STAAR
FIELD GUIDE
FOR TEACHERS

GRADE 2 LEVEL

MATH

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STAAR

The State of Texas of Assessment of Academic Readiness (STAAR) is based on the Texas Essential Knowledge and Skills (TEKS). Most of the state standards, if they are eligible for assessment in a multiple choice/short answer format, will be assessed on STAAR.

STAAR is designed as a **vertical** system. Just as the TEKS are structured in a vertically aligned manner, so is STAAR. Learning from one grade level is aligned with learning at the next grade level. Some skills are developed over the course of a student's educational career from kindergarten through high school, while other skills and learning may begin at a particular grade level and serve as the foundation for later learning. STAAR is an assessment of **academic** readiness.

STAAR is designed to ensure that teachers answer these questions:

- Did students learn what they were supposed to learn in the current year's grade?
- Are students ready for the next grade?
- And are they also ready for the grade after that?

So what's the big deal about that shift? Fundamentally, it requires that teachers relook at curriculum and instruction in a very different way than they have under previous assessment systems (TABS, TEAMS, TAAS, TAKS). Not only are teachers required to have a deep understanding of the content of the grade level they are teaching, but they must also be firmly grounded in how the content of that current grade level prepares students for subsequent grade levels. Overemphasis on grade level attainment ONLY may create a context where teachers in subsequent grade levels have to reteach foundational skills to accommodate for the gap created by the lack of appropriate emphasis earlier. It may require students to "unlearn" previous ways of conceptualizing content and essentially start all over.

STAAR: focus, clarity, depth

[The TEKS] are designed to prepare students to succeed in college, in careers and to compete globally. However, consistent with a growing national consensus regarding the need to provide a more clearly articulated K 16 education program that focuses on fewer skills and addresses those skills in a deeper manner, TEA has further refined the TEKS organization as follows.

STAAR is designed around three concepts: focus, clarity, and depth:

Focus: STAAR will focus on grade level standards that are critical for that grade level and the ones to follow

Clarity: STAAR will assess the eligible TEKS at a level of specificity that allow students to demonstrate mastery

Depth: STAAR will assess the eligible TEKS at a higher cognitive level and in novel contexts

STAAR: the assessed curriculum – readiness, supporting, and process standards

A key concept that underpins the design of STAAR is that all standards (TEKS) do not play the same role in student learning. Simply stated, some standards (TEKS) have greater priority than others - they are so vital to the current grade level or content area that they must be learned to a level of mastery to ensure readiness (success) in the next grade levels. Other standards are important in helping to support learning, to maintain a previously learned standard, or to prepare students for a more complex standard taught at a later grade.

By assessing the TEKS that are most critical to the content area in more rigorous ways, STAAR will better measure the academic performance of students as they progress from elementary to middle to high school. Based on educator committee recommendations, for each grade level or course, TEA has identified a set of readiness standards - the TEKS which help students develop deep and enduring understanding of the concepts in each content area. The remaining knowledge and skills are considered supporting standards and will be assessed less frequently, but still play a very important role in learning.

Readiness standards have the following characteristics:

- They are essential for success in the current grade or course.
- They are important for preparedness for the next grade or course.
- They support college and career readiness.
- They necessitate in-depth instruction.
- They address broad and deep ideas.

Supporting standards have the following characteristics:

- Although introduced in the current grade or course, they may be emphasized in a subsequent year.
- Although reinforced in the current grade or course, they may be emphasized in a previous year.
- They play a role in preparing students for the next grade or course but not a central role.
- They address more narrowly defined ideas.

STAAR assesses the eligible TEKS at the level at which the TEKS were written.

STAAR is a more rigorous assessment than TAKS (and TAAS, TEAMS, TABS before that). The level of rigor is connected with the cognitive level identified in the TEKS themselves. Simply stated, STAAR will measure the eligible TEKS at the level at which they are written.

The rigor of items will be increased by

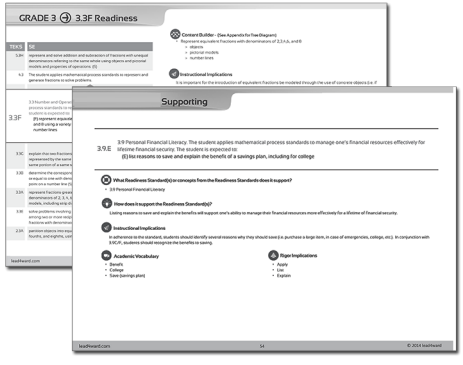
- assessing content and skills at a greater depth and higher level of cognitive complexity
- assessing more than one student expectation in a test item

The rigor of the tests will be increased by

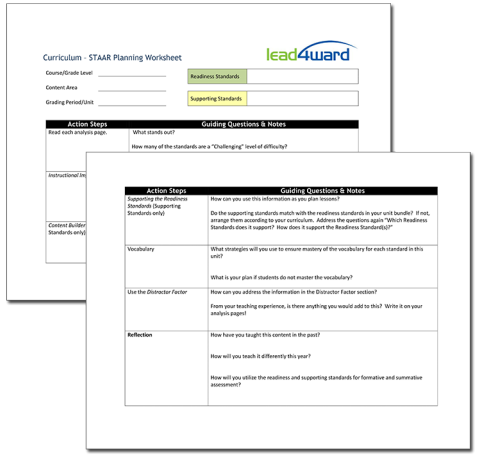
- assessing fewer, yet more focused, student expectations and assessing them multiple times and in more complex ways
- including a greater number of rigorous items on the test, thereby increasing the overall test difficulty

About the STAAR Field Guide for Teachers

The STAAR Field Guide for Teachers is designed as a tool to help teachers prepare for instruction. The tools and resources in this guide are designed to supplement local curriculum documents by helping teachers understand how the design and components of STAAR are connected to the scope and sequence of instruction. In order to help students attain even higher levels of learning as assessed on STAAR, teachers need to plan for increasing levels of rigor. This guide contains the following components:



STAAR Readiness and Supporting Standards Analysis Sheets - overviews of the nature of each readiness and supporting standard assessed on STAAR, designed to be used in planning to build teacher content knowledge and ensure that current grade level instruction reinforces previous learning and prepares students for future grade levels.



STAAR-Curriculum Planning Worksheet - a tool to organize the pages in this guide to be used in planning and professional development.

Steps to Success

1. Download the TEA Documents to add to your STAAR Teacher Field Guide
   - » STAAR Blueprint
   - » Assessed Curriculum Documents
   - » STAAR Test Design
   - » STAAR Reference Materials

2. Visit lead4ward.com/resources to download lead4ward resource materials to add to your STAAR Field Guide
   - » STAAR Snapshot
   - » TEKS Scaffold Documents
   - » IQ Released Tests
   - » Student Recording Sheets

3. Review the STAAR Snapshot for your course/grade level and content area
   - » Note the readiness standards
   - » With your team, explore why those TEKS are classified as readiness standards - and which criteria they meet
   - » Review the supporting standards and note any that may have played a larger role on TAKS

4. Review the components of the STAAR Readiness and Supporting Standards Analysis Sheets
   - » Use the samples on pages 6 and 7 to explore the analysis sheets
   - » Add additional information based on the discussion of the team

5. Create STAAR-Curriculum Planning Packets for each unit or grading period
   - » Collect either the Scope and Sequence document (if it includes the TEKS standards for each unit of instruction) OR Unit Plan documents (where the TEKS standards are bundled together into units of instruction)
   - » The STAAR Field Guide is arranged by standard type (readiness or supporting) in numeric order of the standards. You may need to photocopy certain pages/standards if they are repeated throughout multiple units
   - » Use the scope and sequence or unit plan documents to identify the TEKS taught in each unit/grading period
   - » Compile the STAAR Readiness and Supporting Standards Analysis Sheets that correspond to the TEKS in each unit/grading period
   - » After the pages/standards are sorted into their appropriate unit, create a method of organizing the documents (binder, folder, file, etc.).

6. Plan for instruction
   - » Collect the curriculum documents used for planning
   - » Use the STAAR - Curriculum Planning Worksheet as you plan each unit. The worksheet provides guiding questions and reflection opportunities to aid you in maximizing the material in the STAAR Field Guide
   - » Determine where the team needs additional learning
   - » Evaluate instructional materials
   - » Review the plan for appropriate levels of rigor

How to read STAAR Readiness Standards Analysis Pages

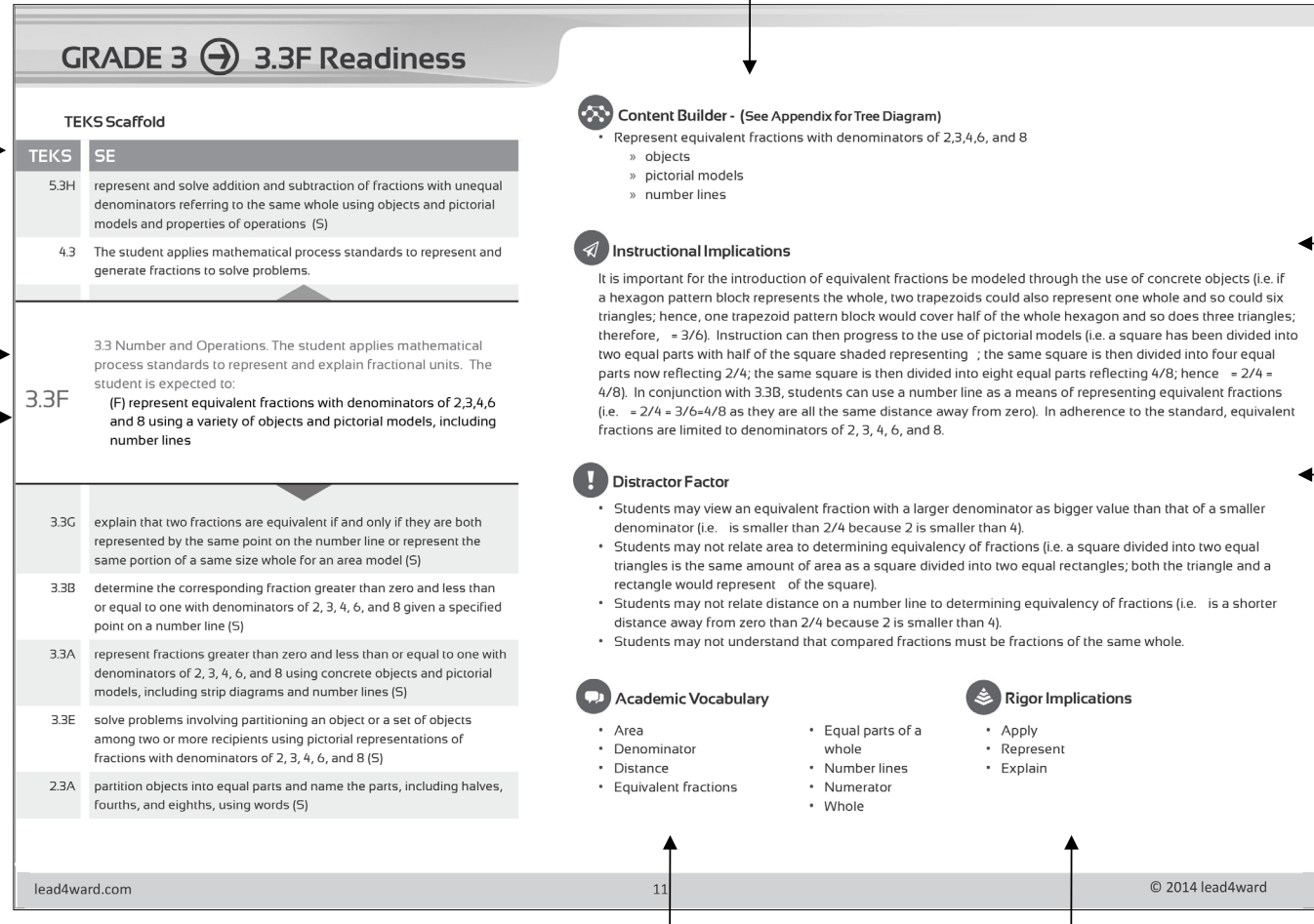
Standard and Indication of "Readiness" or "Supporting"

Content Builder
The basics of the content within the standard are extracted in a bulleted list. Describes multiple measurable parts in a standard - used to select and vary instructional materials.

