 - c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
3. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.

Use place value understanding and properties of operations to add and subtract

4. Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
6. Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Measurement & Data**1.MD****Measure lengths indirectly and by iterating length units.**

1. Order three objects by length; compare the lengths of two objects indirectly by using a third object.
2. Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Tell and write time and money.

3. Tell and write time in hours and half-hours using analog and digital clocks. Recognize and identify coins, their names, and their value.

Represent and interpret data.

4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another

Geometry**1.G****Reason with shapes and their attributes.**

1. Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.
2. Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape¹
3. Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

¹Students do not need to learn formal names such as “right rectangular prism.”

Grade 2 Mathematics – Unpacked Standards

In Grade 2, instructional time should focus on four critical areas: (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) using standard units of measure; and (4) describing and analyzing shapes.

1. Students extend their understanding of the base-ten system. This includes ideas of counting in fives, tens, and multiples of hundreds, tens, and ones, as well as number relationships involving these units, including comparing. Students understand multi-digit numbers (up to 1000) written in base-ten notation, recognizing that the digits in each place represent amounts of thousands, hundreds, tens, or ones (e.g., 853 is 8 hundreds + 5 tens + 3 ones).
2. Students use their understanding of addition to develop fluency with addition and subtraction within 100. They solve problems within 1000 by applying their understanding of models for addition and subtraction, and they develop, discuss, and use efficient, accurate, and generalizable methods to compute sums and differences of whole numbers in base-ten notation, using their understanding of place value and the properties of operations. They select and accurately apply methods that are appropriate for the context and the numbers involved to mentally calculate sums and differences for numbers with only tens or only hundreds.
3. Students recognize the need for standard units of measure (centimeter and inch) and they use rulers and other measurement tools with the understanding that linear measure involves an iteration of units. They recognize that the smaller the unit, the more iterations they need to cover a given length.
4. Students describe and analyze shapes by examining their sides and angles. Students investigate, describe, and reason about decomposing and combining shapes to make other shapes. Through building, drawing, and analyzing two- and three-dimensional shapes, students develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades.

Mathematical Practice

- | | |
|---|--|
| 1. Make sense of problems and persevere in solving them. | 4. Model with mathematics |
| 2. Reason abstractly and quantitatively. | 5. Use appropriate tools strategically. |
| 3. Construct viable arguments and critique the reasoning of others. | 6. Attend to precision. |
| | 7. Look for and make use of structure. |
| | 8. Look for and express regularity in repeated reasoning |

Grade 2 Overview**Operations and Algebraic Thinking**

- Represent and solve problems involving addition and subtraction.
- Add and subtract within 20.
- Work with equal groups of objects to gain foundations for multiplication.

Number and Operations in Base Ten

- Understand place value.
- Use place value understanding and properties of operations to add and subtract.

Measurement and Data

- Measure and estimate lengths in standard units.
- Relate addition and subtraction to length.
- Work with time and money
- Represent and interpret data.

Geometry

- Reason with shapes and their attributes.

Operations & Algebraic Thinking**2.OA****Represent and solve problems involving addition and subtraction**

1. Use addition and subtraction within 100 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using, drawings, and equations with a symbol for the unknown number to represent the problem.

Add and subtract within 20.

2. Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers

Work with equal groups of objects to gain foundations for multiplication.

3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
4. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Number & Operations in Base Ten**2.NBT****Understand place value.**

1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
 - a. 100 can be thought of as a bundle of ten tens — called a “hundred.”
 - b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
2. Count within 1000; skip-count by 5s, 10s, and 100s.
3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
4. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.

Use place value understanding and properties of operations to add and subtract

5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
6. Add up to four two-digit numbers using strategies based on place value and properties of operations.
7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.
9. Explain why addition and subtraction strategies work, using place value and the properties of operations.¹

¹Explanations may be supported by drawings or objects.

Measurement & Data**2.MD****Measure lengths indirectly and by iterating length units.**

1. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2. Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
3. Estimate lengths using units of inches, feet, centimeters, and meters.
4. Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit

Relate addition and subtraction to length.

5. Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
6. Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.

Work with time and money..

7. Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?

Represent and interpret data.

9. Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems¹ using information presented in a bar graph.

Geometry**2.G****Reason with shapes and their attributes.**

1. Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.¹ Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
2. Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
3. Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

¹Sizes are compared directly or visually, not compared by measuring..”

Grade 3 Mathematics – Unpacked Standards

In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes.

1. Students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size. Students use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division.
2. Students develop an understanding of fractions, beginning with unit fractions. Students view fractions in general as being built out of unit fractions, and they use fractions along with visual fraction models to represent parts of a whole. Students understand that the size of a fractional part is relative to the size of the whole. For example, $\frac{1}{2}$ of the paint in a small bucket could be less paint than $\frac{1}{3}$ of the paint in a larger bucket, but $\frac{1}{3}$ of a ribbon is longer than $\frac{1}{5}$ of the same ribbon because when the ribbon is divided into 3 equal parts, the parts are longer than when the ribbon is divided into 5 equal parts. Students are able to use fractions to represent numbers equal to, less than, and greater than one. They solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators.
3. Students recognize area as an attribute of two-dimensional regions. They measure the area of a shape by finding the total number of same-size units of area required to cover the shape without gaps or overlaps, a square with sides of unit length being the standard unit for measuring area. Students understand that rectangular arrays can be decomposed into identical rows or into identical columns. By decomposing rectangles into rectangular arrays of squares, students connect area to multiplication, and justify using multiplication to determine the area of a rectangle.
4. Students describe, analyze, and compare properties of two-dimensional shapes. They compare and classify shapes by their sides and angles, and connect these with definitions of shapes. Students also relate their fraction work to geometry by expressing the area of part of a shape as a unit fraction of the whole.

Mathematical Practice

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning

Grade 3 Overview**Operations and Algebraic Thinking**

- Represent and solve problems involving multiplication and division.
- Understand properties of multiplication and the relationship between multiplication and division.
- Multiply and divide within 100
- Solve problems involving the four operations, and identify and explain patterns in arithmetic.

Number and Operations in Base Ten

- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Number and Operations—Fractions

- Develop understanding of fractions as numbers

Measurement and Data

- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects
- Represent and interpret data.
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

Geometry

- Reason with shapes and their attributes.

Operations & Algebraic Thinking**3.OA****Represent and solve problems involving multiplication and division.**

1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5×7 .
2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.
3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = ? \div 3$, $6 \times 6 = ?$

Understand properties of multiplication and the relationship between multiplication and division.

5. Apply properties of operations as strategies to multiply and divide. Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)
6. Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.

Multiply and divide within 100.

7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Solve problems involving the four operations, and identify and explain patterns in arithmetic.

8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.

Number & Operations in Base Ten**3.NBT****Use place value understanding and properties of operations to perform multi-digit arithmetic.¹**

1. Use place value understanding to round whole numbers to the nearest 10 or 100.
2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations.

¹ A range of algorithms may be used.

Number & Operations-Fractions¹**3.NF****Develop understanding of fractions as numbers.**

1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.
2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.
 - a. Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line.
 - b. Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.
3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
 - a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
 - b. Recognize and generate simple equivalent fractions, e.g., $1/2 = 2/4$, $4/6 = 2/3$. Explain why the fractions are equivalent, e.g., by using a visual fraction model.
 - c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form $3 = 3/1$; recognize that $6/1 = 6$; locate $4/4$ and 1 at the same point of a number line diagram.
 - d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

¹ Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, 8.

Measurement & Data**3.MD****Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.**

1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).¹ Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.²

¹ Excludes compound units such as cm³ and finding the geometric volume of a container

² Excludes multiplicative comparison problems

Represent and interpret data.

3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.
4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

Measurement & Data**3.MD****Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**

5. Recognize area as an attribute of plane figures and understand concepts of area measurement.
 - a. A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.
 - b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.
6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units)
7. Relate area to the operations of multiplication and addition.
 - a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
 - b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
 - c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.
 - d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Geometry**3.G****Reason with shapes and their attributes.**

Use place value understanding to round whole numbers to the nearest 10 or 100.

1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as $1/4$ of the area of the shape

Grade 4 Mathematics – Unpacked Standards

In Grade 4, instructional time should focus on three critical areas: (1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; (3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

1. Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers. Depending on the numbers and the context, they select and accurately apply appropriate methods to estimate or mentally calculate products. They develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. Students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.
2. Students develop understanding of fraction equivalence and operations with fractions. They recognize that two different fractions can be equal (e.g., $15/9 = 5/3$), and they develop methods for generating and recognizing equivalent fractions. Students extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.
3. Students describe, analyze, compare, and classify two-dimensional shapes. Through building, drawing, and analyzing two-dimensional shapes, students deepen their understanding of properties of two-dimensional objects and the use of them to solve problems involving symmetry.

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning

Grade 4 Overview

Operations and Algebraic Thinking

- Use the four operations with whole numbers to solve problems.
- Gain familiarity with factors and multiples.
- Generate and analyze patterns..

Number and Operations in Base Ten

- Generalize place value understanding for multidigit whole numbers.
 - Use place value understanding and properties of operations to perform multi-digit arithmetic.

Number and Operations—Fractions

- Extend understanding of fraction equivalence and ordering.
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- Understand decimal notation for fractions, and compare decimal fractions.

Measurement and Data

- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- Represent and interpret data.
- Geometric measurement: understand concepts of angle and measure angles.

Geometry

- Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Operations & Algebraic Thinking**4.OA****Use the four operations with whole numbers to solve problems.**

1. Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Gain familiarity with factors and multiples..

4. Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

Generate and analyze patterns.

5. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.

Number & Operations in Base Ten¹**4.NBT****Generalize place value understanding for multi-digit whole numbers.¹**

1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division.
2. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.
3. Use place value understanding to round multi-digit whole numbers to any place.

Use place value understanding and properties of operations to perform multi-digit arithmetic.

4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.
5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

¹ Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.

