STAAR
FIELD GUIDE
FOR TEACHERS

GRADE 1 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

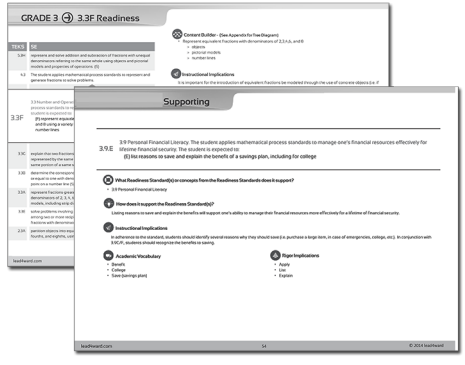
- assessing content and skills at a greater depth and higher level of cognitive complexity
- assessing more than one student expectation in a test item

The rigor of the tests will be increased by

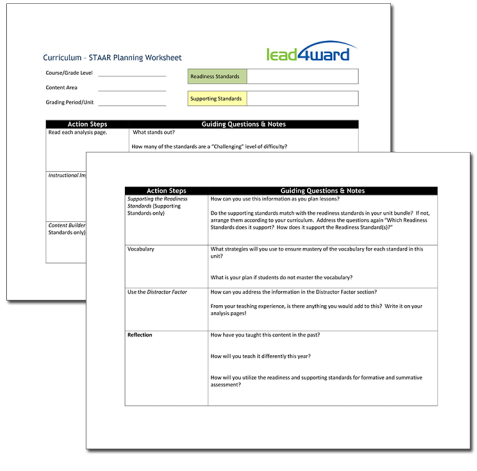
- assessing fewer, yet more focused, student expectations and assessing them multiple times and in more complex ways
- including a greater number of rigorous items on the test, thereby increasing the overall test difficulty

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

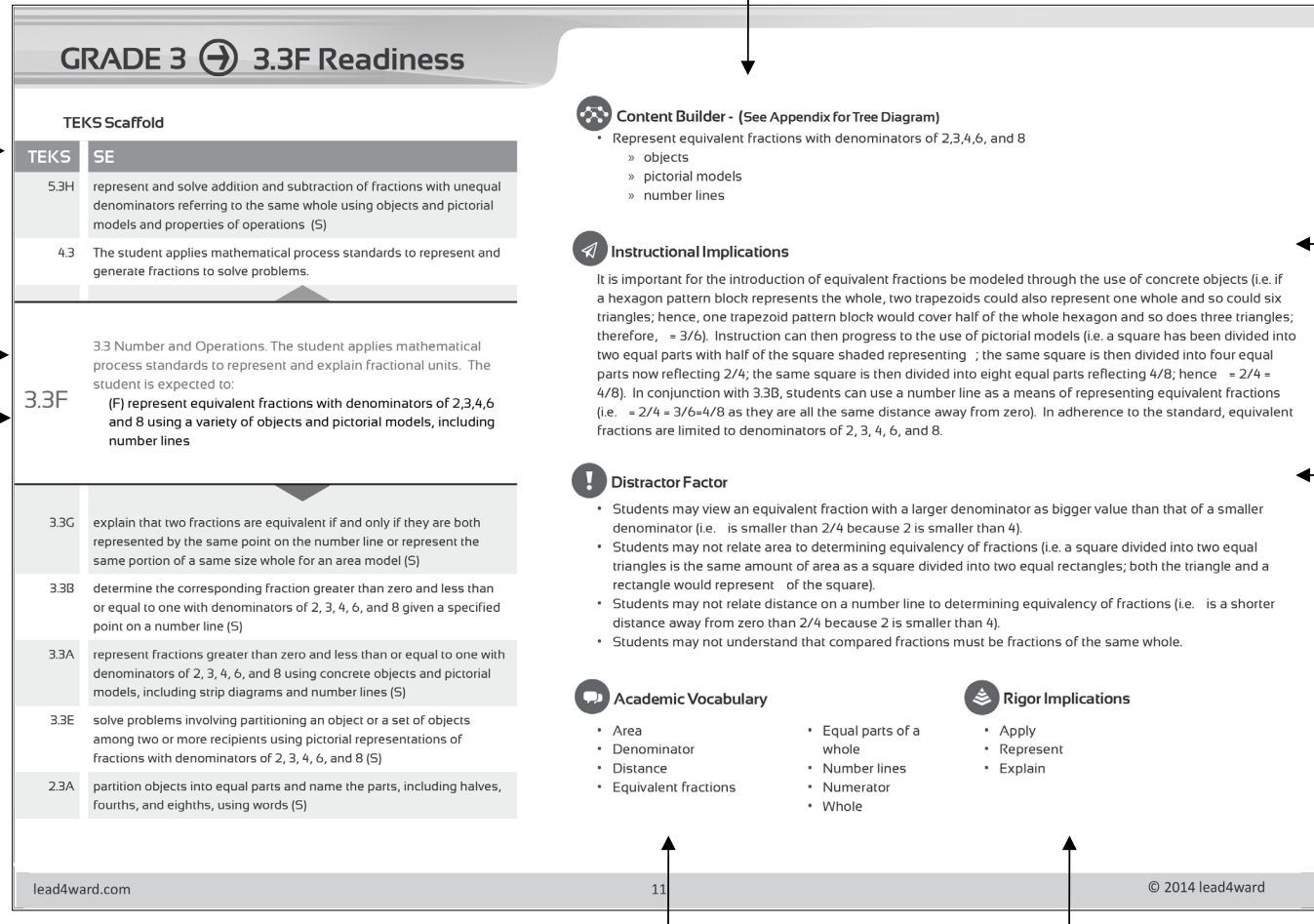
5. Create STAAR-Curriculum Planning Packets for each unit or grading period
   - » Collect either the Scope and Sequence document (if it includes the TEKS standards for each unit of instruction) OR Unit Plan documents (where the TEKS standards are bundled together into units of instruction)
   - » The 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.



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.
	3.3 Number and Operations. The student applies mathematical process standards to represent and explain fractional units. The student is expected to:
3.3F	(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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TEKS Scaffold

Texas Essential Knowledge and Skills Statement

Student Expectation

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

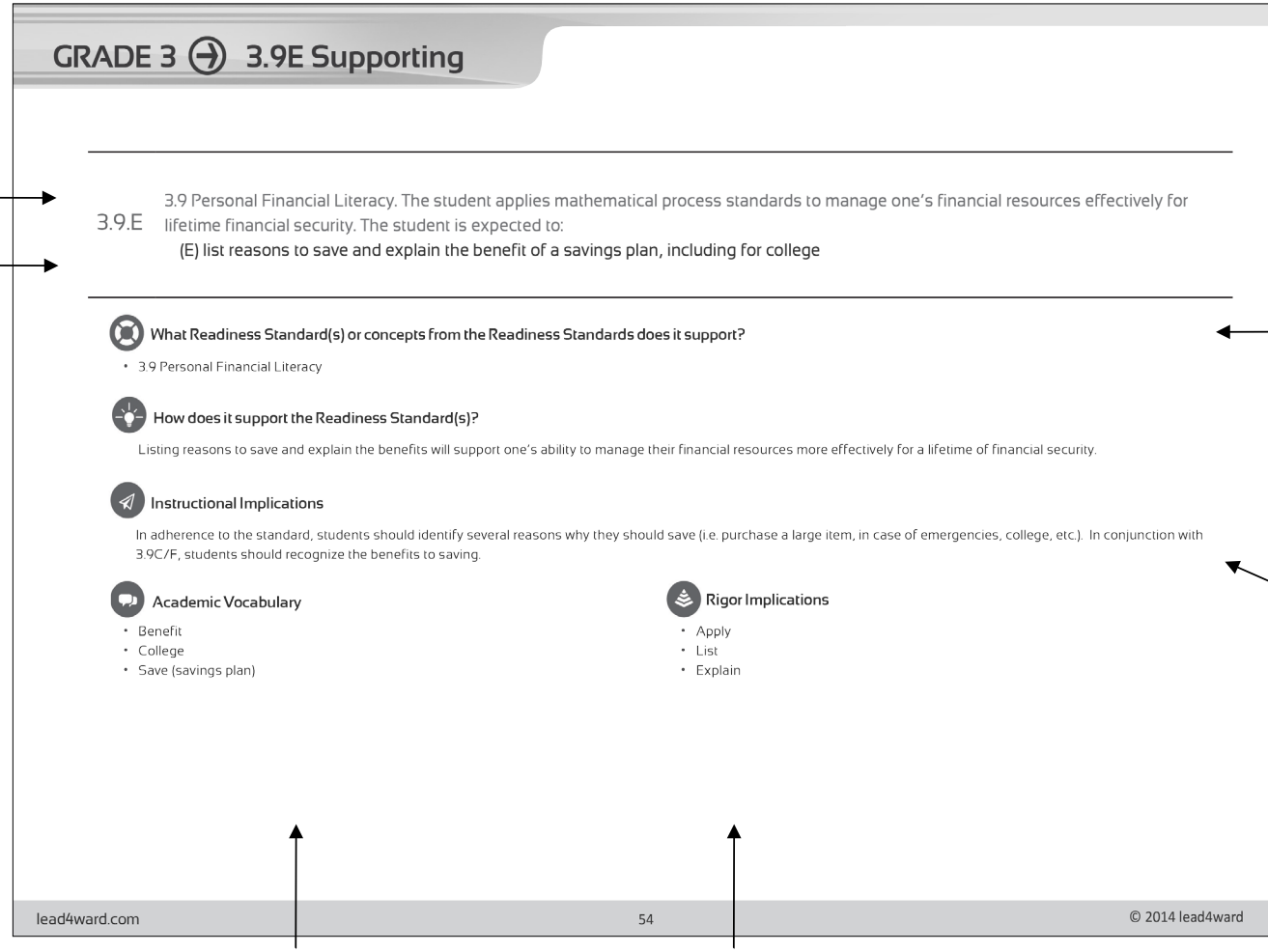
Distractor Factor
Alerts teachers to areas where students traditionally struggle, have misconceptions, or may need reinforcement. Common errors in learning.