TEKS Scaffold

Texas Essential Knowledge and Skills Statement

Student Expectation



GRADE 3 3.3F Readiness

TEKS Scaffold

TEKS	SE
5.3H	represent and solve addition and subtraction of fractions with unequal denominators referring to the same whole using objects and pictorial models and properties of operations (S)
4.3	The student applies mathematical process standards to represent and generate fractions to solve problems.
3.3F	3.3 Number and Operations. The student applies mathematical process standards to represent and explain fractional units. The student is expected to: (F) represent equivalent fractions with denominators of 2,3,4,6 and 8 using a variety of objects and pictorial models, including number lines
3.3G	explain that two fractions are equivalent if and only if they are both represented by the same point on the number line or represent the same portion of a same size whole for an area model (S)
3.3B	determine the corresponding fraction greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 given a specified point on a number line (S)
3.3A	represent fractions greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 using concrete objects and pictorial models, including strip diagrams and number lines (S)
3.3E	solve problems involving partitioning an object or a set of objects among two or more recipients using pictorial representations of fractions with denominators of 2, 3, 4, 6, and 8 (S)
2.3A	partition objects into equal parts and name the parts, including halves, fourths, and eighths, using words (S)

Content Builder - (See Appendix for Tree Diagram)
- Represent equivalent fractions with denominators of 2,3,4,6, and 8
  - objects
  - pictorial models
  - number lines

Instructional Implications
It is important for the introduction of equivalent fractions be modeled through the use of concrete objects (i.e. if a hexagon pattern block represents the whole, two trapezoids could also represent one whole and so could six triangles; hence, one trapezoid pattern block would cover half of the whole hexagon and so does three triangles; therefore, = 3/6). Instruction can then progress to the use of pictorial models (i.e. a square has been divided into two equal parts with half of the square shaded representing ; the same square is then divided into four equal parts now reflecting 2/4; the same square is then divided into eight equal parts reflecting 4/8; hence = 2/4 = 4/8). In conjunction with 3.3B, students can use a number line as a means of representing equivalent fractions (i.e. = 2/4 = 3/6=4/8 as they are all the same distance away from zero). In adherence to the standard, equivalent fractions are limited to denominators of 2, 3, 4, 6, and 8.

Distractor Factor
- Students may view an equivalent fraction with a larger denominator as bigger value than that of a smaller denominator (i.e. is smaller than 2/4 because 2 is smaller than 4).
- Students may not relate area to determining equivalency of fractions (i.e. a square divided into two equal triangles is the same amount of area as a square divided into two equal rectangles; both the triangle and a rectangle would represent of the square).
- Students may not relate distance on a number line to determining equivalency of fractions (i.e. is a shorter distance away from zero than 2/4 because 2 is smaller than 4).
- Students may not understand that compared fractions must be fractions of the same whole.

Academic Vocabulary
- Area
- Denominator
- Distance
- Equivalent fractions
- Equal parts of a whole
- Number lines
- Numerator
- Whole

Rigor Implications
- Apply
- Represent
- Explain

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Instructional Implication
Suggestions to modify instruction that support effectively teaching this standard.

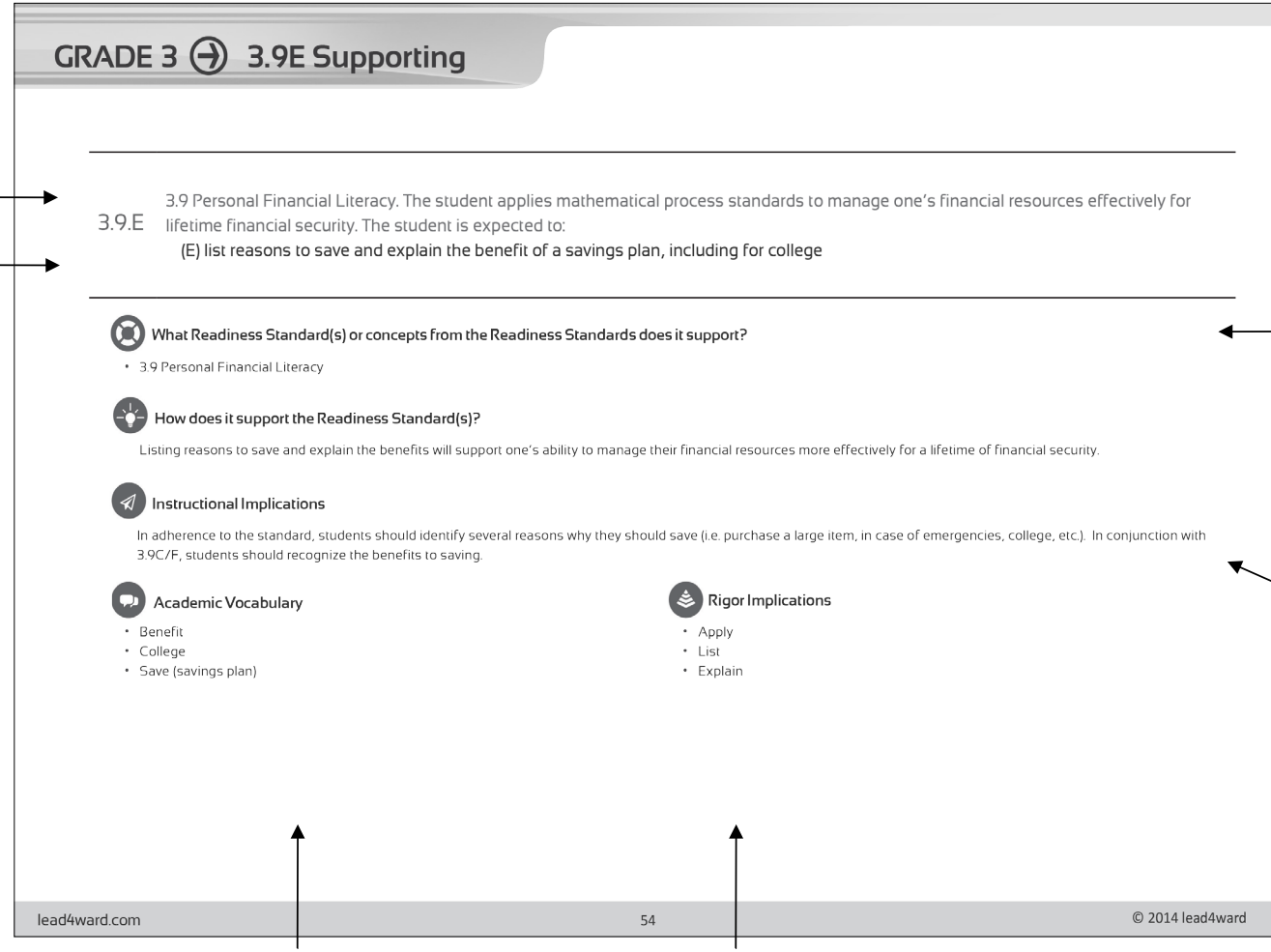
Distractor Factor
Alerts teachers to areas where students traditionally struggle, have misconceptions, or may need reinforcement. Common errors in learning.

Academic Vocabulary
Vocabulary words extracted directly from the standard and/or associated with the instruction of the content within the standard.

Rigor Implications
Uses the verb(s) from the Student Expectation to indicate the cognitive complexity of the standard.

How to read STAAR Supporting Standards Analysis Pages

Standard and Indication of "Readiness" or "Supporting"



GRADE 3 → 3.9E Supporting

Texas Essential Knowledge and Skills Statement

Student Expectation

3.9E 3.9 Personal Financial Literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:
(E) list reasons to save and explain the benefit of a savings plan, including for college

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.9 Personal Financial Literacy

How does it support the Readiness Standard(s)?

Listing reasons to save and explain the benefits will support one's ability to manage their financial resources more effectively for a lifetime of financial security.

Instructional Implications

In adherence to the standard, students should identify several reasons why they should save (i.e. purchase a large item, in case of emergencies, college, etc.). In conjunction with 3.9C/F, students should recognize the benefits to saving.

Academic Vocabulary

- Benefit
- College
- Save (savings plan)

Rigor Implications

- Apply
- List
- Explain

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Supporting the Readiness Standards - Most supporting standards support a readiness standard in the current grade level. This section discusses the relationships of the standards that are often taught together.

Instructional Implication
Suggestions to modify instruction that support effectively teaching this standard.

Academic Vocabulary
Vocabulary words extracted directly from the standard and/or associated with the instruction of the content within the standard.

Rigor Implications
Uses the verb(s) from the Student Expectation to indicate the cognitive complexity of the standard.

Curriculum - STAAR Planning Worksheet

Course/Grade Level _____

Content Area _____

Grading Period/Unit _____

Readiness Standards	

Supporting Standards	

Action Steps	Guiding Questions & Notes
Read each analysis page.	What stands out? Do you have data on any of the standards that suggest whether the standard is a strength or a concern? How many of the standards are at a high level of rigor?
Instructional Implications	How will these implications inform your planning? How can you use this information to modify instruction?
TEKS Scaffolding	What concepts did students learn in the previous grade to prepare them? Do you have students who may struggle with those concepts? Look at how the students will use that concept in subsequent grades - will the way you teach it still apply in those grades?

Curriculum - STAAR Planning Worksheet (continued)

Action Steps	Guiding Questions & Notes
Content Builder (Readiness Standards only)	How many parts does this standard have? Which of the parts are new to your team or to the students? This content is important for students' future learning. How will you assess retention?
Supporting the Readiness Standards (Supporting Standards only)	How can you use this information as you plan lessons? Do the supporting standards match with the readiness standards in your unit bundle? If not, arrange them according to your curriculum. Address the questions again: "Which Readiness Standards does it support? How does it support the Readiness Standard(s)?"
Vocabulary	What strategies will you use to ensure mastery of the vocabulary for each standard in this unit? What is your plan if students do not master the vocabulary?
Use the *Distractor Factor*	How can you address the information in the Distractor Factor section? From your teaching experience, is there anything you would add to this? Write it on your analysis pages!
Reflection	How have you taught this content in the past? How will you teach it differently this year? How will you utilize the readiness and supporting standards for formative and summative assessment?

GRADE 2 → 2.2B Readiness

TEKS Scaffold

TEKS	SE
4.2B	represent the value of the digit in whole numbers through 1,000,000,000 and decimals to the hundredths using expanded notation and numerals (R)
3.2A	compose and decompose numbers up to 100,000 as a sum of so many ten thousands, so many thousands, so many hundreds, so many tens, and so many ones using objects, pictorial models, and numbers, including expanded notation as appropriate (R)
2.2B	**2.2 Number and Operations.** The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to: (B) use standard, word, and expanded forms to represent numbers up to 1,200
2.2A	use concrete and pictorial models to compose and decompose numbers up to 1,200 in more than one way as a sum of so many thousands, hundreds, tens, and ones (S)
1.2C	use objects, pictures, and expanded and standard forms to represent numbers up to 120 (R)
K.2I	compose and decompose numbers up to 10 with objects and pictures (R)
K.2B	read, write, and represent whole numbers from 0 to at least 20 with and without objects or pictures (R)

Content Builder - (See Appendix for Tree Diagram)

- Use standard form to represent numbers up to 1,200
- Use word form to represent numbers up to 1,200
- Use expanded form to represent numbers up to 1,200

Instructional Implications

As students begin representing numbers through 1,200 using base ten blocks (see 2.2A), their understanding should also be associated with writing numbers in standard form (827), word form (eight hundred twenty-seven), and expanded form (i.e. 827 = 800 + 20 + 7). This type of representation will allow students to focus on the value of each digit and support the understanding of the place value system (i.e. eight flats represent the value 800; two ten rods represent the value of 20; seven unit cubes represent the value of 7; 800 + 20 + 7 = 827). As grade 2 introduces the thousands period, it will be essential to explain the use of the comma to separate the periods (i.e. 1,243: the comma separates the ones/unit period from the thousands period). In representing numbers in word form, be sure to emphasize the correct use of the hyphen (i.e. twenty-three).

Distractor Factor

- Students may incorrectly use the word "and" to represent numbers in words (i.e. 345 is represented as "three hundred forty-five," not "three hundred and forty-five). The use of the word "and" is applied in to distinguish the whole and the part (i.e. 3.45 is represented as "three and forty-five hundredths).
- Students may not use the hyphen appropriately when representing numbers in words (i.e. 345 is represented as "three hundred forty-five").
- Students confuse the place value a digit is in with its value (i.e. 345; the digit 4 is in the tens place value but it is valued at 40).
- Students may confuse the terms digit and number.