Number & Operations-Fractions**4.NF****Extend understanding of fraction equivalence and ordering**

1. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $1/2$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.
 - a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
 - b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.
 - c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
 - d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
 - a. Understand a fraction a/b as a multiple of $1/b$. For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.
 - b. Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$.)
 - c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat $3/8$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?

Understand decimal notation for fractions, and compare decimal fractions.

5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.² For example, express $3/10$ as $30/100$, and add $3/10 + 4/100 = 34/100$.
6. Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as $62/100$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
7. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.

¹ Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, 100..² Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.

Measurement & Data**4.MD****Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit**

1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36),
2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.

Represent and interpret data.

4. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

Geometric measurement: understand concepts of angle and measure angles.

5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:
 - a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure angles.
 - b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
7. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

Geometry**4.G****Draw and identify lines and angles, and classify shapes by properties of their lines and angles.**

Use place value understanding to round whole numbers to the nearest 10 or 100.

1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Grade 5 Mathematics – Unpacked Standards

In Grade 5, instructional time should focus on three critical areas: (1) developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); (2) extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and (3) developing understanding of volume.

1. Students apply their understanding of fractions and fraction models to represent the addition and subtraction of fractions with unlike denominators as equivalent calculations with like denominators. They develop fluency in calculating sums and differences of fractions, and make reasonable estimates of them. Students also use the meaning of fractions, of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for multiplying and dividing fractions make sense. (Note: this is limited to the case of dividing unit fractions by whole numbers and whole numbers by unit fractions.)
2. Students develop understanding of why division procedures work based on the meaning of base-ten numerals and properties of operations. They finalize fluency with multi-digit addition, subtraction, multiplication, and division. They apply their understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths. They develop fluency in these computations, and make reasonable estimates of their results. Students use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number), to understand and explain why the procedures for multiplying and dividing finite decimals make sense. They compute products and quotients of decimals to hundredths efficiently and accurately.
3. Students recognize volume as an attribute of three-dimensional space. They understand that volume can be measured by finding the total number of same-size units of volume required to fill the space without gaps or overlaps. They understand that a 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume. They select appropriate units, strategies, and tools for solving problems that involve estimating and measuring volume. They decompose three-dimensional shapes and find volumes of right rectangular prisms by viewing them as decomposed into layers of arrays of cubes. They measure necessary attributes of shapes in order to determine volumes to solve real world and mathematical problems.

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning

Grade 5 Overview

Operations and Algebraic Thinking

- Write and interpret numerical expressions.
- • Analyze patterns and relationships..

Number and Operations in Base Ten

- Understand the place value system.
- • Perform operations with multi-digit whole numbers and with decimals to hundredths..

Number and Operations—Fractions

- Use equivalent fractions as a strategy to add and subtract fractions.
- • Apply and extend previous understandings of multiplication and division to multiply and divide fractions..

Measurement and Data

- Convert like measurement units within a given measurement system.
- • Represent and interpret data.
- • Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition..

Geometry

- Graph points on the coordinate plane to solve real-world and mathematical problems.
- • Classify two-dimensional figures into categories based on their properties..

Operations & Algebraic Thinking

5.OA

Write and interpret numerical expressions.

1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product

Analyze patterns and relationships.

1. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

Number & Operations in Base Ten¹**5.NBT****Understand the place value system.**

1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $1/10$ of what it represents in the place to its left.
2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole number exponents to denote powers of 10.
3. Read, write, and compare decimals to thousandths.
 - a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.
 - b. Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.
4. Use place value understanding to round decimals to any place.

Perform operations with multi-digit whole numbers and with decimals to hundredths.

5. Fluently multiply multi-digit whole numbers using the standard algorithm.
6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Number & Operations-Fractions**5.NF****Use equivalent fractions as a strategy to add and subtract fractions.**

1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)
2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$.

Number & Operations-Fractions**5.NF****Apply and extend previous understandings of multiplication and division to multiply and divide fractions..**

3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret $3/4$ as the result of dividing 3 by 4, noting that $3/4$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $3/4$. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?
4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
 - a. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.)
 - b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
5. Interpret multiplication as scaling (resizing), by:
 - a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
 - b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.
6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.¹
 - a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$
 - b. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.
 - c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $1/3$ -cup servings are in 2 cups of raisins?

¹ Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.

Measurement & Data**5.MD****Convert like measurement units within a given measurement system.**

1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Represent and interpret data.

2. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.

Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
 - a. A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume.
 - b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.
4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.
 - a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
 - b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.
 - c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

Geometry**5.G****Graph points on the coordinate plane to solve real-world and mathematical problems.**

1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x coordinate, y-axis and y-coordinate).
2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Classify two-dimensional figures into categories based on their properties.

3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.
4. Classify two-dimensional figures in a hierarchy based on properties.

Sequence of Pre-Kindergarten Modules Aligned with the Standards

- Module 1: Analyze, Sort, Classify, and Count up to 5
- Module 2: Analyze, Compare, Create, and Compose Shapes
- Module 3: Count and Answer “How Many” Questions up to 10
- Module 4: Describe and Compare Length, Weight, and Capacity
- Module 5: Write Numerals to 5, Addition and Subtraction Stories, Count to 20

A breakdown of each Module is available at the following link:
<http://engageny.org/resource/pre-kindergarten-grade-5-mathematics-curriculum-map>

Summary of Year:

Pre-Kindergarten mathematics is about (1) developing an understanding of whole numbers using concrete materials, including concepts of correspondence, counting, cardinality, and comparison; and (2) describing shapes in their environment. More learning time in Pre-Kindergarten should be devoted to developing the concept of number than to other topics.

Rationale for Module Sequence in Pre-Kindergarten:

Students enter Pre-Kindergarten and find a well-planned, sequential math program awaiting, one that is embedded with hands-on, playful, interactive, largely concrete experiences. Students are encouraged to use their math words to communicate their observations.

The first step, done in Module 1, is to analyze, sort, classify, and count up to 5 with meaning. In Module 2, students practice their numbers up-to-five fluency as they encounter and engage with circles, rectangles, squares, and triangles in their environment. With numbers to 5 understood, work begins in Module 3 on extending “How Many” questions up to 10. The key here is to build from 5, using their fingers to support this perspective.

- 6 is 5 and 1
- 7 is 5 and 2
- 8 is 5 and 3, etc.



Thus, numbers 6–10 are 5 together with numbers 1–5, making the numbers to 10 familiar and manageable. In Module 4, students measure length, weight, and capacity, developing their word bank to include the language of comparison: “small, big, short and tall (length), heavy and light (weight), empty and full (capacity), while continuing to practice fluency with numbers to 10. With numbers 1-10 still developing, counting to 20 begins while addition and subtraction are initiated within classroom stories and playful contexts in Module 5.

Sequence of Kindergarten Modules Aligned with the Standards

- Module 1: Classify and Count Numbers to 10
- Module 2: Identify and Describe Shapes
- Module 3: Comparison with Length, Weight, and Numbers to 10
- Module 4: Number Pairs, Addition and Subtraction of Numbers to 10
- Module 5: Numbers 10–20, Counting to 100 by 1 and 10
- Module 6: Analyze, Compare, Create, and Compose Shapes

Summary of Year:

Kindergarten mathematics is about (1) representing, relating, and operating on whole numbers, initially with sets of objects; and (2) describing shapes and space. More learning time in Kindergarten should be devoted to number than to other topics.

Key Areas of Focus for K-2: Addition and subtraction—concepts, skills, and problem solving

Required Fluency: K.OA.5 Add and subtract within 5.

Rationale for Module Sequence in Kindergarten:

Like Pre-Kindergarten, Kindergarten starts out realistically with solidifying the meaning of numbers to 10 with a focus on relationships to 5. In Module 1, students investigate growth and shrinking patterns to 10 of “1 more” and “1 less” using models such as the number stairs (see picture).

Students learn to identify and describe squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders and spheres in Module 2. During this module students also practice their fluency with numbers to 10.

In Module 3, students begin to experiment with measurement, particularly with units and comparison of units. Students use different units to measure length, weight and capacity, and explore the measurable attributes of an object. Comparison begins with developing the meaning of the word “than” in the context of “taller than,” “shorter than,” “heavier than,” “longer than,” etc.

A breakdown of each Module is available at the following link:
http://engageny.org/resource/pre_kindergraten-grade-5-mathematics-curriculum-map

CCLS Major Emphasis Clusters
Counting and Cardinality
<ul style="list-style-type: none">• Know number names and count sequence.• Count to tell the number of objects.• Compare numbers.
Operations and Algebraic Thinking
<ul style="list-style-type: none">• Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.
Number and Operations in Base Ten
<ul style="list-style-type: none">• Work with numbers 11-19 to gain foundations for place value.



The terms “more” and “less” are abstract later in Kindergarten because of their context: “7 is 2 more than 5” is more abstract than “Jim is taller than John.” “1 more, 2 more, 3 more” lead into the addition fact fluencies (+1, +2, +3). Comparing numbers leads to a study of the numbers that make up a number (e.g., “3 is less than 7” and later, “3 and 4 make 7.”). This, in turn, leads naturally to discussions of adding, subtracting, and solving word problems in Module 4. When students have a firm grasp of numbers 1-10, they progress to Module 5. Module 5 explores numbers 10-20, which are parsed as “10 together with a number from 1-10.” For example, “12 is 2 more than 10.” In numbers 6-10, the role of 5 loses significance as those numbers are shown in different configurations other than “5 and a number.” In contrast, the number 10 is special; it is the anchor that will eventually become the “ten” unit in the place value system.

Module 6 rounds out the year with an exploration of concepts in area. Students discover that shapes can be composed of smaller shapes.

