GRADE 6
TEKS COMPANION GUIDE
Teacher's Manual

A Review Guide for the Grade 6 Math Texas Essential Knowledge and Skills

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Grade 6 TEKS Companion Guide
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Teacher's Manual

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HOW TO USE THIS COMPANION GUIDE

HOW WAS THIS *COMPANION GUIDE* DEVELOPED?

We designed the *TEKS Companion Guide* series to present the essential content from each Student Expectation in the Grade 6 Mathematics course in a concise and student-friendly manner. Following an Understanding by Design (McTighe & Wiggins) approach, we began with the end in mind and studied released Grade 6 Mathematics STAAR® questions that align to the 2012-adopted TEKS that were implemented in Texas classrooms in the 2014-15 school year. From there, lesson development followed a purposeful approach in which we asked ourselves the following questions.

- How might process standards be paired with this content?
- What might this content look like in multiple representations: graphs, tables, equations, and verbal descriptions (i.e., paired with process standard 6.1D: "The student is expected to communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.")?
- What does the Texas Education Agency's *Mathematics TEKS: Supporting Information for Grade 6 Mathematics* (© Texas Education Agency) document say about this TEKS/SE? (Download the latest version of the document from the Texas Gateway, *https://www.texasgateway.org/resource/mathematics-teks-supporting-information*).

HOW DO I DECIDE WHICH LESSONS TO USE?

Lessons in the *Grade 6 Math Companion Guide* are arranged by TEKS/SE in four clusters.

- Numerical Representations and Relationships (6.2, 6.7, parts of 6.4 and 6.5)
- Computations and Algebraic Relationships (6.3, 6.6, 6.9, 6.10, parts of 6.4 and 6.5)
- Geometry and Measurement (6.8, 6.11, and parts of 6.4)
- Data Analysis and Personal Financial Literacy (6.12, 6.13, and 6.14)

Each lesson can be used separately and in any order. The first factor in determining which lesson to use when is to consider the purpose for which students are using the *Companion Guide*.

Accompanying your Grade 6 Mathematics Scope and Sequence

The lessons in the *Grade 6 Math TEKS Companion Guide* focus on one TEKS/SE or two closely related TEKS/SE's. When you are following your district's scope and sequence, you can use the mini-lessons from the *Grade 6 Math TEKS Companion Guide* to supplement your classroom activities and instructional tasks. Mini-lessons are ideal for extra practice opportunities.

In-Class Differentiated Intervention

Teach the TEKS/SE as you normally would. Use a formative assessment activity to collect data about how well students understand the content. Provide an enrichment activity for students who have already mastered the content. Use the mini-lesson in the *Grade 6 Math TEKS Companion Guide* for that TEKS/SE as an intervention or re-teach activity.

Grade 6 Mathematics Tutorial Program

Use student performance data to determine which students need extra practice with which TEKS/SE. Assign students with similar needs to a small group and provide them with the same lesson to work on. For example, if five students all need to work on 6.5C, then place them in one group and direct them to work on "6.5KC: Equivalent Parts of the Same Whole."

HOW IS A LESSON STRUCTURED?

Each lesson follows a direct instruction model, where students are provided information about the content and shown how the content could appear in specific problems. From there, students have the opportunity for skills practice. Each lesson includes three parts.

■ The **Tell Me More**… section gives students a brief, one-half page to three-fourths page, overview of the essentials of the content described in the TEKS/SE. In cases where the TEKS/SE had more content than could be addressed in a short lesson (e.g., 6.8A), we provide two or three lessons to thoroughly address the depth of content. In cases where multiple TEKS really do belong together from an instructional perspective (e.g., 6.3C and 6.3D), we blend them into one lesson. When practical, we include visual representations and pictorial models of commonly used manipulatives. For example, lessons for 6.3C and 6.3D use two-color counters and number lines to lay the conceptual foundation for integer operations.

■ Stepped-out **Examples** show students how problems could be posed based on the content in the TEKS/SE. Problems are solved one step at a time as students see the rationale of why this step is being done and how to execute that step. As appropriate, examples include strategies for using technology (integrating Mathematical Process 6.1C) or visual models (integrating Mathematical Process 6.1E). We also include examples with griddable response questions so that students can practice using the grid to communicate their answers (integrating Mathematical Process 6.1F).

- **Practice Problems** allow students the opportunity to practice solving mathematical and real-world problems. Each section contains about 8-12 problems that are mostly constructed response (short answer or open response) questions so that students can deepen their understanding about what the content in the TEKS/SE means. A few selected response (multiple choice) problems are included so that students get a feel for what the question might look like on a standardized test. Students also encounter griddable response questions in which their numerical answer must be entered and bubbled on a grid.

Determine the product or quotient.

7. −144 ÷ 12   **9.** −8(−15)   **11.** (72 ÷ −8) × 11

8. −13(25)   **10.** −720 ÷ −16   **12.** 5(−18) ÷ 3(6)

13. Simplify the expression shown. Record your answer and fill in the bubbles. Be sure to use the correct place value.

(56 ÷ 8) − 8(3)

15. Which expression has a value of −27?

    A −2(15) ÷ 3
    B −3(10) − 3
    C 4(5) + 2(5) − 3
    D 3 − 4(5) + 2(5)

16. Which expression is represented by the model below?

−18 −16 −14 −12 −10 −8 −6 −4 −2 0

    F 2(−12)
    G −6 • −2
    H −6 • 2
    J −2(−12)

14. The lake level at Choke Canyon Reservoir decreased by 2 feet each week. At this rate, what integer represents the change in the lake level after 7 weeks?

? HOW CAN I USE THE COMPANION GUIDE AS AN INTERACTIVE NOTEBOOK?

YOU TRY IT!

The coordinates of parallelogram *ABCD* are shown in the table. Point *M* is generated by multiplying the *x*- and *y*-coordinates of point *C* by 3. What are the coordinates of point *M*?

Point	Coordinate
A	(−1, 2)
B	(2, 5)
C	(4, −1)
D	(−2, −1)

Coordinates of point *C*: _____

x-coordinate of point *M*: 3 × ___ = ___

y-coordinate of point *M*: 3 × ___ = ___

Coordinates of point *M*: (_____, _____)

We designed the *Grade 6 Math TEKS Companion Guide* as a consumable notebook to be fully interactive with students. Students are encouraged to take notes throughout the book as they work through the lessons they need. We employ particular features to encourage interactivity.

You Try It! Problems

Most of the lessons in the *Grade 6 Math TEKS Companion Guide* contain You Try It! problems where students can check their understanding. These problems are scaffolded so that the guide students through a solution process step by step.

The goal of the You Try It! problems is to provide students with a just-in-time chance to practice a skill they learned by studying an example problem.

Griddable Response Practice

We know that each Grade 6 Mathematics STAAR assessment contains four griddable constructed response items. Students need practice using the place value grid in order to correctly answer these questions. Students must have an understanding of place value in order to effectively use the grid and communicate their correct answer. As appropriate, examples in the lessons provide students with an opportunity to practice gridding their response in the consumable *Grade 6 Math TEKS Companion Guide*. As well, practice problems contain griddable response questions as appropriate.

STEP 3 Since the question is a gridded response question, enter your response on the grid provided.