Academic Vocabulary

- Digit
- Expanded form
- Hyphen
- Period
- Place value
  - » Thousands
  - » Hundreds
  - » Tens
  - » Ones
- Standard form
- Word form

Rigor Implications

- Apply
- Represent
- Compare
- Use

GRADE 2 → 2.2D Readiness

TEKS Scaffold

TEKS	SE
4.2C	compare and order whole numbers to 1,000,000,000 and represent comparisons using the symbols >, <, or = (S)
3.2D	compare and order whole numbers up to 100,000 and represent comparisons using the symbols >, <, or = (R)
2.2D	**2.2 Number and Operations.** The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to: (D) use place value to compare and order whole numbers up to 1,200 using comparative language, numbers and symbols (<,>,=)
1.2G	represent the comparison of two numbers to 100 using the symbols >,<,or = (R)
1.2F	order whole numbers up to 120 using place value and open number lines (S)
1.2E	use place value to compare whole numbers up to 120 using comparative language (S)
K.2G	compare sets of objects up to at least 20 in each set using comparative language (S)
K.2H	use comparative language to describe two numbers up to 20 presented as written numerals (S)

Content Builder - (See Appendix for Tree Diagram)

- Use place value to compare numbers up to 1,200 using
  - » comparative language
  - » numbers
  - » symbols (<,>,=)
- Use place value to order numbers up to 1,200 using
  - » comparative language
  - » numbers

Instructional Implications

As students compare the value of numbers, they need to be able to relate their understanding of place value (i.e. the number 342 is greater than 226 because the digit 3 in 342 means there are 3 hundreds which is a value of 300. However, the digit 2 in 226 means there are only 2 hundreds and has a value of 200.) Using expanded notation 300 + 40 + 2 is greater than 200 + 20 + 6 will help students grasp this concept. Students will compare two numbers using the correct academic vocabulary (i.e. 342 is greater than 226). It is important for students to recognize the inverse comparison statement as well (i.e. 226 is less than 342). The use of the comparative language is critical before moving to the symbolic representation. It is important for students to recognize how their language can be communicated using symbols (>, <, =). It is critical that students do not learn how to read each of the symbols using a trick to remember directionality of the symbols (i.e. the alligator's mouth eats the bigger number). Encourage students to write and articulate two comparison statements during activities (i.e. 342>226 and 226<342). The standard also has students ordering three or more numbers from least to greatest or greatest to least. The use of open number lines (see 2.2E/F) will allow students to order more efficiently. The increase in the value of numbers from left to right on a number line can be associated to ordering from least to greatest; the decrease of numbers from right to left on a number line can be associated to ordering from greatest to least.

Distractor Factor

- Students who rely on a trick to determine the direction of an inequality sign may not be able to read comparison symbols correctly.
- Students may view a comparison statement and its inverse as two different comparison statements
  - » (i.e. 456 > 412 is the same as 412 < 456).
- Students confuse the place value a digit is in with its value
  - » (i.e. 345; the digit 4 is in the tens place value, but it is valued at 40).
- Students may confuse the term digit and number.

Academic Vocabulary

- Digit
- Equal to (=)
- Greater than (>)
- Greatest to least
- Less than (<)
- Least to greatest
- Place value
  - » Thousands
  - » Hundreds
  - » Tens
  - » Ones

Rigor Implications

- Apply
- Represent
- Compare
- Use
- Order

GRADE 2 → 2.3B Readiness

TEKS Scaffold

TEKS	SE
4.3D	compare two fractions with different numerators and different denominators and represent the comparison using the symbols >, =, or < (R)
3.3H	compare two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using symbols, words, objects, and pictorial models (R)
2.3B	**2.3 Number and Operations.** The student applies mathematical process standards to recognize fractional units and communicates how they are used to name parts of a whole. The student is expected to: (B) explain that the more fractional parts used to make a whole, the smaller the part; and the fewer the fractional parts, the larger the part
1.6G	partition two-dimensional figures into two and four fair shares or equal parts and describe the parts using words (S)

Content Builder - (See Appendix for Tree Diagram)

- Explain that the more fractional parts used to make the whole, the smaller the part
- Explain that the fewer the fractional parts, the larger the part

Instructional Implications

In conjunction with 2.3A, as students are partitioning whole objects into 2, 4, and 8 equal parts, they need to recognize that the more parts an object is divided into, the smaller the parts become; the fewer the parts an object is divided into, the larger parts become. Instruction should provide real world examples to build conceptual understanding (i.e. Would you rather share a candy bar with two friends or four? Would you rather have a slice of a pizza that was cut into eight equal parts or ten equal parts?).

Distractor Factor

- Students may not understand that the more times you divide a whole object into parts, the smaller the parts become.
- Students may think that one-eighth is larger than one-sixth because eight is bigger than six.
- Students may not understand that fractional parts of the same whole must be equal in area.

Academic Vocabulary

- Fraction
- Fractional parts
- Whole

Rigor Implications

- Apply
- Recognize
- Communicate
- Explain

GRADE 2 → 2.4C Readiness

TEKS Scaffold

TEKS	SE
4.4A	add and subtract whole numbers and decimals to the hundredths place using the standard algorithm (R)
3.4A	solve with fluency one-step and two-step problems involving addition and subtraction within 1,000 using strategies based on place value, properties of operations, and the relationship between addition and subtraction (R)
2.4C	**2.4 Number and Operations.** The student applies mathematical process standards to develop and use strategies and methods for whole number computation in order to solve addition and subtraction problems with efficiency and accuracy. The student is expected to: (C) solve one-step and multi-step word problems involving addition and subtraction within 1,000 using a variety of strategies based on place value, including algorithms
2.4B	add up to four two-digit numbers and subtract two-digit numbers using mental strategies and algorithms based on knowledge of place value and properties of operations (S)
1.3F	generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20 (R)
1.3A	use concrete and pictorial models to determine the sum of a multiple of ten and a onedigit number in problems up to 99 (S)

Content Builder - (See Appendix for Tree Diagram)

- Solve one-step word problems
  - » addition using place value strategies
  - » subtraction using place value strategies
- Solve multi-step word problems involving addition within 1,000
  - » addition using place value strategies
  - » subtraction using place value strategies
  - » addition and subtraction using place value strategies

Instructional Implications

In conjunction with 2.4B, students will apply their strategies for addition and subtraction to solve real world problems. Instruction should include how the subtraction symbol represents distance (i.e. How far away is 3 from 11 on the number line in the following problem, 11 - 3 = ___?). This understanding of subtraction representing distance will lay the foundation for future learning of subtraction of integers (i.e. In the problem 11 - (-3) = 14, -3 is 14 spaces away from 11). In adherence to the standard, students are required to solve multi-step word problems. Instruction should include samples of multiple step addition, subtraction, and a mixture of addition and subtraction problems. Students may need a visual to represent multiple-step understanding.

Whole		
Part	Part	Part

Word problems should include a variety of contexts.
Joining: Sarah had 43 pencils. Juan gave her 18 more pencils. How many pencils does Sarah have now? Sarah had 25 pencils. Juan gave her some more pencils. Now Sarah has 43 pencils. How many pencils did Juan give her? Sarah had some pencils. Juan gave her 18 pencils. Now Sarah has a total of 43 pencils. How many pencils did Sarah have to begin with?
Separating: Sarah had 43 pencils. She gave 18 pencils to Juan. How many pencils does Sarah have now? Sarah had a total of 43 pencils. She gave some to Juan. Now she only has 25 pencils. How many pencils did she give to Juan? Sarah had some pencils. She gave 18 to Juan. Now Sarah has 25 pencils left. How many pencils did Sarah have before?
Comparing: Juan has 43 pencils and Sarah has 25 pencils. How many more pencils does Juan have than Sarah? Sarah has 18 fewer pencils than Juan. If Sarah has 25 pencils, how many pencils does Juan have? Juan has 18 more pencils than Sarah. If Juan has 43 pencils, how many pencils does Sarah have? If Juan has 43 and Sarah has 25, how many more does Sarah need to have the same amount as Juan?

Distractor Factor

- Students may try to apply "key words" to select the appropriate operation instead of understanding the context of the problem.
- Students may not recognize a number sentence and its inverse as being equivalent (i.e. 42 - 18 = ___ is the same things as 18 + ___ = 42).

Academic Vocabulary

- Addition
- Difference
- Place value
- Strategies
- Subtraction
- Sum

Rigor Implications

- Apply
- Develop
- Use
- Solve
- Identify
- Describe

GRADE 2 → 2.4D Readiness

TEKS Scaffold

TEKS	SE
3.4A	solve with fluency one-step and two-step problems involving addition and subtraction within 1,000 using strategies based on place value, properties of operations, and the relationship between addition and subtraction (R)
3.5A	represent one- and two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models, number lines, and equations (R)
2.4D	**2.4 Number and Operations.** The student applies mathematical process standards to develop and use strategies and methods for whole number computation in order to solve addition and subtraction problems with efficiency and accuracy. The student is expected to: (D) generate and solve problems situations for given mathematics number sentence involving addition and subtraction of whole numbers within 1,000
2.4C	solve one-step and multi-step word problems involving addition and subtraction within 1,000 using a variety of strategies based on place value, including algorithms (R)
1.3F	generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20 (R)
1.5D	represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences (R)

Content Builder - (See Appendix for Tree Diagram)

- Generate problem situations for given mathematics number sentences within 1,000 using
  - » addition
  - » subtraction
  - » addition and subtraction
- Solve problem situations for given mathematics number sentences within 1,000 using
  - » addition
  - » subtraction
  - » addition and subtraction

Instructional Implications

In adherence to the standard, students not only have to solve word problems that are provided to them, but they must also create their own story problems when given a number sentence. This standard will assess whether students understand the conceptual difference between addition and subtraction. Instruction should provide students opportunities to write story problems with multiple representations of various number sentences (i.e. 42 - 18 = ____; ___ = 42 - 18; 18 + ____ = 42; 18 + ____ + 6 = 42; ___ = 42 - 6 - 18; _____ = 42 - 18 + 4).

Distractor Factor

- Students may try to apply "key words" to select the appropriate operation instead of understanding the context of the problem.
- Students may not recognize a number sentence and its inverse as being equivalent (i.e. 42 - 18 = ___ is the same things as 18 + ___ = 42).

Academic Vocabulary

- Addition
- Difference
- Equations/Number sentences
- Subtraction
- Sum

Rigor Implications

- Apply
- Develop
- Use
- Solve
- Generate

GRADE 2 → 2.5A Readiness

TEKS Scaffold

TEKS	SE
4.8C	solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate (R)
3.4C	determine the value of a collection of coins and bills (S)
2.5A	**2.5 Number and Operations.** The student applies mathematical process standards to determine the value of coins in order to solve monetary transactions. The student is expected to: (A) determine the value of a collection of coins up to one dollar
1.4C	determine the value of a collection of coins and bills (S)
K.4	identify U.S. coins by name, including pennies, nickels, dimes and quarters (S)

Content Builder - (See Appendix for Tree Diagram)

- Determine the value of a collection of coins up to one dollar

Instructional Implications

Students are to apply their knowledge of skip counting (see 1.5B) to determine the value of a collection up to one dollar (i.e. skip count by twos to count a collection of pennies; skip count by fives to count a collection of nickels; skip count by tens to count a collection of dimes). As students become comfortable with determining the value of a collection of like coins, instruction should then address a mixture of unlike coins. Again, associating a child's understanding of skip counting will allow them to add the value with ease (i.e. Given 3 dimes, 4 nickels and 6 pennies, students will skip count by tens to add the value of dimes 10, 20, 30, skip counting by fives to add the value of the nickels 35, 40, 45, 50, and then skip count by twos to add the value of the pennies; 52, 54, 56). In adherence to the standard, students should solve problems involving monetary transactions.

Distractor Factor

- Students may not recognize the heads and/or tails side of a coin.
- Students may not recognize non-traditional coins.
- Students may confuse the size of the coin with its value (i.e. a nickel is worth more than a dime because it is larger in size).