Sequence of Grade 1 Modules Aligned with the Standards

- Module 1: Addition and Subtraction of Numbers to 10 and Fluency
- Module 2: Place Value, Comparison, Addition and Subtraction of Numbers to 20
- Module 3: Ordering and Expressing Length Measurements as Numbers
- Module 4: Place Value, Comparison, Addition and Subtraction of Numbers to 40
- Module 5: Identify, Compose, and Partition Shapes
- Module 6: Place Value, Comparison, Addition and Subtraction of Numbers to 100

A breakdown of each Module is available at the following link:
<http://engageny.org/resource/pre-kindergarten-grade-5-mathematics-curriculum-map>

Summary of Year:

First Grade mathematics is about (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths as iterating length units; and (4) reasoning about attributes of, and composing and decomposing geometric shapes.

Key Areas of Focus for K-2: Addition and subtraction—concepts, skills, and problem solving

Required Fluency: 1.OA.6

Add and subtract within 10.

CCLS Major Emphasis Clusters
Operations and Algebraic Thinking <ul style="list-style-type: none">• Represent and solve problems involving addition and subtraction.• Understand and apply properties of operations and the relationship between addition and subtraction.• Add and subtract within 20.• Work with addition and subtraction equations.
Number and Operations in Base Ten <ul style="list-style-type: none">• Extend the counting sequence.• Understand place value.• Use place value understanding and properties of operations to add and subtract.
Measurement and Data <ul style="list-style-type: none">• Measure lengths indirectly and by iterating length units.

Rationale for Module Sequence in Grade 1:

In Grade 1, work with numbers to 10 continues to be a major stepping-stone in learning the place value system. In Module 1, students work to build fluency with addition and subtraction facts—a major gateway to later grades. Students begin right away with the intention of energetically practicing the entire year. The next major stepping-stone in understanding place value is learning to group “10 ones” as a single unit: 1 ten.

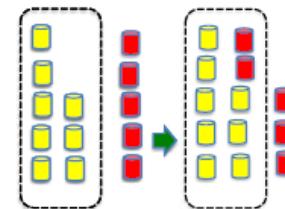
In Module 2, students practice grouping into tens and ones by adding and subtracting numbers to 20. Work begins slowly by modeling “adding and subtracting across a ten” in word problems, with equations, and as part of fluency. Solutions like that shown to the right for $8 + 5$ reinforce the need to “make 10.” Learning to “complete a unit” empowers students in later grades to understand “renaming” in the addition algorithm, to add 298 and 35 mentally (i.e., $298 + 2 + 33$), and to add measurements like 4 m, 80 cm, and 50 cm.

Module 3, which focuses on measuring lengths indirectly and by iterating length units, gives students a few weeks to practice and internalize “making a 10” during daily fluency activities. Introducing measurement in the first half of the academic year also allows for an increased variety of word problems that can be given throughout the remainder of the year.

Module 4 returns to understanding place value. Addition and subtraction to 40 rests on firmly establishing a “ten” as a unit that can be counted. In earlier modules, students loosely grouped 10 objects to make a ten. They now transition to conceptualizing that ten as a single unit (using 10 linker cubes stuck together, for example). Students begin to see a problem like $23 + 6$ as an opportunity to push the “2 tens” in 23 over to the side and concentrate on the familiar addition problem $3 + 6$.

In Module 5, students think about attributes of shapes and practice composing and decomposing geometric shapes. They also practice fluency with addition and subtraction within 40 (from Module 4). Thus, this module provides important “internalization time” for students between two intense number-based modules. The module placement also gives more spatially-oriented students the opportunity to build their confidence before they return to arithmetic.

Although Module 6 focuses on “adding and subtracting within 100,” the learning goal differs from the “within 40” module. Here, the new level of complexity is to introduce the addition and subtraction algorithms, building off the place value understanding and mental math strategies that were introduced in earlier modules. Students explore the algorithms by using simple examples and the familiar units of 10 made out of linker cubes.



$$8 + 5 = 8 + (2 + 3) = (8 + 2) + 3 = 10 + 3 = 13$$

Adding Across a Ten

Sequence of Grade 2 Modules Aligned with the Standards

- Module 1: Mastery of Sums and Differences to 20 and Word Problems to 100
- Module 2: Addition and Subtraction with Length, Weight, Capacity, and Time Measurements
- Module 3: Place Value, Counting, and Comparison of Numbers to 1000
- Module 4: Addition and Subtraction of Numbers to 1000
- Module 5: Preparation for Multiplication and Division Facts
- Module 6: Comparison, Addition and Subtraction with Length and Money
- Module 7: Recognizing Angles, Faces, and Vertices of Shapes, Fractions of Shapes

A breakdown of each Module is available at the following link:
<http://engageny.org/resource/pre-kindergarten-grade-5-mathematics-curriculum-map>

Summary of Year:

Second Grade mathematics is about (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) using standard units of measure; and (4) describing and analyzing shapes.

Key Areas of Focus for K-2: Addition and subtraction—concepts, skills, and problem solving

Required Fluency: 2.OA.2 Add and subtract within 20.
 2.NBT. 5 Add and subtract within 100.

Rationale for Module Sequence in Grade 2:

Students start Grade 2 with extensive experience working with numbers to 10.

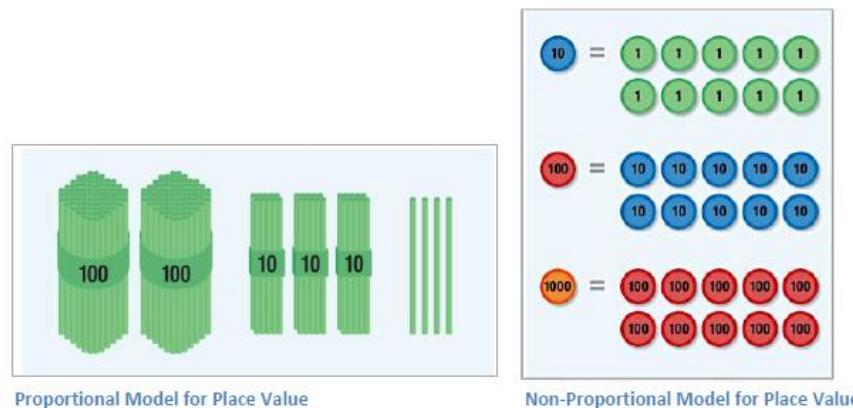
Module 1 establishes a motivating, differentiated fluency program in the first few weeks that will provide each student with enough practice to achieve mastery of the required fluencies (i.e., adding and subtracting within 20 and within 100) by the end of the year. Students learn to represent and solve problems using addition and subtraction: a practice that will also continue throughout the year.

In Module 2, students learn to measure and estimate using standard units for length and solve measurement word problems involving addition and subtraction of length. A major objective is for students to use measurement tools with the understanding that linear measure involves an iteration of units and that the smaller a unit, the more iterations are necessary to cover a given length.

CCLS Major Emphasis Clusters
Operations and Algebraic Thinking <ul style="list-style-type: none">• Represent and solve problems involving addition and subtraction.• Add and subtract within 20.• Work with equal groups of objects to gain foundations for multiplication.
Number and Operations in Base Ten <ul style="list-style-type: none">• Understand place value.• Use place value understanding and properties of operations to add and subtract.
Measurement and Data <ul style="list-style-type: none">• Measure and estimate lengths in standard units.• Relate addition and subtraction to length.

An underlying goal for this module is for students to learn the meaning of a “unit” in different contexts (e.g., capacity, length, weight, and time). This understanding serves as the foundation of arithmetic, measurement, and geometry in elementary school. In particular, units play a central role in the next module and in the addition and subtraction algorithms of Module 4.

All arithmetic algorithms are manipulations of place value units: ones, tens, hundreds, etc. In Module 3 students extend their understanding of base ten notation and apply their understanding of place value to count and compare numbers to 1000. In Grade 2 the place value units move from a proportional model to a non-proportional number disk model (see picture). The place value table with number disks can be used through Grade 5 for modeling very large numbers and decimals, thus providing students greater facility with and understanding of mental math and algorithms



In Module 4, students continue to work with place value units to understand the addition and subtraction algorithms of numbers up to 1000. This work deepens their understanding of base-ten, place value, and properties of operations. It also challenges them to apply their knowledge to one step and two-step word problems. During this module, students also continue to develop one of the required fluencies of the grade: addition and subtraction within 100.

In Module 5, students extend their understanding of a unit to build the foundation for multiplication and division. Making equal groups of “four apples each” establishes the unit “four apples” (or just four) that can then be counted: 1 four, 2 fours, 3 fours, etc. Relating the new unit to the one used to create it develops the idea of multiplication: 3 groups of 4 apples equal 12 apples (or 3 fours is 12).

Module 6 provides another opportunity for students to practice their algorithms and problem-solving skills with perhaps the most well-known, interesting units of all: dollars, dimes, and pennies. Measuring and estimating length is revisited in this module in the context of units from both the customary system (e.g., inches and feet) and the Metric System (e.g., centimeters and meters). As they study money and length, students represent data given by measurement and money data using picture graphs, bar graphs, and line plots.

Students finish Grade 2 by describing and analyzing shapes in terms of their sides and angles. In Module 7, students investigate, describe, and reason about the composition and decomposition and of shapes to form other shapes. Through building, drawing, and analyzing two- and three-dimensional shapes, students develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades.

Sequence of Grade 3 Modules Aligned with the Standards

- Module 1: Multiplication and Division with Factors of 2, 3, 4, 5 and 10
- Module 2: Problem Solving with Mass, Time, and Capacity
- Module 3: Multiplication and Division with Factors of 6, 7, 8 and 9
- Module 4: Multiplication and Area
- Module 5: Fractions as Numbers on the Number Line
- Module 6: Collecting and Displaying Data
- Module 7: Word Problems with Geometry and Measurement

A breakdown of each Module is available at the following link:

<http://engageny.org/resource/pre-kindergarten-grade-5-mathematics-curriculum-map>

Summary of Year:

Third Grade mathematics is about (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes.