1. Record a 9 in the tens column, a 6 in the ones column, and a 7 in the tenths column.

2. Bubble **9** beneath the numeral 9. Bubble **6** beneath the numeral 6. Bubble **7** beneath the numeral 7.

Make a Note… Features

Some lessons contain a reflective prompt inside a "Make a Note…" box. These prompts are used to help students make connections to their existing knowledge. For example, when students are working with multiple representations such as graphs, tables, and equations, it's important for students to understand how those representations convey the same information differently. The Make a Note prompt shown here asks students to extend what they've seen about stem-and-leaf plots with two-digit numbers to three-digit numbers.

MAKE A NOTE . . .

How are the values in a table and graph of the same question related?

Personal Glossary

Elementary school mathematics is laden with vocabulary terms that may seem foreign to many students. Sometimes, the same term is used to mean different things (e.g., "base" of a triangle, "base-ten" blocks with place value, or "base" of a rectangular prism). To support all students, and students with special needs or English language learners in particular, we provide a personal glossary at the end of the book where students can build their own illustrated glossary of terms.

Encourage students to use external resources, such as their textbooks or online reference manuals, as they craft a definition in their own words. Terms may be organized alphabetically, by lesson, or by cluster.

PERSONAL GLOSSARY

Term	Picture and Definition

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WHAT'S AN EFFECTIVE WAY TO TEACH A LESSON?

Lessons in the *Grade 6 Math TEKS Companion Guide* follow a direct instruction model, where students are provided information about the content and several examples. Then, students work through a set of practice problems to refine and practice using the skill they just learned.

Using the Tell Me More… Section

Consider using a *pre-reading* strategy such as one of the following:

- Preview the text by looking at the language in the TEKS/SE identified at the beginning of the lesson, analyzing any figures, or looking at subtitles within the passage.
- Brainstorm a list of what students already know about the topic using a structure such as K-W-L (What do you know? What do you want to learn? What did you learn?).
- Construct a Frayer model or Semantic Feature Analysis to help students make sense of key vocabulary terms.

Consider using a *reading* strategy such as one of the following:

- Ask students to highlight key terms or ideas in the narrative.
- If the passage includes graphics or figures, ask students to label the figure with additional information such as background information or how the idea might be represented with a graph, table, or verbal description.

Using the Examples

Before working through the examples, frame the problem in terms of a problem-solving process:

Analyze the Problem

- What information is given in the problem?
- What does the question ask you to find or do?

Formulate a Plan or Strategy

- What formula could you use?
- How could you use a graph, table, or equation to help you?
- How could a figure or picture help?

Determine the Solution

- Implement the plan.
- Work through the problem step by step.

Justify the Solution

- What mathematical properties or processes makes your answer valid?
- How did you use a mathematical formula, step, or procedure to determine your answer?

Evaluate for Reasonableness

- Use rounding or compatible numbers to see if your answer is reasonable.
- How did a problem-solving process help you determine your solution?
- What's another way you could determine a solution?

Work through the examples with students. As you do, pause at each step to ask questions such as:

- How did you know you needed to do that?
- What would that look like if the number were a fraction instead of a (decimal, whole number, integer)?
- What would have happened if you were given that information in a different representation (graph, table, equation)?

Using the Practice Problems

Practice problem sets contain a mixture of several different types of problems.

- **Skills practice** problems are decontextualized problems (i.e., "naked math" problems) that have low cognitive demand. They are important for helping students practice using a new skill and should be assigned in smaller numbers.
- **Constructed response** problems are open-ended and require students to generate an answer that could be numerical, verbal, graphical, or symbolic. These problems may be decontextual, like a skills practice problem, or they may be contextual and require students to interpret a problem situation before attempting a solution.
- **Griddable response** problems are a type of constructed response problem in which students are expected to enter their numerical answer on a place value based grid.
- **Selected response** problems are multiple choice problems where students are expected to determine which of a set of choices is the best answer.

In general, it is better to have students work through a few meaningful problems rather than a large number of problems. Balance the need for skills practice and exposing students to a variety of ways that a problem could be asked with students' stamina. When selecting problems for students to do, consider the following:

- Do students need to practice the skill or decoding a word problem?
- Which representations (graph, table, equation, etc.) do students need more practice with?
- Do students need more practice with open-ended problems or multiple-choice problems?

WHY DO INTERACTIVE MATH NOTEBOOKS WORK SO WELL?
Robert Marzano and his colleagues (*What Works in Classroom Instruction*, 2001) identified 9 high-yield instructional strategies that research shows make significant impacts on student learning. Several of those strategies are embedded in effective use of interactive math notebooks.

- ✔ Identifying similarities and differences
- ✔ Summarizing and note taking
- ✔ Homework and practice
- ✔ Nonlinguistic representations
- ✔ Generate and testing hypothesis
- ✔ Questions, cues, and advance organizers

ANSWER KEY

6.2A CLASSIFYING RATIONAL NUMBERS
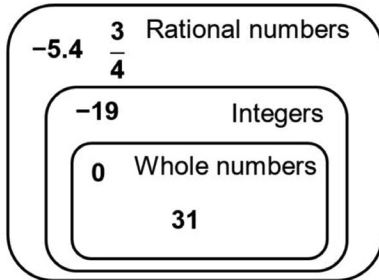
You Try It!

- 0, 31
- −19
- −5.4, $\frac{3}{4}$

Practice:

1.
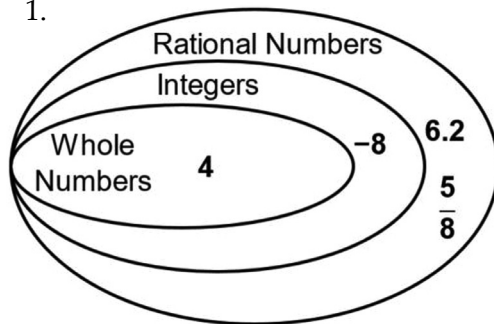
2. integers
3. integers
4. rational numbers
5. whole numbers
6. D
7. F

6.2B ABSOLUTE VALUE OF NUMBERS

You Try It!

- 1.75
- −1.75
- 1.75

Practice:

1. −14, 14
2. 0.5, 0.5
3. 28, 28
4. $-\frac{2}{3}, \frac{2}{3}$
5. −36, 36
6. 6.85, 6.85
7. 437
8. $-7\frac{5}{8}$ and $7\frac{5}{8}$
9.
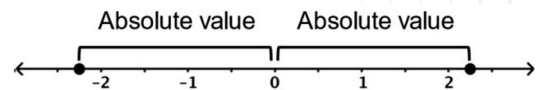
10. −216.48
11. 158
12. B
13. F
14. C
15. −23

6.2C USING NUMBER LINES WITH RATIONAL NUMBERS

You Try It!

-
- −9
- 3
- 1

Practice:

1-4.
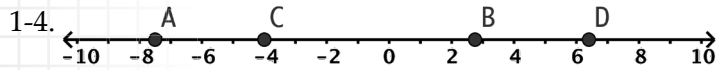
5. $-\frac{3}{5}$

6. D

7. A

8. yellow

9. G

6.2D ORDERING RATIONAL NUMBERS

Example #1 Step 3

	10	1	.	0.1	0.01	0.001
$-\frac{38}{3}$	–1	2	.	6	6	7
–12.19	–1	2	.	1	9	0
–10.85	–1	0	.	8	5	0
$-10\frac{3}{4}$	–1	0	.	7	5	0
–9.5	–0	9	.	5	0	0

You Try It!

- −7.25 and −6.1

Practice:

1. $4, 0.7, -8\frac{3}{8}, -9.3$

2. −20, −15, −12, −9, −6, −3

3. $\frac{2}{20}, \frac{1}{3}, \frac{3}{8}, \frac{2}{5}, \frac{3}{4}$

4. $1\frac{1}{5}, -3.3, 0, -4$

5. 3.75 yards, 2.61 yards, 1.85 yards, 1.48 yards, 0.25 yard, 0.075 yard

6. $\frac{3}{5}, 45\%, -\frac{5}{8}, -0.7$

7. $\frac{3}{4}, \frac{7}{8}, 1, \frac{15}{12}, 2, 2.5$

8. Art, History, Spanish, Science, English/Reading, Mathematics

9. A

10. J

6.2E AND 6.3A DIVISION AND FRACTIONS

Make a Note:

$5 \div 4 = \frac{5}{4} = 4\overline{)5}$

$$
\begin{array}{r}
1.25 \\
4\overline{)5.00} \\
\underline{-4} \\
1\,0 \\
\underline{-8} \\
2\,0 \\
\underline{-2\,0} \\
0
\end{array}
$$

You Try It!

- $\frac{15}{8}$
- $\frac{28}{4}$
- $\frac{39}{3}$
- $\frac{54}{10}$
- 18×3
- $27 \times \frac{1}{2}$ or $2\overline{)27}$
- $\frac{5}{4} \times \frac{5}{2}$
- $\frac{7}{8} \times \frac{4}{3}$

Practice:

1. $\frac{87}{9}$, $9\overline{)87}$
2. $8\overline{)28}$, $28 \div 8$
3. $\frac{17}{4}$, $17 \div 4$
4. 42×6
5. $\frac{18}{4} \times \frac{1}{6}$
6. $\frac{45}{8} \times \frac{3}{2}$
7. $\frac{15}{4}$, $15 \div 4$, $4\overline{)15}$
8. $\frac{3}{4} \div 12 \div$, $\frac{3}{4} \times \frac{1}{12}$
9. A
10. H
11. B

6.4C RATIOS AS MULTIPLICATIVE COMPARISONS

You Try It!

- $14 : 42 = 1 : 3$
- $14 : 56 = 1 : 4$
- $42 : 56 = 3 : 4$
- 3

Practice:

1. $9 : 35$
2. $5 : 6$
3. $\frac{10}{3}$ or $3\frac{1}{3}$
4. $10 : 19$
5. $2 : 3$
6. $1 : 16$
7. $1 : 3$
8. A
9. G
10. D
11. F

6.4D RATES AS DIVISION COMPARISONS

You Try It!

- 220 miles : 8 gallons
- 55 miles : 2 gallons
- 27.5 miles per gallon

Practice:

1. $27 to 3 hours or $9 per hour
2. $0.12 per plate
3. 11 computers to 2 printers
4. 1,020 gallons per hour
5. 8 beats per 3 seconds
6. 251 calories per 4 ounces
7. 62.5 miles per hour
8. B
9. H
10. A

6.4E RATIOS AND PERCENTS

You Try It!
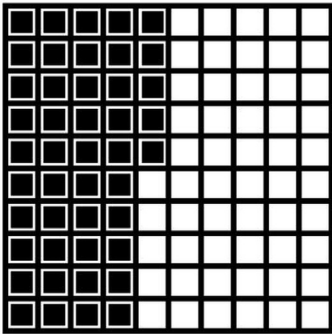
- $\frac{11}{20}$
- 55%
- 0.55

Practice:

1. $\frac{21}{40}$
2. $52\frac{1}{2}\%$
3. 0.475
4. 0.75
5.
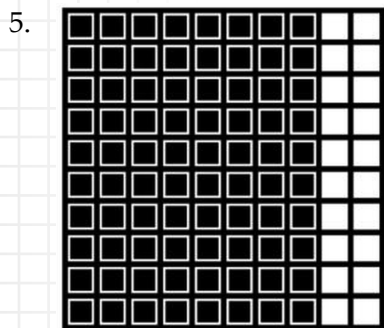
6. 0.14
7. $\frac{11}{20}$
8. D
9. G
10. C
11. F

6.4F REPRESENTING BENCHMARK FRACTIONS AND PERCENTS

You Try It!

- 25
- 75
- Possible answer:
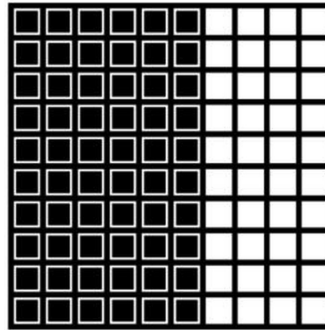
Practice:
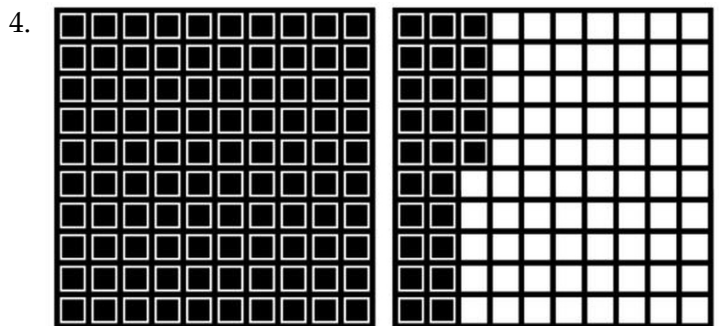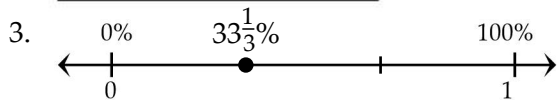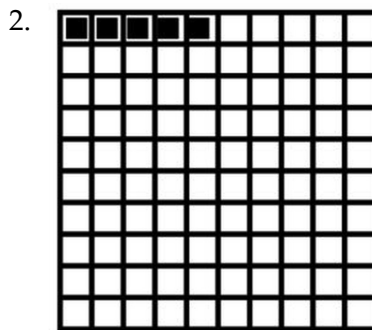
1.
2.
3.
4.
5. $\frac{1}{10} = 10\%$
6. $\frac{1}{2} = 50\%$
7. $1\frac{4}{5} = 180\%$
8. D
9. G
10. C

6.4G GENERATING EQUIVALENT RATIONAL NUMBERS

You Try It!

- $\dfrac{\text{Money Spent}}{\text{Total Amount}} = \dfrac{9}{75} = \dfrac{3}{25}$

- 0.12

$$
\begin{array}{r}
0.12 \\
\boxed{75})\,9.00 \\
\underline{-7\,5} \\
\boxed{1\,5}0 \\
\underline{-\boxed{1\,5\,0}} \\
0
\end{array}
$$

- **0.12** × 100 = **12**%

Practice:

1. $\dfrac{2}{25}$

2. 8%

3. 0.08

4. $1\dfrac{3}{8}$

5. 1.375

6. 137.5%

7. $\dfrac{17}{20}$

8. 0.22

9. $2\dfrac{3}{4}$

10. 48%

11. $33\dfrac{1}{3}$%

12. 0.2

13. C

14. F

6.5C EQUIVALENT PARTS OF THE SAME WHOLE

You Try It!

- $\dfrac{9}{20}$

- 0.45

- 45%

Practice:

1. $\dfrac{2}{5}$, 0.4, 40%

2. $\dfrac{17}{10} = 1\dfrac{7}{10}$, 1.7, 170%

3. $\dfrac{6}{8}$, 0.75, 75%

4. $\dfrac{7}{9}$, $0.\overline{7}$, $77\dfrac{7}{9}$%

5. $\dfrac{5}{8}$, 0.625, 62.5%

6. $\dfrac{2}{3}$, $0.\overline{66}$, $66\dfrac{2}{3}$%

7. $2\dfrac{3}{4}$, 2.75, 275%

8. B

9. G

10. C

6.7A USING THE ORDER OF OPERATIONS

You Try It!

$$
\begin{array}{c}
32 \div 2^2(-7 + 5)^3 \\
32 \div 2^2(\boxed{-2})^3 \\
32 \div \boxed{4}(\boxed{-8}) \\
\boxed{8}(\boxed{-8}) \\
32 \div 2^2(-7 + 5)^3 = \underline{\;\;-64\;\;}
\end{array}
$$

Practice:

1. 9.18

2. 30

3. 16

4. $2^3 \times 5^2$

5. $2^2 \times 3 \times 5 \times 7$

6. $3^3 \times 5$

7. $56

8. -21

9. D

10. H

11. B

12. J

© Cosenza & Associates, LLC   ANSWER KEY **11**

6.7B AND 6.7C EXPRESSIONS AND EQUATIONS

You Try It!

$3[4^2 – 6(4) + 9]$

- $3[16 – 6(4) + 9]$
- $3[16 – 24 + 9]$
- $3[–8 + 9]$
- $3[1]$
- 3

$\dfrac{(32 – 2^3) – (3^2 \times 2)}{2}$

- $\dfrac{(32 – 8) – (9 \times 2)}{2}$
- $\dfrac{(24) – (9 \times 2)}{2}$
- $\dfrac{(24) – (18)}{2}$
- $\dfrac{6}{2}$
- 3

The expressions are equivalent.

Practice:

1. equation
2. expression
3. expression
4. equation
5. expression
6. equation
7. $4(x + 3)$ or $2(2x + 6)$
8. The expressions are NOT equivalent.
9. $6x + 2$ and $2(3x + 1)$
10. B
11. H
12. C
13. G

6.7D PROPERTIES OF OPERATIONS

You Try It!

- Commutative (multiplication)
- Inverse (multiplication)
- Associative (addition)
- Identity (addition)
- Inverse (addition)
- Distributive
- Commutative (addition)
- Identity (multiplication)
- Associative (multiplication) and Commutative (multiplication)

Practice:

1. distributive
2. additive inverse and commutative
3. commutative & associative
4. multiplicative identity
5. distributive and multiplicative inverse
6. associative
7. $2 + (k + 14)$ or $(2 + 14) + k$
8. $6n + 14$ or $2(3n) + 2(7)$
9. $9(5 + p)$ or $9(p + 5)$
10. $2k + \dfrac{5}{2}$
11. B
12. J
13. A
14. H

6.3B ESTIMATING PRODUCTS WITH FRACTION MULTIPLICATION

Make a Note:

If the fraction is less than one, the product will be less than the first factor. If the fraction is greater than one, the product will be greater than the first factor.

You Try It!

- less than   greater than
- greater than   greater than
- less than   greater than

Practice:

1. decreased
2. increased
3. increased

4. decreased
5. greater than
6. decrease
7. D
8. H
9. A
10. G
11. H

8. −21
9. 52
10. −27
11. −17
12. $45
13. A
14. H

6.3C AND 6.3D ADDING AND SUBTRACTING INTEGERS
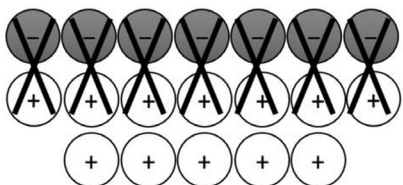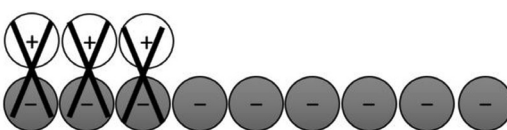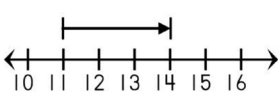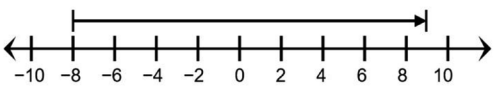
You Try It!

- −3 + 2 = −1
- −1 + −1 = −2
- −2 + 4 = 2
- 2

Make a Note…

- Adding the opposite of a number has the same result as subtracting a number. Instead of subtracting −17, you can add its opposite, +17.

Practice:
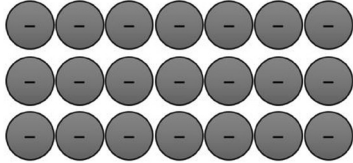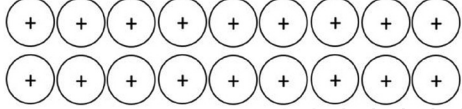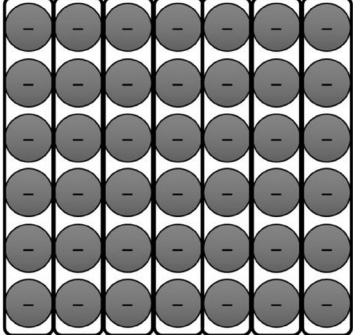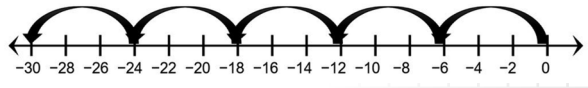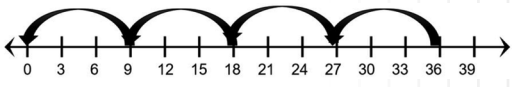
1. 5

2. −6

3. 14

4. 9

5. −19
6. 12
7. −45

6.3C AND 6.3D MULTIPLYING AND DIVIDING INTEGERS

You Try It!

- (4, −1)
- 3 × **4** = **12**
- 3 × **−1** = **−3**
- (12, −3)

Practice:

1. −21

2. 18

3. −6

4. −30

5. −4

6. 8

7. −12

8. −325

9. 120

10. 45

11. −99

12. −5

13. −17

14. −14 feet

15. A

16. H

6.3E MULTIPLYING FRACTIONS

You Try It!

#1

$\frac{3}{4} \times \frac{5}{8} = \frac{15}{32}$

#2

- $5\frac{1}{4} \times \frac{1}{3}$
- $\frac{21}{4} \times \frac{1}{3}$
- $\frac{21}{4} \times \frac{1}{3} = \frac{21}{12} = 1\frac{9}{12} = 1\frac{3}{4}$

Practice:

1. $\frac{1}{4}$

2. $\frac{14}{25}$

3. $1\frac{11}{45}$

4. $1\frac{5}{6}$

5. $5\frac{5}{12}$

6. $9\frac{3}{7}$

7. $\frac{5}{6}$

8. $3\frac{9}{16}$

9. A

10. H

11. 4

12. B

6.3E DIVIDING FRACTIONS

You Try It! #1
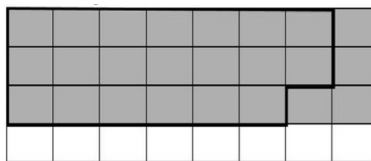
$\frac{5}{8}$ of the whole is 20 squares, so there is one group of 20 squares with 4 squares left over.

4 is $\frac{1}{5}$ of 20.

$\frac{3}{4} \div \frac{5}{8} = 1\frac{1}{5}$

You Try It! #2

- $12\frac{3}{4} \div 2\frac{1}{5}$
- $\frac{51}{4} \div \frac{11}{5}$
- $\frac{51}{4} \times \frac{5}{11}$
- $\frac{51}{4} \times \frac{5}{11} = \frac{255}{44} = 5\frac{35}{44}$

Practice:

1. $2\frac{2}{5}$

2. $3\frac{1}{5}$

3. $1\frac{49}{72}$

4. $1\frac{1}{35}$

5. $5\frac{1}{4}$

6. $2\frac{2}{45}$

7. $7\frac{7}{8}$

8. $22\frac{1}{2}$

9. C

10. F

11. B

12. J

6.4A ADDITIVE AND MULTIPLICATIVE RELATIONSHIPS

You Try It!

- Additive
- The value of y is **4** units **more than** the value of x.
- Multiplicative
- The value of y is **4** units **times** the value of x.

Make a Note:

A multiplicative pattern includes the origin as part of the input and output values, because multiplication of the input by 0 does not affect the output, whereas addition with the input does affect the output.

Practice:

1. table A

2. graph B

3. table A

4. graph B

5. Jeanie's age is Pablo's age plus 6 years.

6. additive; Matt, because $y = x + 8$

7. $y = 0.30x$

8. C

9. F

10. B

6.4B SOLVING PROBLEMS WITH RATIOS AND RATES

You Try It!

- Coop A: $\frac{\text{blue}}{\text{total}} = \frac{3}{27} = \frac{1}{9}$

- Coop B: $\frac{\text{blue}}{\text{total}} = \frac{4}{40} = \frac{1}{10}$

- $\frac{1}{9}$

- Coop A

Practice:

1. Jackson Farms

2. Franklin

3. $15.00

4. 52

5. 2-door car

6. 8

7. 56

8. Mr. Loren's homeroom

9. C

10. F

11. B

6.5A REPRESENTING PROBLEMS WITH RATES AND RATIOS

You Try It!

- $\frac{82}{2}$

- $\frac{t}{12}$

- $\frac{82}{2} = \frac{t}{12}$

Practice:

1. 3.5

2. $\frac{2}{24} = \frac{22}{m}$

3.

Time (hours), h	1	2	5	8
Area Plowed (acres), A	6	12	30	48

4. C

5. J

6.

Apples to Pies Ratio
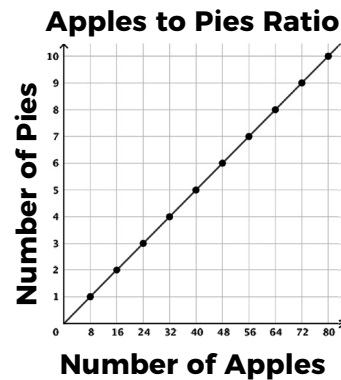
7. J

8. A

6.5B SOLVING PERCENT PROBLEMS

You Try It!

- Part: **discount of hat**; Percent: **35%**; Whole: **$40**

-
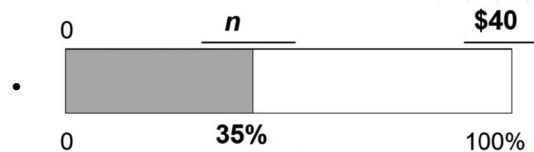
- $\frac{35}{100} = \frac{n}{40}$

- discount is $14 off

- **$40 - $14 = $26**

- No

Practice:

1. 121
2. 20%
3. 117
4. 37.5%
5. $9
6. $37\frac{1}{2}$%
7. 7
8. D
9. G
10. 403.2

6.6A INDEPENDENT AND DEPENDENT QUANTITIES

You Try It!

- The <u>postage required to mail</u> a letter depends on the <u>weight in ounces</u> of a letter.
- Independent = Weight
- Dependent = Postage

Practice:

1. perimeter
2. {0, 1, 2, 3, 4}
3. tree age
4. interest earned
5. B
6. G
7. D
8. F
9. B

6.6B WRITING EQUATIONS FROM TABLES

You Try It!

- Additive
- 30
- $b = m + 30$

Practice:

1. $p = 4s$
2. $n = d + 9$
3. $y = 2.5x$
4. $y = x - 2$
5. $y = x + 7.50$
6. $y = \frac{x}{20}$
7. A
8. G

6.6C REPRESENTING ADDITIVE AND MULTIPLICATIVE RELATIONSHIPS

Example 1 Step 2

Bracelets sold, x	Process	Donation Amount, y
50	50 × 6	$300
100	100 × 6	$600
125	125 × 6	$750
175	175 × 6	$1,050
200	200 × 6	$1,200

You Try It!

- plus
- +

Practice:

1. The input is the number of boxes and the output is the weight in ounces.
   The weight is 8 times the number of boxes.

2.

Number of Boxes x	Weight in Ounces y
10	80
25	200
40	320
65	520

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3.
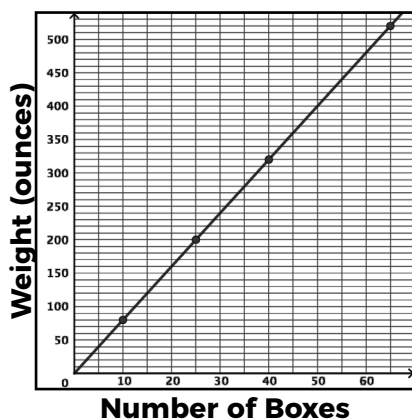
Number of Boxes

4. $y = 8x$, where x is the number of boxes produced and y is the weight in ounces.

5. The input is the worker's weight in pounds and the output is the combined weight of the worker and the backpack.
The combined weight of the worker and the backpack is 24 pounds more than the worker's weight.

6.

Worker's Weight (pounds) x	Combined Weight (pounds) y
135	**159**
150	**174**
175	**199**
200	**224**

7.
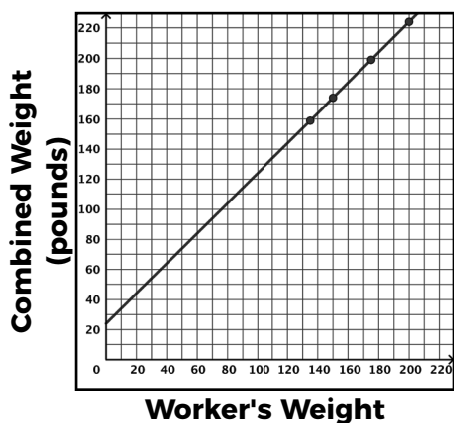
Worker's Weight

8. $y = x + 24$, where y is the combined weight in pounds and x is the worker's weight in pounds.

9. A

10. H

11. B

6.9A AND 6.9C EQUATIONS, INEQUALITIES, AND REAL-WORLD PROBLEMS

You Try It!

- Inequality
- Subtraction
- $m - 41 < 280$

Practice:

1. Inequality
2. Equation
3. Inequality
4. Equation
5. $2.85g = 39.90$ or $\dfrac{39.90}{g} = 2.85$
6. $w - 7 < 39$
7. $52 + m = 148$
8. $6t > 800$
9. 26; 5.2; h; exceed
10. 332; 89; p
11. A
12. H
13. B
14. J

6.9B AND 6.10.A SOLVING EQUATIONS USING ADDITION AND SUBTRACTION

You Try It!

- $t = 14.5$
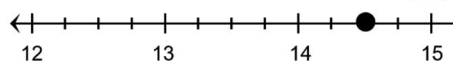
- $t = 48.7$
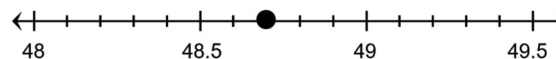
Practice:

1. $x = 11.3$
2. $x = 1\frac{3}{4}$
3. $x = 18$
4. 4
5. $x = 66°$
6. $x = 121°$

7. $p = 68$

8. B

9. F

10. A

11. J

6.9B AND 6.10A SOLVING EQUATIONS USING MULTIPLICATION AND DIVISION

You Try It!

- $n = 4.5$
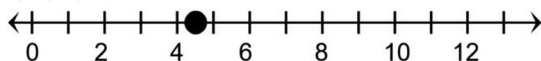
- $n = 29$
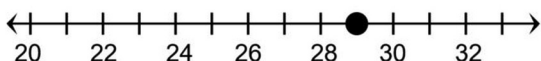
Practice:

1. $x = 8.5$

2. $x = 37\frac{1}{3}$

3. $x = -1.5$

4. 0.5

5. $\frac{b}{4} = 13.45$; $b = \$53.80$

6. $6m = 720$; $m = 120°$

7. $w = \$984$

8. D

9. F

10. B

11. G

12. C

13. -9

6.10A AND 6.9B SOLVING ONE-STEP INEQUALITIES

You Try It!

- Possible answer: $\frac{-(\;\mathbf{22}\;)}{11} \leq 3$

- Possible answer: $-2 \leq 3$ is a true statement, so 22 is a solution to the inequality.

Practice:

1. $x < 14$

2. $x \geq -31.1$

3. $x \leq -26$

4. $x \leq 8$

5. $x > -3$

6.

$x > -9$

7.

$x > -3$
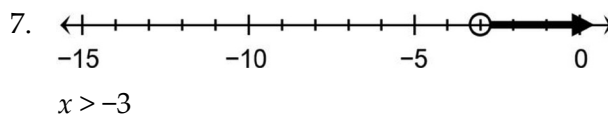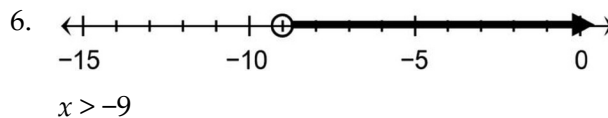
8. $x > 8$

9. $2.35n \geq 20$; $n \geq 8.5$, so Genesis can buy lunch for at least 8 school days.

10. B

11. H

12. A

13. J

14. B

6.10B VERIFYING SOLUTIONS TO EQUATIONS AND INEQUALITIES

You Try It! #1

- For $n = 5$
  - □ $(5) - 6 = -11$
  - □ $-1 \neq -11$
  - □ 5 is not a solution

- For $n = -5$
  - □ $(-5) - 6 = -11$
  - □ $-11 = -11$
  - □ -5 is a solution

You Try It! #2

- $\frac{-(\;-60\;)}{12} \leq 4$

- $\underline{\;\;\mathbf{5}\;\;} \leq 4$

- Not a solution

Practice:

1. no

2. yes

3. no

4. yes

5. yes

6. no

7. Jayme is correct. $m > 72$ is the solution set for the inequality and $110 > 72$.

8. *$g = 14.7$*

9. C

10. F

11. B

12. H

13. B

6.4H CUSTOMARY MEASUREMENT CONVERSIONS WITH UNIT RATES

You Try It!

- larger, smaller
- multiplication
- $\dfrac{12.5 \text{ quarts}}{1} \times \dfrac{\boxed{2} \text{ pints}}{\boxed{1} \text{ quart}} \times \dfrac{\boxed{2} \text{ cups}}{\boxed{1} \text{ pint}}$
- 50

Practice:

1. 456

2. 12.5

3. 4,000

4. 416

5. 84.25

6. 0.4

7. 13.125 quarts

8. 600 feet

9. 114 yards

10. 42.4 ounces

11. 1.75

12. D

13. F

14. C

15. J

16. B

6.4H METRIC MEASUREMENT CONVERSIONS WITH UNIT RATES

You Try It!

- 2 liters
- 2, 8 liters
- 0.35 liter
- 0.35, 2.1 liters
- 10.1 liters

Practice:

1. 4,200 m

2. 0.872 L

3. 1,890,000 mg

4. 350 mL

5. 17.34 g

6. 23.04 m

7. 1.5 g

8. 320 m

9. 490 mm

10. 3,485 g

11. A

12. F

13. D

6.8A TRIANGLE RELATIONSHIPS: ANGLE SUMS

You Try It!

- $x = 42°$

Practice:

1. $m\angle H = 21°$

2. $m\angle R = 29°$

3. $m\angle K = 60°$

4. $53\frac{1}{3}°$

5. $37.2°$

6. $90°$

7. $83.68°$

8. A

9. H

10. B

11. 47.65

6.8A TRIANGLE RELATIONSHIPS: SIDE LENGTHS AND ANGLES

You Try It!

- $JK = \underline{\textbf{8.4}}$ in.
- $8.4 + \underline{\textbf{8.4}} > JL$
- $8.4 + JL > \underline{\textbf{8.4}}$
- JL is between $\underline{\textbf{0}}$ in. and $\underline{\textbf{16.8}}$ in.

Practice:
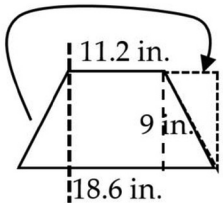
1. yes
2. no
3. no
4. $\angle S$
5. $\overline{EF}$
6. $\angle L$ and $\angle M$
7. between 5.6 and 19.2
8. $\overline{EF}$
9. A
10. H
11. B
12. D
13. A

6.8B MODELING AREA FORMULAS

You Try It!

or
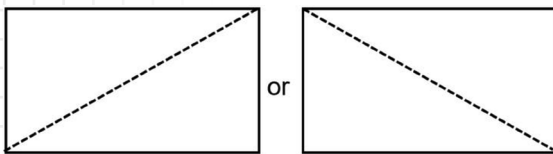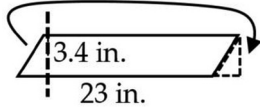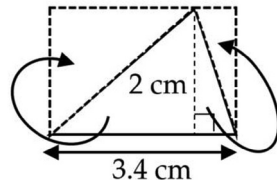
Practice:

1.

$$A = \left[11.2 + \frac{(18.6 - 11.2)}{2}\right] \times 9$$

2.

$A = 23 \times 3.4 = 78.2$ sq in.

3.

$A = \frac{1}{2}(3.4)(2) = 3.4$ sq cm

4. Trapezoid
5. 26 m
6. 32 m and 16 m
7. 624 m² (48 × 26)
8. C
9. H

6.8C AND 6.8D AREA OF RECTANGLES AND PARALLELOGRAMS

You Try It!

- $2{,}535 = 39 \times h$
- 65 inches

Practice:

1. $A = 5\frac{1}{3}b$
2. $h = \frac{273.6}{18} = 15.2$ in.
3. 15.75 ft²
4. $194.88 = 17.4x$ or $x = 194.88 \div 17.4$, so $x = 11.2$ cm
5. 1.875 square inches
6. $A = (14 \times 5.4) - (18)$
7. 401 ft²
8. B
9. F
10. C
11. G

6.8C AND 6.8D AREA OF TRIANGLES AND TRAPEZOIDS

You Try It!

- $A = \frac{1}{2} \times \underline{\ 18\ } \times \underline{\ 16.5\ } + \frac{1}{2} \times \underline{\ 15\ } \times \underline{\ 16.5\ }$

- $A = \frac{1}{2} \times (\underline{\ 18\ } + \underline{\ 15\ }) \times (\underline{\ 16.5\ })$

- Both expressions simplify to the same value, 272.25 cm².

Practice:

1. $b = 2A \div 3\frac{1}{4}$

2. $210 = \frac{17 + 23}{2} \times h$ or $h = \frac{210(2)}{17 + 23}$, $h = 10.5$ m

3. $l = 11.5$

4. 20 square centimeters

5. 2.5 square inches

6. $A = \frac{1}{2}(5.1 + 1.6) \times 7.2$; 24.12 ft²

7. C

8. F

9. B

10. J

6.8C AND 6.8D VOLUME OF RECTANGULAR PRISMS

You Try It!

-
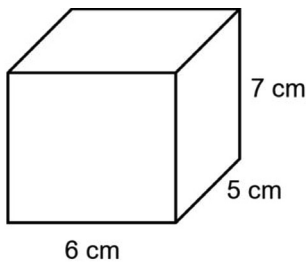
- $B = \underline{6 \text{ cm}} \times \underline{5 \text{ cm}} = \underline{30 \text{ cm}^2}$

- $V = \underline{30 \text{ cm}^2} \times \underline{7 \text{ cm}} = \underline{210 \text{ cm}^3}$

Practice:

1. $V = (7 \times 4.5) \times 6$

2. $B = 170\frac{4}{5} \div 12\frac{1}{5}$

3. $h = \frac{1,630.72}{B}$

4. 12.5 cubic inches

5. 11 centimeters

6. 14 inches

7. $V = [(3\frac{1}{2} \times 3) \times 6] \div 2$; 31.5

8. B

9. J

10. C

11. F

6.11A GRAPHING ON THE COORDINATE PLANE

You Try It!
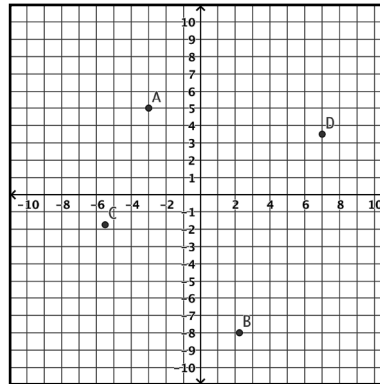
Practice:

1. (−4.25, 3.5)

2. (3.5, −2.25)

3. (2.25, 5.75)

4. (−2.5, −4.75)

5. move 8.75 units right and 6.75 units up

6. (−3.5, −1)

7. (2, −9.75)

8. (0, −3)

9. C

10. J

11. A

6.12A CONSTRUCTING DOT PLOTS, STEM-AND-LEAF PLOTS, AND HISTOGRAMS

You Try It!

- 2
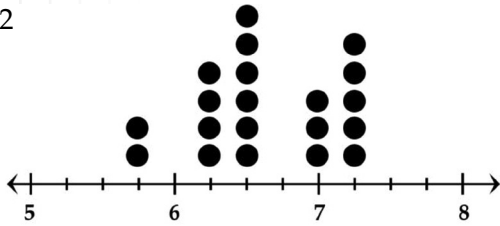
Make a Note…

- The shape of the graph tells you about the distribution of the data. Where there are more symbols or a taller bar, there are more data values in that number or range. The distance between the first and last values tells you how spread out the data set is.

Practice:

1.

Hours	0	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Number of People	3	6	4	5	2

2. In grams: 14.25, 15, 16.25, 16.50, 16.75, 18, 18, 18.25, 19.50, 19.50, 19.75, 20.5

3. **Social Studies Test Scores**
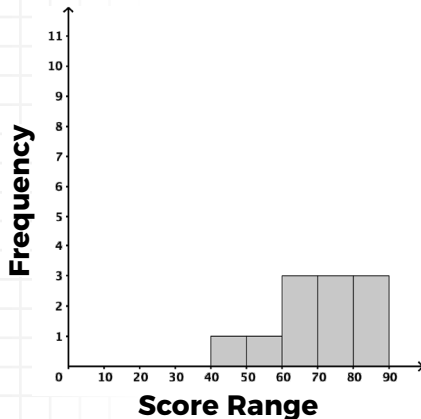
4. C

5.
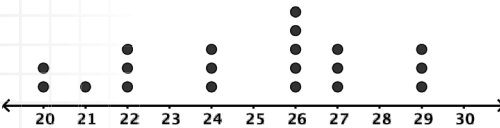
6.

Stem	Leaf
7	2 4 4 6 7 8 9 9
8	0 0 1 2 3 4 4 5

7 | 2 represents 72

7. B

6.12A CONSTRUCTING BOX PLOTS

You Try It!

- 8.68, 9.94, 10.50, 11.95, 14.84, 17.19, 20.16

- Minimum value: **8.68**
  Maximum value: **20.16**

- First quartile: **9.94**   Median: **11.95**
  Third quartile **17.19**

Practice:

1.
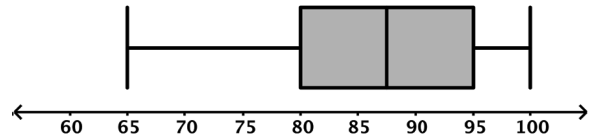
2.
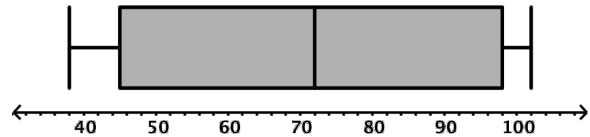
3.
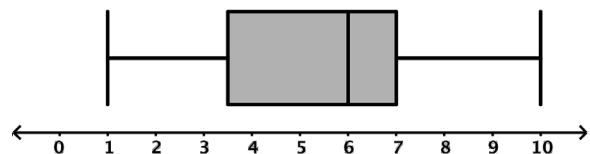
4.

Minimum Age	10
Q1 Age	25
Median Age	35
Q3 Age	50
Maximum Age	75

5. Beto is missing the median line at 2.5.

6. D

7. H

6.12B DESCRIBING DATA DISTRIBUTIONS GRAPHICALLY

You Try It!

- 9.5
- 12 – 8 = 4
- 4 sizes
- skewed right

Practice:

1. symmetrical
2. skewed right
3. skewed left
4. neither symmetrical nor skewed
5. 45 minutes
6. 31
7. 33 grams (from 58 to 91)
8. 80 candies
9. B
10. G
11. A
12. G

6.12C ANALYZING NUMERICAL DATA: CENTRAL TENDENCY

You Try It!

- 147, 169, 184, 190, 205
- 184
- 895
- 5
- 895 ÷ 5
- 179

Practice:

1. 43
2. 39
3. The mean is higher than the median causing the shape to be skewed right.
4. The mean is 281 and median is 297.
5. The mean is less than the median causing the shape to be skewed left.

6. 5 to less than 7 pounds
7. Mean is greater than median
8. 268
9. B
10. F
11. D

6.12C ANALYZING NUMERICAL DATA: SPREAD OF DATA

You Try It!

- 7, 10, 12, 17, 18, 19, 22
- 7
- 22
- 22 – 7 = 15
- 10
- 19
- 19 – 10 = 9

Practice:

1. Blake family: 31; Tran family: 31
2. Blake family: 28; Tran family: 30
3. The Tran family data is slightly more spread out than the Blake family based on the higher IQR value with the same range.
4. 251 cans
5. 129 cans
6. The data points are mostly clustered in the middle with some outliers making the IQR the better measure of spread.
7. 24
8. 18
9. 38
10. B
11. F
12. D

6.12D CATEGORICAL DATA: PERCENT BAR GRAPHS

You Try It!

- mocha

Practice:

1. Dog

2. Brown

3. 4 and 8 books

4.

Books Read	Frequency	Relative Frequency
0	1	4%
1	2	8%
2	1	4%
3	3	12%
4	5	20%
5	4	16%
6	2	8%
7	1	4%
8	5	20%
9	0	0%
10	1	4%

5.

Car Color	Percent of Inventory
Blue	35%
Red	$8\frac{1}{3}$%
Black	$28\frac{1}{3}$%
White	20%
Tan	$3\frac{1}{3}$%
Silver	5%

6.

Animal	Count
Horse	14
Pig	**6**
Cow	**10**
Chicken	**11**
Goat	**9**

7. D

8. B

6.13A INTERPRETING DOT PLOTS AND STEM-AND-LEAF PLOTS

You Try It!

- 0.5

- 2

- 3

- 2

- 7

Practice:

1. 6 hours

2. 5.7 hours

3. 10 hours

4. 4 hours

5. 51.2 minutes

6. 36 minutes

7. The spread of the middle 50% of the data is represented by the interquartile range, which is 23 minutes. The spread of the entire data set is represented by the range, which is 44 minutes. The middle 50% of the data is more clustered than the full data set.

8. about 33.7 minutes

9. A

10. H

6.13A INTERPRETING HISTOGRAMS AND BOX PLOTS

You Try It!

- 8.50

- 15.00

- 15.00 – 8.50 = 6.50

Practice:

1. 175 songs

2. 925 songs

3. 350 songs

4. Yes, because the right whisker is so long, it indicates that the 4th quartile of the data is very spread apart compared to all the other quartiles of the data set. The interquartile range is about 350, and 1.5(350) = 525. The maximum value is 550 greater than the third quartile, and 550 > 525.

5. 32

6. skewed right

7. 24 to 8

8. 50-99 followers meaning this is the mode, or the most common interval of followers.

9. B

10. F

11. C

6.13B VARIABILITY OF DATA

You Try It!

Data with Variability	Data Without Variability
The number of text messages sent each day	The library fee for a book that is 2 days overdue
The high temperature each day	The cost of a notebook in the school bookstore
The number of substitute teachers on campus each day	

Make a Note…:

- Possible answer: Data with variability have factors that cause the data values to change, such as people being absent from school on random days or costs that change from day to day. Data without variability have factors that are more fixed and do not cause the data values to change.

Practice:

1. with variability

2. without variability

3. without variability

4. with variability

5. without variability

6. with variability

7. have variability

8. no

9. A

10. J

11. A

12. G

6.14A AND 6.14B CHECKING ACCOUNTS, DEBIT CARDS, AND CREDIT CARDS

You Try It! #1

Possible answers may include:

- No minimum balance required.
- No monthly fee
- No fee for online bill payments.
- A free use debit card that can be used online

You Try It! #2

- Debit card
- Credit card

Practice:

1. Money Bank is better when you can maintain $500 or more in the account.

2. Legacy Bank is better if you cannot maintain a $500 balance in the account.

3. Option 1 is best for Ms. Hardin because she plans to use online services and a debit card and could direct deposit her paycheck to waive the monthly fees.

4. Option 2 would be better if she planned to write more checks and not use online bill pay more than 15 times a month.

5. credit card

6. debit card

7. debit card

8. D

9. H

10. A

6.14C BALANCING A CHECK REGISTER

You Try It! #1

• Withdrawal

• Withdrawal

• Deposit

• Deposit

• Withdrawal

You Try It! #2

• $701.30

Date	Description	Withdrawal (–)	Deposit (+)	Balance
4/10				$ 391.46
4/12	Check #161 I Love Clothes	$ 216.30		$ 175.16
4/12	ATM Cash for dinner	$ 40.00		$ 135.16
4/15	Paycheck Santo's Sports		$ 1,008.17	$ 1,143.33
4/16	Transfer from savings		$ 1,200.00	$ 2,343.33
4/20	House payment - online	$ 1,642.03		$ 701.30

Practice:

1. paycheck deposit, gift from mom deposit

2. transfer to savings, check for pizza, check for rent, online electricity payment, monthly bank fee

3.

Date	Description	Withdrawal	Deposit	Balance
8/30	Balance account			$ 425.55
9/1	Paycheck		$ 228.94	$ 654.49
9/2	Transfer to savings	$ 23.00		$ 631.49
9/5	Check #156 Pizza Mall	$ 22.40		$ 609.09
9/5	Check #157 Rent	$ 350.00		$ 259.09
9/6	Electric - online payment	$ 125.16		$ 133.93
9/10	Monthly bank fee	$ 2.25		$ 131.68
9/12	Gift from Mom		$ 150.00	$ 281.68

$281.68

4.

Date	Description	Withdrawal	Deposit	Balance
4/3		$	$	$ 33.50
4/5	Check from Grandmother	$	$ 50.00	$ 83.50
4/7	Transfer to savings	$ 25.00	$	$ 58.50
4/10	Debit for video game	$ 32.46	$	$ 26.04
4/15	ATM withdrawal	$ 20.00	$	$ 6.04

5. $6.04

6. B

7. H

6.14D, 6.14E, AND 6.14F CREDIT REPORTS

You Try It! #1

Possible answers include:

- Not have too many accounts open or too high of limits on your accounts.
- Have a variety of credit account types.
- Don't have so much debt that you have to file bankruptcy.
- Don't apply for too many credit accounts.

You Try It! #2

- NO
- YES
- YES
- NO
- NO
- NO
- YES
- NO

Practice:

1. 64 months

2. The apartment landlord wants to make sure Able is able to pay his rent on time, is stable with his work and credit history, and does not have any financial liens or judgments.

3. The interest rate, and therefore the amount of money Brandon has to pay back, is likely to be greater due to his low credit score.

4. Mark is correct.

5. bankruptcy, court judgments or closed account payment history, credit inquiries

6. C

7. H

8. B

9. J

10. C

11. F

6.14G AND 6.14H COLLEGE AND POST-SECONDARY EDUCATION

You Try It! #1

Possible answer:

1. Scholarships (or grants)

2. Grants (or scholarships)

3. Work-Study

4. Savings

5. Student Loans

The order is based on the least impact financially. Scholarships and grants are free money that does not need to be paid back. Work-Study allows you to work off part of your tuition costs. Savings can be applied to the remaining costs. Student loans must be repaid so you want to minimize the amount you need.

You Try It! #2

   A. 80%

   B. 20%

Practice:

1. The income for hours worked on campus is applied to tuition and fee costs for college so the student has to pay less money for tuition and fees.

2. grants, scholarships, and work-study

3. a grant

4. 70%

5. $22,230 more per year

6. $212,520, because he will earn his bachelor's degree salary for 2 more years while working on his master's degree. He will earn an additional $26,565 each year for 8 years.

7. Denver

8. Associate's degree

9. D

10. G