Academic Vocabulary

- Coins
  - » Pennies/cents
  - » Nickels
  - » Dimes
  - » Quarters
- Dollar

Rigor Implications

- Apply
- Determine
- Solve

GRADE 2 → 2.8B Readiness

TEKS Scaffold

TEKS	SE
3.6A	classify and sort two- and three-dimensional figures, including cones, cylinders, spheres, triangular and rectangular prisms, and cubes, based on attributes using formal geometric language (R)
2.8B	**2.8 Geometry and Measurement.** The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties. The student is expected to: (B) classify and sort three-dimensional solids, including spheres, cones, cylinders, rectangular prism (including cubes as special rectangular prisms), and triangular prism, based on attributes using formal geometric language
1.6E	identify three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes), and triangular prisms, and describe their attributes using formal geometric language (R)
K.6B	identify three-dimensional solids, including cylinders, cones, spheres, and cubes, in the real world (S)

Content Builder - (See Appendix for Tree Diagram)

- Classify three-dimensional solids based on attributes using formal geometric language:
  - » spheres, cones, cylinders, rectangular prism, cubes, triangular prism
- Sort three-dimensional solids based on attributes using formal geometric language:
  - » spheres, cones, cylinders, rectangular prism, cubes, triangular prism

Instructional Implications

Students must be given a variety of three-dimensional solids to sort based on their attributes (i.e. number of edges, number of vertices, number/types of faces, etc.). In adherence to the standard, solids are limited to prisms and do not include pyramids. It is essential for students to recognize that a cube is a rectangular prism; it is a special rectangular prism that has all edges equal in length. Instruction should relate how three-dimensional figures are comprised of two-dimensional shapes (i.e. six rectangles are put together to make a rectangular prism).

Distractor Factor

- Students may interchange the term side referencing two-dimensional shapes and edge referencing a three-dimensional shape.
- Students may count the common vertices of a three-dimensional figure twice as they view each face independently.
- Students may not view a square as a rectangle or a cube as a rectangular prism.

Academic Vocabulary

- Attributes
  - » Edges
  - » Vertices
  - » Faces
- Three-dimensional
  - » Solid
  - » Sphere
  - » Cone
  - » Cylinder
  - » Rectangular prism
  - » Cube as a special rectangular prism
  - » Triangular prism

Rigor Implications

- Apply
- Analyze
- Develop
- Classify
- Sort

GRADE 2 → 2.8C Readiness

TEKS Scaffold

TEKS	SE
4.6D	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 (R)
3.6A	classify and sort two- and three-dimensional figures, including cones, cylinders, spheres, triangular and rectangular prisms, and cubes, based on attributes using formal geometric language (R)
3.6B	use attributes to recognize rhombuses, parallelograms, trapezoids, rectangles, and squares as examples of quadrilaterals and draw examples of quadrilaterals that do not belong to any of these subcategories (S)
2.8C	**2.8 Geometry and Measurement.** The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties. The student is expected to: (C) classify and sort polygons with 12 or fewer sides according to attributes, including identifying the number of sides and number of vertices
1.6A	classify and sort regular and irregular two-dimensional shapes based on attributes using informal geometric language (R)
K.6E	classify and sort a variety of regular and irregular twoand three-dimensional figures regardless of orientation or size (R)

Content Builder - (See Appendix for Tree Diagram)

- Classify polygon with 12 or fewer sides according to attributes using
  - » number of sides and number of vertices
- Sort polygon with 12 or fewer sides according to attributes using
  - » number of sides and number of vertices

Instructional Implications

Students must be given a variety of two-dimensional shapes to sort based on their attributes. In adherence to the standard, students need exposure to polygons up to 12 sides (i.e. triangles, quadrilaterals, pentagons, hexagons, heptagons, octagon, nonagon, decagon, etc.). Students need to be exposed to both regular (i.e. pentagon with all five sides equal in length) and irregular (i.e. chevron shaped pentagon where all sides are not of equal length) two-dimensional figures.

Distractor Factor

- Students may interchange the term side referencing two-dimensional shapes and edge referencing a three-dimensional shape.
- Students may not view a square as a rectangle.

Academic Vocabulary

- Attribute
  - » Sides
  - » Vertex (vertices)
- Polygons
  - » Triangles
  - » Quadrilaterals, rectangles, squares, rhombus, parallelogram, trapezoid
  - » Pentagons
  - » Hexagon
  - » Octagon

Rigor Implications

- Apply
- Analyze
- Develope
- Classify
- Sort

GRADE 2 → 2.9E Readiness

TEKS Scaffold

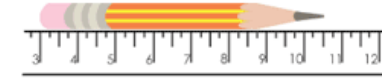
TEKS	SE
4.5D	solve problems related to perimeter and area of rectangles where dimensions are whole numbers (R)
4.5C	use models to determine the formulas for the perimeter of a rectangle (l+w+l+w or 2l+2w), including the special form for perimeter of a square (4s) and the area of a rectangle (l x w)
4.8C	solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate (R)
3.7B	determine the perimeter of a polygon or a missing length when given perimeter and remaining side lengths in problems (R)
2.9E	**2.9 Geometry and Measurement.** The student applies mathematical process standards to select and use units to describe length, area, and time. The student is expected to: (E) determine a solution to a problem involving length, including estimating lengths
1.7D	describe a length to the nearest whole unit using a number and a unit (R)
K.7B	compare two objects with a common measureable attribute to see which object has more of/less of the attribute and describe the difference (S)

Content Builder - (See Appendix for Tree Diagram)

- Determine solution to a problem involving length
- Estimate lengths

Instructional Implications

Instruction should provide a variety of problem situations involving length. Vary the context of the measurement problems (i.e. how many centimeters long is your pencil? If by sharpening your pencil you lost 2 centimeters of length, how long would the newly sharpened pencil be? How many inches longer is your notebook than your pencil? If you taped two pieces of paper together, how long would the new piece of paper be?). In adherence to the standard, word problems should include estimations as well, such as estimating the length of your eraser in centimeters. It is essential that students have a mental visual image of each of the standard units of measure in order to accurately estimate (i.e. I know a unit cube is about a centimeter and it looks like my eraser would be about 2 of those unit cubes; I estimate the length of my eraser to be 2 centimeters). Instruction should also include measuring with a measurement tool that does not start at zero (i.e. using your broken ruler, measure the length of your pencil.)



Distractor Factor

- Students may not align the zero marking of the ruler appropriately.
- Students may inaccurately read the length of an object being measured with a tool not aligned at the zero marking.
- Students may think that an object measuring 12 inches in length is longer than an object measuring one foot because 12 is bigger than 1.
- Students may not estimate a measurement reasonably because they do not have a good understanding of the size of various measures.

Academic Vocabulary

- Estimation
- Length

Rigor Implications

- Apply
- Select
- Use
- Describe
- Determine
- Estimate

GRADE 2 → 2.9G Readiness

TEKS Scaffold

TEKS	SE
4.8C	solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate (R)
3.7C	determine the solutions to problems involving addition and subtraction of time intervals in minutes using pictorial models or tools such as a 15-minute event plus a 30-minute event equals 45 minutes (S)
2.9G	**2.9 Geometry and Measurement.** The student applies mathematical process standards to select and use units to describe length, area, and time. The student is expected to: (G) read and tell time to the nearest one-minute increment using analog and digital clocks and distinguish between a.m. and p.m.
1.7E	tell time to the hour and half hour using analog and digital clocks (R)

Content Builder - (See Appendix for Tree Diagram)

- Read time to the nearest one-minute increment using
  - » analog clock
  - » digital clock
- Tell time to the nearest one-minute using
  - » analog clock
  - » digital clock
- Distinguish between a.m. and p.m.

Instructional Implications

Relate the clock to a circular, closed number line (see 2.2 E/F). Create a number line identifying the whole numbers 0 -12. Demonstrate how to connect both ends of the number line to create a circular number line referencing how the hour numerals on the clock relate to those on a number line. Extend the use of the closed number line to include the minute increments. Instruction should relate the hour and minute hands from the analog clock to the digits represented on a digital clock. Clarify that the use of the colon (:) on the digital clock is to separate the hours (whole) from the minutes (part). Instruction should include discussions about how our day is divided into two equal parts (a.m. and p.m.). Activities that happen from midnight until noon are considered to occur in the a.m. and activities that happen from noon until midnight are considered to occur in the p.m. Creating a timeline of classroom activities with the appropriate a.m./p.m. recordings may support this understanding .

Activity	Time
Reading	8:40 a.m. - 9: 55 a.m.
Social Studies	9:55 a.m. - 10:40 a.m.
Library	10:45 a.m. - 11:30 a.m.
Lunch	11:35 a.m. - 12:25 p.m.
Math	12:30 p.m. - 1:30 p.m.
Science	1:30 p.m. - 2:30 p.m.

Distractor Factor

- Students may confuse the hour and minute hand.
- Students may not be able to accurately read the hour hand as it falls between two hour points.
- Students may be able to read time accurately but struggle when asked to represent a given time on a clock.
- Students may think that activities that happen in the day time are a.m. and activities that happen in the night time are p.m. activities.
- Students may confuse 12:00 a.m. and 12:00 p.m.

Academic Vocabulary

- a.m./p.m.
- Analog clock
- Digit
- Digital clock
- Hour hand
- Minute
- Minute hand
- Number line
- Time

Rigor Implications

- Read
- Tell
- Distinguish

GRADE 2 → 2.10C Readiness

TEKS Scaffold

TEKS	SE
4.9B	solve one- and two-step problems using data in whole number, decimal, and fraction form in a frequency table, dot plot, or stem-and-leaf plot (S)
3.8B	solve one- and two-step problems using categorical data represented with a frequency table, dot plot, pictograph, or bar graph with scaled intervals (S)
2.10C	**2.10 Data Analysis.** The student applies mathematical process standards to organize data to make it useful for interpreting information and solving problems. The student is expected to: (C) write and solve one-step word problems involving addition and subtraction using data represented within pictographs and bar graphs with intervals of one
2.10D	draw conclusions and make predictions from information in a graph (S)
1.8C	draw conclusions and generate and answer questions using information from picture and bar-type graphs (S)
K.8C	draw conclusions from real-object and picture graphs (R)

Content Builder - (See Appendix for Tree Diagram)

- Write one-step word problems using addition with pictographs
- Write one-step word problems using addition with bar graphs
- Write one-step word problems using subtraction with pictographs
- Write one-step word problems using subtraction with bar graphs
- Solve one-step word problems using addition with pictographs
- Solve one-step word problems using addition with bar graphs
- Solve one-step word problems using subtraction with pictographs
- Solve one-step word problems using subtraction with bar graphs

Instructional Implications

As students organize their data into pictographs and/or bar graphs (see 2.10B), instruction should then lead students to creating their own questions (i.e. How many more daffodils did my grandmother have in her garden than roses? How many roses and carnations are there in Grandma's garden?). Designing appropriate questions that relate to the data is an informal way to assess whether students understand the information represented in the graphs. Student could then exchange their graphs and ask fellow classmates to answer their self-generated questions. Note that in the difference between 2.10B and 2.10C, students must organize data with interval graphs of one or more but the writing and solving of problems is limited to graphs with intervals of one only.

Distractor Factor

- Students may misinterpret pictographs in which each picture represents a value other than one.
- Students may misread bar graphs that have scaled intervals.
- When representing the same set of data on the two types of graphs, students may interpret the data as different because they are represented with different graphs.
- When representing the same set of data vertically and horizontally, students may interpret the data as different because of the difference in the visual representations.
- Students may apply the use of "key words" instead of understanding the context of the problem.

Academic Vocabulary

- Addition
- Bar graph
  - » Horizontal
  - » Vertical
- Data
- Difference
- Information
- Interval
- Pictograph
- Subtraction
- Sum

Rigor Implications

- Apply
- Organize
- Interpret
- Solve
- Write

STAAR
SUPPORTING
STANDARDS

2.2A **2.2 Number and Operations.** The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:
(A) use concrete and pictorial models to compose and decompose numbers up to 1,200 in more than one way as a sum of so many thousands, hundreds, tens, and ones

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.2A compose and decompose numbers up to 100,000 as a sum of so many thousands, so many hundreds, so many tens, and so many ones using objects, pictorial models, and numbers, including expanded notation as appropriate
- 2.2B use standard, word, and expanded forms to represent numbers up to 1,200

How does it support the Readiness Standard(s)?

The use of concrete objects (base ten blocks) and pictorial models to represent numbers through 1,200 will support student's conceptual understanding of the magnitude of numbers and the relationship between the place values. This knowledge will extend to relating those visual representations to expanded notation, supporting the comparing/ordering of numbers, and developing addition/subtraction place value algorithms.