Key Areas of Focus for 3-5: Multiplication and division of whole numbers and fractions—concepts, skills, and problem solving.

Required Fluency: 3.OA.7 Multiply and divide within 100.
 3.NBT.2 Add and subtract within 1000.

Rationale for Module Sequence in Grade 3:

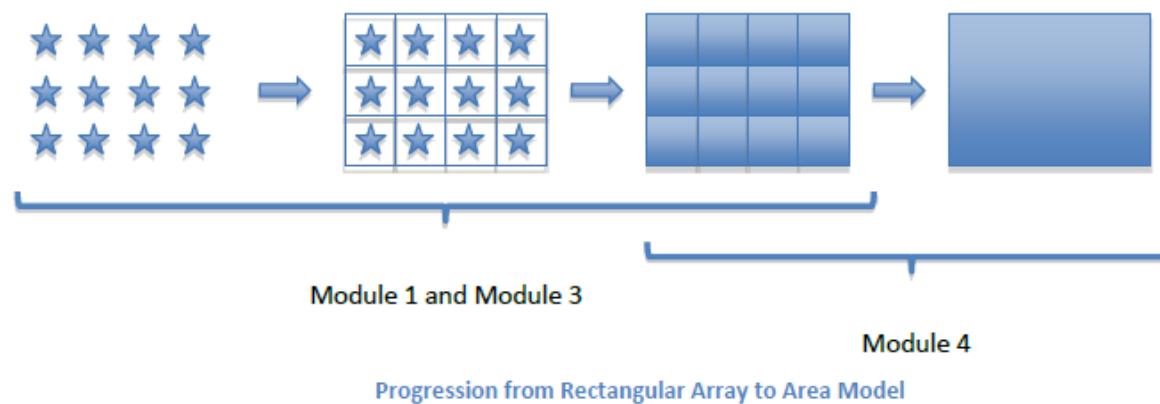
The first module builds upon the foundation of multiplicative thinking with units started in Grade 2. First, students concentrate on the meaning of multiplication and division and begin developing fluency for learning products involving factors of 2, 3, 4, 5, and 10 (see key areas of focus and required fluency above). The restricted set of facts keeps learning manageable, and also provides enough examples to do one- and two-step word problems and to start measurement problems involving weight, capacity and time in the second module.

Module 2, which focuses on measurement, again provides students with internalization time for learning the 2, 3, 4, 5, and 10 facts as part of their fluency activities. Students can also take this time to work with place value, comparison and rounding concepts. The goal is to develop students' number sense well enough that they can build proportional bar diagrams used in solving word problems in Grade 3 and beyond (e.g., "If this bar represents 62 kg, then a bar representing 35 kg needs to be slightly longer than half the 62 kg bar...").

CCLS Major Emphasis Clusters
Operations and Algebraic Thinking
<ul style="list-style-type: none">• Represent and solve problems involving multiplication and division.• Understand the properties of multiplication and the relationship between multiplication and division.• Multiply and divide within 100.• Solve problems involving the four operations and identify and explain patterns in arithmetic.
Number and Operations – Fractions
<ul style="list-style-type: none">• Develop understanding of fractions as numbers.
Measurement and Data
<ul style="list-style-type: none">• Solve problems involving measurement and estimation of intervals of time, liquid volumes and masses of objects.• Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

Drawing the relative sizes of the lengths of two bars also prepares students to locate fractions on a number line in Module 5 (where they learn to locate the points $\frac{1}{3}$ and $\frac{1}{5}$ on the number line relative to each other and relative to the whole unit).

Students learn the remaining multiplication and division facts in Module 3 as they continue to develop their understanding of multiplication and division strategies within 100 and use those strategies to solve two-step word problems. The “2, 3, 4, 5 and 10 facts” module (Module 1) and the “6, 7, 8 and 9 facts” module (Module 3) both provide important, sustained time for work in understanding the structure of rectangular arrays to prepare students for area in Module 4. This work is necessary because students initially find it difficult to distinguish the different squares in a rectangular array area model (the third array in the picture below), count them and recognize that the count is related to multiplication. Modules 1 and 3 slowly build up to a rectangular array area model using hands-on rectangular arrays (i.e., a Rekenrek) and/or pictures of rectangular arrays involving objects only (stars, disks, etc.)—all in the context of learning multiplication and division:



By Module 4, students are ready to investigate area and the formula for the area of a rectangle. They measure the area of a shape by finding the total number of same-size units of area required to cover the shape without gaps or overlaps. When that shape is a rectangle with whole number side lengths, it is easy to partition the rectangle into squares with equal areas (as in the third stage of the illustration above).

The goal of Module 5 is for students to transition from thinking of fractions as parts of a figure to points on a number line. To make that jump, students think of fractions as being constructed out of unit fractions: “1 fourth” is the length of a segment on the number line such that the length of four concatenated fourth segments on the line equals 1 (the whole). Once the unit “1 fourth” has been established, counting them is as easy as counting whole numbers: 1 fourth, 2 fourths, 3 fourths, 4 fourths, 5 fourths, etc. Students also compare fractions, find equivalent fractions in special cases, and solve problems that involve comparing fractions.

In Module 6, students leave the world of exact measurements behind. By applying their knowledge of fractions from Module 5, they estimate lengths to the nearest halves and fourths of an inch and record that information in bar graphs and line plots. This module also prepares students for the multiplicative comparison problems of Grade 4 by asking students “how many more” and “how many less” questions of scaled bar graphs.

The year rounds out with plenty of time to solve two-step word problems involving the four operations, and to improve fluency for concepts and skills initiated earlier in the year. In Module 7, students also describe, analyze, and compare properties of two-dimensional shapes. By now, students have done enough work with both linear and area measurement models to study that there is no relationship in general between the perimeter and area of a figure, one of the concepts of the last module.

Sequence of Grade 4 Modules Aligned with the Standards

- Module 1: Place Value, Rounding, Fluency with Addition and Subtraction Algorithms of Whole Numbers
- Module 2: Unit Conversions: Addition and Subtraction of Length, Weight, and Capacity
- Module 3: Multiplication and Division of up to a 4-Digit Number by up to a 1-Digit Number Using Place Value
- Module 4: Addition and Subtraction of Angle Measurement of Planar Figures
- Module 5: Order and Operations with Fractions
- Module 6: Decimal Fractions
- Module 7: Exploring Multiplication

Summary of Year:

Fourth grade mathematics is about (1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; and (3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Key Areas of Focus for 3-5: Multiplication and division of whole numbers and fractions—concepts, skills, and problem solving

Required Fluency: 4.NBT.4 Add and subtract within 1,000,000.

Rationale for Module Sequence in Grade 4:

Module 1 begins with a study of large numbers. Students are familiar with big units. For example, movies take about a gigabyte (1,000,000,000 bytes) to store on a computer while songs take about a megabyte (1,000,000 bytes). To understand these big numbers, the students rely upon previous mastery of rounding and the addition and subtraction algorithms. In a sense, the algorithms have come full circle: In Grades 2 and 3 the algorithms were the abstract idea students were trying to learn, but by Grade 4 the algorithms have become the concrete knowledge students use to understand new ideas.

A breakdown of each Module is available at the following link:
<http://engageny.org/resource/pre-kindergarten-grade-5-mathematics-curriculum-map>

CCLS Major Emphasis Clusters
Operations and Algebraic Thinking
<ul style="list-style-type: none">• Use the four operations with whole numbers to solve problems.
Number and Operations in Base Ten
<ul style="list-style-type: none">• Generalize place value understanding for multi-digit whole numbers.• Use place value understanding and properties of operations to perform multi-digit arithmetic.
Number and Operations – Fractions
<ul style="list-style-type: none">• Extend understanding of fraction equivalence and ordering.• Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.• Understand decimal notation for fractions, and compare decimal fractions.

The algorithms continue to play a part in Module 2 on unit conversions. Repetitive by design, this module helps students draw similarities between:

- 10 ones = 1 ten
- 100 ones = 1 hundred
- 100 cm = 1 m
- 1000 ones = 1 thousand
- 1000 m = 1 km
- 1000 g = 1 kg
- 1000 mL = 1 L

Here again, measurement problems act as the glue that binds knowledge of the algorithms, mental math, place value, and real-world applications together into a coherent whole.

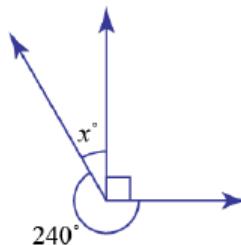
In Module 3, measurements provide the concrete foundation behind the distributive property in the multiplication algorithm: $4 \times (1 \text{ m } 2 \text{ cm})$ can be made physical using ribbon, where it is easy to see the 4 copies of 1 m and the 4 copies of 2 cm. Likewise, $4 \times (1 \text{ ten } 2 \text{ ones}) = 4 \text{ tens } 8 \text{ ones}$. Students then turn to the place value table with number disks to develop efficient procedures for multiplying and dividing one-digit whole numbers and use the table with number disks to understand and explain why the procedures work. Students also solve word problems throughout the module where they select and accurately apply appropriate methods to estimate, mentally calculate, or use the procedures they are learning to compute products and quotients.

Module 4 focuses as much on solving unknown angle problems using letters and equations as it does on building, drawing, and analyzing two dimensional shapes in geometry. Students have already used letters and equations to solve word problems in earlier grades. They continue to do so in Grade 4, and now they also learn to solve unknown angle problems: work that challenges students to build and solve equations to find unknown angle measures. First, students learn the definition of degree and learn how to measure angles in degrees using a protractor. From the definition of degree and the fact that angle measures are additive, the following rudimentary facts about angles naturally follow:

1. Vertical angles are equal.
2. The sum of angle measurements on a line is 180 degrees.
3. The sum of angle measurements around a point is 360 degrees.