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 1 → 1.2C Readiness

TEKS Scaffold

TEKS	SE
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)
2.2A	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	**1.2 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) use objects, pictures, and expanded and standard forms to represent numbers up to 120
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)

- Represent numbers up to 120
  - » objects
  - » pictures
  - » expanded form
  - » standard form

Instructional Implications

As students begin representing numbers through 120 using base ten blocks (see 1.2B), their understanding should also be associated with writing numbers in standard form (24), word form (twenty-four), and expanded form (i.e. 24 = 20 + 4). 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. two ten rods represent the value of 20; four unit cubes represent the value of 4; 20 + 4 = 24). 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. 105 is represented as "one hundred five" not "one hundred and five). The use of the word "and" is applied in distinguishing between the whole and the part of the whole (i.e. 3.45 is represented as "three and forty-five hundredths).
- Students confuse the place value a digit has with its value (i.e. 105; the digit 1 is in the hundreds place value but it is valued at 100).
- Students may confuse "digit" with "number."

Academic Vocabulary

- Digit
- Expanded form
- Place value
  - » Hundreds
  - » Tens
  - » Ones
- Standard form

Rigor Implications

- Apply
- Represent
- Compare
- Use

GRADE 1 → 1.2G Readiness

TEKS Scaffold

TEKS	SE
3.3D	compose and decompose a fraction a/b with a numerator greater than zero and less than or equal to b as a sum of parts 1/b (S)
2.2D	use place value to compare and order whole numbers up to 1,200 using comparative language, numbers, and symbols (<,>, or =) (R)
1.2G	**1.2 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: (G) represent the comparison of two numbers to 100 using the symbols <,>, or =
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)

- Represent the comparison of two numbers to 100 using the symbols <,>, or =

Instructional Implications

As students become more comfortable with how to compare two numbers using the correct academic language of greater than, less than, or equal to (see 1.2E), instruction can then introduce the comparison symbols. It is important for students to recognize how their language can be communicated using symbols (>, <, =) just like we use the symbols (+/-) to represent joining, separating, and comparing problems (see 1.3B). 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). It is important for students to read the number sentence from left to right. Encourage students to write and articulate two comparison statements during activities (i.e. 54 > 36 and 36<54).

Distractor Factor

- Students that rely on a trick to determine directionality 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. 45>41 is the same as 41<45). Students confuse the place value a digit is in with its value (i.e. 45; the digit 4 is in the tens place value but it is valued at 40).

Academic Vocabulary

- Comparison symbol
- Digit
- Equal to (=)
- Greater than (>)
- Less than (<)
- Place value
  - » Hundreds
  - » Tens
  - » Ones

Rigor Implications

- Apply
- Represent
- Compare

GRADE 1 → 1.3F Readiness

TEKS Scaffold

TEKS	SE
2.4D	generate and solve problem situations for a given mathematical number sentence involving addition and subtraction of whole numbers within 1,000 (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)
1.3F	**1.3 Number and Operations.** The student applies mathematical process standards to develop and use strategies for whole number addition and subtraction computations in order to solve problems. The student is expected to: (F) generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20
1.5D	represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences (R)
K.3B	solve word problems using objects and drawings to find sums up to 10 and differences within 10 (R)

Content Builder - (See Appendix for Tree Diagram)

- Generate problem situations when given a number sentence
  - » involving addition of numbers within 20
  - » involving subtraction of numbers within 20
  - » involving addition and subtraction of numbers within 20
- Solve problems
  - » involving addition of numbers within 20
  - » involving subtraction of numbers within 20
  - » involving addition and subtraction of numbers within 20

Instructional Implications

In adherence to the standard, students not only have to solve word problems that are provided for them, but they must also create their own story problems when given a number sentence. In conjunction with 1.3B, this standard will assess students' conceptual understanding of joining (+), separating (-), or comparison situation (+/-) and how it applies to the appropriate operation. Instruction should provide students opportunities to write story problems with multiple representations of various number sentences
(i.e. 12 - 8 = ____; ___ = 12 - 8; 8 + ____ = 12; ____ + 8 = 12).

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. 12 - 8 = ___ is the same things as 8 + ___ = 12).
- Students may substitute the term "take away" for "minus," creating a misconception that subtraction is only about separating.

Academic Vocabulary

- Addition (joining)
- Difference
- Number sentence
- Subtraction (separating, comparing, distance)
- Sum

Rigor Implications

- Apply
- Develop
- Solve
- Generate

GRADE 1 → 1.4C Readiness

TEKS Scaffold

TEKS	SE
3.4C	determine the value of a collection of coins and bills (S)
2.5A	determine the value of a collection of coins up to one dollar (R)
1.4C	**1.4 Number and Operations.** The student applies mathematical process standards to identify coins, their values, and the relationships among them in order to recognize the needs for monetary transactions. The student is expected to: (C) use relationships to count by twos, fives, and tens to determine the value of a collection of pennies, nickels, and/or dimes
1.4A	identify U.S. coins including pennies, nickels, dimes and quarters by value and describe the relationships between them (S)
K.4	identify U.S. coins by name, including pennies, nickels, dimes and quarters (S)

Content Builder - (See Appendix for Tree Diagram)

- Use relationships to count by twos to determine the value of a collection of pennies
- Use relationships to count by fives to determine the value of a collection of nickels
- Use relationships to county by tens to determine the value of a collection of dimes
- Use relationships to count by twos, fives, and tens to determine the value of a collection of pennies, nickels, and/or dimes

Instructional Implications

In conjunction with 1.5B, students are to apply their knowledge of skip counting to determine the value of a collection of coins (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; continuing skip counting by fives to add the value of the nickels 35, 40, 45, 50; then skip count by twos to add the value of the pennies; 52, 54, 56).

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).
- When adding a collection of unlike coins, students may struggle to determine which coins to begin with when skip counting.

Academic Vocabulary

- Coins
  - » Dimes
  - » Nickels
  - » Pennies and cents
- Twos, fives, tens

Rigor Implications

- Apply
- Recognize
- Use
- Determine

GRADE 1 → 1.5D Readiness

TEKS Scaffold

TEKS	SE
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)
2.4C	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)
2.4D	generate and solve problem situations for a given mathematical number sentence involving addition and subtraction of whole numbers within 1,000 (R)
2.7C	represent and solve addition and subtraction word problems where unknowns may be any one of the terms in the problem (S)
1.5D	**1.5 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: (D) represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences
1.5F	determine the unknown whole number in an addition or subtraction equation when the unknown may be any one of the three or four terms in the equation (S)
1.5E	understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value(s) (S)
K.3C	explain the strategies used to solve problems involving adding and subtracting within 10 using spoken words, concrete and pictorial models, and number sentences (S)

Content Builder - (See Appendix for Tree Diagram)

- Represent word problems involving addition of whole numbers up to 20
  - » concrete models
  - » pictorial models
  - » number sentence
- Represent word problems involving subtraction of whole numbers up to 20
  - » concrete models
  - » pictorial models
  - » number sentence
- Represent word problems involving addition and subtraction of whole numbers up to 20
  - » concrete models
  - » pictorial models
  - » number sentence

Instructional Implications

In conjunction with 1.3, students continue to demonstrate their understanding of joining, separating, comparing, and distance types of problem solving with the associated operations. In adherence to the standard, instruction should require students to act out, draw, and write number sentences for various story problems. Students should be able to articulate the components of the word problem, to the presented manipulative/drawing, to the values in their number sentence (i.e. 11 + 8 = 19 or 19 = 8 + 11. These eleven blue birds in the picture stand for the 11 in the number sentence. These eight red birds in the picture joined the blue birds which is the + 8 in my number sentence; there is now a total of 19 birds sitting in the tree which is the same as 19 in the number sentence). Real world situations should be extended beyond two addends (i.e. There were 9 blue birds, 5 red robins, and 6 hummingbirds in the tree. How many birds are in the tree?). Instruction should vary the context of +/- type problems provided to students (see 1.3B for examples).

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. 19 - 8 = ___ is the same things as 8 + ___ = 19).
- Students may gravitate to one subtraction structure (i.e. separating) and not recognize the other (i.e. comparing or distance).

Academic Vocabulary

- Addition (joining)
- Difference
- Number sentence
- Subtraction (separating, comparing, distance)
- Sum

Rigor Implications

- Apply
- Identify
- Describe
- Represent

GRADE 1 → 1.5G 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)
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)
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)
1.5G	**1.5 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: (G) apply properties of operations to add and subtract two or three numbers
K.3C	explain the strategies used to solve problems involving adding and subtracting within 10 using spoken words, concrete and pictorial models, and number sentences (S)

Content Builder - (See Appendix for Tree Diagram)

- Apply properties of operations to add two numbers
- Apply properties of operations to add three numbers
- Apply properties of operations to subtract two numbers
- Apply properties of operations to subtract three numbers
- Apply properties of operations to add and subtract three numbers

Instructional Implications

Properties of operations include the commutative, associative, and inverse operational properties. Although instruction may not include the formal academic language, the underlying concepts will be used to solve addition and subtraction problems.

- Commutative Property: 4 + 3 + 6 = ____ (to employ the make ten strategy, one could change the order of the addends and not change the sum); 4 + 6 + 3 = 13
- Associative Property: 12 + 6 = _____ (to employ the make ten strategy, one could decompose 12 and it will not change the sum); (10 + 2) + 6 = _____; 10 + (2 + 6) = 18
- Inverse Operational Property: 12 - 9 = ____ (to employ the think addition method, one could employ the inverse property); 9 + ____ = 12; 9 + 3 = 12.

Distractor Factor

- Students may try to apply the commutative property in subtraction.
- Students may not recognize how applying addition to solve a subtraction problem may be easier.

Academic Vocabulary

- Add
- Difference
- Sum
- Subtract

Rigor Implications

- Apply
- Identify
- Describe
- Add
- Subtract

GRADE 1 → 1.6A 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)
2.8C	classify and sort polygons with 12 or fewer sides according to attributes, including identifying the number of sides and number of vertices (R)
1.6A	**1.6 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) classify and sort regular and irregular two-dimensional shapes based on attributes using informal geometric language
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 two-dimensional shapes including regular and irregular shapes using informal geometric language
  - » circle, triangle, rectangle, square, rhombus, and hexagon
  - » identification of geometric attributes (i.e. number/types of sides and number of vertices)
- Sort two-dimensional shapes including regular and irregular shapes using informal geometric language
  - » circle, triangle, rectangle, square, rhombus, and hexagon
  - » identification of geometric attributes (i.e. number/types of sides and number of vertices)

Instructional Implications

Students must be given a variety of two-dimensional shapes to sort based on their attributes. Students need to be exposed to both regular (i.e. equilateral triangle) and irregular (i.e. right, scalene, isosceles type of triangles) two-dimensional figures. Although students may describe a given two-dimensional shape as having "three lines" and/or "three pointy corners," teachers should paraphrase student response with "three sides and three vertices." With exposure, students will begin use the formal vocabulary on their own. Students will recognize that circles have curved sides, and triangles, rectangles, and squares have straight sides. The teacher should model the term polygon for those two-dimensional shapes that are enclosed with straight sides. As students begin to recognize how a rectangle, square, and rhombus all have four sides, the teacher should model the term quadrilateral.

Distractor Factor

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

Academic Vocabulary

- Attributes
- Irregular
- Regular
- Shape
  - » Circle
  - » Hexagon
  - » Polygon
  - » Rectangle
  - » Rhombus
  - » Square as a Special Rectangle
  - » Triangle
- Sides
- Two-dimensional
- Vertex (vertices)

Rigor Implications

- Apply
- Analyze
- Develop
- Classify
- Sort

GRADE 1 → 1.6D Readiness

TEKS Scaffold

TEKS	SE
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)
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)
2.8C	classify and sort polygons with 12 or fewer sides according to attributes, including identifying the number of sides and number of vertices (R)
1.6D	**1.6 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) identify two-dimensional shapes, including circles, triangles, rectangles, and squares as special rectangles, rhombuses, and hexagons, and describe their attributes using formal geometric language
1.6A	classify and sort regular and irregular two-dimensional shapes based on attributes using informal geometric language (R)
K.6A	identify two-dimensional shapes, including circles, triangles, rectangles, and squares as special rectangles (R)
K.6D	identify attributes of two-dimensional shapes using informal and formal geometric language interchangeable (S)

Content Builder - (See Appendix for Tree Diagram)

- Identify two-dimensional shapes using formal geometric language
  - » circles, triangles, rectangles, squares, rhombuses, hexagons

Instructional Implications

- Students should use the attributes of a given two-dimensional figure to correctly identify a shape. A variety of shapes (i.e. equilateral triangle, scalene triangle, right triangle, etc.) and a variety of orientation, color, and size should be used to ensure that students use the geometric attributes (number of sides/vertices; length of sides) to identify a shape. Instruction should identify a square as a rectangle (opposite sides are of equal length) and a rhombus (all four sides are of equal length).

Distractor Factor

- Students may interchange the terms side, referencing two-dimensional shapes, and edge, referencing a three-dimensional shape.
- Students may not view a square as a rectangle.
- Students may only recognize the more common equilateral triangle (i.e. green triangle pattern block) as a triangle.

Academic Vocabulary

- Attributes
  - » Curved side
  - » Sides
  - » Vertex (vertices)
- Irregular
- Shape
  - » Circle
  - » Hexagon
  - » Polygon
  - » Rectangle
  - » Rhombus
  - » Squares as special rectangles
  - » Triangle
- Regular
- Two-dimensional

Rigor Implications

- Apply
- Analyze
- Develop
- Identify
- Describe

GRADE 1 → 1.6E 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	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 (R)
1.6E	**1.6 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) identify three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes), and triangular prisms, and describe their attributes using formal geometric language
1.6B	distinguish between attributes that define a two-dimensional or three-dimensional figure and attributes that do not define the shape (S)
K.6E	classify and sort a variety of regular and irregular twoand three-dimensional figures regardless of orientation or size (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)

- Identify three-dimensional shapes using formal geometric language
  - » spheres, cones, cylinders, rectangular prism, cubes, triangular prisms

Instructional Implications

Students should use the attributes (i.e. number of edges, vertices, and faces) of a given three-dimensional figure to correctly identify a solid. Instruction should clearly identify a cube as a rectangular prism as the faces have four sides and four vertices. It is a special rectangular prism as the lengths of all the edges are equal. To distinguish a triangular prism from a rectangular prism, students should recognize that the shape found at the base of the figure defines the type of prism.

Distractor Factor

- Students may interchange the terms side, referencing two-dimensional shapes, and edge, referencing a three-dimensional shape.
- Students may not view a cube as a rectangular prism.
- Students may identify a triangular prism as a rectangular prism because it is comprised of rectangular faces.
- Students may confuse the identification a three-dimensional shape by its two-dimensional attribute (i.e. a cube is mistakenly identified as a square).

Academic Vocabulary

- Attributes
  - » Edges
  - » Faces
  - » Vertex (vertices)
- Solids
  - » Cones
  - » Cubes as a special rectangular prism
  - » Cylinders
  - » Rectangular prisms
  - » Spheres
  - » Triangular prism
- Three-dimensional

Rigor Implications

- Apply
- Analyze
- Develop
- Identify
- Describe

GRADE 1 → 1.7D Readiness

TEKS Scaffold

TEKS	SE
3.7B	determine the perimeter of a polygon or a missing length when given perimeter and remaining side lengths in problems (R)
2.9E	determine a solution to a problem involving length, including estimating lengths (R)
2.9D	determine the length of an object to the nearest marked unit using rulers, yardsticks, meter sticks, or measuring tapes (S)
2.9A	find the length of objects using concrete models for standard units of length (S)
1.7D	**1.7 Geometry and Measurement.** The student applies mathematical process standards to select and use units to describe length and time. The student is expected to: (D) describe a length to the nearest whole unit using a number and a unit
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)

- Describe a length to the nearest whole unit using a number and a unit

Instructional Implications

- As with most measurements, the length of objects will not always be exact. Students will measure the length of objects to the nearest whole unit of measure (i.e. students will not record measurements as 3 1/2 unit cubes). Beware of students that will want to fill in the missing length with smaller units of measure. Remind them that units of measure cannot be mixed (see 1.7B). This standard also requires students to record their measurements using a number and unit (i.e. 6 color tiles; 5 small paper clips; 16 rainbow cubes, etc.).

Distractor Factor

- Students may leave gaps when measuring with manipulatives not understanding that the manipulatives must be laid back to back.
- Students may turn manipulatives different directions not understanding that the side length must be consistent.
- Students may mix different manipulatives not understanding the consistency of the measurement tool (manipulative) when measuring length.
- Students may think that an object measuring 4 color tiles in length is shorter than an object measuring 13 unit cubes in length as they are comparing the value of numbers instead of the length of the sides.

Academic Vocabulary

- Length
- Unit of measure
- Whole unit

Rigor Implications

- Apply
- Select
- Use
- Describe

GRADE 1 → 1.7E Readiness

TEKS Scaffold

TEKS	SE
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	read and write time to the nearest one-minute increment using analog and digital clocks and distinguish between a.m. and p.m. (R)

1.7E

1.7 Geometry and Measurement. The student applies mathematical process standards to select and use units to describe length and time. The student is expected to:

(E) tell time to the hour and half hour using analog and digital clocks

Content Builder - (See Appendix for Tree Diagram)

- Tell time to the hour using
  - » analog clocks
  - » digital clocks
- Tell time to the nearest half hour using
  - » analog clocks
  - » digital clocks

Instructional Implications

Relate the clock to a circular, closed number line (see 1.2 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 pointing out how hour numerals on the clock relate to those on a number line. The telling of time to the nearest hour with only the hour hand shown on the face of a clock will allow students to focus on the positioning of the hour hand and determine the hour when in-between numerals. As instruction moves to the telling time to the half hour, associate the concept to fractions (see 1.6G). Be sure to relate the hour and minute hand from the analog clock to the digits represented on a digital clock. Instruction should clarify the use of the colon (:) on the digital clock is to separate the hours (whole) from the minutes (part).

Distractor Factor

- Students may misidentify the hour and minute hands, confuse how to read each one, and/or not understand what each hand measures.
- 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.

Academic Vocabulary

- Analog clock
- Colon
- Digit
- Digital clock
- Hour Hand
- Minute Hand
- Time
  - » Half hour
  - » Hour

Rigor Implications

- Apply
- Select
- Use
- Describe
- Tell

GRADE 1 → 1.8C Readiness

TEKS Scaffold

TEKS	SE
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)
2.10D	draw conclusions and make predictions from information in a graph (S)
2.10C	write and solve one-step word problems involving addition or subtraction using data represented within pictographs and bar graphs with intervals of one (S)
1.8C	**1.8 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) draw conclusions and generate and answer questions using information from picture and bar-type graphs
K.8C	draw conclusions from real-object and picture graphs (R)

Content Builder - (See Appendix for Tree Diagram)

- Draw conclusions from a
  - » picture graph
  - » bar-type graph
- Generate questions with a
  - » picture graph
  - » bar-type graph
- Answer questions about a
  - » picture graph
  - » bar-type graph

Instructional Implications

- As student have collected their own data and organized it into graphs (see 1.8A/B), they should reflect on what type of information the graphs provide. 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, etc.) and inferential responses (i.e. Roses must not grow very well in that type of soil). Instruction should then lead students to create their own questions from the data they collected (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?) and inferential questions that require the students to draw conclusions (Which flower do you think my grandmother likes the most and why? Which flower might be the hardest to grow and why?). Student could then exchange their graphs and ask fellows classmates to answer their self-generated questions.

Distractor Factor

- When representing the same set of data on the two types of graphs, students may interpret the data as different because of the difference in the visual representations.
- 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.
- When using real objects to represent data, students may associate the larger the object the more data it represents (i.e. two king size candy bars aligned next to four snack size candy bars appears as if there are more king size than snack size candy bars).

Academic Vocabulary

- Bar-type graphs
- Information
- Picture graph

Rigor Implications

- Apply
- Organize
- Interpret
- Solve
- Draw (conclude)
- Generate
- Answer

STAAR
SUPPORTING
STANDARDS

GRADE 1 → 1.2A Supporting

1.2A 1.2 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) recognize instantly the quantity of structured arrangements

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 (<,>,=)
- 1.2G represent the comparison of two numbers to 100 using the symbols < , >, or =

How does it support the Readiness Standard(s)?

Being able to recognize the quantity of a structured arrangement will support students in being able to visually compare two numbers.

Instructional Implications

Students learn to recognize dot arrangements on standard dice (number cube) due to the board games they have played. Similar instant recognition can be developed for other patterns as well (i.e. dominos, fingers, tens frame, etc.). Quantities up to 10 can be known and named without the routine of counting.
Some students may continue to rely on physically counting using one-to-one correspondence to determine the total number of objects; however, with continuous exposure to pattern sets, students will begin to rely less on their counting skills and more on their spatial reasoning.

Academic Vocabulary

- Counting Words

Rigor Implications

- Apply
- Represent
- Compare
- Recognize

1.2B

1.2 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 concrete and pictorial models to compose and decompose numbers up to 120 in more than one way as so many hundreds, so many tens, and so many ones

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
- 1.2C use objects, pictures, and expanded and standard forms to represent numbers up to 120

How does it support the Readiness Standard(s)?

Using concrete and pictorial models to represent various numbers will support student's understanding of place value. The use of visual representations will allow students to develop relationships among the different place values. Being able to represent a number in more than one way will support students with the ability to rename numbers when having to subtract with regrouping.

Instructional Implications

Developmentally, students may need to work with individual snapping cubes and/or bundled popsicle sticks to create sets of tens and ones. Concrete experiences will allow students to see how 10 ones are bundled in order to create a ten. As students progress in their understanding, instruction can move to the use of base ten blocks. Through the use of base ten blocks, students will begin to visually understand the magnitude of numbers (i.e. the ten rod is ten times more than the ones cube; the hundred flat is ten times more than the ten rod; the ones cube is ten times smaller than the ten rod; the ten rod is ten times smaller than the hundred flat). Students need to understand that the digit in a given number represents its place value which is different from the value of the number (i.e. 24; the digit two is in the tens place is represented by two ten rods, but it is valued at 20). It is critical for students to represent a number in more than one way (i.e. 24 can be represented as two tens and four ones or one ten and fourteen ones). This understanding will lend itself to regrouping in subtraction (i.e. 24 - 18 = ___; 24 would have to be regrouped into one ten and fourteen ones in order to subtract.)

Academic Vocabulary

- Compose
- Decompose
- Digit
- Place value
  - » Hundreds
  - » Tens
  - » Ones
- Value of a number

Rigor Implications

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

GRADE 1 → 1.2D Supporting

1.2D 1.2 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) generate a number that is greater than or less than a given whole number up to 120

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 (<,>,=)
- 1.2G represent the comparison of two numbers to 100 using the symbols >, < , or =

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 fluid with their use of the place value system in using the base-ten blocks (1.2B) and expanded notation (1.2C), 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 37, students understand that the digit three represents the number of ten rods and its value is 30). This concept is important to ask of children before they begin to abstractly comparing two given numbers (1.2E/G) to clarify student's understanding of place value.

Academic Vocabulary

- Counting numbers
- Digit
- Greater than
- Less than
- Place Value
- Value of a number

Rigor Implications

- Apply
- Represent
- Compare
- Generate

1.2E 1.2 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) use place value to compare whole numbers up to 120 using comparative language

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 (<,>,=)
- 1.2G represent the comparison of two numbers to 100 using the symbols >, < , or =

How does it support the Readiness Standard(s)?

As students compare the value of numbers, they need to be able to relate their understanding of place value and use the appropriate academic vocabulary (greater than, less than, equal to) before moving to the abstract use of comparison symbols (<, >, or =).

Instructional Implications

Students will compare two numbers using the academic vocabulary correctly (i.e. 42 is greater than 26). It is important for students to recognize the inverse comparison statement as well (i.e. 26 is less than 42). Encourage students to articulate both comparison statements during activities. The use of the comparative language is critical before moving to the symbolic representation (1.2G). Be sure to relate how the value of the digits determined which number was larger/smaller (i.e. the number 42 is greater than 26 because the digit 4 in 42 means there are 4 tens which is a value of 40; however, the digit 2 in 26 means there are only 2 tens which is a value of 20; therefore, 42 is greater than 26).

Academic Vocabulary

- Digit
- Equal to
- Place value
- Greater than
- Less than
- Place value
  - » Hundreds
  - » Tens
  - » Ones
- Value of a number

Rigor Implications

- Apply
- Represent
- Compare
- Use

1.2F 1.2 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) order whole numbers up to 120 using place value and open number lines

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 (<,>,=)
- 1.2G represent the comparison of two numbers to 100 using the symbols >, < , or =

How does it support the Readiness Standard(s)?

A number line can be used as a strategy to compare/order numbers as well as develop 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 conjunction with 2.2E, students will order three or more numbers from least to greatest or greatest to least through the use of an open number line. 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 how 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 52 would fall between 50 and 60 on a number line as 52 can be expressed as 50 + 2 or the number 52 has 5 tens and two ones). By locating three or more numbers on an open number line, you will be able to assess students' understanding of place value (i.e. students place the number 52 between 50 and 60), the position of numbers (i.e. the number 50 would be indicated first and the number 60 would be indicated second on the open number line), and the magnitude of numbers (i.e. students physically place the number 52 closer to 50 than 60).

Students will need to associate their understanding of how numbers increase from left to right on a number line to ordering from least to greatest and how numbers decrease from right to left on a number line to ordering from greatest to least.

Academic Vocabulary

- Digit
- Least to greatest
- Greatest to least
- Open number line
- Place Value
  - » Hundreds
  - » Tens
  - » Ones
- Value of a number

Rigor Implications

- Apply
- Represent
- Compare
- Order
- Use

1.3A 1.3 Number and Operations. The student applies mathematical process standards to develop and use strategies for whole number addition and subtraction computations in order to solve problems. The student is expected to:

(A) use concrete and pictorial models to determine the sum of a multiple of ten and a one-digit number in problems up to 99

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
- 1.3F generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20
- 1.5G apply properties of operations to add and subtract two and three numbers

How does it support the Readiness Standard(s)?

Using concrete and pictorial models (i.e. base ten blocks) to represent the sum of a multiple of ten and one-digit number (30 + 6 = 36) will support students in developing algorithms based on place values.

Instructional Implications

As students become comfortable with representing numbers with base ten blocks and associating the concrete representation with the expanded notation of a number (see 1.2B/C), instruction will extend this understanding to addition. Through continued use of the base ten blocks, provide students ample opportunities to act out various addition story problems in which students are joining various tens and ones (i.e. Margarita collected 30 sea shells from the beach on Monday. She found 6 more sea shells on Tuesday. How many sea shells did Margarita collect during those two days at the beach?). In adherence to the standard, instruction is limited to problems with a multiple of ten for one addend (30 sea shells) and a one-digit number for the second addend (i.e. 6 sea shells). Be sure to connect the given number sentence to the base ten representation (i.e. 30 + 6 = 36; three ten rods represents the number of sea shells she collected on Monday; six unit cubes represents how many sea shells she collected on Tuesday; the total value of the sea shells is 36).

Academic Vocabulary

- Addition (joining)
- Multiple of ten
- One digit number
- Sum

Rigor Implications

- Apply
- Develop
- Solve
- Use
- Determine

GRADE 1 → 1.3B Supporting

1.3B

1.3 Number and Operations. The student applies mathematical process standards to develop and use strategies for whole number addition and subtraction computations in order to solve problems. The student is expected to:

(B) use objects and pictorial models to solve word problems involving joining, separating, and comparing sets within 20 and unknowns as any one of the terms in the problem such as 2 + 4 = ____; 3 + _____ = 7; and 5 = ____ - 3

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
- 1.3F generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20
- 1.5G apply properties of operations to add and subtract two or three numbers

How does it support the Readiness Standard(s)?

The use of concrete objects and pictorial model to demonstrate joining, separating, and comparison situations will support a student's understanding of the context of addition and subtraction problems. Connecting such actions to their corresponding number sentence will support students as they move from concrete to abstract understanding.

Instructional Implications

Students will use their manipulatives to act out joining (i.e. Margarita collected 11 sea shells on Monday and 8 sea shells on Tuesday. How many sea shells did Margarita collect during those two days?), separating (i.e. Margarita found 11 sea shells at the beach. Eight of them were cracked so she threw them back in to the ocean. How many sea shells did Margarita keep?), and comparing (i.e. Margarita collected 11 sea shells on Monday and 8 sea shells on Tuesday. How many more sea shells did Margarita find on Monday than Tuesday?). Instruction should include how the subtraction symbol represents distance (i.e. 11 - 3 = ___; how far away is 3 from 11 on the number line?). This understanding how subtraction represents distance lays the foundation for future learning of subtraction of integers (i.e. 11 - (-3) = 14; -3 is 14 spaces away from 11 on the number line).
Students should write at least two different number sentences for each type of problem (i.e. joining: 11 + 8 = ____; 8 + 11 = ____; _____=11 +8; _____= 8 + 11; separating: 11 - 8 = _____; ____= 11-8; comparison/distance: 11 - 8=____; ____=11 - 8; 8 + ____= 11; ____ + 8 = 11). Joining, separating, and comparing word problems should include a variety of contexts.
joining: Sarah had 8 pencils. Juan gave her 3 more pencils. How many pencils does Sarah have now? Sarah had 8 pencils. Juan gave her some more pencils. Now Sarah has 11 pencils. How many pencils did Juan give her? Sarah had some pencils. Juan gave her 3 pencils. Now Sarah has a total of 11 pencils. How many pencils did Sarah have to begin with?
separating: Sarah had 11 pencils. She gave 3 pencils to Juan. How many pencils does Sarah have now? Sarah had a total of 11 pencils. She gave some to Juan. Now she only has 3 pencils. How many pencils did she give to Juan? Sarah had some pencils. She gave 3 to Juan. Now Sarah has 8 pencils left. How many pencils did Sarah have before?
comparing: Juan has 11 pencils and Sarah has 8 pencils. How many more pencils does Juan have than Sarah? Sarah has 3 fewer pencils than Juan. If Sarah has 8 pencils, how many pencils does Juan have? Juan has 3 more pencils than Sarah. If Juan has 12 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?

Academic Vocabulary

- Comparing (addition/subtraction)
- Distance
- Joining (addition)
- Number sentence
- Separating (subtraction)

Rigor Implications

- Apply
- Develop
- Solve
- Use

1.3C 1.3 Number and Operations. The student applies mathematical process standards to develop and use strategies for whole number addition and subtraction computations in order to solve problems. The student is expected to:

(C) compose 10 with two or more addends with and without concrete objects

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
- 1.3F generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20
- 1.5G apply properties of operations to add and subtract two and three numbers

How does it support the Readiness Standard(s)?

Being able to compose ten in more than one way will support the students' flexible use of numbers. Becoming fluid with manipulating numbers is critical in moving students toward developing strategies for solving addition and subtraction problems.

Instructional Implications

Instruction should begin with two different colored manipulatives where students create as many different color patterns as possible for a train of ten (i.e. ten blue; ten yellow; one blue and nine yellow; two blue and eight yellow; three blue and seven yellow; four blue and six yellow; etc.). Students should then associate a given number sentence for each of the different representations (i.e. seven blue and three yellow represents 7 + 3 = 10 and/or 10 = 7 + 3).

Students may begin to informally discover the commutative property (i.e. I can build a train of 7 blue and 3 yellow to represent 7 + 3 = 10, but can flip the train to reflect 3 yellow and 7 blue to represent 3 + 7 = 10). As students become comfortable with understanding the many ways the sum of ten can be represented with two colors (addends), provide students with a set of another color and ask them to now build different color patterns with three different colors (i.e. ten red; ten green; ten yellow; 1 red, 1 green, and 8 yellow; 2 red, 1 green, 7 yellow; etc.). Again, students should associate a given number sentence for each of the different representations (i.e. 1 red, 1 green, and 8 yellow represents 1 + 1 + 8 = 10 and/or 10 = 1 + 1 + 8). Challenge students to create as many different number sentences as possible with three addends for the sum of 10. Students will begin developing their own variations without the use of the manipulatives.

Academic Vocabulary

- Addends
- Number sentence
- Sums

Rigor Implications

- Apply
- Develop
- Solve
- Compose

1.3D 1.3 Number and Operations. The student applies mathematical process standards to develop and use strategies for whole number addition and subtraction computations in order to solve problems. The student is expected to:

(D) apply basic fact strategies to add and subtract within 20, including making 10 and composing a number leading to a 10

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
- 1.3F generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20
- 1.5G apply properties of operations to add and subtract two or three numbers

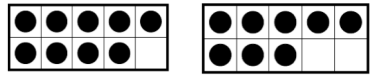
How does it support the Readiness Standard(s)?

Being flexible to applying basic facts strategies is critical in moving students toward developing algorithms for solving addition and subtraction problems.

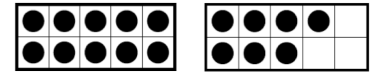
Instructional Implications

In order to adhere to the standard, students must use their basic facts in order to solve problems through 20. Instruction may include some of the following strategies:
Addition:

- Make Ten with the use of two tens frames as a model

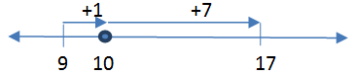


(i.e. 9 + 8 = _____;



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)

Academic Vocabulary

- Count back
- Doubles
- Make 10
- Think addition/count on

Rigor Implications

- Apply
- Develop
- Solve
- Add
- Subtract

1.3E

1.3 Number and Operations. The student applies mathematical process standards to develop and use strategies for whole number addition and subtraction computations in order to solve problems. The student is expected to:

(E) explain the strategies used to solve addition and subtraction problems up to 20 using spoken words, objects, pictorial models, and number sentences

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
- 1.3F generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20
- 1.5G apply properties of operations to add and subtract two and three numbers

How does it support the Readiness Standard(s)?

Being able to relate the manipulation of concrete objects to pictorials to a number sentence is a critical transition to moving students from concrete to abstract understanding of addition and subtraction.

Instructional Implications

In conjunction with 1.3D, it is essential that students not only apply the appropriate basic fact strategy, but explain their thought processes (i.e. student made use of an open number line to solve the problem 12 - 9 = ____; student marked an "x" on the numbers 9 and 12 on the open number line; students demonstrated how there are three spaces between the number 9 and 12, so the difference between the two numbers is 3; 12 - 9 = 3). Students need to also explain which of the strategies is most appropriate in different contexts (i.e. 12 - 9 = ____; count back would not be as efficient as make ten).

Academic Vocabulary

- Addition
- Difference
- Number sentence
- Strategy
- Subtraction
- Sum

Rigor Implications

- Apply
- Develop
- Solve
- Explain

1.4A 1.4 Number and Operations. The student applies mathematical process standards to identify coins, their values, and the relationships among them in order to recognize the needs for monetary transactions. The student is expected to:

(A) identify U.S. coins including pennies, nickels, dimes, and quarters by value and describe the relationships between them

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
- 1.4C use relationships to count by twos, fives, and tens to determine the value of a collection of pennies, nickels and/or dimes

How does it support the Readiness Standard(s)?

Being able to identify U.S. coins and describe the relationship between them is critical in solving monetary transactions.

Instructional Implications

Students need to be able to identify the coin and its value whether the heads or tails side of the coin is visible. Instruction must also address how various coins are related to each other (i.e. five pennies = one nickel; two nickels = one dime; five nickels = one quarter). The TEKS also requires the students to recognize the need for coins in monetary transactions (i.e. when would we need to know that value of coins; why would it be important to know the relationship between the coins).

Academic Vocabulary

- Coins
  - » Pennies
  - » Nickels
  - » Dimes
  - » Quarters
- Value

Rigor Implications

- Apply
- Recognize
- Identify
- Describe

1.4B 1.4 Number and Operations. The student applies mathematical process standards to identify coins, their values, and the relationships among them in order to recognize the needs for monetary transactions. The student is expected to:

(B) write a number with the cent symbol to describe the value of a coin

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 coin is critical in solving monetary transactions.

Instructional Implications

In conjunction with 1.4A, as students begin to identify U.S. coins and their value, they will use the cent symbol to represent the value.

Academic Vocabulary

- Cent symbol
- Coins
  - » Pennies
  - » Nickels
  - » Dimes
  - » Quarters
- Value

Rigor Implications

- Apply
- Recognize
- Write
- Describe

1.5A 1.5 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) recite numbers forward and backward from any given number between 1 and 120

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 (<,>,=)
- 1.2G represent the comparison of two numbers to 100 using the symbols >, <, or =

How does it support the Readiness Standard(s)?

Counting numbers backward and forward from any given number supports the contextual understanding of the value of numbers. This understanding can be associated with the representations of numbers on a number line. The number line can be used as a strategy to compare/order numbers and develop a student's understanding of place value, the relative position of numbers, and the magnitude of numbers. The use of this tool is a critical support mechanism.

Instructional Implications

The counting sequence is a rote procedure; however, asking students to begin counting at a particular number relates to the understanding of relative position (37 comes before 38) and asking a student to count forward or backward connects to their understanding of the magnitude of numbers (as I recite numbers forward the numbers become larger; as I recite numbers backward they become smaller).

Academic Vocabulary

- Backward
- Counting numbers 1 - 120
- Forward

Rigor Implications

- Apply
- Identify
- Describe
- Recite

1.5B 1.5 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) count by twos, fives, and tens to determine the total number of objects up to 120 in a set

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)?

Associating skip counting by twos, fives, and tens is a foundational skill to determining the value of a collection of coins.

Instructional Implications

Students use skip counting by twos, fives, and tens to count the number of objects more efficiently (i.e. a bag of candy counted by twos; the total number of sides for six pentagons can be more efficiently determined by skip counting of fives; the value of a handful of dimes can be quickly determined by skip counting by tens). Instruction should move between skip counting by tens, fives, and twos (i.e. counting the value of a set of 4 ten rods and 8 unit cubes; 10, 20, 30, 40, 42, 44, 46, 48 or counting a collection of unlike coins; 2 dimes, 4 nickels and 6 pennies; 10, 20, 25, 30, 35, 40, 42, 44, 46).

Academic Vocabulary

- Twos, fives, tens

Rigor Implications

- Apply
- Identify
- Describe
- Count
- Determine

GRADE 1 → 1.5C Supporting

1.5C 1.5 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) use the relationships to determine the number that is 10 more and 10 less than a given number up to 120

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 (<,>,=)
- 1.2G represent the comparison of two numbers to 100 using the symbols >, <, or =

How does it support the Readiness Standard(s)?

Students will begin identifying patterns in determining 10 more/10 less than a given number. Recognizing the change in the digits will reinforce the tens place value. This standard will reinforce the concept of place value which is critical for comparing and ordering whole numbers.

Instructional Implications

In order to adhere to the standard, students must be able to determine 10 more/10 less of a given number (i.e. ten more than 34 is 44; ten less than 34 is 24). Instruction might begin with the use of a 100s chart to recognize the patterns of 10 more/10 less. Students should begin relating how the digit in the tens place is changing by one with each adding/subtracting of 10. The standard requires students to determine 10 more/less through 120. 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 34 is 44 because 34 + 10 = ____; 30 + 4 + 10 = ____; 30 + 10 + 4 = 44). This understanding is also reiterated in 1.3A.

Academic Vocabulary

- Place value
- 10 more
- 10 less

Rigor Implications

- Apply
- Identify
- Describe
- Use
- Determine

1.5E 1.5 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:

(E) understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value(s)

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
- 3.5B represent ad solve one- and two-step multiplication and division problems within 100 using arrays, strip diagrams, and equations
- 2.4D generate and solve problem situations for a given mathematical number sentence involving addition and subtraction of whole numbers within 1,000
- 1.5D represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences
- 1.5G apply properties of operations to add and subtract two and three numbers

How does it support the Readiness Standard(s)?

Understanding that the equal sign represents equivalent values is foundational to representing and identifying number sentences/equations in more than one way (i.e. 23 - 9 = ___; ___= 23 - 9; 9 + ___= 23; 23 = ____ + 9).

Instructional Implications

If number sentences are limited to only one type of representation (i.e. 7 + 4 = 11), students develop the misconception that the equal sign stands for "the answer is coming." Therefore, it is essential for instruction to vary the representation of number sentences (i.e. 7 + 4 = 11; 11 = 7 + 4). Students need to understand that the equal sign is a symbolic representation of how one side of the equation "is the same" value as the other side of the equation (i.e. 10 + 1 = 7 + 4; 9 + 2 + 2 = 4 + 4 + 1 + 4). As students begin to solve multi-step problems, it is essential for them to understand the representation of their work:
(i.e. 5 + 4 + 3 = ____; 5 + 4 ≠ 9 + 3 = 12 does not represent equality).

5 + 4 + 3 = ___

5 + 4 is the same as 9

9 + 3 = _____

Academic Vocabulary

- Equal sign
- Expression
- Value

Rigor Implications

- Apply
- Identify
- Describe
- Understand

GRADE 1 → 1.5F Supporting

1.5F

1.5 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:

(F) determine the unknown whole number in an addition or subtraction equation when the unknown may be any one of the three or four terms in the equation

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
- 1.3F generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20
- 1.5G apply properties of operations to add and subtract two and three numbers

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 1.5E, student will apply their understanding of equality to determine the unknown value of a given equation (i.e. ___= 7 + 4; 7 + 4 = ___ + 6; 15 = 4 + 3 + ____; ____ -7 = 6). The use of a part-part-whole format may provide structure to student understanding.

Whole 15		
Part 4	Part 3	Part ?

Academic Vocabulary

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

Rigor Implications

- Apply
- Identify
- Describe
- Determine

1.6B 1.6 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) distinguish between attributes that define a two-dimensional or three-dimensional figure and attributes that do not define the shape

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
- 1.6D identify two-dimensional shapes, including circles, triangles, rectangles, and squares as special rectangles, rhombuses, and hexagons, and describe their 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

How does it support the Readiness Standard(s)?

Defining geometric attributes that define a figure (i.e. number of sides/edges and vertices) and understanding those attributes that do not define a figure (i.e. color, size, orientation) is critical in supporting the appropriate sorting and classifying of two- and three-dimensional figures.

Instructional Implications

Geometric attributes include the study of the sides/edges, vertices, and faces. Color, orientation, and size do not define a geometric figure. It is possible to have a triangle (a geometric figure that has three sides and three vertices) of a different color (i.e. green, blue, yellow, etc.), different orientation (i.e. on its side, upside down, etc.), and a different size (i.e. thick/thin, big/small, long/short, etc.). Therefore, students sorting shapes based on color or size **are not** describing the geometric differences.

Academic Vocabulary

- Polygon
- Shape
- Two-dimensional
  - » Attributes
  - » Sides
  - » Vertex (vertices)
- Three-dimensional
  - » Attributes
  - » Edge
  - » Face
  - » Vertex (vertices)

Rigor Implications

- Apply
- Analyze
- Develop
- Distinguish

1.6C 1.6 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) create two-dimensional figures, including circles, triangles, rectangles, and squares as a special rectangles, rhombuses, and hexagons

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
- 1.6D identify two-dimensional shapes, including circles, triangles, rectangles, and squares as special rectangles, rhombuses, and hexagons, and describe their attributes using formal geometric language

How does it support the Readiness Standard(s)?

Creating two-dimensional shapes given attributes (i.e. the number of sides and vertices) and properties (i.e. all sides are of different lengths) allows 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

This standard requires students to take their ability to identify attributes of two-dimensional shapes (1.6A) and create them (i.e. given the attributes of a polygon with six sides and six vertices, students use materials to represent a hexagon). Instruction should vary the materials (i.e. spaghetti, straws, toothpicks, pennies, string, etc.) in order to observe student selection of appropriate materials (i.e. will students recognize that six straws would be easier to demonstrate a hexagon than pennies). Instruction should extend the study of attributes by taking an already created shape and asking students to modify it to create a new shape (i.e. students made a rectangle out of clay; student is now asked to now 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
  - » Sides
  - » Vertex (vertices)
- Shape
  - » Circle
  - » Hexagon
  - » Polygon
  - » Quadrilateral
  - » Rectangle
  - » Rhombus
  - » Square as a special rectangle
  - » Triangle
- Two-dimensional

Rigor Implications

- Apply
- Analyze
- Develop
- Create

1.6F 1.6 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:

(F) compose two-dimensional shapes by joining two, three, and four figures to produce a target shape in more than one way if possible

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
- 1.6D identify two-dimensional shapes, including circles, triangles, rectangles, and squares as special rectangles, rhombuses, and hexagons, and describe their attributes using formal geometric language

How does it support the Readiness Standard(s)?

Joining various two-dimensional shapes to create a target shape (i.e. given a right angled trapezoid as the target shape, students use their pattern blocks to create the shape).

Encourage students to find more than one way of creating a given target shape. The attention to the critical attributes to create a target shape will support the appropriate sorting and classification of two-dimensional figures (i.e. enables the learner to focus on the attributes of the target shape and the joining parts).

Instructional Implications

As students begin to recognize and describe the attributes of given two-dimensional figures, instruction will lead to more spatial reasoning development. Students will be given a targeted two-dimensional shape (i.e. a trapezoid) and asked to use their manipulatives (i.e. pattern blocks, tangram pieces, etc.) to create the targeted shape. Encourage students to find more than one way (i.e. a trapezoid could be made out of three triangle pattern blocks, one square and one triangular pattern block, four triangular pattern blocks, etc.).

Academic Vocabulary

- Polygon
- Two-dimensional
- Shapes
  - » Circle
  - » Hexagon
  - » Polygon
  - » Quadrilateral
  - » Rectangle
  - » Rhombus
  - » Square as a Special Rectangle
  - » Triangle

Rigor Implications

- Apply
- Analyze
- Develop
- Compose
- Produce

GRADE 1 → 1.6G Supporting

1.6G 1.6 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:

(G) partition two-dimensional figures into two and four fair shares or equal parts and describe the parts using words

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)?

Dividing a figure into two and four equal parts and describing the parts using words supports the foundational understanding of fractions. Observing a figure being divided into two equal parts vs. four equal parts allows the learner to focus on the size of the parts. This will support future learning of comparing fractions. Partitioning the same whole into two and four equal parts will introduce the conceptual understanding of equivalent fractions.

Instructional Implications

The study of fractions will unveil itself through the lens of geometry. Students will take a two-dimensional shape (i.e. a square) and divide the figure into two and/or four equal parts. 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 students' understanding of how it is possible for different shapes to represent the same fair share of the whole. In adherence to the standard, instruction should include irregular two-dimensional shapes. The use of geoboards will support the trial and error process of dividing an irregular shape into two and four equal parts. Students should then be able to describe the equal parts in words (i.e. one of two equal parts; one of two fair shares, one-half, and halves).

Academic Vocabulary

- Fair shares/equal parts
- Half, halves
- Polygon
- Shape
  - » Circle
  - » Hexagon
  - » Polygon
  - » Quadrilateral
  - » Rectangle
  - » Rhombus
  - » Square
  - » Triangle
- Two-dimensional

Rigor Implications

- Apply
- Analyze
- Develop
- Partition
- Describe

1.6H 1.6 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:

(H) identify examples and non-examples of halves and fourths

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 students in understanding the part-to-whole relationship and the equal size of the parts. This knowledge provides the foundation for visually comparing two fractions and/or concretely representing equivalent fractions.

Instructional Implications

In conjunction with 1.6G, as students are partitioning figures into two and four equal parts and identifying them as halves/fourths, students 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 verify examples of halves and fourths by comparing the amount of area in each part.

Academic Vocabulary

- Examples/non-examples
- Fourths
- Half, Halves

Rigor Implications

- Apply
- Analyze
- Develop
- Identify

1.7A 1.7 Geometry and Measurement. The student applies mathematical process standards to select and use units to describe length and time. The student is expected to:

(A) use measuring tools to measure the length of objects to reinforce the continuous nature of linear measurement

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
- 1.7D describe a length to the nearest whole unit using number and a unit

How does it support the Readiness Standard(s)?

Understanding that linear measurement is continuous in nature provides the foundational understanding of the functionality of the ruler.

Instructional Implications

As students begin to measure the length of various objects, it is important to understand that linear measurements are continuous in nature (i.e. measurement tools need to be aligned back to back with no gaps or overlaps in between). Instruction should begin with aligning non-standard units of measure (i.e. paper clips, snap cubes, index cards, unit cubes, color tiles, etc.) in order for students to grasp the concept of linear measurement being continuous. This will be important when students begin to measure with rulers.

Academic Vocabulary

- Length
- Measurement tool
- Unit of measure

Rigor Implications

- Apply
- Select
- Use
- Describe
- Measure

GRADE 1 → 1.7B Supporting

1.7B

1.7 Geometry and Measurement. The student applies mathematical process standards to select and use units to describe length and time. The student is expected to:

(B) illustrate that the length of an object is the number of same-size units of length that, when laid end-to-end with no gaps or overlaps, reach from one end of the object to the other

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
- 1.7D describe a length to the nearest whole unit using number and a unit

How does it support the Readiness Standard(s)?

Understanding the appropriate process for measuring objects is a critical foundation component before introducing the use of formal measurement tools such as a ruler.

Instructional Implications

In conjunction with 1.7A, students need to decipher between the object being measured (i.e. length of an index card) and the unit of measure (i.e. paper clips). As students begin to measure the length of various objects, they need to understand where the measurement begins and ends (i.e. to determine the length of the index card we will only measure one side), the unit of measure must be consistent (i.e. paper clips must be the same length; cannot mix smaller paper clips with larger ones), and manipulatives need to be aligned back-to-back with no gaps or overlaps. As non-standard units of measure will also be used to determine area in grade 2 (see 2.9F), it is critical to identify that only the length of one of the sides of the manipulative is used, not the entire object (i.e. when utilizing color tiles, draw a line along one of the sides to visually demonstrate that we will only use this component of the measuring tool to determine length).

Academic Vocabulary

- End to end
- Gaps/overlaps
- Length
- Unit of measure

Rigor Implications

- Apply
- Select
- Use
- Describe
- Illustrate (demonstrate)

GRADE 1 → 1.7C Supporting

1.7C 1.7 Geometry and Measurement. The student applies mathematical process standards to select and use units to describe length and time. The student is expected to:

(C) measure the same object/distance with units of two different lengths and describe how and why the measurement differ

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
- 1.7D describe a length to the nearest whole unit using number and a unit

How does it support the Readiness Standard(s)?

Measuring the length of objects with a variety of concrete objects supports the understanding that objects can be measured with various units. This supporting standard allows the learner to experience that the shorter the unit of measure the more units are needed to measure the length; the longer the unit of measure, the fewer units needed to measure the length. As students move to measuring with a ruler, this non-standard unit of measurement experience supports their understanding of how objects can be measured in centimeters and inches and of the inverse relationship between the size of the units and the number of units 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 paper clips, unit cubes, color tiles, etc.). Instruction leads the students to discover that the longer the unit of measure, the fewer units of measure are needed; the shorter the units 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

- Distance
- Fewer/More
- Length
- Longer than/shorter than
- Unit of measure

Rigor Implications

- Apply
- Select
- Use
- Describe
- Measure
- Describe (justify)

1.8A 1.8 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) collect, sort, and organize data in up to three categories using models/representations such as a tally marks or T-charts

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 pictographs and bar graphs with intervals of one
- 1.8C draw conclusions and general and answer questions using information from picture and bar-type graphs

How does it support the Readiness Standard(s)?

Having students collect, sort, and organize their own data allows students to interpret data on a graph more effectively.

Instructional Implications

It is imperative for students to generate a question before a unit of study on data (i.e. What types 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 three categories (i.e. sorting by the different color of flowers may yield too many categories). Students collect their own data, so they have a personal connection. Students will use tally marks to collect the data and the information will be organized in T-charts in order to better interpret the data. Ensure that students title and label their models/representations of tally marks and T-chart.

Academic Vocabulary

- Categories
- Data
- Graph Title
- Labels
- Tally marks
- T-charts

Rigor Implications

- Apply
- Organize
- Interpret
- Solve
- Collect
- Sort

GRADE 1 → 1.8B Supporting

1.8B 1.8 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) use data to create picture and bar-type graphs

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
- 1.8C draw conclusions and generate and answer questions using information from picture and bar-type graphs

How does it support the Readiness Standard(s)?

Having students collect, sort, and organize their own data assists them in drawing conclusions and making reasonable predictions. Representing student collected data on picture and bar-type graphs enables them to interpret the information more accurately.

Instructional Implications

In conjunction with 1.8A, students will represent the data they have collected in a picture and/or bar-type graph. Ensure that students title and label their graphs appropriately. At this stage of development, one-to-one correspondence should be employed for the picture representations and scales on the bar-type graphs. Instruction should emphasize the importance of a title and labeling the categories of the graph.

Academic Vocabulary

- Bar-type graphs
- Data
- Graph title
- Labels
- Picture graphs

Rigor Implications

- Apply
- Organize
- Interpret
- Solve
- Use

GRADE 1 → 1.9A Supporting

1.9A 1.9 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:

(A) define money earned as income

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

- 1.9A Personal Financial Literacy

How does it support the Readiness Standard(s)?

Defining money earned as income will support one's ability to manage financial resources more effectively for a lifetime of financial security.

Instructional Implications

Students in Kindergarten (see K.9B), discussed the difference between money received as income and money received as a gift. In Grade 1 students learn that money that is earned from goods and labor is classified as income. Doing chores to earn money is income; money received from family/friends for birthdays/holidays is a gift. Story problems involving real world situations of money being earned could be incorporated into the Number and Operations strand (see 1.2E/F/G and 1.3F).

Academic Vocabulary

- Money earned
- Income

Rigor Implications

- Apply
- Define

GRADE 1 → 1.9B Supporting

1.9B 1.9 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:

(B) identify income as a means of obtaining goods and services, often times making choice between wants and needs

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

- 1.9A Personal Financial Literacy

How does it support the Readiness Standard(s)?

Identifying income and distinguishing between wants and needs will support one's ability to manage financial resources more effectively for a lifetime of financial security.

Instructional Implications

Students in Kindergarten (see K.9D), discussed the difference between wants (i.e. video games, computers, vacations, etc.) and needs (i.e. water, food, shelter, etc.) and how income is needed to obtain both. In Grade 1 students continue that understanding with an emphasis on making choices between the two (i.e. when my income is limited, I will have to make choices between what is a necessity and what is luxury). Perhaps story problems involving real world situations of money being earned and/or money being spent on goods (i.e. video games, computer, candy, etc.) and services (i.e. manicures, cable television, dry cleaning, etc.) could be incorporated into the Number and Operations strand (see 1.2E/F/G and 1.3F).

Academic Vocabulary

- Goods
- Income
- Needs
- Services
- Wants

Rigor Implications

- Apply
- Identify

GRADE 1 → 1.9C Supporting

1.9C 1.9 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:

(C) distinguish between spending and saving

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

- 1.9A Personal Financial Literacy

How does it support the Readiness Standard(s)?

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

Instructional Implications

Students will need to decipher between spending money (on either wants or needs) and saving. Future grade level discussions extend this learning to why both are necessary. Perhaps story problems involving real world situations of money being spent and earned could be incorporated into the Number and Operations strand (see 1.2E/F/G and 1.3F).

Academic Vocabulary

- Saving
- Spending

Rigor Implications

- Apply
- Distinguish

GRADE 1 1.9D Supporting

1.9D 1.9 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:

(D) consider charitable giving

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

- 1.9A Personal Financial Literacy

How does it support the Readiness Standard(s)?

Understanding charitable giving will support one's ability to manage financial resources more effectively for a lifetime of financial security.

Instructional Implications

Instruction should include discussions about what is a charity, identifying types of charities, and benefits of giving to charity. Perhaps story problems involving real world situations of charitable giving could be incorporated into the Number and Operations strand (see 1.2E/F/G and 1.3F).

Academic Vocabulary

- Charitable giving

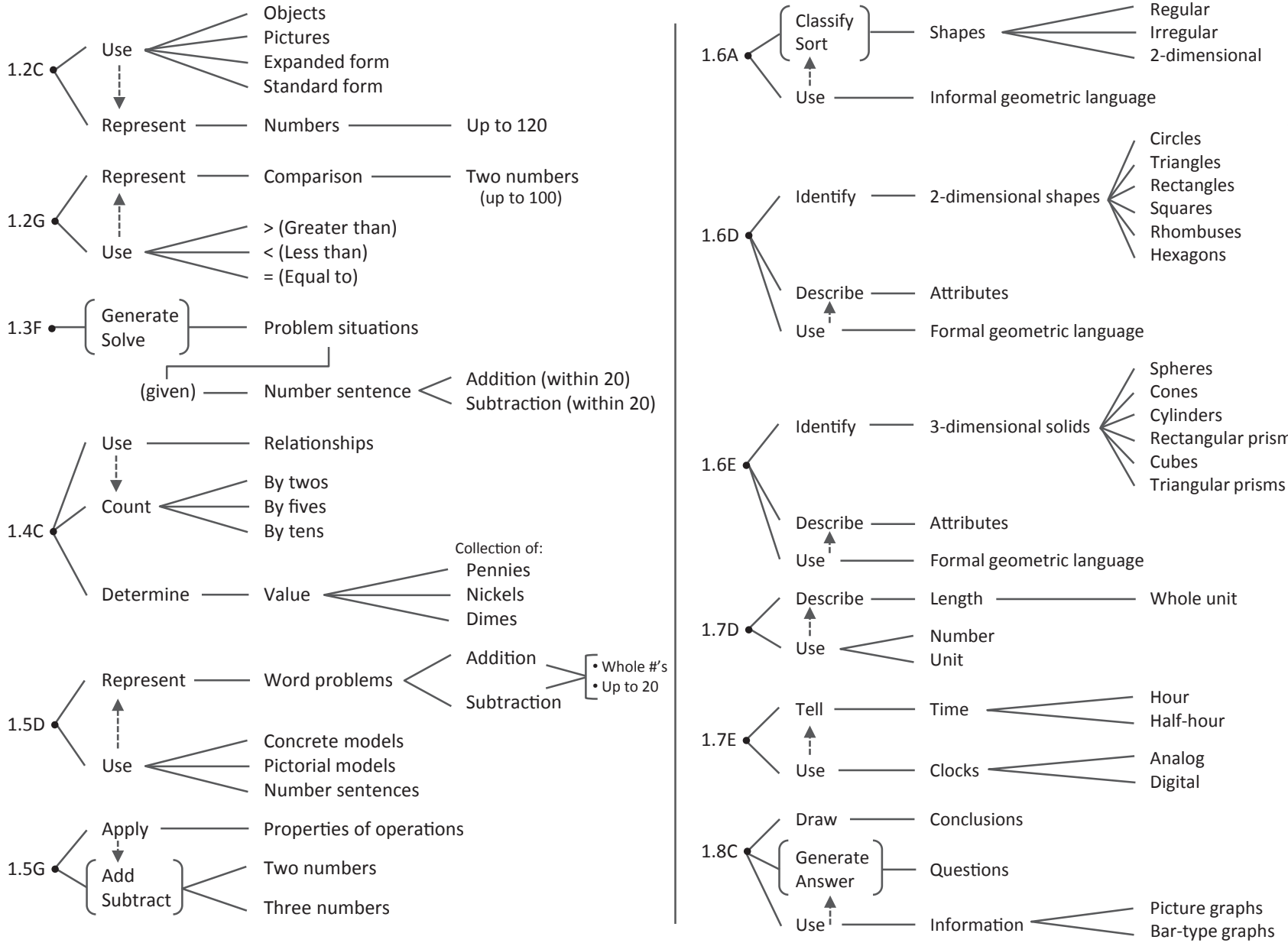
Rigor Implications

- Apply
- Consider

APPENDIX

TREE DIAGRAM

Grade 1 Math TEKS Tree - Readiness Standards



*NOTE: The classification of first 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.