Instructional Implications

Through the use of base ten blocks, students will begin to visually understand the magnitude of numbers (i.e. the thousand cube is ten times more than the hundred flat, the hundred flat is ten times more than the ten rod; the hundred flat is ten times smaller than the thousand cube, the ten rod is ten times smaller than the hundred flat, etc.). Students need to understand that the digit in the number represents its place value which is different from the value of the number (i.e. In the number 124; the digit two is in the tens place represented by two ten rods, but it is valued at 20). Numbers should be represented in more than one way (i.e. The number 589 can be represented as 5 hundreds, 8 tens, 9 ones or 4 hundreds, 18 tens, and 9 ones or 5 hundreds, 7 tens, and 19 ones). This understanding will lend itself to regrouping in subtraction (i.e. 589 - 192 = ___; 589 would have to be regrouped into 4 hundreds, 18 tens, and 9 ones).

Academic Vocabulary

- Digit
- Place value
  - » Thousands
  - » Hundreds
  - » Tens
  - » Ones

Rigor Implications

- Apply
- Represent
- Compare
- Use
- Compose
- Decompose

2.2C 2.2 **Number and Operations.** The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:
(C) generate a number that is greater than or less than a given whole number up to 1,200

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.2D use place value to compare and order whole numbers up to 100,000 and represent comparisons using the symbols <, >, or =
- 2.2D use place value to compare and order whole numbers up to 1,200 using comparative language, numbers and symbols (<,>,=)

How does it support the Readiness Standard(s)?

Generating a number greater than or less than a given whole number will allow students to focus on the value of various digits in a number before moving to the abstract use of comparison symbols (<, >, =).

Instructional Implications

As students become more knowledgeable with their use of the place value system in using the base-ten blocks (2.2A) and expanded notation (2.2B), instruction should include students generating a number "greater than" or "less than" a given whole number. Students should be able to explain that the position of each digit in a numeral determines the quantity of a given number (i.e. Given the number 437, students understand that the digit four represents the number of hundred flats and its value is 400; the digit three represents the number of ten rods and its value is 30). This explanation is important to ask of children before they begin abstractly comparing two given numbers (2.2D) so students can demonstrate understanding of place value.

Academic Vocabulary

- Digit
- Greater than
- Less than
- Place value
- Value of a number

Rigor Implications

- Apply
- Represent
- Compare
- Generate

2.2E 2.2 **Number and Operations.** The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:
(E) locate the position of a given whole number on an open number line

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.2D use place value to compare and order whole numbers up to 100,000 and represent comparisons using the symbols <, >, or =
- 2.2D use place value to compare and order whole numbers up to 1,200 using comparative language, numbers and symbols (<,>,=)

How does it support the Readiness Standard(s)?

Students can use number lines to compare/order numbers and develop their understanding of place value, the relative position of numbers, and magnitude of numbers. The use of this tool is a critical support mechanism.

Instructional Implications

An open number line does not have landmark numbers earmarked, does not have to begin at zero, and should include the use of arrows on both ends of the number line to indicate that the numbers continue beyond what is marked.

Students will apply their understanding of the place value system in relation to the relative position on an open number line (i.e. The number 352 would fall between 350 and 360 on a number line as 352 can be expressed as 300 + 50 + 2 or the number 352 has 3 hundreds, 5 tens and two ones). As students are given a specific number to locate on an open number line, you will begin to assess students' understanding of place value (i.e. students place the number 352 between 350 and 360), the relative position of numbers (i.e. the number 350 would be indicated first and the number 360 would be indicated second on the open number line), and the magnitude of numbers (i.e. students physically place the number 352 closer to 350 than 360).

Academic Vocabulary

- Open number line
- Place value
- Whole numbers

Rigor Implications

- Apply
- Represent
- Compare
- Locate

2.2F 2.2 **Number and Operations.** The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:
(F) name the whole number that corresponds to a specific point on a number line

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

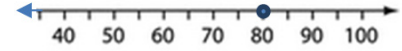
- 3.2D use place value to compare and order whole numbers up to 100,000 and represent comparisons using the symbols <, >, or =
- 2.2D use place value to compare and order whole numbers up to 1,200 using comparative language, numbers and symbols (<,>,=)

How does it support the Readiness Standard(s)?

As a number line is used as a strategy to compare/order numbers and develops a student's understanding of place value, the relative position of numbers, and the magnitude of numbers, the use of this tool will be a critical support mechanism.

Instructional Implications

In contrast to 2.2E, specific numbers are already marked on this number line, did not have to begin at zero, and includes the use of arrows on both ends of the number line to indicate how the numbers continue beyond what is marked.



Students will be provided a specific location identified on a given number line and asked to name the whole number representing its value. In conjunction with 2.2E, this activity will allow you to assess students' understanding of place value, the relative position of numbers and the magnitude of numbers.

Academic Vocabulary

- Number line
- Place value
- Whole numbers

Rigor Implications

- Apply
- Represent
- Compare
- Locate

2.3A 2.3 **Number and Operations.** The student applies mathematical process standards to recognize fractional units and communicates how they are used to name parts of a whole. The student is expected to:
(A) partition objects into equal parts and name the parts, including halves, fourths, and eighths, using words

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.3H compare two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using symbols, words, objects, and pictorial models
- 2.3B explain that the more fractional parts used to make a whole, the smaller the part; and the fewer the fractional parts, the larger the part

How does it support the Readiness Standard(s)?

This supporting standard develops the conceptual understanding of fractional parts of a whole. Being able to physically partition objects into equal parts in various ways will allow students to observe how the size of the parts varies depending on the number of equal parts.

Instructional Implications

As identified by the cognitive expectation of this standard, students should be provided with a whole object and asked to partition it into two, four, and/or eight equal parts. Students should then be able to describe the equal parts in words only (i.e. Halves, fourths, and eighths). Instruction will not extend to the symbolic (i.e. 1/2, 1/4, 1/8) until grade 3. Encourage students to find more than one way to divide a given shape into equal parts (i.e. A square can be divided in two equal parts vertically, horizontality, or diagonally). This will develop a student's understanding of how it is possible for various shapes to represent the same fractional part (i.e. The rectangle formed from dividing the square vertically represents one-half and so does the triangle formed when the same square was divided diagonally). The use of geoboards will support the trial and error process of finding more than one way and comparing the amount of area represented in each fractional part regardless of the shape created.

Academic Vocabulary

- Equal parts
  - » Halves
  - » Fourths
  - » Eighths
- Fractional units
- Whole

Rigor Implications

- Apply
- Recognize
- Communicate
- Partition
- Name

2.3C 2.3 **Number and Operations.** The student applies mathematical process standards to recognize fractional units and communicates how they are used to name parts of a whole. The student is expected to:

(C) use concrete models to count fractional parts beyond one whole using words and recognize how many parts it takes to equal one whole

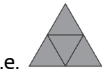
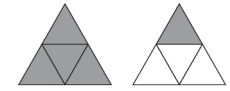
What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.3F represent equivalent fractions with denominators of 2, 3, 4, 6, and 8 using a variety of objects and pictorial models, including number lines
- 3.3H compare two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using symbols, words, objects, and pictorial models
- 2.3B explain that the more fractional parts used to make a whole, the smaller the part; and the fewer the fractional parts, the larger the part

How does it support the Readiness Standard(s)?

Recognizing how many parts it takes to equal one whole will direct the student to focus on the size of the parts. The size of the parts will allow the learner to more accurately compare fractions. Counting fractional parts beyond one whole supports the concrete understanding of improper and mixed number fractions being equivalent (i.e. "Five fourths" is the same as "one and one-fourth").

Instructional Implications

All fraction lessons should begin with identifying how many parts it takes to equal one whole (i.e.  if the whole is represented by the large triangle, then it takes four equal parts to represent the whole). This first step will alleviate the misconception of whether a fractional representation is greater than or less than one whole. In adherence to this standard, students will use manipulatives to represent fractional parts beyond one whole (i.e.  Students identify that the whole is made up of four equal parts and they will be counting in fourths. Students must count each shaded part as one-fourth, two-fourths, three-fourths, four-fourths, five-fourths. Students relate that it takes four parts to represent one whole. Thus, the pictorial representation of five-fourths can also be called one and one-fourth). Instruction is limited to word use only (i.e. one-fourth; two-fourths, etc.) not the symbolic representation (i.e. 5/4 or 1 1/4).

Academic Vocabulary

- Equal parts
- Fractional parts
- One whole

Rigor Implications

- Apply
- Recognize
- Communicate
- Use
- Count

2.3D 2.3 **Number and Operations.** The student applies mathematical process standards to recognize fractional units and communicates how they are used to name parts of a whole. The student is expected to:
(D) identify examples and non-examples of halves, fourths, and eighths

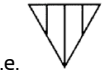
What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.3F represent equivalent fractions with denominators of 2, 3, 4, 6 and 8 using a variety of objects and pictorial models, including number lines
- 3.3H compare two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using symbols, words, objects, and pictorial models
- 2.3B explain that the more fractional parts used to make a whole, the smaller the part; and the fewer the fractional parts, the larger the part

How does it support the Readiness Standard(s)?

Identifying examples and non-examples of fractional parts of the same whole will support student understanding of the part-to-whole relationship and the size of the parts. This knowledge will provide the foundation for being able to visually compare two fractions and/or concretely represent equivalent fractions.

Instructional Implications

In conjunction with 2.3A, as students are partitioning figures into 2/4/8 equal parts and describe them as halves/fourths/eighths, students should recognize examples (i.e.  Regular and irregular shapes divided equally) and non-examples of such partitions (i.e.  Whole objects divided unequally). With the use of geoboards, students would be able to verify examples of halves/fourths/eighths by comparing the amount of area in each part.

Academic Vocabulary

- Equal parts
- Examples/non-examples
- Fractional units
  - » Halves
  - » Fourths
  - » Eighths
- Whole

Rigor Implications

- Apply
- Recognize
- Communicate
- Identify

2.4A 2.4 **Number and Operations.** The student applies mathematical process standards to develop and use strategies and methods for whole number computation in order to solve addition and subtraction problems with efficiency and accuracy. The student is expected to:
(A) recall basic facts to add and subtract within 20 with automaticity

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.4A solve with fluency one-step and two-step problems involving addition and subtraction within 1,000 using strategies based on place value, properties of operations, and the relationship between addition and subtraction
- 2.4C solve one-step and multi-step word problems involving addition and subtraction within 1,000 using a variety of strategies based on place value, including algorithms
- 2.4D generate and solve problems situations for given mathematics number sentence involving addition and subtraction of whole numbers within 1,000

How does it support the Readiness Standard(s)?

Efficiency and accuracy with basic addition/subtraction facts will be a critical foundation for students to be able to solve multi-step addition and subtraction problems using place value strategies.

Instructional Implications

In conjunction with 1.3D, students will continue to apply the following strategies to recall basic facts:

Addition:
- Make ten with the use of two tens frames as a model (i.e. 9 + 8 = _____; 9 + 1 + 7 = ____; 10 + 7 = ____; 10 + 7 = 17)
- Make ten with the use of an open number line (i.e. 9 + 8 = _____; 9 + 1 + 7 = ____; 10 + 7 = ____; 10 + 7 = 17)
- Doubles (i.e. 6 + 8 = ___; 6 + 6 + 2 = ___; 12 + 2 = ____; 12 + 2 = 14
- Count on (i.e. 3 + 8 = ____; 8, 9, 10, 11; 3 + 8 = 11)

Subtraction:
- Think Addition/Count On (i.e. 12 - 9 = ____; 9 + ____ = 12; 9 + 3 = 12)
- Make ten with the use of two tens frames as a model (i.e. 12 - 9 = ____; 12 - 10 = 2; 2 + 1 = 3)
- Make ten with the use of an open number line (i.e. 12 - 9 = ____; 12 - 10 = 2; 2 + 1 = 3)
- Count back (i.e. 12 - 3 = ___; 12, 11, 10, 9; 12 - 3 = 9)

In adherence to this grade level standard, students will continue to practice using these strategies in order to recall their basic facts with automaticity.

Academic Vocabulary

- Add
- Basic facts
- Difference
- Subtract
- Sum

Rigor Implications

- Apply
- Develop
- Use
- Solve
- Recall
- Add
- Subtract

2.4B

2.4 **Number and Operations.** The student applies mathematical process standards to develop and use strategies and methods for whole number computation in order to solve addition and subtraction problems with efficiency and accuracy. The student is expected to:

(B) add up to four two-digit numbers and subtract two-digit numbers using mental strategies and algorithms based on knowledge of place value and properties of numbers

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.4A solve with fluency one-step and two-step problems involving addition and subtraction within 1,000 using strategies based on place value, properties of operations, and the relationship between addition and subtraction
- 2.4C solve one-step and multi-step word problems involving addition and subtraction within 1,000 using a variety of strategies based on place value, including algorithms
- 2.4D generate and solve problems situations for given mathematics number sentence involving addition and subtraction of whole numbers within 1,000

How does it support the Readiness Standard(s)?

Adding multi-digit numbers based on place value and properties of operations is a fundamental skill in order to solve multi-step addition problems.

Instructional Implications

Students will employ their understanding of place value and expanded notation to develop mental strategies to add multiple two-digit numbers. Properties of operations include the commutative, associative, and inverse properties. Although the teacher may model the names of the properties (i.e. commutative, associative, inverse, etc.), students will only be asked to employ the underlying concepts in order to solve addition and subtraction problems.
(i.e. Commutative & Associative Property: 34 + 16 + 23 + 12= ____; (30 + 4) + (10 + 6) + (20 + 3) + (10 + 2) = _____; (30 + 10 + 20 + 10) + (4 + 6 + 3 + 2) = _____; 70 + 15 = 85).
(i.e. Inverse Property: 62 - 58 = ___; 58 + ____ = 62; applying add-on, 59, 60, 61, 62; 62 - 58 = 4).
Once students become fluent using the mental strategies, the traditional algorithm can be introduced relating the steps in the algorithm to the steps in the mental math strategies described above.

Academic Vocabulary

- Addition
- Difference
- Place value
- Subtraction
- Sum

Rigor Implications

- Apply
- Develop
- Use
- Solve
- Add
- Subtract

2.5B 2.5 **Number and Operations.** The student applies mathematical process standards to determine the value of coins in order to solve monetary transactions. The student is expected to:

(B) use the cent symbol, dollar sign, and the decimal point to name the value of a collection of coins

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 2.5A determine the value of a collection of coins up to one dollar

How does it support the Readiness Standard(s)?

Being able to symbolically represent the value of a collection of coins appropriately is critical in solving monetary transactions.

Instructional Implications

In conjunction with 2.5A, students will begin using the cent symbol or the dollar sign and decimal point to represent the value of a collection of coins. Instruction should address that money can be represented two ways (i.e. 42¢ or $0.42) but cannot be represented using both symbols (i.e. $0.42¢). Instruction should address how the decimal point is used to separate the dollars (whole) from the cents (part).

Academic Vocabulary

- Cent symbol
- Coins
- Dollar sign
- Decimal point
- Part
- Whole

Rigor Implications

- Apply
- Determine
- Solve
- Use
- Name

2.6A 2.6 **Number and Operations.** The student applies mathematical process standards to connect repeated addition and subtraction to multiplication and division situations that involve equal groupings and shares. The student is expected to:
(A) model, create, and describe contextual multiplication situations in which equivalent sets of concrete objects are joined

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.4K solve one-step and two-step problems involving multiplication and division within 100 using strategies based on objects; pictorial models, including arrays, area models, and equal groups; properties of operations; or recall of facts

How does it support the Readiness Standard(s)?

This supporting standard develops the conceptual understanding of multiplication. The manipulation of objects into equal groups, the creation of multiplicative scenarios, and the verbal description of multiplicative situations provides the foundation for future problem solving.

Instructional Implications

Students should be provided a variety of opportunities to model the joining of equal groups with objects (i.e. Using manipulatives a student can model how many wheels are on six tricycles). Instruction will **not** represent the multiplication situations with a multiplicative number sentence (i.e. 3 x 6 = 18). As outlined by the TEKS, students are to connect multiplicative situations to repeated addition. Therefore the recording of an addition number sentence would be appropriate (i.e. 3 + 3 + 3 + 3 + 3 + 3 = 18). In adherence to the standard, students should also create situations where repeated addition can be modeled.

Academic Vocabulary

- Equivalent sets
- Repeated addition

Rigor Implications

- Apply
- Connect
- Model
- Create
- Describe

2.6B 2.6 **Number and Operations.** The student applies mathematical process standards to connect repeated addition and subtraction to multiplication and division situations that involve equal groupings and shares. The student is expected to:
(B) model, create, and describe contextual division situations in which a set of concrete objects is separated into equivalent sets

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.5B represent and solve one- and two-step multiplication and division problems within 100 using arrays, strip diagrams, and equations

How does it support the Readiness Standard(s)?

This supporting standard develops the students' conceptual understanding of division which they will need in order to understand, appropriately represent, and solve division problems.

Instructional Implications

Students should be provided a variety of opportunities to model the separating of a set of objects into equivalent groups (i.e. Using manipulatives, students model how many tricycles are needed using 18 wheels). Instruction will not represent the division situations with a division number sentence (i.e. 18 ÷ 3 = 6). As outlined by the TEKS, students are to connect divisional situations to repeated subtraction. Therefore the recording of a subtraction number sentence would be appropriate (i.e. 18 - 3 - 3 - 3 - 3 - 3 - 3 = 0).
Divisional situations should be limited to those that yield equal groupings/shares (no remainders). In adherence to the standard, students should also create situations where repeated subtraction will be modeled.

Academic Vocabulary

- Equivalent sets
- Repeated subtraction
- Separated

Rigor Implications

- Apply
- Connect
- Model
- Create
- Describe

2.7A 2.7 **Algebraic Reasoning.** The student applies mathematical process standards to identify and apply number patterns within properties of numbers and operations in order to describe relationships. The student is expected to:

(A) determine whether a number up to 40 is even or odd using pairing of objects to represent the number

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.4A solve with fluency one-step and two-step problems involving addition and subtraction within 1,000 using strategies based on place value, properties of operations, and the relationship between addition and subtraction
- 3.4K solve one-step and two-step problems involving multiplication and division within 100 using strategies based on objects: pictorial models, including arrays, area models, and equal groups; properties of operations; or recall of facts

How does it support the Readiness Standard(s)?

As students solve problems using all operations, developing patterns with even and odd solutions can support students with their computational efficiency and accuracy (i.e. odd + odd = even; even + odd = odd; odd - odd = even; odd - even = odd).

Instructional Implications

In order to adhere to the standard, students should be provided a set of objects to group in pairs to determine if a number is even or odd. As students begin pairing objects, instruction should relate this concept to the double facts (i.e. 18 is even as there are 9 groups of pairs (2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2= 18); 15 is odd as there are 7 groups of pairs with one left over (2 + 2 + 2 + 2 + 2 + 2 + 2 +1 = 15).

Academic Vocabulary

- Even
- Odd
- Pairing

Rigor Implications

- Apply
- Identify
- Describe
- Determine
- Represent

2.7B 2.7 **Algebraic Reasoning.** The student applies mathematical process standards to identify and apply number patterns within properties of numbers and operations in order to describe relationships. The student is expected to:

(B) use an understanding of place value to determine the number that is 10 or 100 more or less than a given number up to 1,200

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.2D compare and order whole numbers up to 100,000 and represent comparison using symbols >, <, or =
- 2.2D use place value to compare and order whole numbers up to 1,200 using comparative language, numbers, and symbols (<,>, or =)

How does it support the Readiness Standard(s)?

Students will begin identifying patterns in determining 10 or 100 more/less than a given number. Recognizing the change in the digits will reinforce tens and hundreds place value. This standard will reinforce place value in support of comparing and ordering whole numbers.

Instructional Implications

In order to adhere to the standard, students must be able to determine 10 more/10 less or 100 more/100 less of a given number (i.e. ten more than 234 is 244; 100 less than 340 is 240). Instruction might begin with the use of a 100s chart to recognize the patterns of 10 more/10 less (i.e. using your 100s chart, what is 10 more than 23 or what is 10 less than 45?). As students move down a row to model ten more than a number, they should begin relating how the digit in the tens place is increasing by one with each move down a row in a column. As students move up a row in a column to model 10 less than a number, they should begin relating how the digit in the tens place is decreasing with each move up a row. As student become proficient with addition/subtraction of ten, instruction can extend to 100 more/100 less. In accordance with the TEKS, students also need to connect their findings through the use of properties of numbers and operations (i.e. Ten more than 234 is 244 because 234 + 10 = ____; 200 +30 + 4 + 10 = ____; 200 + 30 + 10 + 4 = 200 + 40 + 4 = 244).

Academic Vocabulary

- Place value
- 10 more
- 10 less
- 100 more
- 100 less

Rigor Implications

- Apply
- Identify
- Describe
- Use
- Determine

2.7C 2.7 **Algebraic Reasoning.** The student applies mathematical process standards to identify and apply number patterns within properties of numbers and operations in order to describe relationships. The student is expected to:

(C) represent and solve addition and subtraction word problems where unknowns may be any one of the terms in the problem

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.5A represent and solve one- and two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models, number lines, ad equations
- 2.4D generate and solve problem for a given mathematical number sentence involving addition and subtraction of whole numbers within 1,000

How does it support the Readiness Standard(s)?

Relating addition and subtraction number sentences/equations supports a student's ability to represent and solve addition and subtraction problems.

Instructional Implications

In conjunction with 2.4, students continue to demonstrate their understanding of addition and subtraction with the appropriate number sentence. Instruction should vary the context of +/- type problems provided to students (see 2.4C for examples). In adherence to the standard, students should represent the same word problem with a variety of number sentences (i.e. 17 + 18 = _____; 18 + 17 = _____; _____ = 18 + 17; ____= 17 + 18); (i.e. 42 - 16 = _____; ____ = 42 - 16; 16 + ____ = 42; 42 = ____ + 16).

Academic Vocabulary

- Addition
- Difference
- Number sentence/Equation
- Subtraction
- Sum
- Term
- Unknown

Rigor Implications

- Apply
- Identify
- Describe
- Represent
- Solve

2.8A 2.8 **Geometry and Measurement.** The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties. The student is expected to:
(A) create two-dimensional shapes based on given attributes, including number of sides and vertices

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.6A classify and sort two- and three-dimensional figures, including cones, cylinders, spheres, triangular and rectangular prism, and cubes, based on attributes using formal geometric language
- 2.8C classify and sort polygons with 12 sides or fewer sides according to attributes including identifying the number of sides and number of vertices

How does it support the Readiness Standard(s)?

Creating two-dimensional shapes given the number of sides and vertices allows students to focus on the geometric attributes of a figure. This attention to specific attributes will support the classification and sorting of various polygons.

Instructional Implications

Students are provided with a variety of materials (i.e. toothpicks, straws, string, marshmallows, clay, etc.) and a description of a two-dimensional shape (i.e. polygon with five sides and five vertices). Students are to use the materials to build the shape or arrange the materials to create the shape based on the given attributes and associate the materials to the appropriate geometric attribute (i.e. The five marshmallows represent the five vertices and the five toothpicks represent the five sides of the pentagon). Instruction should extend to the study of attributes by taking an already created shape and modify it to create a new shape (i.e. Students made a rectangle out of clay and are now asked to modify the rectangle to make it a square and explain how the attributes/properties of the two shapes were similar yet different).

Academic Vocabulary

- Attributes
- Polygon
- Shape
- Sides
- Two-dimensional
- Vertex (vertices)

Rigor Implications

- Apply
- Analyze
- Develop
- Create

2.8D 2.8 **Geometry and Measurement.** The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties. The student is expected to:
(D) compose two-dimensional shapes and three-dimensional solids with given properties or attributes

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.6A classify and sort two- and three-dimensional figures, including cones, cylinders, spheres, triangular and rectangular prism, and cubes, based on attributes using formal geometric language
- 2.8C classify and sort polygons with 12 sides or fewer sides according to attributes including identifying the number of sides and number of vertices
- 2.8B classify and sort three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes as special rectangular prisms), and triangular prisms, based on attributes using formal geometric language

How does it support the Readiness Standard(s)?

Creating two- and three-dimensional shapes given attributes (i.e. the number of sides and vertices) and properties (i.e. all sides are of different lengths) requires students to focus on the geometric attributes of a figure. This attention to specific attributes and properties will support the classification and sorting of various figures.

Instructional Implications

Students are provided with a variety of materials (i.e. toothpicks, straws, string, marshmallows, clay, etc.) and a description outlining properties and/or attributes for a given figure (i.e. a solid with 8 vertices, 6 faces and 12 edges which are not all of equal length). Students are to use the materials to build the figure based on the given attributes and associate the materials used to the appropriate geometric attribute (i.e. the 8 balls of clay on each end represent the eight vertices and the 12 straws represent the 12 edges of my rectangular prism. However, I had to cut the straws to be different in length so that it would not represent a cube).

Academic Vocabulary

- Attributes
  - » Edges
  - » Faces
  - » Sides
  - » Vertex (vertices)
- Polygons
- Properties
- Shapes
- Solids
- Three-dimensional
- Two-dimensional

Rigor Implications

- Apply
- Analyze
- Develop
- Compose

GRADE 2 → 2.8E Supporting

2.8E

2.8 **Geometry and Measurement.** The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties. The student is expected to:

(E) decompose two-dimensional shapes such as cutting out a square from a rectangle, dividing a shape in half, or partitioning a rectangle into identical triangles and identify the resulting geometric parts

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.6A classify and sort two- and three-dimensional figures, including cones, cylinders, spheres, triangular and rectangular prism, and cubes, based on attributes using formal geometric language
- 2.8C classify and sort polygons with 12 sides or fewer sides according to attributes including identifying the number of sides and number of vertices

How does it support the Readiness Standard(s)?

Decomposing shapes into other polygons will support the classification and sorting of two-dimensional figures. The student will have to focus on the various attributes to identify the resulting geometric parts.

Instructional Implications

As students begin to recognize and describe the attributes of given two-dimensional shapes, instruction will lead to more spatial reasoning development. Students will be given a targeted two-dimensional shape (i.e.  a trapezoid) and asked to decompose the figure into different smaller geometric parts (i.e.  a rectangle and one triangle). Encourage students to partition shapes in different ways (i.e.  one with three triangles;  one with two rectangles and one triangle, etc.).

Academic Vocabulary

- Geometric parts
- Polygon
- Shape
- Two-dimensional

Rigor Implications

- Apply
- Analyze
- Develop
- Decompose
- Identify

2.9A 2.9 **Geometry and Measurement.** The student applies mathematical process standards to select and use units to describe length, area, and time. The student is expected to:

(A) find the length of objects using concrete models for standard units of length

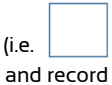
What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.7B determine the perimeter of a polygon or a missing length when given perimeter and remaining side lengths in problems
- 2.9E determine a solution to a problem involving length, including estimating lengths

How does it support the Readiness Standard(s)?

This supporting standard develops the conceptual understanding that perimeter is the measurement of length. The use of non-standard units of measure (concrete objects) to measure length will develop a visual benchmark of various lengths which will support a student's ability to estimate lengths more appropriately.

Instructional Implications

The use of non-standard units of measure (i.e. Teddy bear counters, paper clips, index cards, etc.) will be restricted to only models that represent an approximate standard unit of length (i.e. A unit cube represents a centimeter, a color tile represents an inch, a ruler represents a foot, etc.). As non-standard units of measure will also be used to determine area (see 2.9F), it will be critical to identify that only the length of one of the sides of the manipulative will be used not the entire object (i.e.  "When measuring in inches, we will only be using the length of one of the sides of a color tile to determine length"). Students will measure lengths of various objects and record the measurements in standard units of measure (i.e. "The length of a notebook was approximately 11 color tiles in length measuring 11 inches"). It is imperative that instruction allow plenty of time for students to engage in the use of concrete models representing a standard unit of measure as a mental image of the length of a centimeter, inch, foot, yard, etc. will lead to more educated estimations and reasonableness of length (i.e. See 2.9E).

Academic Vocabulary

- Length
- Standard units (centimeters, inches, feet, etc.)

Rigor Implications

- Apply
- Select
- Use
- Describe
- Find

2.9B 2.9 **Geometry and Measurement.** The student applies mathematical process standards to select and use units to describe length, area, and time. The student is expected to:

(B) describe the inverse relationship between the size of the unit and the number of units needed to equal the length of an object

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.7B determine the perimeter of a polygon or a missing length when given perimeter and remaining side lengths in problems
- 2.9E determine a solution to a problem involving length, including estimating lengths

How does it support the Readiness Standard(s)?

Measuring the length of objects with a variety of concrete objects will support the understanding that length of objects can be measured in various units. This supporting standard will allow the learner to experience how the shorter the unit of measure, the more units needed to measure the length; the longer the unit of measure, the fewer units needed to measure the length. As students begin moving to measuring with a ruler, this non-standard unit of measurement experience will support how objects can be measured in centimeters and inches and how the inverse relationship between the size of the units and the number of units are needed to equal the length of an object.

Instructional Implications

Students should measure a given object with more than one unit of measure (i.e. measure the length of an index card using unit cubes and color tiles). In conjunction with 2.9A, students record both measurements in standard units of measure (i.e. 5 color tiles=5 inches, 15 unit cubes=15 centimeters). Students need to justify how it is possible to have two different measurement recordings for the same object (i.e. the length of the object was measured with different measurement tools). Instruction is to lead to the discovery that the longer the unit of measure, the fewer units of measure is needed; the shorter the unit of measure, the more units of measure are needed. This concept leads to future understanding of how an object measuring 2 yards in length is not shorter than an object measuring 6 feet in length.

Academic Vocabulary

- Length
- Size of unit
- Unit of measure

Rigor Implications

- Apply
- Select
- Use
- Describe (justify)

2.9C 2.9 **Geometry and Measurement.** The student applies mathematical process standards to select and use units to describe length, area, and time. The student is expected to:

(C) represent whole numbers as distances from any given location on a number line

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

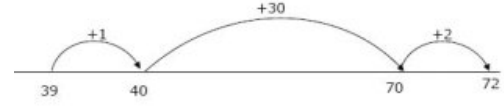
- 3.5A represent one- and two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models, number lines, and equations
- 3.2D compare and order whole numbers up to 100,000 and represent comparisons using >,<, or =
- 2.2D use place value to compare and order whole numbers up to 1,200 using comparative language, numbers, and symbols (<,>, or =)
- 2.9E determine a solution to a problem involving length, including estimating lengths

How does it support the Readiness Standard(s)?

Identifying whole numbers as distances from any given location can relate to the effective use of a ruler. This understanding will support the solving of problems involving length. Being able to represent whole numbers on a number line will support the comparing and ordering of numbers as larger numbers progress to the right and smaller numbers progress to the left of a number line. The understanding of whole numbers as distances from a given location will support the use of a number line as a strategy to add and subtract numbers.

Instructional Implications

Students will locate and name points on a number line (see 2.2E/F). Instruction needs to address that whole numbers identified on a number line represent the distance away from zero. This understanding will then be related to the use of the ruler and how the whole numbers identified on a ruler represent a measureable length (see 2.9D). In conjunction with 2.4B/C, instruction could extend the use of a number line in adding and subtracting two-digit numbers (i.e. 39 + ____ = 72)



Academic Vocabulary

- Distance
- Location
- Number line
- Place value
- Whole numbers

Rigor Implications

- Apply
- Select
- Use
- Describe
- Represent

2.9D 2.9 **Geometry and Measurement.** The student applies mathematical process standards to select and use units to describe length, area, and time. The student is expected to:

(D) determine the length of an object to the nearest marked unit using rulers, yardsticks, meter sticks, and measuring tapes

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.7B determine the perimeter of a polygon or a missing length when given perimeter and remaining side lengths in problems
- 2.9E determine a solution to a problem involving length, including estimating lengths

How does it support the Readiness Standard(s)?

Hands-on experiences measuring the length of objects with a variety of measurement tools will be essential for students to estimate length and solve problems involving length to include perimeter.

Instructional Implications

This standard begins the transition from the use of concrete objects to measure length to the use of a formal measurement tool.

Through the lens of the number line, students will begin associating the number line to the representation of various measurement tools (i.e. the whole numbers represented on a ruler). In conjunction with 2.9A, students can begin comparing the size of the concrete object they used to measure length to the standard measuring tool (i.e. Align 12 color tiles next to a ruler to demonstrate how 12 inches equals one foot). Students will measure the lengths of various objects using a variety of standard measurement tools (i.e. ruler, yard stick, meter stick, measuring tape). In adherence to the standard, students will only measure to the nearest whole number.

Academic Vocabulary

- Length
- Marked unit
- Measuring tape
- Meter stick
- Ruler
- Yardstick

Rigor Implications

- Apply
- Select
- Use
- Describe
- Determine

2.9F 2.9 **Geometry and Measurement.** The student applies mathematical process standards to select and use units to describe length, area, and time. The student is expected to:

(F) use concrete models of square units to find the area of a rectangle by covering it with no gaps or overlaps, counting to find the total number of square units, and describing the measurement using a number and the unit

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.6C determine the area of rectangles with whole number side lengths in problems using multiplication related to the number of rows times the number of unit squares in each row

How does it support the Readiness Standard(s)?

Hands-on experiences covering rectangles with square units with no gaps or overlaps develop the concrete understanding of area. The use of square units to cover the region of a rectangle supports the future understanding of how area is reflected in square units.

Instructional Implications

Students will use square units (i.e. unit cubes, color tiles, sticky not pads, etc.) to determine the area of various rectangles. As non-standard units of measure are used to determine the length of objects (see 2.9A), it will be critical to identify that only the length of one of the sides of the manipulative was used to determine the length of an object. To determine area, we use the entire object (i.e.  when measuring length, draw a line along one of the sides to visually demonstrate that we only use this component of the measuring tool to determine length;

 When measuring area, outline and shade in the area of the square unit). As students begin to measure the area of various rectangles, they need to understand the amount of space inside the object is what to be measured, the unit of measure must be consistent (i.e. unit cubes and color tiles cannot be mixed to cover the area of an object), and manipulatives must completely fill the interior with no gaps or overlaps in the square units. As with any measurement, area will not always be exact. Students should articulate their findings accordingly (i.e. The area of the index card is about 24 color tiles. The amount of space inside of the sticky note pad measures a little more than 20 unit cubes; approximately 88 color tiles cover my notebook).

Academic Vocabulary

- Area
- Gaps/overlaps
- Estimation language such as about, a little more/less than, close to, approximately
- Square units

Rigor Implications

- Apply
- Select
- Use
- Describe
- Find
- Count

GRADE 2 → 2.10A Supporting

2.10A 2.10 **Data Analysis.** The student applies mathematical process standards to organize data to make it useful for interpreting information and solving problems. The student is expected to:

(A) explain the length of a bar in a bar graph or the number of pictures in a pictograph represents the number of data points for a given category

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.8A summarize a data set with multiple categories using a frequency table, dot plot, pictograph, or bar graph with scaled intervals
- 2.10C write and solve one-step word problems involving addition or subtraction using data represented within pictograph and bar graphs with intervals of one

How does it support the Readiness Standard(s)?

Understanding the length of the bar graph or the number of pictures in a pictograph represents the number of data points for a given category will support a student in accurately solving addition/subtraction problems and summarization of data.

Instructional Implications

According to the TEKS, students will organize data (i.e. results of a poll of 2nd grade students' favorite color) in a bar graph or pictograph. As students begin organizing the data, they need to understand the difference between category (i.e. red, green, blue, etc.) and data points (i.e. number of students that selected a particular category). The length of bar graph or the number of pictures in a pictograph identifies the number of data points for a particular category.

Academic Vocabulary

- Bar graph
- Category
- Data points
- Length
- Pictograph

Rigor Implications

- Apply
- Organize
- Interpret
- Solve
- Explain

2.10B 2.10 **Data Analysis.** The student applies mathematical process standards to organize data to make it useful for interpreting information and solving problems. The student is expected to:

(B) organize a collection of data with up to four categories using pictographs and bar graphs with intervals of one or more

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 3.8A summarize a data set with multiple categories using a frequency table, dot plot, pictograph, or bar graph with scaled intervals
- 2.10C write and solve one-step word problems involving addition or subtraction using data represented within pictograph and bar graphs with intervals of one

How does it support the Readiness Standard(s)?

Having students collect, sort, and organize their own data allows students to be able understand how to solve various problems based on the data. Understanding how to create and interpret data using pictographs and bar graphs will evolve into the use of frequency tables and dot plots in future grades.

Instructional Implications

It is imperative for students to generate a question before a unit of study on data (i.e. What type of flowers grow in my Grandmother's garden?). Instruction should encourage students to extend beyond two categories (i.e. roses, carnations, and daffodils), yet restrict the sorting to within four categories (i.e. sorting by the different color of flowers may yield too many categories). Students are then to collect their own data as this will make more of a personal connection when interpreting the data. Students will organize their data through the use of a pictograph (one picture/icon represents one or more than one piece of data) or bar graph (intervals of one or more). Ensure that students title and label their models/representations.

Academic Vocabulary

- Bar graph
- Categories
- Data
- Graph title
- Interval
- Labels
- Pictograph

Rigor Implications

- Apply
- Organize
- Interpret
- Solve

GRADE 2 → 2.10D Supporting

2.10D 2.10 **Data Analysis.** The student applies mathematical process standards to organize data to make it useful for interpreting information and solving problems. The student is expected to:

(D) draw conclusions and make predictions from information in a graph

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 2.10C write and solve one-step word problems involving addition or subtraction using data represented within pictograph and bar graphs with intervals of one

How does it support the Readiness Standard(s)?

Drawing conclusions and making predictions from information in a graph will allow students to write and solve associated word problems more effectively.

Instructional Implications

As student have collected their own data and organized it into graphs (see 2.10B), they will be able to draw more logical conclusions and make more educated predictions. Students will be able to better articulate the type of information when it is personal. Students will naturally give factual responses (i.e. My grandmother has 18 daffodils, 4 roses, and 16 carnations in her garden; she really loves flowers) and inferential responses (i.e. Roses must not grow very well in that type of soil as it was the fewest number of flowers grown).

Academic Vocabulary

- Bar Graph
- Frequency table
- Horizontal
- Information
- Pictograph
- Vertical

Rigor Implications

- Apply
- Organize
- Interpret
- Solve
- Draw (conclude)
- Make (prediction)

2.11A 2.11 **Personal Financial Literacy.** The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:

(A) calculate how money saved can accumulate into a larger amount over time

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 2.11 Personal Financial Literacy

How does it support the Readiness Standard(s)?

Calculating how savings accumulates larger amounts over time will support one's ability to manage financial resources more effectively for a lifetime of financial security.

Instructional Implications

Instruction should include discussions about how saving money over a period of time can yield you a larger amount of money. Providing real world second grade examples of savings accumulation will allow students to relate to the state expectation (i.e. Saving your positive behavior tickets will allow you to buy a more expensive prize from the class store). Perhaps story problems involving real world situations of how money can be saved over a period of time could be incorporated into the Number and Operations strand (see 2.4C).

Academic Vocabulary

- Money saved

Rigor Implications

- Apply
- Calculate

2.11B

2.11 **Personal Financial Literacy.** The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:

(B) explain that saving is an alternative to spending

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 2.11 Personal Financial Literacy

How does it support the Readiness Standard(s)?

Explaining savings and spending will support one's ability to manage financial resources more effectively for a lifetime of financial security.

Instructional Implications

Students will need to distinguish between spending money (on either wants or needs) and saving money (for either wants or needs). Providing real world second grade examples of student spending versus saving will allow students to relate to the state expectation (i.e. spending a student's weekly allowance on video arcade games versus saving his/her money to purchase a video game that can be played at home over and over). Story problems involving real world situations of money being spent and saved could be incorporated into the Number and Operations strand (see 2.4C).

Academic Vocabulary

- Saving
- Spending

Rigor Implications

- Apply
- Explain

2.11C 2.11 **Personal Financial Literacy.** The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:
(C) distinguish between a deposit and a withdrawal

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 2.11 Personal Financial Literacy

How does it support the Readiness Standard(s)?

Distinguishing between a deposit and a withdrawal will support one's ability to manage financial resources more effectively for a lifetime of financial security.

Instructional Implications

Students will decipher between a deposit (funds placed in to an account) and withdraw (funds removed from an account). Providing real world second grade examples of a deposit and a withdrawal will allow students to relate to the state expectation (i.e. Joshua's dad deposits $20 into Joshua's school lunch account. Every time that Joshua eats lunch at school, the school withdrawals $2 from the account). Story problems involving real world situations of money being deposited and withdrawn could be incorporated into the Number and Operations strand (see 1.2E/F/G and 1.3F).

Academic Vocabulary

- Deposit
- Withdrawal

Rigor Implications

- Apply
- Distinguish

GRADE 2 → 2.11D Supporting

2.11D 2.11 **Personal Financial Literacy.** The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:

(D) identify examples of borrowing and distinguish between responsible and irresponsible borrowing

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 2.11 Personal Financial Literacy

How does it support the Readiness Standard(s)?

Understanding the role of a responsible borrower will support one's ability to manage financial resources more effectively for a lifetime of financial security.

Instructional Implications

Providing real world second grade examples of borrowing will allow students to relate to the state expectation (i.e. borrowing a pencil from a friend, borrowing a dollar from your mom, borrowing a video game from a brother, etc.). Classroom discussion should extend to the difference between responsible and irresponsible borrowing (i.e. Responsible borrowing means returning the item in a timely manner and returning the item in good condition. Irresponsible borrowing means not returning the item, not returning the item in a timely manner, returning the item damaged, or losing the item).

Academic Vocabulary

- Borrow
- Irresponsible
- Responsible

Rigor Implications

- Apply
- Identify

2.11E 2.11 **Personal Financial Literacy.** The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:

(E) identify example of lending and use concepts of benefits and costs of evaluate lending decisions

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 2.11 Personal Financial Literacy

How does it support the Readiness Standard(s)?

Identifying the benefits and costs to lending will support one's ability to manage financial resources more effectively for a lifetime of financial security.

Instructional Implications

Providing real world second grade examples of lending will allow students to relate to the state expectation (i.e. lending a pencil to a classmate, lending a dollar to your best friend, lending a video game to your brother, etc.). Classroom discussion should extend to the difference between the benefits and costs of lending (i.e. benefits: make a new friend, earn interest on the money lent; get to play the video game with someone instead of alone) and costs. (i.e not having enough money for school supplies or not being able to play a video game.)

Academic Vocabulary

- Benefits
- Costs
- Lending

Rigor Implications

- Apply
- Identify
- Evaluate

GRADE 2 → 2.11F Supporting

2.11F 2.11 **Personal Financial Literacy.** The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:

(F) differentiate between producers and consumers and calculate the cost to produce a simple item

What Readiness Standard(s) or concepts from the Readiness Standards does it support?

- 2.11 Personal Financial Literacy

How does it support the Readiness Standard(s)?

Understanding the difference between producers and consumers and calculating the cost to produce a simple item will support one's ability to manage their financial resources more effectively for a lifetime of financial security.

Instructional Implications

This supporting standards serves as an informal study of producers and consumers in terms of economics. Instruction should make connections to those terms in relationship to the real world (i.e. People are consumers as they buy groceries from the producer, our local grocery store. The grocery store becomes the consumer as they rely on the local farmers for their product, etc.). Classroom discussions can then lead to the costs involved for producers to make simple items (i.e. The production of shoes includes the cost of leather, laces, rubber, dye, design, advertisement, shoe salesman, etc.) Perhaps, story problems involving real world situations of the cost to produce simple items could be incorporated into the Number and Operations strand (see 1.2E/F/G and 1.3F).

Academic Vocabulary

- Consumers
- Cost
- Producers

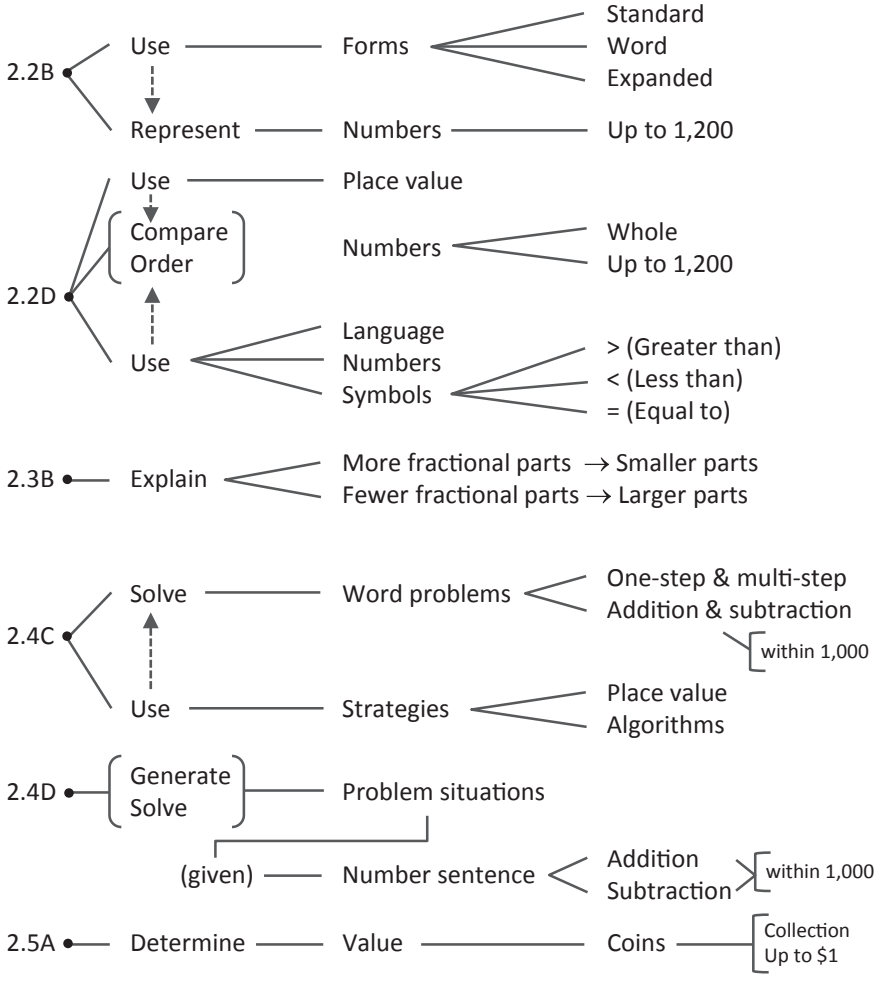
Rigor Implications

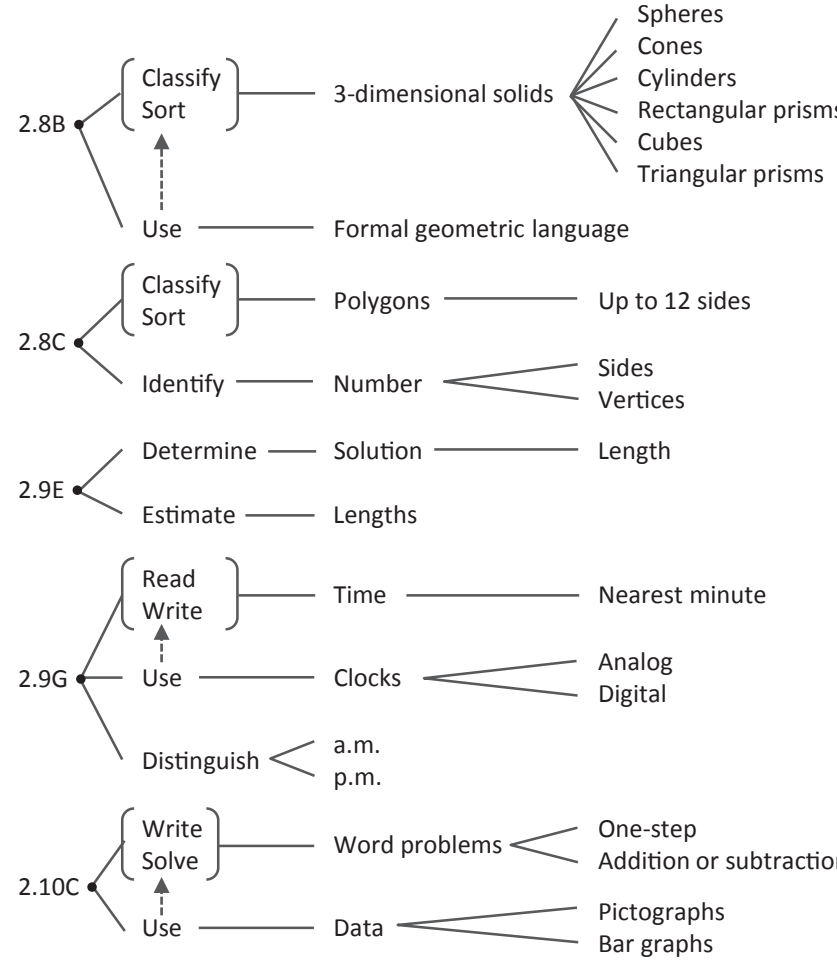
- Apply
- Identify

APPENDIX

TREE DIAGRAM

Grade 2 Math TEKS Tree - Readiness Standards





*NOTE: The classification of second grade "readiness" standards on this document represents the reviewed and synthesized input from a sample of Texas mathematics teachers. This DOES NOT represent an endorsement of the Texas Education Agency.

TEKS Student Expectations for implementation beginning 2014-2015.