Armed only with these three facts (and the two facts used to justify them), students are able to generate and solve equations that make sense, as in the following problem:

Find the unknown angle x .



$$x + 240 + 90 = 360$$

$$x + 330 = 360$$

$$x = 30$$

Unknown angle problems help to unlock algebraic concepts for students because such problems are visual. The x clearly stands for a specific number: If a student wished, he could place a protractor down on that angle and measure it to find x . But doing so destroys the joy of deducing the answer and solving the puzzle on his own.

Module 5 centers on equivalent fractions and operations with fractions. We use fractions when there is a given unit, the whole unit, but we want to measure using a smaller unit, called the fractional unit. To prepare students to explore the relationship between a fractional unit and its whole unit, examples of such relationships in different contexts were already carefully established earlier in the year:

- 360 degrees in 1 complete turn
- 100 cm in 1 meter
- 1000 g in 1 kilogram
- 1000 mL in 1 liter

The beauty of fractional units, once defined and understood, is that they behave just as all other units do:

- “3 fourths + 5 fourths = 8 fourths” like “3 apples + 5 apples = 8 apples”
- “3 fourths × 4 = 12 fourths” like “3 apples × 4 = 12 apples”

This module also includes measuring and plotting fractional numbers and adding/subtracting those measurements. In Grade 2, fractions were mostly used as adjectives (for example, half cup, third of an hour, etc.). As students do basic fraction arithmetic in Grade 4, they gradually come to understand fractions as numbers.

Module 6, on decimal fractions, starts with the realization that decimal place value units are simply special fractional units: 1 tenth = $1/10$, 1 hundredth = $1/100$, etc. Fluency plays an important role in this topic as students learn to relate $3/10 = 0.3 = 3$ tenths.

The year ends with an exploratory module on multiplication. Students have been practicing the algorithm for multiplying by a one-digit number since Module 3. The goal of Module 7 is to structure opportunities for them to discover ways to multiply two-digit \times two-digit numbers with their tools (such as place value tables, area models, bar diagrams, number disks, the distributive property and equations). Students also solve fraction and area problems that involve customary measurements (inches and feet, etc.).

Sequence of Grade 5 Modules Aligned with the Standards

- Module 1: Whole Number and Decimal Fraction Place Value to the One-Thousandths
- Module 2: Multi-Digit Whole Number and Decimal Fraction Operations
- Module 3: Addition and Subtraction of Fractions
- Module 4: Multiplication and Division of Fractions and Decimal Fractions
- Module 5: Addition and Multiplication with Volume and Area
- Module 6: Graph Points on the Coordinate Plane to Solve Problems

A breakdown of each Module is available at the following link:
http://engageny.org/resource/pre_kinder-garten-grade-5-mathematics-curriculum-map

Summary of Year:

Fifth grade mathematics is about (1) developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); (2) extending division to two-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and (3) developing understanding of volume.

Key Areas of Focus for 3-5: Multiplication and division of whole numbers and fractions—concepts, skills, and problem solving

Required Fluency: 5.NBT. 5 Multi-digit multiplication.

Rationale for Module Sequence in Grade 5:

Students' experiences with the algorithms as ways to manipulate place value units in Grades 2-4 really begin to pay dividends in Grade 5. In Module 1, whole number patterns with number disks on the place value table are easily generalized to decimal numbers. As students work word problems with measurements in the metric system, where the same patterns occur, they begin to appreciate the value and the meaning of decimals. Fractions of the form $1/10$, $1/100$, $1/1000$ also play a prominent role in the first module and are used to investigate patterns on the place value table.

CCLS Major Emphasis Clusters
Number and Operations in Base Ten
<ul style="list-style-type: none">• Understand the place value system.• Perform operations with multi-digit whole numbers and with decimals to hundredths.
Number and Operations – Fractions
<ul style="list-style-type: none">• Use equivalent fractions as a strategy to add and subtract fractions.• Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
Measurement and Data
<ul style="list-style-type: none">• Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Module 2 starts by giving students a chance to sharpen their skills in multiplying and dividing (decimal) numbers by 1-digit whole numbers. Now they are ready to generalize the 1-digit algorithms to the multi-digit whole number versions (multi-digit decimal multiplication such as 4.1×3.4 and division such as $4.5 \div 1.5$ are studied in Module 4). For multiplication, students must grapple

with and fully understand the distributive property (one of the key reasons for teaching the multi-digit algorithm). While the multi-digit multiplication algorithm is a straightforward generalization of the one digit multiplication algorithm, the division algorithm with two-digit divisor requires far more care to teach because students have to also learn estimation strategies, error correction strategies, and the idea of successive approximation (all of which are central concepts in math, science, and engineering).

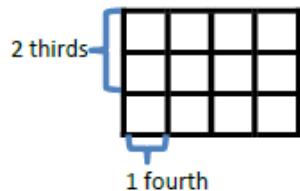
Work with place value units in the first two modules paves the path to fractions and arithmetic with fractions in Module 3 as elementary math's place value emphasis shifts to a focus on the larger set of fractional units for algebra. Like units are added to and subtracted from like units:

$$1.5 + 0.8 = 1\frac{5}{10} + \frac{8}{10} = 15 \text{ tenths} + 8 \text{ tenths} = 23 \text{ tenths} = 2 \text{ and } 3 \text{ tenths} = 2\frac{3}{10} = 2.3$$

$$1\frac{5}{9} + \frac{8}{9} = 14 \text{ ninths} + 8 \text{ ninths} = 22 \text{ ninths} = 2 \text{ and } 4 \text{ ninths} = 2\frac{4}{9}$$

The new complexity is that if units are not equivalent, they must be changed for smaller equal units so that they can be added or subtracted. Probably the best model for showing this is the rectangular fraction model pictured below. The equivalence is then represented symbolically as students engage in active meaning-making rather than obeying the perhaps mysterious command to "multiply the top and bottom by the same number."

$$\begin{aligned} 2 \text{ boys} + 1 \text{ girl} &= 2 \text{ children} + 1 \text{ child} = 3 \text{ children} \\ 2 \text{ thirds} + 1 \text{ fourth} &= 8 \text{ twelfths} + 3 \text{ twelfths} = 11 \text{ twelfths} \end{aligned}$$

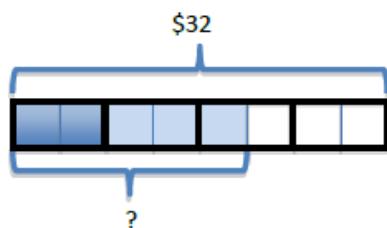


$$\frac{2}{3} + \frac{1}{4} = \left(\frac{2 \times 4}{3 \times 4} \right) + \left(\frac{1 \times 3}{4 \times 3} \right) = \frac{8}{12} + \frac{3}{12} = \frac{11}{12}$$

Relating different fractional units to one another requires extensive work with area and number line diagrams. Tape diagrams are used often in word problems. Tape diagrams, which students began using in the early grades and which become increasingly useful as students applied them to a greater and greater variety of word problems, hit their full strength as a model when applied to fraction word problems.

At the heart of a tape diagram is the now-familiar idea of forming units. In fact, forming units to solve word problems is one of the most powerful examples of the unit theme and is particularly helpful for understanding fraction arithmetic, as in the following example:

Jill had \$32. She gave $\frac{1}{4}$ of her money to charity and $\frac{3}{8}$ of her money to her brother. How much did she give altogether?



Solution with units:

$$\begin{aligned}8 \text{ units} &= \$32 \\1 \text{ unit} &= \$4 \\5 \text{ units} &= \$20\end{aligned}$$

Solution with arithmetic:

$$\begin{aligned}\frac{1}{4} + \frac{3}{8} &= \frac{2}{8} + \frac{3}{8} = \frac{5}{8} \\ \frac{5}{8} \times 32 &= 20\end{aligned}$$

Jill gave \$20 altogether.

Similar strategies enrich students' understanding of division and help them to see multi-digit decimal division as whole number division in a different unit. For example, we divide to find, "How many groups of 3 apples are there in 45 apples?" and write $45 \text{ apples} \div 3 \text{ apples} = 15$. Similarly, $4.5 \div 0.3$ can be written as "45 tenths \div 3 tenths" with the same answer: There are 15 groups of 0.3 in 4.5. This idea was used to introduce fraction division earlier in the module, thus gluing division to whole numbers, fractions and decimals together through an understanding of units.

Through the daily use of area models, the fraction module prepares students for an in-depth discussion of area and volume in Module 5. But the module on area and volume also reinforces work done in the fraction module: Now, questions about how the area changes when a rectangle is scaled by a whole or fractional scale factor may be asked. Measuring volume once again highlights the unit theme, as a unit cube is chosen to represent a volume unit and used to measure the volume of simple shapes composed out of rectangular prisms.

Scaling is revisited in the last module on the coordinate plane. Ever since the growth and shrinking patterns were first introduced in Kindergarten, students have been using bar graphs to display data and patterns. Extensive bar-graph work has set the stage for line plots, which are both the natural extension of bar graphs and the precursor to linear functions. It is in this final module of K-5 that a simple line plot of a straight line is presented on a coordinate plane and students are asked about the scaling relationship between the increase in the units of the vertical axis for 1 unit of increase in the horizontal axis. This is the first hint of slope and marks the beginning of the major theme of middle school: ratios and proportions.

SAMPLE PLANS

K-5

ALIGNED TO COMMON CORE

Kindergarten Math Unit Sample Lesson



STANDARDS: K.OA.1, K.OA.2, K.OA.3, K.OA.4

UNIT RESULTS:

1. Students will define an expression as the way we explain our math work
2. Students will represent addition using expressions
3. Students will represent addition through verbal explanations
4. Students will add within 10 using drawings
5. Students will decompose numbers less than or equal to 10 into pairs in more than one way.
6. Students will use a drawing to show how to decompose a number.

GUIDING QUESTIONS:

1. What is an expression?
2. How can we add using expressions?
3. How can we use words to explain how we add?
4. How can we add within 10 using drawings?
5. How can we decompose one number (numbers less than or equal to 10) into two different numbers? What are other ways we can decompose the same number?
6. How can a drawing show how we decompose a number?

VOCABULARY: expression, decompose, part, whole, addition, add, sum, 16,17,18,19, 20 sixteen, seventeen, eighteen, nineteen, twenty, 11, 12, 13, 14, 15, eleven, twelve, thirteen, fourteen, fifteen treasure boxes, count, counting on, numeral cards, counting, numeral , sequence, tens frame, number, manipulatives, zero, one, two, three, four, five, six, seven, eight, nine, ten, 0,1,2,3,4,5, 6,7,8,9,10

MATERIALS: vocabulary word cards, chart paper, tens frame, rekenreks, number cards, paper, pencils, crayons, 9 beans sheet, 2 sided counters (bingo chips, bean counters)

WHOLE GROUP MINI-LESSON:

Teacher explains to the class that they are going to continue to learn about the math word expression. Teacher reviews that an expression is a way we explain our math work. Teacher passes out treasure boxes for class and tens frame. Teacher writes the word **Expression** on chart paper and the number **9** underneath the word. Teacher explains that we are going to build different ways to express 9. (what numbers added together make 9) Teacher models taking 9 treasures out of the treasure box and closing the box. Teacher models placing 9 treasures on the tens frame. Teacher explains we are going to use the tens frame a little different this time. We are going to break up the 9 into the boxes below to build an expression. So teacher models putting 5 in one box and 4 in the other box. Teacher reads the expression aloud, $5+4$. (I do) Teacher then asks the students to put the treasures back on the tens frames. Teacher has the students on their own break up the 9 to make different expressions. Give the students a few minutes and then share out. (we do) Teacher walks around to assist students who might be struggling. If needed teacher should model another one before allowing them to try on their own. After sharing out the teacher has the students put the 9 objects back on the tens frame. Teacher instructs students to break up the 9 again and build an expression for 9. After a few minutes have students stop and share out the expressions. When the students share out begin recording the correct expressions on the chart. (you do) Teacher writes the expressions on the chart (ex: $1+8$, $8+1$, $2+7$, $7+2$... Expressions should include ALL expressions to begin exposing them to the commutative property of addition) Explain that these are expressions and expresses different ways to make 9. Teacher reminds students that we are adding numbers together and explaining the expression through our words and our writing. Teacher reviews the chart with the class and tells them that they are going to work on expressions at the teacher led center. Teacher and students prepare to transition to centers.

WORK PERIOD:

Teacher led center: At this center each student will use the [9 beans](#) sheet and 9, 2 sided counters (ex: beans: use a white bean and color one side red). The students will shake their beans and drop the beans on the paper. They will then color the 1st box of beans on the sheet to match their bean counters. Remind students not to throw the beans and model how to drop the beans neatly. Have the students continue the routine for the first 8 boxes. The final 4 boxes, the students will draw their bean expressions independently. Please have students explain verbally their bean expressions and drawings.

Center 2: Adding on a [tens frame](#)

[Center 3:](#) Adding using our fingers using [number cards](#) (teacher model before centers begin: choose 2 cards and have students use fingers to solve)

Center 4: Adding on rekenreks using [number cards](#)(teacher models before centers begin choose 2 cards and have students use rekenreks to solve)

CLOSURE:

- Students will share their work.
- Students will follow routine for audience and math chair.
- Students will receive specific praise from teacher about good strategies demonstrated.

Grade 1 Math Unit Sample Lesson



STANDARDS: 1.NBT.6

UNIT RESULTS:

1. Students will know the value of ten using ten frames, towers of ten, and base ten blocks.
2. Students will extend the counting sequence.
3. Students will write the numbers 1-10/multiples of 10.
4. Students will know combinations of 10.
5. Students will review using the symbols $+$ / $=$ to write an equation

GUIDING QUESTIONS:

1. What is a ten frame?
1. What is a tower of ten?
1. What is a "10"?
2. How do we write multiples of 10?
- 2, 3. How do we read multiples of 10?
4. How can we use symbols instead of words when writing equations that are multiples of 10?

VOCABULARY: math, number, counting, sequence, math center, transition, rotation, ten frame, plus, equal, $+$, $=$, numeral, how many, combinations, value, sum, multiple, equation, expression, symbol, tower of ten (*words in bold print are new vocabulary to be introduced and added to the word wall*)

MATERIALS: towers of ten, counters for tens frames, base ten blocks (rods) [Hundreds Chart](#), [Ten Frame](#).

WORK PERIOD:

Center 1: Teacher Led Center: Using the [Multiples of Ten Addition Cards](#)

students will find the sum using the hundreds chart. Through manipulation of the hundreds chart and discussion students will realize that they don't have to count by ones but can count down rows based on the digit in the tens place.

*Hundreds charts should be available at every center.

*For centers 2,3, and 4 students will use multiples of ten addition cards. Students will use the manipulatives in these centers to represent their addition equation.

Center 2: [Ten Frame](#)

Center 3: [Base Ten Cards](#)

Center 4: Towers of Ten

Center 5: Comparing Tens: [Multiples of Ten Addition Cards](#) and [Base Ten Cards](#)

CLOSURE:

- Students will participate in discussions about what they noticed during center time.
- Students will follow routine for audience and math chair.
- Students will receive specific praise from teacher about good strategies demonstrated

Grade 2 Math Unit Sample Lesson



STANDARDS: 2.NBT.6, 2.NBT.7, 2.NBT.9

UNIT RESULTS:

1. Students will use place value understanding and properties of operations to add and subtract.

GUIDING QUESTIONS:

1. Students will use place value understanding and properties of operations to add and subtract.

VOCABULARY: count back, count on, count up, expression, regroup, place value, digit, ones, tens, hundreds, one thousand, numeral, number, standard form, expanded form, decompose, compose (*words in bold print are new vocabulary to be introduced and added to the word wall*)

MATERIALS: addition problems using three-digit numbers

WHOLE GROUP MINI-LESSON:

Teacher will review how to decompose three-digit numbers by place value. Teacher will review the partial sums strategy to add two numbers, this time using three-digit numbers. In this strategy, students are decomposing the addends and adding the numbers by place value. Students are then combining partial sums to find the answer. [Approaches to Addition](#). Teacher will use three-digit numbers today in order to extend this strategy.

WORK PERIOD:

Teacher led center: Students will work on solving three-digit addition problems using the partial sums strategy. [Three-digit addition problems](#)

Center 2: [Flip and Add \(3-digit\) Recording Sheet](#)

Center 3: Use any of the previous centers based on the results of the informal assessment of Weeks 1-3.

Center 4: [Story Problem Center Problems 1-100+](#) with [student recording sheet](#)

CLOSURE:

- Students will share their addition work using partial sums.
- Students will practice decomposing three-digit numbers.

ADDITIONAL RESOURCES:

[Homework and Approaches to Addition](#)

Sample Lesson**Grade 3 - (Equivalent Fractions Task)**

Estimated Time: 60 minutes

Domain: Number and Operations-Fractions

Cluster: Develop understanding of fractions as numbers.

CCS Standard 3.NF.3- Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

CCS Standard 3.NF.3a- Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.

CCS Standard 3.NF.3b- Recognize and generate simple equivalent fractions, e.g., $1/2 = 2/4$, $4/6 = 2/3$. Explain why the fractions are equivalent, e.g., by using a visual fraction model.

CCS Standard 3.NF.3d- Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

Mathematical Practices:

1. Make sense of problem and persevere in solving them.
2. Reasons abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make sure of structure.
8. Look for and express regularity in repeated reasoning.

Key Vocabulary: fraction, numerator, denominator, number line, fraction tiles, equivalent

Essential Question:

- How do we use our knowledge of equivalent fractions to solve story problems?

The Bridge:

- To activate prior knowledge and facilitate spiral review, complete and discuss the next Bridge for Unit 3.

The Mini Lesson:

- Explain to the students that today they will have an opportunity to apply what they have learned about equivalent fractions.
- Hand out the equivalent fractions task, read it with the class, and ask if there are any questions.
- Correct any misconceptions and tell students they are to complete the task independently.

Work Period:

- While students are completing the task, circulate around the classroom and informally check students understanding of the task.

Summary:

- Have students share their solutions for each part of the task on chart paper, ELMO, overhead, SmartBoard, etc.
- For Part A of the task have students share their shaded fraction bars and explain why the fractions are or are not equivalent.
- For Part B of the task have students share the fraction bars they created and explain why the fractions are or are not equivalent.

Closure:

- Return to and answer the essential question.

Learning Extensions:

- Complete the attached homework assignment.

Additional Resources:

Name _____
Classwork

Date _____

Equivalent Fractions Task

Part A- Read each story problem. Shade the amount shown next to each fraction bar. Write yes if the two fractions are equivalent and no if they are not.

1. The Marshall family and the Billings family each had same-sized pies to eat for dessert after dinner. The Marshall family ate $\frac{1}{2}$ of their pie after dinner. The Billings family ate $\frac{3}{6}$ of their pie after dinner.

Marshall Family at $\frac{1}{2}$ of their pie.



Billings family ate $\frac{3}{6}$ of their pie.



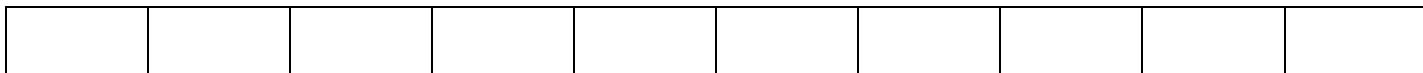
Did they eat equal amounts? _____

2. Marjorie and Celia began walking from their school to the store 5 blocks away. Marjorie stopped to rest after traveling $\frac{3}{5}$ of the distance to the store. Celia stopped to rest after traveling $\frac{5}{10}$ of the distance to the store.

Marjorie traveled $\frac{3}{5}$ of the distance.



Celia traveled $\frac{5}{10}$ of the distance.



Did they travel equal amounts? _____

3. Paul and Cheryl each had equal-sized vegetable gardens. Paul planted potatoes in $\frac{4}{6}$ of his garden. Cheryl planted potatoes in $\frac{1}{3}$ of her garden.

Paul planted potatoes in $\frac{4}{6}$ of his garden.

--	--	--	--	--	--

Cheryl planted potatoes in $\frac{1}{3}$ of her garden.

--	--	--

Did they plant an equal amount of potatoes? _____

Who planted the greater amount of potatoes? _____

Explain how you know who planted the greater amount of potatoes.

Part B- Read the story problem. Draw fraction bars to represent the fractions in the story. Write yes if the two fractions are equivalent and no if they are not.

4. Dina and Julie made same-sized quilts. Dina used red quilt blocks for $\frac{2}{4}$ of her quilt. Julie used red quilt blocks for $\frac{4}{8}$ of her quilt.

Dina's quilt



Julie's Quilt



Did they use an equal amount of red quilt blocks? _____

Explain how you know. _____

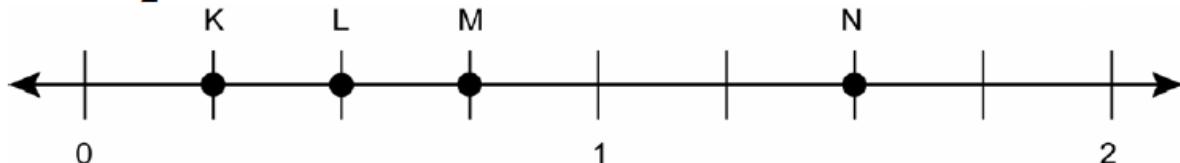
Name _____

Date _____

Homework

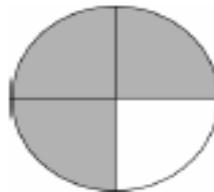
1. Which point on the number line below represents a fraction equivalent

to $\frac{1}{2}$?

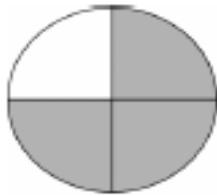
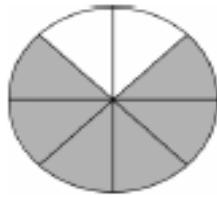
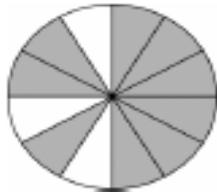
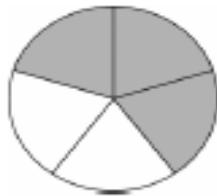


- A Point K
- B Point L
- C Point M
- D Point N

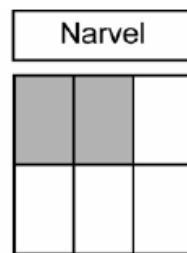
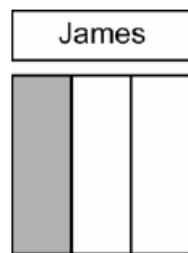
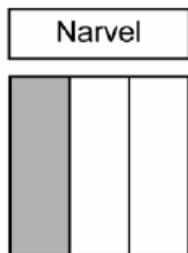
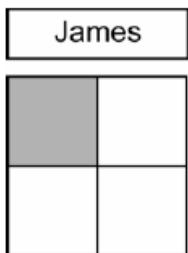
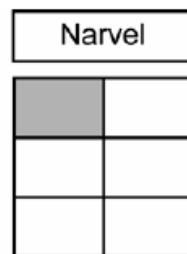
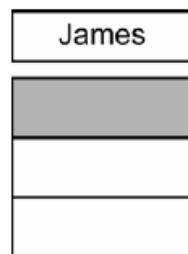
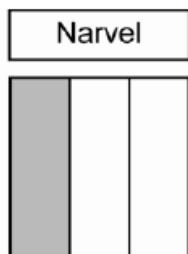
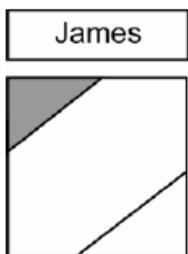
2. The model below shows $\frac{3}{4}$ shaded.



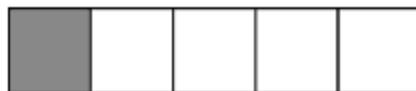
Which of the following shows a shaded portion that is NOT equivalent to $\frac{3}{4}$?



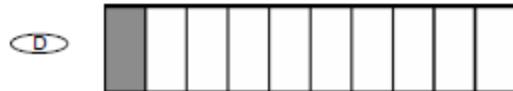
3. James and Narvel each mowed $\frac{1}{3}$ of their lawns on Saturday. Which of the following shows a shaded portion that could represent the parts of their lawns that James and Narvel mowed on Saturday?



4. The model below shows $\frac{1}{5}$ shaded.



Which of the following shows an equivalent amount shaded?



Sample Lesson

Grade 4 Lesson 6 (Word Problems)

Estimated Time: 60 minutes

Domain: Numbers and Operations Fractions

Cluster: Build fractions from unit fractions by applying and extending previous understanding of operations on whole numbers.

CCS Standard: (What exactly will students know or be able to do?)

4.NF.3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

Key Vocabulary: fraction, mixed numbers, numerator, denominator

Essential Question: How do we add and subtract mixed numbers? How do we rename a mixed number?

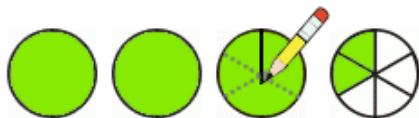
The Bridge: see 4.2.2.4 RIF Lesson 4 (word problems PPT)

The Mini Lesson: We talk about regrouping when subtracting whole numbers. What do we do if the mixed number is less than the number we are subtracting?

Strategy 3: Rename the mixed number.

In this method you break up one whole pie into slices, and join the "slices" from the whole pie with the existing slices. *After that*, you subtract. Examples will make this strategy clear.

$3\frac{2}{6}$ is renamed as $2\frac{8}{6}$, and then we subtract $1\frac{5}{6}$.



At first we have three uncut pies and $\frac{2}{6}$. Then one of the whole pies is cut into 6th parts. Now we have only two whole (uncut) pies and $\frac{8}{6}$.

We say that $3\frac{2}{6}$ is renamed as $2\frac{8}{6}$.
Then we can subtract $1\frac{5}{6}$ easily.

$$\frac{2}{6} - \frac{5}{6} = \frac{8}{6} - \frac{5}{6} = \frac{3}{6}$$

Borrow 1 whole pie.

Borrow 1 whole pie from the whole pies' column into the fractional parts' column.

The one whole pie is 6 sixths.
There were already two sixths in the fractional parts' column, so that is why it now has $\frac{8}{6}$.
Now you can subtract $\frac{5}{6}$.

$$\begin{array}{r} 2\frac{8}{6} \\ - 1\frac{5}{6} \\ \hline \end{array}$$

$$\begin{array}{r} 1\frac{3}{6} \\ \hline \end{array}$$

<p>$\frac{1}{8}$</p> <p>$2\frac{1}{8}$ is renamed as $1\frac{9}{8}$, and then we subtract $\frac{5}{8}$.</p> <p>At first we have two uncut pies and $1/8$. Then one of the whole pies is cut into 8th parts. Now we have only one whole (uncut) pie and 8 eighth parts.</p> <p>We say that $2\frac{1}{8}$ is renamed as $1\frac{9}{8}$. Then we can subtract $5/8$ easily.</p> $2\frac{1}{8} - \frac{5}{8} = 1\frac{9}{8} - \frac{5}{8} = 1\frac{4}{8}$	<p>Borrow 1 whole pie.</p> <p>Borrow 1 whole pie from the whole pies' column into the fractional parts' column.</p> <p>The one whole pie is 8 eighths.</p> <p>There was already one eighth in the fractional parts' column, so that is why it now has $9/8$.</p> <p>Now you can subtract $5/8$.</p>
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Work Period: (see attached) Students are renaming the mixed fractions and then solving word problems.

Summary: Students share out and justify their answers as well as their strategies.

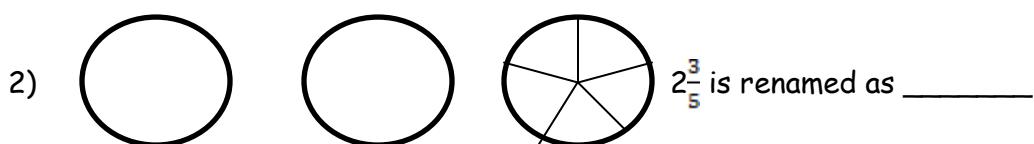
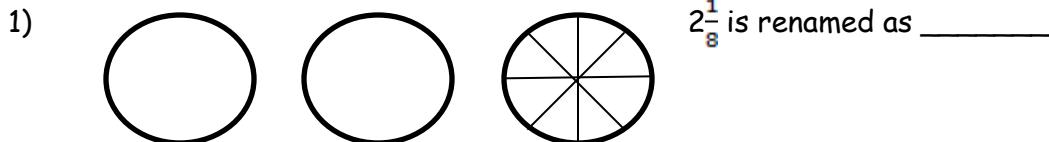
Closure: See attached Task. Allow them to get frustrated and use any and all strategies they know in order to approach the task. They have to show all of their work and justify their answers.

Learning Extensions: Homework

Additional Resources:

Name: _____ Date: _____ WP

Rename these mixed numbers:



Find the difference:

3) $3\frac{4}{9}$
- $\frac{8}{9}$

4) $2\frac{3}{5}$
- $1\frac{4}{5}$

- 5) There were 20 liters of milk in the refrigerator this morning. Jenny drank $7\frac{5}{6}$ liters of it. Along came Vicki who drank $1\frac{2}{6}$ liters of the milk. Then Sarah woke up and drank $3\frac{2}{6}$ liters of the milk. How much milk is left? Show your work

Answer: _____

Name: _____

Date: _____ HW

Find the difference:

- 1) Sam had $7\frac{7}{12}$ yards of rope. He used $4\frac{5}{12}$ yards for his tree house. How much does he have left?

- 2) Hannah had $9\frac{7}{12}$ yards of elastic. She made several bracelets and now has $2\frac{11}{12}$ yards left. How much did she use for the bracelets?

Name: _____ Date: _____ Task

- 1) There are seven pies to split equally between three people. How much pie will each person get?

Show your work:

Answer: _____

- 2) How would your answer change if there were only 5 pies?

Show your work:

Justify your reasoning:

Sample Lesson

Grade 5 - Volume of Real Life Rectangular Prisms Using a Formula

Estimated Time: 60 minutes

Domain: Measurement and Data

Cluster: Understand Concepts of Volume and Relate Volume to Multiplication and to Addition

Standard: 5.MD.5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

- Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
- Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems

Mathematical Practices: #2. Reason abstractly and quantitatively, # 5. Use appropriate tools strategically

6. Attend to precision, #8. Look for and express regularity in repeated reasoning

Vocabulary: capacity, volume, rectangular prism, cubic units, length, width, height

Materials: juice box (optional)

Essential Question: How do we use the formula ($V = l \times w \times h$) to find volume of figures?

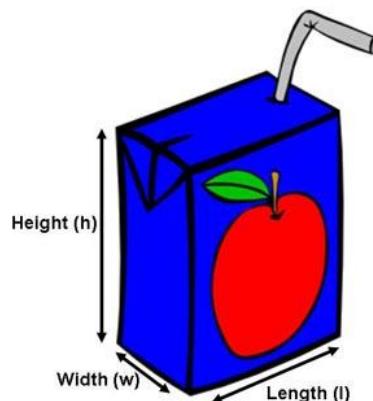
The Bridge: Yesterday we discovered the formula to find the volume of a rectangular prism. What is this formula? ($V = l \times w \times h$) What does each variable (letter) represent?

The l stands for length. Discuss that this tells how many cubic units long the prism is.

The w stands for width. Discuss that this tells how many cubic units wide the prism is.

The h stands for height. Discuss that this tells how many cubic units high the prism is.

If students have difficulty with the meaning of height, discuss when the doctor measures you to see how tall you are, he is measuring your height.



The Mini Lesson: Let's use this formula to find the volume of some actual containers where we don't have individual cubic units to count. (If you have an actual juice box, have students measure the length, width and height in centimeters and use these measurements)

Here is a juice box that is the shape of a rectangular prism.

The length of the juice box is 6 cm. The width is 2 cm. The height is 8 cm. What is the volume of this juice box?

Let's input these numbers into our formula.

$$V = l \times w \times h$$

$$V = 6 \times 2 \times 8$$

$$V = 12 \times 8$$

$$V = 96 \text{ cm}^3$$

What is the volume of this cube? What dimension do we know? (height=3cm)

What are the other two dimensions? (length and width are both 3 cm)

Explain your reasoning. (all edges of a cube are the same)



3 cm Let's input these numbers into our formula.

$$V = l \times w \times h$$

$$V = 3 \times 3 \times 3$$

$$V = 27 \text{ cm}^3$$

- [http://www.adaptedmind.com/p.php?tagId=1227](http://www.adaptedmind.com/p.php>tagId=1227)
- <http://studyjams.scholastic.com/studyjams/jams/math/decimals-percents/place-value-decimals.htm> video
- http://edcar-cdn.pbs.org/u/pr/KAET/Prisms%20-%20Turn%20Up%20the%20Volume%20with%20English%20Voice%20Math%20Interactive_a984a82c-6070-4ee7-8479-18781b0f9f5c/look.swf interactive video
- <http://www.watchknowlearn.org/Video.aspx?VideoID=2600&CategoryID=5621> song and examples with formula – using cubic units

Work Period: 5.3.3.4

Summary: Share answers from work period.

Closure: A rectangular prism has a length of 5 m, a width of 4m and a height of 8 m.

Pablo and Gloria solved the problem in different ways.

Pablo: $V = \ell \times w \times h$
 $V = 5 \times 4 \times 8$
 $V = 20 \times 8$
 $V = 160 \text{ cm}^3$

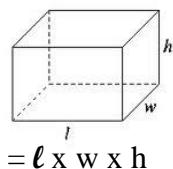
Gloria: $V = \ell \times w \times h$
 $V = 5 \times 4 \times 8$
 $V = 5 \times 32$
 $V = 160 \text{ cm}^3$

Who is correct and why? (They are both correct). $(5 \times 4) \times 8 = 5 \times (4 \times 8)$ because of the associative property. The grouping of the factors does not affect the product.

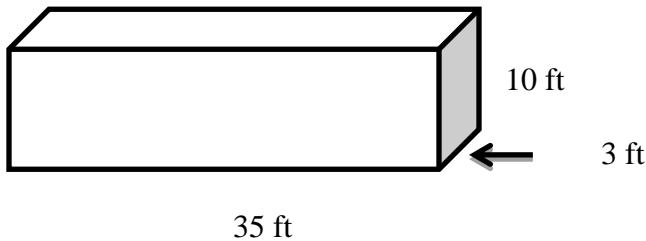
Learning Extensions: Homework 5.3.3.4

Name: _____

Date: _____

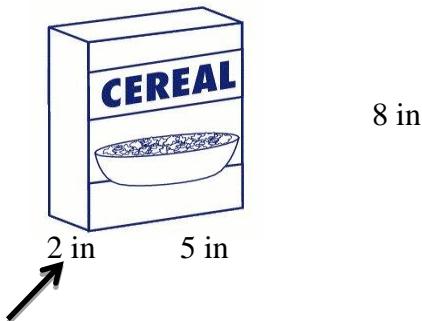
5.3.3.4. Work Period – Volume of Real Life Rectangular Prisms Using a Formula**Directions:** Find the volume of each rectangular prism.

1.



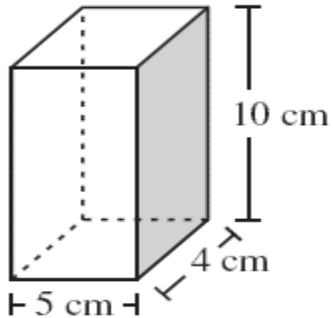
$$V = \underline{\hspace{2cm}}$$

2.



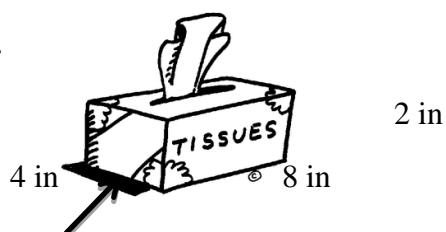
$$V = \underline{\hspace{2cm}}$$

3.



$$V = \underline{\hspace{2cm}}$$

4.



$$V = \underline{\hspace{2cm}}$$

Directions: Solve each word problem. Be sure to show your work!

5. A moving company storage room with a length of 5 m, width of 3 m and height of 2 m. What is the volume of the storage room?

$$V = \underline{\hspace{2cm}}$$

6. How would the volume of the storage room in problem # 5 change if the length of the room was **doubled**? Find the new volume and explain how you got your answer.

$$V = \underline{\hspace{2cm}}$$

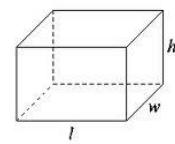
Explain: _____

7. A swimming pool is 24 ft long, 18 ft wide and 5 ft deep (height). What is the volume of the swimming pool?

$$V = \underline{\hspace{2cm}}$$

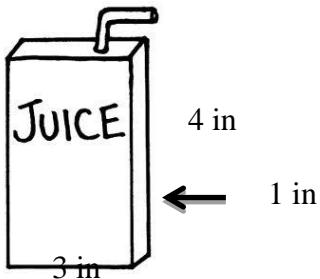
Name: _____

Date: _____

5.3.3.4. Homework – Volume of Real Life Rectangular Prisms Using a Formula**Directions:** Find the volume of each rectangular prism.

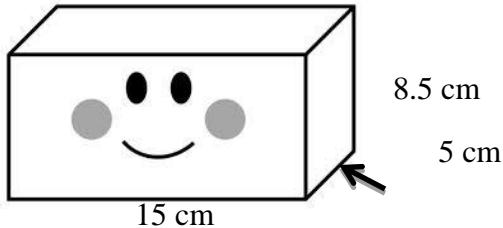
$$V = l \times w \times h$$

1.



$$V = \underline{\hspace{2cm}}$$

2.



$$V = \underline{\hspace{2cm}}$$

3.



$$V = \underline{\hspace{2cm}}$$

4.



$$V = \underline{\hspace{2cm}}$$

Directions: Solve each word problem. Be sure to show your work!

5. A fish aquarium is 75 cm long, 35 cm wide, and 8 cm high. What is the volume of the aquarium?

$$V = \underline{\hspace{2cm}}$$

6. A truck whose bed is 10 feet long, 5 feet wide, and 2 feet high is delivering sand for a sand sculpture competition. How many trips must the truck make to deliver 300 cubic feet of sand? (HINT: This problem has more than one step)

$$V = \underline{\hspace{2cm}}$$

Answer: trips

7. Paul and Jim work at a t-shirt factory. They pack t-shirt in boxes and send them to stores. Jim has a box that measures 2 ft by 4 ft by 6 ft. Paul has a box that measures 3 ft by 5 ft by 3 ft. Whose box can hold more t-shirts? (HINT: This problem takes more than one step.)

$$V \text{ of Paul's Box} = \underline{\hspace{2cm}}$$

$$V \text{ of Jim's Box} = \underline{\hspace{2cm}}$$

$$\text{Box that holds more} = \underline{\hspace{2cm}}$$

NOTES: