BIL Counter Evidence to Ed Reports Alignment Grade 1

GATEWAY TWO: Rigor and Mathematical Practices

Rigor and Balance

Indicator 2a -- Attention to conceptual understanding: Materials develop conceptual understanding of key mathematical concepts, especially where called for in specific content standards or cluster headings.

Ed Reports Review	BIL Counter Evidence
Indicator 2a --The instructional materials for Big Ideas Math: Modeling in Real Life Grade 1 partially meets expectations that the materials develop conceptual understanding of key mathematical concepts, especially where called for in specific standards or cluster headings. Cluster 1.NBT.B addresses understanding place value of ones and tens. Some lessons in Chapters 4, 6-9, 11, and 12 explore ways for students to develop and demonstrate conceptual understanding of ones and tens through the use of tens frames, 100 charts, and number lines. Cluster 1.NBT.C addresses understanding place value of ones and tens and properties of operations to add and subtract. Some lessons in Chapters 8-9 explore ways to develop and demonstrate conceptual understanding of addition and subtraction using properties of operations as well as place value within 100. A variety of representations are used to help develop the conceptual understanding of place value including models, base ten blocks, quick sketches, 120 charts or hundred chart, and open number lines. Some opportunities for students to demonstrate conceptual understanding independently are evident, the instructional materials do not always provide students opportunities to independently demonstrate conceptual understanding throughout the grade-level. Within the Apply and Grow, and Homework and Practice sections, students have limited opportunities to independently demonstrate conceptual understanding.	Conceptual problems are intentionally included throughout the program. Each lesson begins with an Explore and Grow section where students develop conceptual understanding. In every lesson, each Think and Grow example is directly followed by a set of Show and Grow exercises that provide students immediate opportunity to independently practice the concept. These are always followed by Apply and Grow exercises which often include at least one conceptual problem. Also, every Practice set often contains at least one conceptual problem. For example: Apply and Grow: Practice • ***2.2 #11, page 73*** • 3.2 #7, page 135 • 4.4 #10, page 207 • 7.3 #9, page 369 • 9.2 #6, page 467 • 13.3 #9, page 627 Practice • 3.4 #3, page 150 • 5.4 #5, page 266 • 8.3 #9, page 420 • 10.3 #4, page 520 • 12.4 #7, page 606 • ***14.3 #7, page 692***

Indicator 2c -- Attention to Applications: Materials are designed so that teachers and students spend sufficient time working with engaging applications of the mathematics, without losing focus on the major work of each grade

Ed Reports Review	BIL Counter Evidence
Indicator 2c -- The instructional materials for Big Ideas Math: Modeling in Real Life Grade 1 partially meet expectations that the materials are designed so that teachers and students spend sufficient time working with engaging applications of the mathematics. The instructional materials present opportunities for students to engage in routine applications of grade-level mathematics. The instructional materials present few opportunities for students to engage in non-routine applications of the mathematics. Most problems are routine application representing the common addition and subtraction situations in Grade 1.	In every lesson, each Think and Grow: Modeling Real Life example is directly followed by a set of Show and Grow exercises that provide students immediate opportunity to independently engage in routine and non-routine application problems. Students have similar opportunities in the Practice. Students have abundant opportunity to engage in routine and non-routine application problems throughout the grade. Examples of non-routine problems: Show and Grow • ***4.3 #10, page 202*** • 6.2 #8, page 302 • 8.8 #10, page 448 • 10.4 #6, page 524 Practice • 3.5 #4, page 156 • 4.3 #6, page 204 • 9.6 #4, page 494 • ***11.5 #2, page 570*** Performance tasks also give students opportunity to independently engage in non-routine applications. For example: • Ch 2 #1, page 119 • Ch 4 #1-3, page 235 • ***Ch 5 #1b-c, page 285*** • Ch 11 #1-4, page 571

Boldfaced italic indicates pages where additional explanation is annotated on the supporting pages of this document.

Mathematical Practice - Content Connections

Indicator 2e -- The Standards for Mathematical Practice are identified and used to enrich mathematics content within and throughout each applicable grade.

Ed Reports Review	BIL Counter Evidence
Indicator 2e -- The instructional materials reviewed for Big Ideas Math: Modeling in Real Life Grade 1 partially meet expectations that the Standards for Mathematical Practice are identified and used to enrich mathematics content within and throughout the grade-level. The Teacher Edition, page vi, identifies the Standards for Mathematical Practice noting where specific standards would be located. For example, MP2 states, "Explore and Grows allow students to investigate math to understand the reasoning behind the rules." The MPs are explicitly identified in Laurie's Notes and are connected pertaining to the mathematics specific problems within the lesson. In the Student Edition, MPs are noted with an abbreviated title, for example, "MP Number Sense" or "MP Structure." No document correlates the abbreviated title with the Standards for Mathematical Practice. There are some instances where the MPs are over or under identified.	We have provided a correlation online at bigideasmath.com for students, aligning the MP labels and other headings in the Student Edition with the Standards for Mathematical Practice. Big Ideas Learning will also send the correlation to existing users of our program. The correlation will also be included in future textbook printings. The page is attached here for your reference. • ***Front matter, page vi*** We suggest that MP2 is not over-identified because students must consistently use reasoning to develop deep conceptual understanding and procedural fluency of all topics throughout the grade. Questions such as "How did you know?" and "Why does this make sense?" encourage students to use reasoning to express their thinking.

Indicator 2f -- Materials carefully attend to the full meaning of each practice standard.	
Ed Reports Review	**BIL Counter Evidence**
Indicator 2f -- The instructional materials present few opportunities for student to engage with the full intent of MP1: Make sense of problems and persevere in solving them. MP1 is identified in the instructional materials, however, there are few instances where students need to persevere to find a solution. MP1 is not found in Chapters 1, 3, 7, 8, 9, 10, 11, 12, and 14.	While the Think and Grow: Modeling Real Life examples are solved as a class, students have opportunities to make sense of problems and persevere in solving them when they independently solve the related problems that follow. For example: Think and Grow: MRL and Show and Grow / Practice • 2.3 Example and #12, page 80 / • 2.3 #8, page 82 • 4.1 Example and #12, page 190 / • 4.1 #6, page 192 • 7.2 Example and #7, page 364 / • 7.2 #6, page 366 • 8.6 Example and #8, page 436 / • ***8.6 #5, page 438*** • ***10.3 Example and #6, page 518*** / • 10.3 #5, page 520 Students are encouraged to circle what they know and underline what they need to find to think through and solve problems. For example: Think and Grow / Apply and Grow: Practice • ***4.8 Example and #1, page 230*** / • 4.8 #2, page 231 • 5.7 Example and #1, page 280 / • ***5.7 #2, page 281*** • 9.6 Example and #1, page 490 / • 9.6 #2, page 491 Teaching Edition notes labeled with MP1 give opportunities for the teacher to emphasize these habits to students and for students to use them going forward. For example: • 5.3 page T-255 • 5.5 page T-270 • 6.8 page T-336 • ***13.3 page T-628***

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Indicator 2f -- The instructional materials present few opportunities for student to engage with the full intent of MP5: Choose appropriate tools strategically. MP5 is identified a total of two times throughout the instructional materials. The materials present no opportunities for students to choose appropriate tools strategically, therefore the full meaning of the MP is not being attended to. MP5 is not found in Chapters 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, and 14.	Students have opportunities to choose tools strategically. In addition to the specific MP5 labels, the Teaching Edition often indicates where students have a choice of tools. For example: • Ch 2 Laurie's Overview, page T-63C • 2.4 Supporting Learners, page T-84 • 4.3 Additional Support, page T-201 • 6.9 Additional Support, page T-343 • 8.6 Supporting Learners, page T-434 • Ch 9 Laurie's Overview, page T-457D • ***12.1 Additional Support, page T-585*** In the Dynamic Student Edition, students have access to the following math tools at all times. • Balance scale • Four function calculator • Geoboard • Money • Number line • Place value • Flash cards • Fraction models • Linking cubes • Number frames • Pattern blocks • Rekenrek
Indicator 2f -- The instructional materials present few opportunities for student to engage with the full intent of MP7: Look for and make use of structure. MP7 is rarely identified in the instructional materials. When it is identified students do not look for and make use of structure, nor do they all call for recognition of mathematical structure.	The Teaching Edition provides teachers with prompts that help students identify patterns and structure on their own. Teachers are also provided with insights as to what students may say and how to lead students to specific conclusions. For example: • 1.6 Dig In (Circle Time), page T-33 • 2.6 Explore and Grow, page 95 • ***3.3 Explore and Grow, page 139*** • 8.7 Explore and Grow, page 439 • 10.4 Explore and Grow, page 521
Indicator 2f -- MP8: The instructional materials do not use words “regularity”, “repeated”, or “reasoning” in the opportunities teachers are encouraged to give the students. MP8 is not found in Chapters 1, 3, 5, 7, 8, 9, 10, 11, 12, 13, and 14. There are a few instances where MP8 is used to engage students with the full intent of the practice.	Students have opportunities to express regularity in repeated reasoning throughout our program. In addition to the specific MP labels, the Teaching Edition often indicates where students engage in repeated reasoning. For example: • 2.3 page T-77 • 4.6 page T-218 • 6.4 page T-311 • ***8.2 Preparing to Teach, page T-409*** • 12.1 page T-583 • 13.2 page T-620
Indicator 2g.i -- Materials prompt students to construct viable arguments and analyze the arguments of others concerning key grade-level mathematics detailed in the content standards.	
Ed Reports Review	**BIL Counter Evidence**
Indicator 2g.i -- The instructional materials reviewed for Big Ideas Math: Modeling in Real Life Grade 1 partially meet expectations that the instructional materials prompt students to construct viable arguments and analyze the arguments of others concerning key grade-level mathematics. Additionally, MP3 is not identified in Chapters 6, 7, 8, 9, or 14. Throughout the materials students are presented with “You be the Teacher” problems, where they analyze errors or different representations. The instructional materials present few opportunities for students to construct arguments, however, in some instances, students are asked to explain how they know, rather than construct a mathematical argument.	At this grade level, students use drawings, models, and written explanations to construct viable arguments and analyze the arguments of others. This is prompted by statements such as "Show how you know." and "Explain." The ability to critique someone else's reasoning also helps students analyze their own work and formulate good explanations. For example: • 2.6 #6, page 100 • 4.2 #4, page 198 • 6.2 #6, page 304 • ***10.2 #5, page 511*** • 11.2 #2, page 552

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<table>
<tr><td colspan="2">Indicator 2g.ii -- Materials assist teachers in engaging students in constructing viable arguments and analyzing the arguments of others concerning key grade-level mathematics detailed in the content standards.</td></tr>
<tr><td>Ed Reports Review</td><td>BIL Counter Evidence</td></tr>
<tr><td>Indicator 2g.ii -- The instructional materials reviewed for Big Ideas Math: Modeling in Real Life Grade 1 partially meet expectations that the instructional materials assist teachers in engaging students to construct viable arguments and analyze the arguments of others concerning key grade-level mathematics.

The materials identify MP3 in the Teacher Edition. Laurie’s Notes sometimes include guidance to support teachers to engage students in constructing viable arguments and analyze the arguments of others.

There are occasions where the materials do not provide guidance for teachers to engage students in MP3. Not all explanations require students to construct an argument or analyze the arguments of others.

MP3 is not identified in the materials in Chapters 6, 7, 8, 9, or 14.</td><td>The Teaching Edition contains many instances of guidance, along with probing questions the teacher can ask, to engage students in constructing arguments and analyzing the arguments of others. These are often indicated with either an MP3 inline head or a red "?" icon. For example:

MP3 inline head
• 1.4 page T-22
• 2.3 page T-78
• 2.4 page T-84
• 3.2 page T-134
• 5.2 page T-252
• 10.2 page T-512
• 11.1 page T-544
• 12.1 page T-586

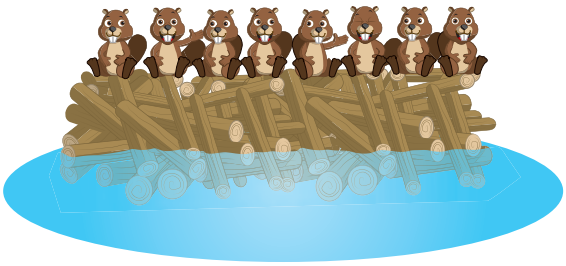
Red "?" icon
• 3.4, page T-148
• 6.2, page 299
• 8.8, page T-448
• 11.3, page T-553
• 13.5, page T-638</td></tr>
</table>

Name _____

Apply and Grow: Practice

Use the picture to write an equation.

5.



_____ − 0 = _____

6.

_____ − _____ = 0

7. 5 − 5 = _____

8. 6 − 0 = _____

9. 9 − 0 = _____

Indicator 2a - In #11, students complete both an equation and a sentence to demonstrate their conceptual understanding of subtracting zero.

11. MP **Structure** Complete the equation. Then use the words to complete the sentence.

4 − _____ = 4

When you _____ 0 from a number,

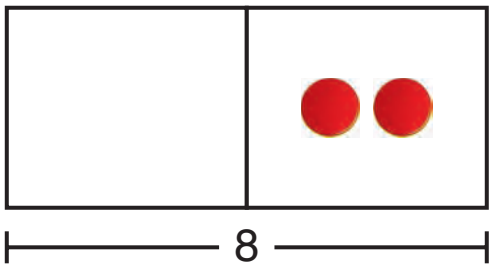
the _____ is that _____.

Words
difference
number
subtract

Name _____

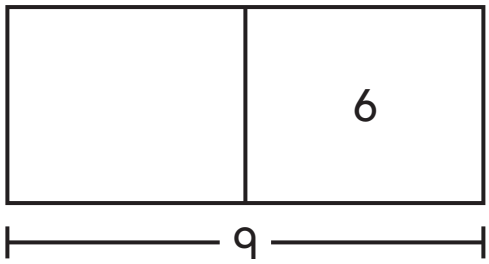
Apply and Grow: Practice

3. $8 - ? = 2$



$8 - \_\_\_\_ = 2$

4. $9 - ? = 6$

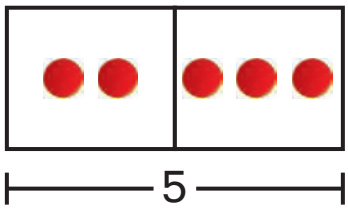


$9 - \_\_\_\_ = 6$

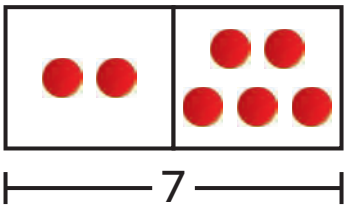
5. $3 - \_\_\_\_ = 0$

6. $10 - \_\_\_\_ = 5$

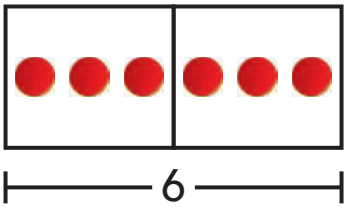
7. MP **Repeated Reasoning** Match each model with its correct equation.



$7 - 2 = 5$



$5 - 2 = 3$



$6 - 3 = 3$

Name _____

Apply and Grow: Practice

3.

$3 + 5 + 3 = \_\_\_\_$

$3 + 5 + 3 = \_\_\_\_$

$3 + 5 + 3 = \_\_\_\_$

4.

$3 + 1 + 2 = \_\_\_\_$

5.

$7 + 5 + 5 = \_\_\_\_$

6.

$4 + 5 + 2 = \_\_\_\_$

7.

$7 + 8 + 1 = \_\_\_\_$

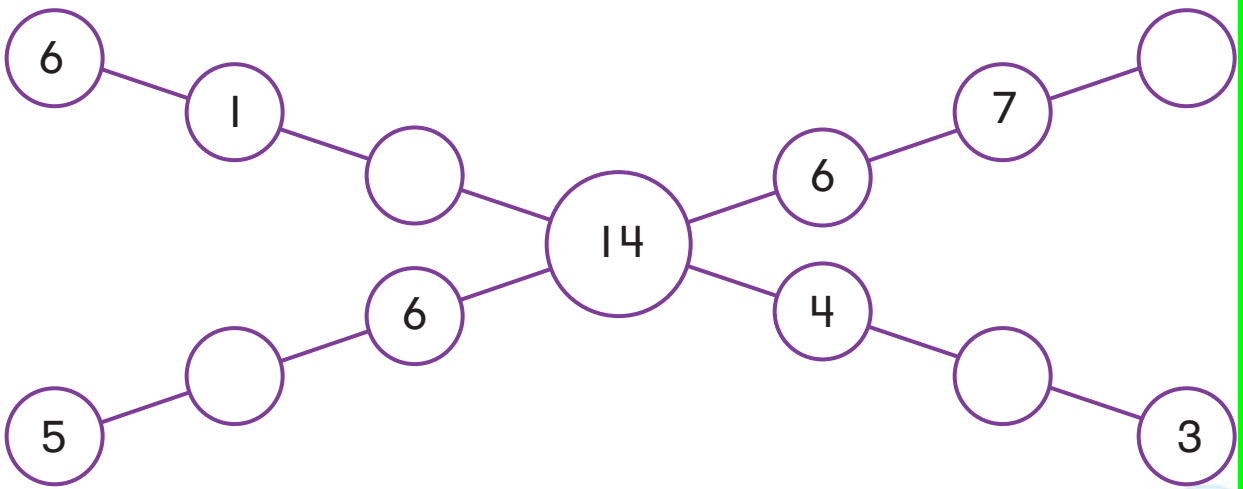
8.

$8 + 6 + 2 = \_\_\_\_$

9.

$4 + 9 + 4 = \_\_\_\_$

10. DIG DEEPER! Complete the number puzzle so that each branch has a sum of 14.



Name _____

Apply and Grow: Practice

Compare. Which digits help you decide?

3. 39 is greater than / is less than 48.

_____ tens _____ ones _____ tens _____ ones

4. 80 is greater than / is less than 62.

_____ tens _____ ones _____ tens _____ ones

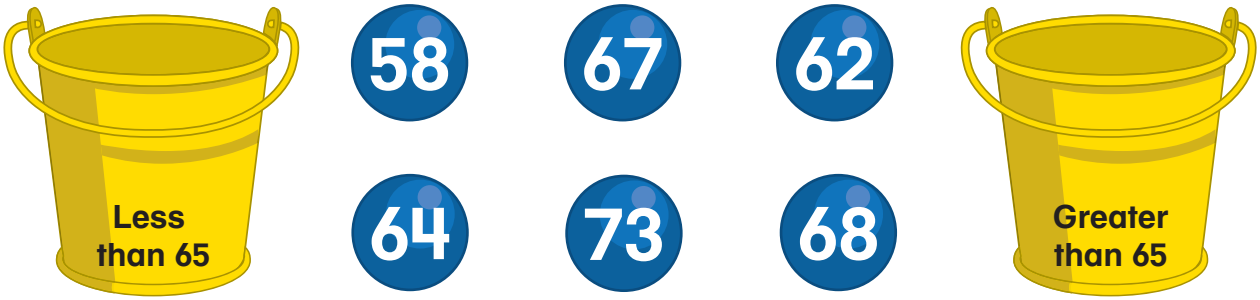
5. 26 is greater than / is less than 23.

6. 51 is greater than / is less than 86.

7. 17 is greater than / is less than 71.

8. 97 is greater than / is less than 92.

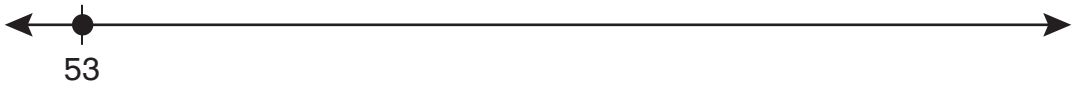
9. MP **Precision** Match each ball with its bucket.



Name _____

Apply and Grow: Practice

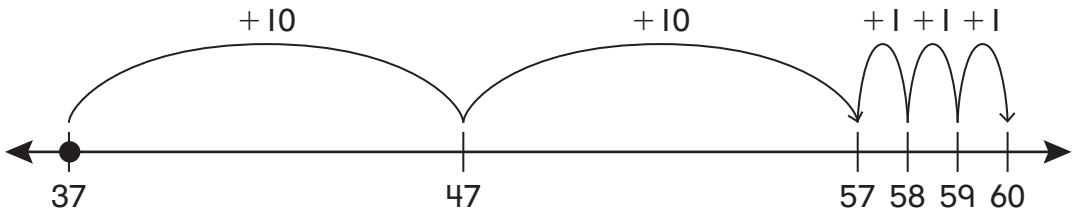
3. 53 + 40 = _____



4. 82 + 12 = _____

5. 48 + 31 = _____

6. MP **Structure** Write an equation that matches the number line.



_____ + _____ = _____

Name _____

Apply and Grow: Practice

5. How many  make a  ?

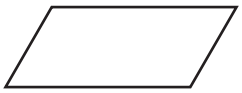
_____  make a  .

6. How many  make a  ?

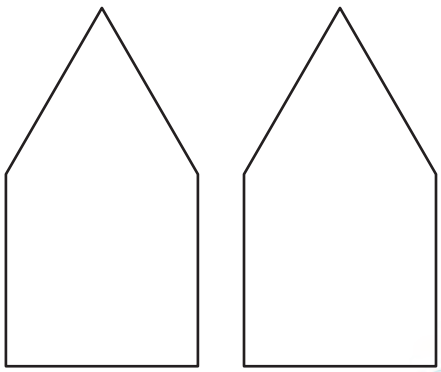
_____  make a  .

7. Draw the shape you can use 2 times to make a .

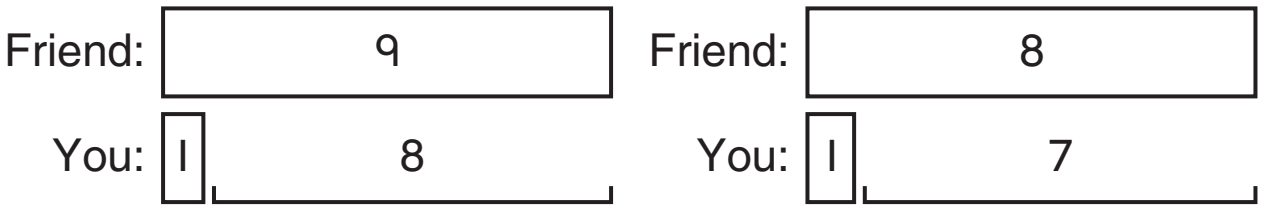
8. Draw the shape you can use 3 times to make a .

9. MP **Choose Tools** Which shape can you use 2 times to make a  ?

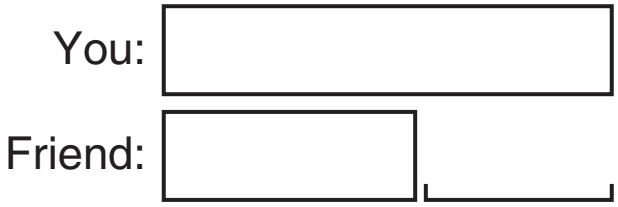
10. DIG DEEPER! Draw to show 2 different ways you can use pattern blocks to make the shape.



3. **Precision** You have 1 seashell. Your friend has 8 more than you. How many seashells does your friend have? Circle the bar model that matches the problem.



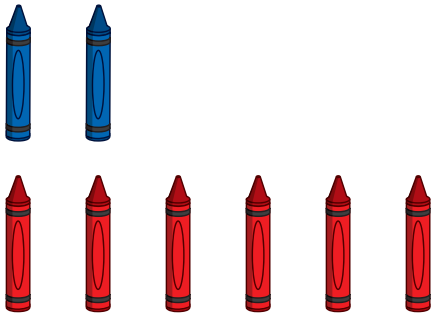
4. **Modeling Real Life** Your friend has 2 comic books and 2 mystery books. You have 3 more books than your friend. How many books do you have?



____ books

Review & Refresh

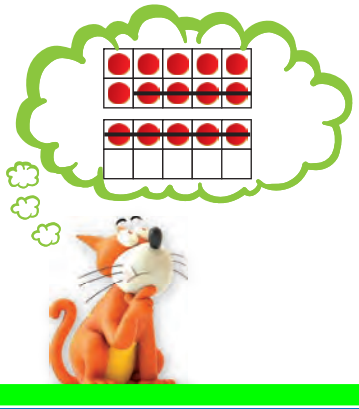
5. There are 2 blue crayons and 6 red crayons. How many fewer blue crayons are there?



____ − ____ = ____

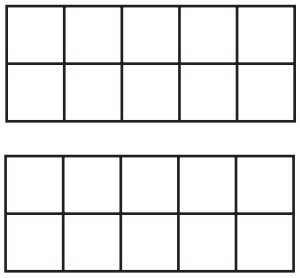
____ fewer blue crayons

5. MP **Number Sense** Which equations did Descartes use to solve the problem?



- ◯ $15 - 5 = 10, \quad 10 - 4 = 6$
- ◯ $20 - 5 = 15, \quad 15 - 5 = 10$
- ◯ $20 - 4 = 16, \quad 16 - 5 = 11$

6. **Modeling Real Life** Your friend recycles 14 cans. You recycle 7 fewer. How many cans do you recycle?



_____ cans

Review & Refresh

Is the equation true or false?

7. $3 + 2 \stackrel{?}{=} 5 + 0$

_____ $\stackrel{?}{=}$ _____

True False

8. $8 - 2 \stackrel{?}{=} 5 + 5$

_____ $\stackrel{?}{=}$ _____

True False

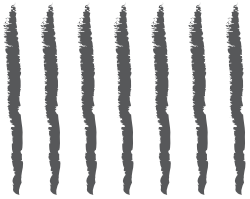
5. _____ + 40 = 50

6. _____ + 30 = 60

7. _____ + 20 = 70

8. _____ + 50 = 90

9. **DIG DEEPER!** Which choices match the model?



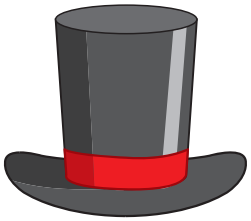
3 tens + 4 ones

5 tens + 2 tens

60

30 + 40

10. **Modeling Real Life** One magic set has 30 pieces. Another set has the same number of pieces. How many pieces are there in all?



_____ pieces

Review & Refresh

11. _____ = 6 + 5

12. _____ = 3 + 17

13. _____ = 11 + 5

14. _____ = 5 + 9

4. MP **Reasoning** The green yarn is about 3 color tiles long. How long is the blue yarn?

about _____ color tiles

5. **Modeling Real Life** Will the gift card fit inside an envelope that is 8 color tiles long?

Circle: Yes No

Tell how you know:

Review & Refresh

6. Complete the fact family.

$7 + 3 =$ _____ _____ $- 3 = 7$

_____ $+$ _____ $=$ _____ _____ $- 7=$ _____

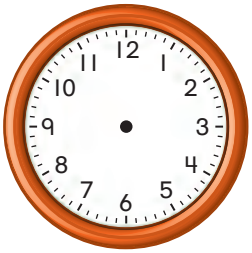
7. Which One Doesn't Belong? Which time does not belong with the other three? Think: How do you know?

half past 6

8. Modeling Real Life Bowling starts 1 hour later than ice skating. Show and circle the time bowling starts.

Ice Skating

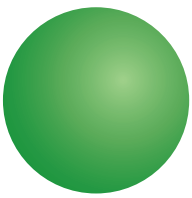
Bowling

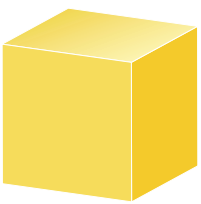


half past 5 | 5 o'clock | half past 4 | 3 o'clock

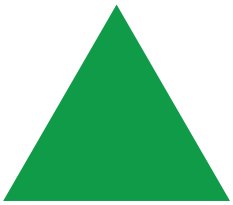
Review & Refresh

9. Circle the cone. Draw a rectangle around the cylinder.

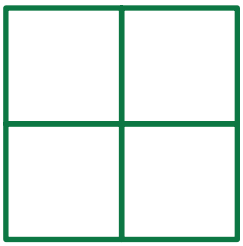




6. DIG DEEPER! Which shape shows a fourth of a circle?



7. MP **Reasoning** Color half of the square. How many fourths did you color?



_____ fourths

Indicator 2a - In #7, students begin to develop a conceptual understanding of the relationship between halves and fourths.

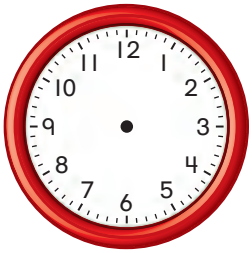
8. **Modeling Real Life** You cut a slice of bread into quarters. Your friend eats 3 quarters. How many more friends could have a piece of bread?

_____ friend

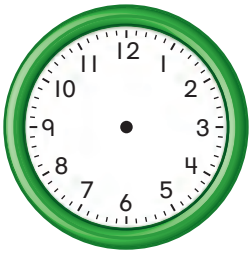
Review & Refresh

Draw to show the time.

9.



10.



Think and Grow: Modeling Real Life

You have 7 train cars. Newton has 5 more than you. Descartes has 4 more than you. Who has more train cars, Newton or Descartes?

Model:

Equations: Newton Descartes

Who has more? Newton Descartes

Indicator 2c - #10 is non-routine because students must first count on to find how many comic books Newton and Descartes each have. Then they compare to determine who has more.

Show and Grow *I can think*

10. You have 6 comic books. Newton has 5 more than you. Descartes has 6 more than you. Who has more comic books, Newton or Descartes?

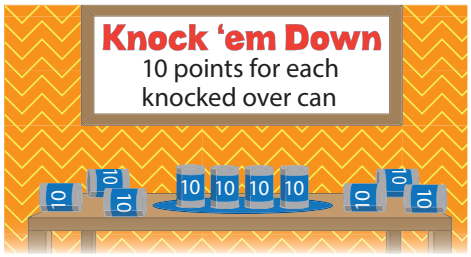
Model:

Equations: Newton Descartes

Who has more? Newton Descartes

Think and Grow: Modeling Real Life

You have 50 points. On your next turn, you knock over 6 cans. How many points do you have now?



Write the numbers:

_____ points

Show and Grow *I can think deeper!*

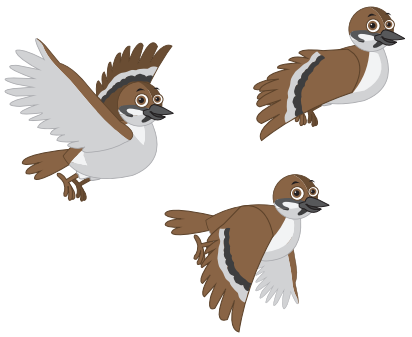
8. You have 21 points. On your next turn, 3 beanbags land in the circle. How many points do you have now?

Write the numbers:

_____ points

Think and Grow: Modeling Real Life

You count 8 birds on your way to school. You count 40 more on your way home. Your friend counts 45 birds in all. Who counts more birds?



Model:

Addition equation:

Compare: _____ ◯ _____

Who counts more birds? You Friend

Show and Grow *I can think deeper!*

10. You make 21 snowballs. Your friend makes 11 small snowballs and 20 large snowballs. Who makes more snowballs?

Model:

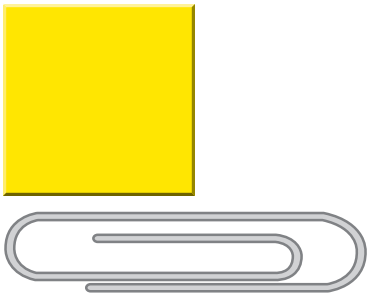
Addition equation:

Compare: _____ ◯ _____

Who makes more snowballs? You Friend

Think and Grow: Modeling Real Life

Your guitar is 33 color tiles long. Is your guitar more than or less than 33 paper clips long?

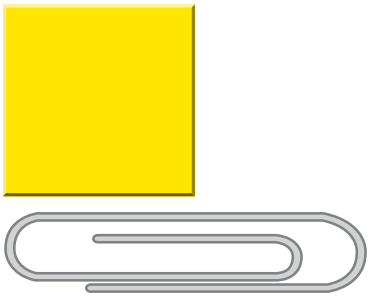


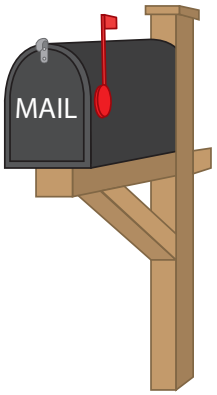
Circle: more than 33 less than 33

Tell how you know:

Show and Grow *I can think deeper!*

6. Your mailbox is 11 paper clips long. Is your mailbox more than or less than 11 color tiles long?

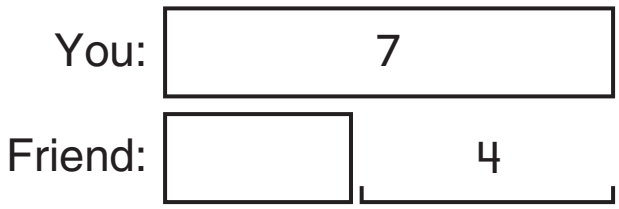




Circle: more than 11 less than 11

Tell how you know:

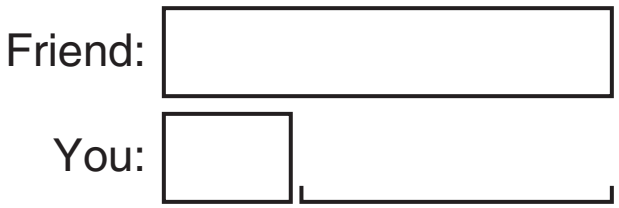
3. MP **Reasoning** Complete the bar model. Circle the equation that matches the bar model.



$7 - 4 = 3$

$7 + 3 = 10$

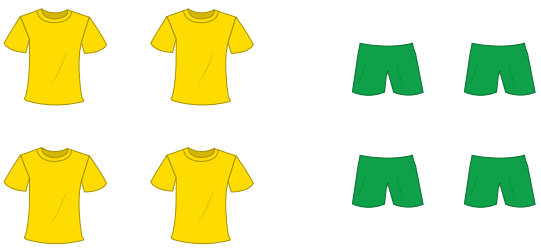
4. **Modeling Real Life** Your friend has 8 black cats and 2 orange cats. You have 7 fewer cats than your friend. How many cats do you have?

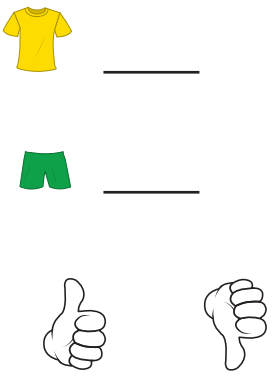


_____ cats

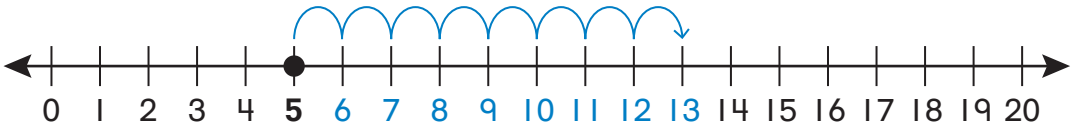
Review & Refresh

5. Write the numbers of shirts and shorts. Are the numbers equal? Circle the thumbs up for *yes* or the thumbs down for *no*.





5. **Structure** Write the equation shown by the number line. Then write the equation another way.



____ + ____ = ____ ____ + ____ = ____

6. **Modeling Real Life** You have 11 toys. Newton has 3 more than you. Descartes has 6 more than you. Who has more toys, Newton or Descartes?

Newton Descartes

Review & Refresh

7. Circle the triangle. Draw a rectangle around the hexagon.

8. Circle the cube. Draw a rectangle around the sphere.

3. **YOU BE THE TEACHER** You have 25 movies. You have 18 more video games than movies. Your friend says you have 43 movies and video games in all. Is your friend correct? Explain.

_____

_____

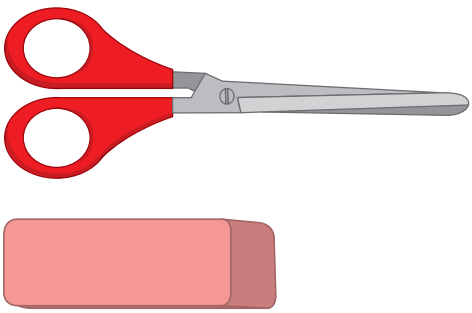
4. **Modeling Real Life** Newton needs 90 chairs for a party. He has 51. He rents 39 more. Does Newton have enough chairs?

Circle: Yes No

Review & Refresh

Circle the longer object.

5.



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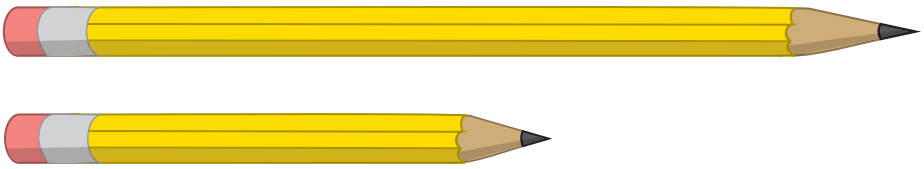


2. DIG DEEPER! You ask 19 students to name their favorite fruit. Complete the tally chart to show how many chose apples. Explain how you know.

Favorite Fruit	
Apple	
Banana	𝍸 ||
Orange	||

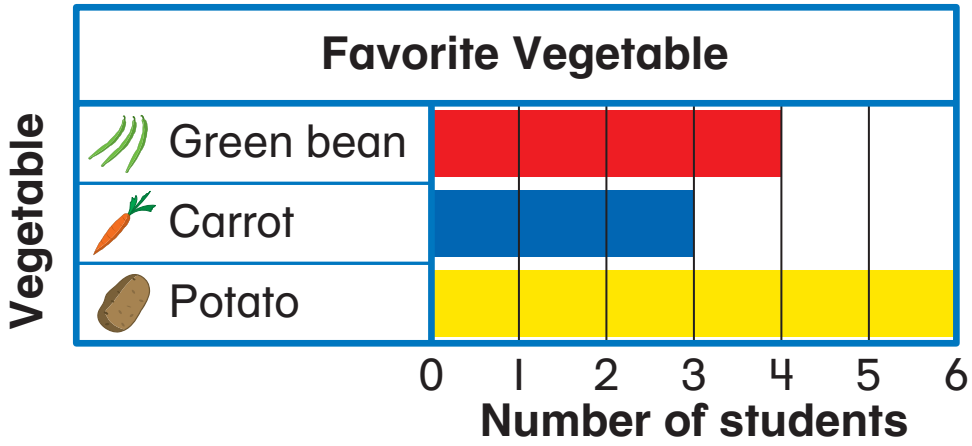
_____

_____

_____

Indicator 2c - #2 is non-routine because students must use the total number of students and the information given in the tally chart to determine how many students chose apples. Then they need to complete the tally chart.

3. **Modeling Real Life** Write and answ
using the bar graph.



_____

_____

_____

Review & Refresh

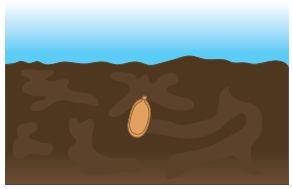
4. 51 + 40 = _____

5. 76 + 3 = _____

Name _____

Performance Task 2

1. You plant 4 red flower seeds and 4 yellow flower seeds. Your friend plants 5 red flower seeds and 4 yellow flower seeds.



a. 1 of your yellow seeds does not grow. How many of your flowers grow?

_____ flowers

b. 3 of your friend's red seeds do not grow. How many of your friend's flowers grow?

_____ flowers

c. Who has more flowers?

You Friend

d. How many more red flowers do you have than your friend?

_____ flowers

Name _____

Performance Task 4

1. You track the weather for a few weeks. Each week has 7 days.

   a. You track the weather every day for the first week. But you miss 1 day in the second week. How many days do you track the weather?

_____ days

   b. You track the weather for 1 more week. How many days in all do you track the weather?

_____ days

2. Your friend also tracks the weather. She records 9 sunny days and 5 cloudy days. How many days does your friend track the weather?

_____ days

3. You record 10 rainy days in the first three weeks. Is the number of rainy days the same as the number of sunny days?

Week	Sunny Days
1	4
2	3
3	4

Yes No

Show how you know:

Name _____

Performance Task 5

1. You keep track of the number of honeybees and bumblebees you see.

Day	Honeybees
Monday	12
Tuesday	6
Wednesday	13

Day	Bumblebees
Monday	5
Tuesday	14
Wednesday	

a. How many more honeybees did you see on Monday than on Tuesday?

_____ more honeybees

Indicator 2c - #1b-c are non-routine because students must add and subtract several times to answer the questions.

b. How many fewer bees did you see on Monday than on Tuesday?

_____ fewer bees

c. How many bumblebees must you see on Wednesday so that the numbers of bees you see on Tuesday and Wednesday are the same?

_____ bumblebees

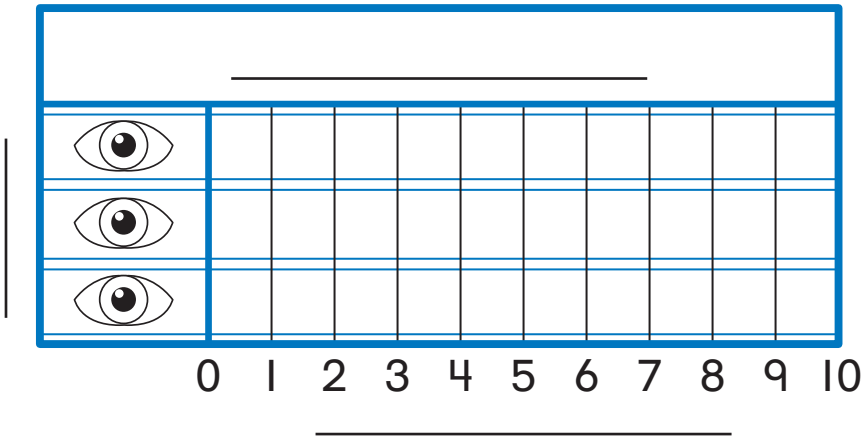
Name _____

Performance Task 11

1. Ask your classmates about their eye colors. Use your data to complete the tally chart.

Eye Color	
	
	
	

2. Use your tally chart to complete the bar graph.



3. Describe two ways to tell how many students you asked.

_____

_____

4. Write and answer a question about your graphs.

_____

_____

Indicator 2e - The front matter provides a correlation aligning the MP labels and other headings in the Student Edition with the Standards for Mathematical Practice.

Standards for Mathematical Practice

1 Make sense of problems and persevere in solving them.

- Multiple representations are presented to help students move from concrete to representative and into abstract thinking.
- In *Modeling Real Life* examples and exercises, students MAKE SENSE OF PROBLEMS using problem-solving strategies, such as drawing a picture, circling knowns, and underlining unknowns.

2 Reason abstractly and quantitatively.

- Visual problem-solving models help students create a coherent representation of the problem.
- *Explore and Grows* allow students to investigate concepts to understand the REASONING behind the rules.
- Exercises encourage students to apply NUMBER SENSE and explain and justify their REASONING.

3 Construct viable arguments and critique the reasoning of others.

- *Explore and Grows* help students make conjectures, use LOGIC, and CONSTRUCT ARGUMENTS to support their conjectures.
- Exercises, such as *You Be The Teacher* and *Which One Doesn't Belong?*, provide students the opportunity to CRITIQUE REASONING.

4 Model with mathematics.

- Real-life situations are translated into pictures, diagrams, tables, equations, or graphs to help students analyze relations and to draw conclusions.
- Real-life problems are provided to help students apply the mathematics they are learning to everyday life.
- MODELING REAL LIFE examples and exercises help students see that math is used across content areas, other disciplines, and in their own experiences.

5 Use appropriate tools strategically.

- Students can use a variety of hands-on manipulatives to solve problems throughout the program.
- A variety of tools, such as number lines and pattern blocks, manipulatives, and digital tools, are available as students CHOOSE TOOLS and consider how to approach a problem.

6 Attend to precision.

- PRECISION exercises encourage students to formulate consistent and appropriate reasoning.
- Cooperative learning opportunities support precise communication.

7 Look for and make use of structure.

- *Learning Targets* and *Success Criteria* at the start of each chapter and lesson help students understand what they are going to learn.
- *Explore and Grows* provide students the opportunity to see PATTERNS and STRUCTURE in mathematics.
- Real-life problems help students use the STRUCTURE of mathematics to break down and solve more difficult problems.

8 Look for and express regularity in repeated reasoning.

- Opportunities are provided to help students make generalizations through REPEATED REASONING.
- Students are continually encouraged to check for reasonableness in their solutions.

The colored words above are used throughout the program to indicate exercises that correlate to the Standards for Mathematical Practice.

Think and Grow: Modeling Real Life

You have 9 action figures. Newton has 1 more than you. Descartes has 1 fewer than you. Who has more, Newton or Descartes?

Equations: Newton Descartes

Who has more? Newton Descartes

Show and Grow *I can think deeper!*

12. You have 5 video games. Newton has 1 fewer than you. Descartes has 1 more than you. Who has fewer, Newton or Descartes?

Equations: Newton Descartes

Who has fewer? Newton Descartes

DIG DEEPER! Circle the problem with the greater sum or difference.

5. $4 - 1$ $4 + 1$

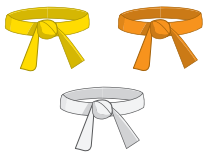
6. $7 + 1$ $8 - 1$

7. **YOU BE THE TEACHER** Circle to show who is correct. Show how you know.

$6 - 1 = \underline{5}$

$6 - 1 = \underline{7}$

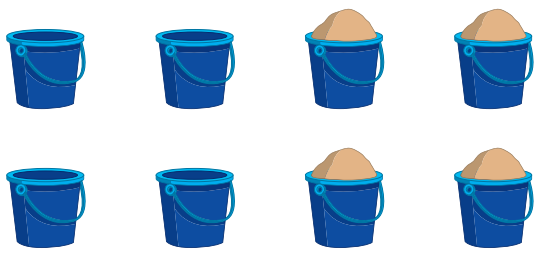
8. **Modeling Real Life** You have 3 karate belts. Newton has 1 fewer than you. Descartes has 1 more than you. Who has fewer, Newton or Descartes?

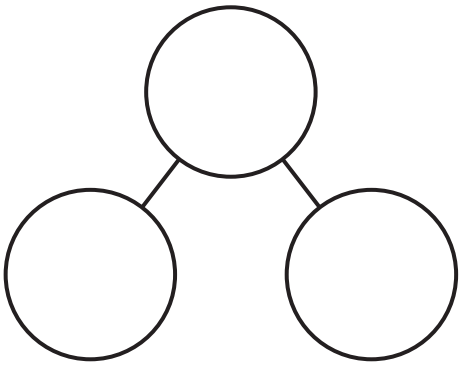


Who has fewer? Newton Descartes

Review & Refresh

9. Use the picture to complete the number bond.





Think and Grow: Modeling Real Life

You and your friend have the same number of video games. There are 16 in all. How many video games do you have?

Draw a picture:

Addition equation:

_____ video games

Show and Grow *I can think deeper!*

12. 2 friends give you the same number of pictures. You have 12 in all. How many pictures does each friend give you?

Draw a picture:

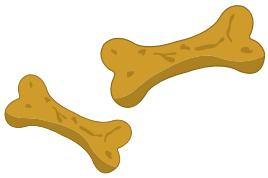
Addition equation:

_____ pictures

5. MP **Reasoning** You and your friend each do 7 jumping jacks. How many jumping jacks do you and your friend do in all?

____ jumping jacks

6. **Modeling Real Life** Newton and Descartes each have the same number of treats. They have 18 treats in all. How many treats does Newton have?



____ treats

Review & Refresh

Use the picture to write an equation.

7.

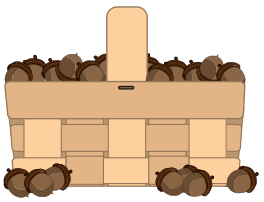
____ + ____ = ____

8.

____ + ____ = ____

Think and Grow: Modeling Real Life

Newton collects 61 acorns. Descartes collects 75 acorns. Who collects more acorns?



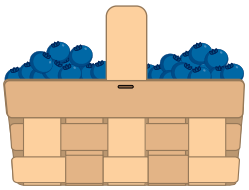
Models: Newton Descartes

Compare: _____ is greater than _____.

Who collects more acorns? Newton Descartes

Show and Grow *I can think deeper!*

7. You pick 57 blueberries. Your friend picks 53 blueberries. Who picks more blueberries?



Models: You Friend

Compare: _____ is greater than _____.

Who picks more blueberries? You Friend

4. 68 is greater than / is less than 86.

5. MP **Number Sense** Choose 2 numbers between 50 and 99. Write a sentence to compare the numbers.

_____ _____

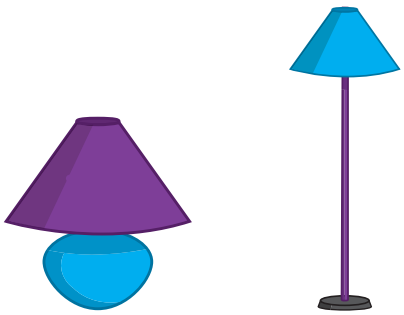
6. **Modeling Real Life** You collect 37 stamps. Your friend collects 27 stamps. Who collects more stamps?

Who collects more stamps? You Friend

Review & Refresh

Circle the taller object.

7.



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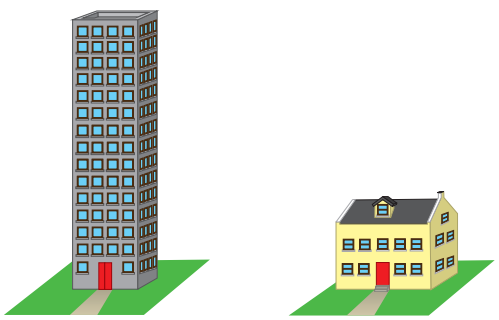
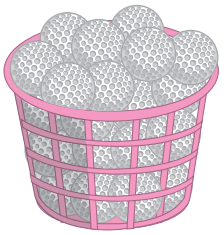


Think and Grow: Modeling Real Life

You have a bucket of 80 golf balls. You hit 60 of them. Your friend has 28 golf balls left. Who has more golf balls left?



Model:

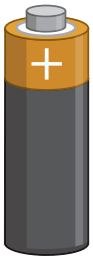
Subtraction equation:

Compare: _____ ◯ _____

Who has more golf balls left? You Friend

Show and Grow *I can think deeper!*

8. Pack A has 50 batteries. 40 of them have been used. Pack B has 15 batteries. Which pack has more batteries left?



Model:

Subtraction equation:

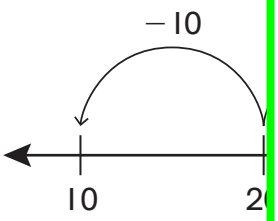
Compare: _____ ◯ _____

Which pack has more batteries left? Pack A Pack B

Indicator 2f - While the Think and Grow: Modeling Real Life examples are solved as a class, students have opportunities to make sense of problems and persevere in solving them when they independently solve the related problems that follow.

MP1 Make sense of problems and persevere in solving them. Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary.... Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

4. MP **Structure** W
number line.



5. Modeling Real Life You have 80 raffle tickets and give away 30 of them. Your friend has 47 raffle tickets. Who has more raffle tickets?

Who has more raffle tickets? You Friend

Review & Refresh

6. 13 − 8 = ?

Think 8 + _____ = 13.

So, 13 − 8 = _____.

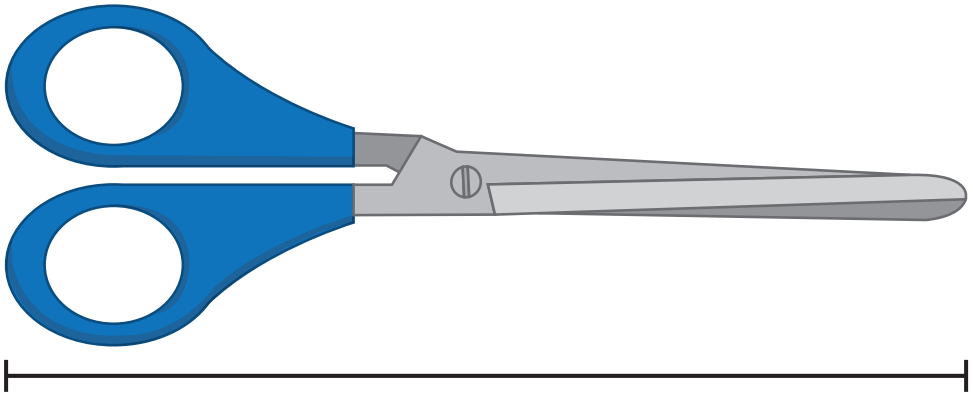
7. 15 − 7 = ?

Think 7 + _____ = 15.

So, 15 − 7 = _____.

Think and Grow: Modeling Real Life

Will the scissors fit inside a pencil case that is 7 color tiles long?



Circle: Yes No

Tell how you know:

Indicator 2f - While the Think and Grow: Modeling Real Life examples are solved as a class, students have opportunities to make sense of problems and persevere in solving them when they independently solve the related problems that follow.

Show and Grow *I can think deeper!*

6. Will the cell phone fit inside a case that is 5 color tiles long?

Circle: Yes No

Tell how you know:

4. MP **Reasoning** The green yarn is about 3 color tiles long. How long is the blue yarn?

about _____ color tiles

5. **Modeling Real Life** Will the gift card fit inside an envelope that is 8 color tiles long?

Circle: Yes No

Tell how you know:

Review & Refresh

6. Complete the fact family.

$7 + 3 =$ _____ _____ $- 3 = 7$

_____ $+$ _____ $=$ _____ _____ $- 7 =$ _____

Think and Grow

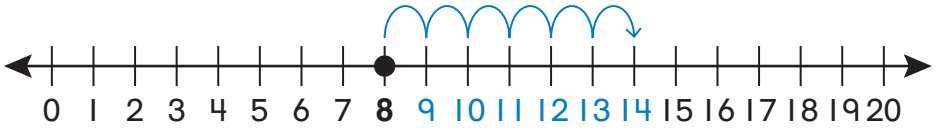
There are 8 girls and 6 boys in your class.
How many students are in your class?

Circle what you know.

Underline what you need to find.

Solve:

Start at 8.
Count on 6.



8 + 6 = 14

Indicator 2f - Students use problem solving strategies like, circling what they know and underlining what they need to find, to help make sense of problems. Then they use a model to persevere in solving the problem.

Show and Grow *I can do it!*

1. You have 6 notebooks. You buy 5 more.
How many notebooks do you have now?

Circle what you know.

Underline what you need to find.

Solve:

____ ○ ____ = ____ ____ notebooks

Name _____

Apply and Grow: Practice

2. There are 6 soccer balls, 10 basketballs, and 4 volleyballs. How many balls are there in all?

Circle what you know. Underline what you need to find.

Solve:

___ ○ ___ ○ ___ = ___

□

____ balls

3. You do 8 push-ups. Your friend does 1 fewer than you. How many push-ups do you and your friend do in all?

____ push-ups

4. **YOU BE THE TEACHER** Newton has 9 magnets. Descartes has 8 more than Newton. Your friend uses a bar model to show how many magnets Descartes has. Is your friend correct? Show how you know.

Newton: | 9 |

Descartes: | 8 | 1 |

8 + 1 = 9

9 magnets

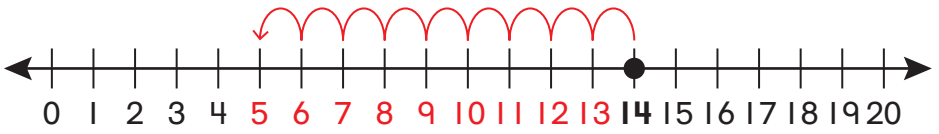
Think and Grow

There are 14 kids in a bounce house. Some of them get out. There are 5 kids left. How many kids got out of the bounce house?

Circle what you know.

Underline what you need to find.

Solve:



14 − 9 = 5

9 kids

Show and Grow *I can do it!*

1. You have some stuffed animals. You give 3 away. You have 8 left. How many stuffed animals did you have to start?

Circle what you know. Underline what you need to find.

Solve:

___ ◯ ___ = ___

___ stuffed animals

Name _____

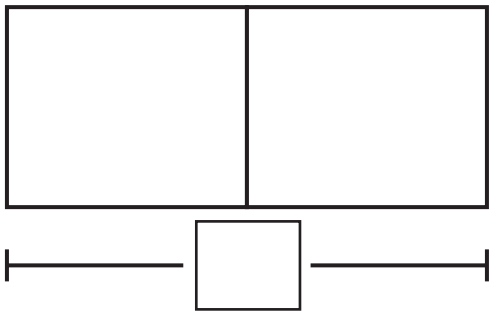
Indicator 2f - In #2, students use problem solving strategies to help make sense of the problems and persevere in solving them.

Apply and Grow: Practice

2. A group of students are at an arcade. 8 of them leave. There are 3 left. How many students were at the arcade to start?

Circle what you know. Underline what you need to find.

Solve:



___ ◯ ___ = ___

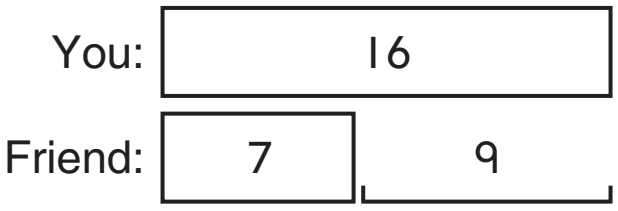
___ students

3. You have 15 trucks. Your friend has 7. How many more trucks do you have?

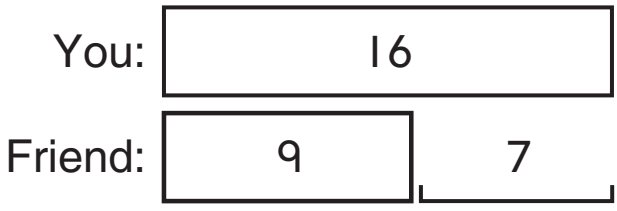
___ more trucks

---

4. DIG DEEPER! You have 16 stickers. Your friend has 7 fewer than you. Which bar model shows how many stickers your friend has?



16 − 9 = 7



16 − 7 = 9

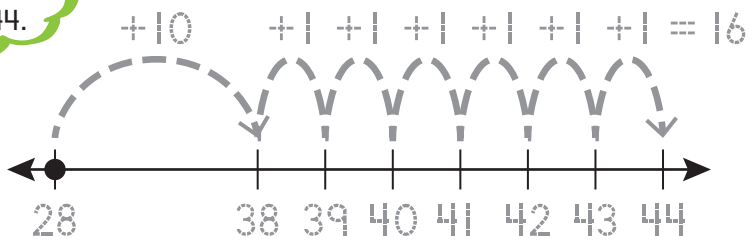
Think and Grow

You ride your bike for 28 minutes. Then you ride your scooter. You ride for 44 minutes in all. How long do you ride your scooter?

Circle what you know. Underline what you need to find.

Solve: $28 + ? = 44$

Start at 28. Count on by tens and ones until you reach 44.



Use an open number line.

16 minutes

Show and Grow *I can do it!*

1. You have 49 toy soldiers. You buy some more. Now you have 84. How many toy soldiers did you buy?

Circle what you know: Underline what you need to find.

Solve:

_____ toy soldiers

Name _____

Apply and Grow: Practice

2. You have 55 pounds of dog food and some cat food. You have 63 pounds of pet food in all. How many pounds of cat food do you have?

Circle what you know.

Underline what you need to find.

Solve:

_____ pounds

3. A teacher has 34 erasers. There are 46 fewer erasers than pencils. How many pencils are there?

_____ pencils

4. DIG DEEPER! You have 25 toys. Your friend has more than you. There are more than 60 toys in all. How many toys can your friend have?

29 33 24 38

5.3

Learning Target

Use the *get to 10* strategy when subtracting 9.

Success Criteria

- Use partner numbers to get to 10 when subtracting.
- Subtract the remaining partner number from 10.
- Explain how to use the *get to 10* strategy when subtracting 9.

Warm-Up

Practice opportunities for the following are available in the Resources by Chapter or at *BigIdeasMath.com.*

- Daily skills
- Vocabulary
- Prerequisite skills

ELL Support

When one number is subtracted from another, the answer is known as the difference. When an instruction says to "find the difference" it is asking for one number to be subtracted from the other. This phrase may be familiar from visual puzzles where two similar drawings are presented and the viewer is asked to find the differences in each picture.

Laurie's Notes

STATE STANDARDS
1.OA.A.1, 1.OA.B.3, 1.OA.C.6, 1.OA.D.8

Preparing to Teach

Today's lesson concentrates on subtracting 9. Today we learn a strategy that will be continued in tomorrow's lesson. The basis of the subtraction strategy is to break the subtraction into two steps. The first step is to subtract an amount to get to a difference of ten. The next is to subtract the remaining amount.

Materials

- Double Ten Frames*
- counters

**Found in the Instructional Resources*

Dig In (Circle Time)

Students will model the *get to 10* strategy by standing in a circle, and then sitting down in two stages: the first step is to have enough students sit so that 10 remain standing, and the second is to have more students sit down so that a total of 9 students have sat.

- "We are going to subtract 9 from different numbers today. We are going to do it in two steps. The first step will be to *get to 10*, meaning we subtract some so that 10 are left. The second step is to subtract however many more we need in order to subtract a total of 9."
- Have 15 students stand in the circle. "We want 9 students to sit down, but want to do it in two steps. How many students should sit down so there are only 10 students standing?" Pause. "There are 10 students standing. 5 sat down, and I want to have 9 sit down. How many more students should sit down?" Pause.

? **MP1 Make Sense of Problems:** "How did we know to have 5 students and then 4 students sit down?"

Double Ten Frames. "We want to get to ten, so subtract 2 first (remove 2 counters). We need to subtract 9, not 2. How many more need to be subtracted? We can think, what plus 2 equals 9?" Take 7 counters off the ten frames. "How many are left?"

◉ Write $12 - 9$ on chart paper. "We wanted to *get to 10*, so we subtracted 2 from 12 to *get to 10.*" Show the branches from 9 with 2 on one branch. "We need to subtract 9, not 2. We thought what plus 2 equals 9?" Show the other branch with a 7. "We then subtracted $10 - 7$." Repeat process with $17 - 9$.

$12 - 9$
$2 + 7 = 9$
$12 - 2 = 10$
$10 - 7 = 3$

◉ "How can we think of a partner number that will let us *get to 10*? How can we think of the other number to be subtracted?"

? Teaching Prompt ◉ Learning Target

Laurie's Notes

ELL Support

Check for understanding of Lesson 5.5. Read each story aloud as students follow along. You may want to discuss the cultural phenomenon of the lemonade stand as a way for children to raise money. Allow time to complete each exercise. Have students write out equations on whiteboards or pieces of paper and hold them up for your review. Then have them indicate with a thumbs up signal for *yes* or thumbs down signal for *no* the answer to the following questions.

1. Do you and your friend have the same number of lemons?
2. Do you and your friend have the same number of grapes?

Think and Grow: Modeling Real Life

These applications create contexts where it is necessary to create expressions and evaluate if they are equivalent. Many students will need help translating the words into an expression.

- **MP1 Make Sense of Problems:** Discuss the word problem line by line to develop the equation. Talk with students about the two expressions individually, discussing "your lemons" first. See if students can suggest the expression $12 - 4$. Next take "your friend's lemons" and see if students can suggest $3 + 4$.

Ask, "Have you answered the question?" This will help students realize that it is important to always remember what question is to be answered when working with word problems. Continue to finish the problem.

- In Exercise 10, watch for students who have difficulty writing the expressions from the words. You may need to clarify that the question asks if you and your friend have the same number of grapes left after eating some.
- As you observe students working on Exercise 10, make note of the strategies students are using. Also note where difficulties arise for students who are not proficient. Is it due to writing the equations? number sense? not having strategies to subtract? not understanding the equal sign? not understanding what makes an equation true or false? These will need different interventions.

◉ "Today we worked with equations and decided if they were true or false. What makes an equation true? What makes it false? How were you able to tell? Tell your partner."

❓ "What strategies did you use for adding? for subtracting?

◉ "How are you at telling the value of each side of an equation? Once you have the values, how are you at telling if an equation is true or false?"

Closure

- "We are going to do a back-to-back equation now. Work with a partner to decide if $17 - 8 = 10 + 3$. Partner A will solve $17 - 8$ and Partner B will solve $10 + 3$." Partners sit back-to-back to figure out their side of the equation. When both partners are ready, they turn back around to compare answers and decide if the equation is true or false. Reach a class consensus.

Laurie's Notes

ELL Support

Model the example. Then have students practice verbal language in groups using Exercise 1. Each group should discuss different ways to show a number and then draw and write the examples. Monitor discussion. Expect students at different language proficiency levels to perform as follows.

Beginner students may state and write the numbers.
Intermediate students may answer with simple sentences, such as, "There can be 4 tens and 6 ones."
Advanced students may answer with compound sentences, such as, "Four tens and six ones is forty six."

Think and Grow

Getting Started

- The key learning in this lesson is the exchange between 1 ten (rod) and 10 ones (cubes). Students need to see that they can trade ten ones for a ten, but also trade one ten for ten ones.

Teaching Notes

- Have students model 46 with base ten blocks if needed. Some students will benefit from the concrete materials instead of the quick sketch.

? **Model:** "Do you agree with the quick sketch of 46? Fill in the quick sketch. How many tens and ones do we have? Fill in the tens and ones."

- Discuss Newton's thought. Have students tell their partners what he means by 1 ten being the same as 10 ones and why we need to know that to find another way to show 46.

? "How many tens are in the new model? How many ones? Tell your partner what happened. Do these tens and ones still equal 46?"

- **MP1 Make Sense of Problems:** Have several students explain how they understand what happened between the two models. Then fill in the quick sketch and tens and ones.
- To introduce Exercise 1, have students share with a partner and then share out loud the number of tens and ones in 25. Have them make the quick sketch and fill in the table. If they are not making sense of the exchange, pull a small group together to review and then do the second part together.
- **Supporting Learners:** Have students model numbers with the base ten blocks. Have them line up a rod with ten cubes to make the exchange.
- **Extension:** Have students come up with other equivalent models for numbers by exchanging more than one ten rod.

Laurie's Notes

ELL Support

Check for understanding of Lesson 13.3. Read each question aloud as students follow along. Ask how many of each shape is used in Exercise 11 and have students answer by holding up the correct number of fingers for your review.

Think and Grow: Modeling Real Life

The exercises on this page may remind students of working with tangrams. The outline of a shape is given and they need to decide what shapes are used to cover the outline. There are not gaps or overlap of pieces when they finish. The shapes available to use for each design are shown. The number of each shape to use is not known. Observe what shapes students use to fit in the corners of the shape. Do they sense the size of the piece, or attend to the angle that is needed to fit in the outline of the shape?

? **Preview:** "What do you see in the picture? What shapes do you think were used to make the picture?" Students will be excited

? **MP1 Make Sense of Problems:** "What shapes are we going to use to make the fish in Newton's sign?" Give time for students to observe the shapes at the bottom. "In the first sign, you can only use three shapes. In the second sign you can only use four shapes. Do you know how many we need of each?" no "Are you already thinking about where some of the pieces will go?" yes

eces.

because it uses three of the

with four pieces is more

a trapezoid and hexagon, ask

gon.

pattern blocks they will need

r to make larger shapes and

ke a picture. Tell your partner

ning today."

g shapes to make a larger

ore shapes to make a picture

Show your partner when you

blem.

Indicator 2f - The Teaching Edition encourages teachers to ask students questions to help them make sense of the problem.

MP1 Make sense of problems and persevere in solving them.
Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary....
Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

Laurie's Overview

About the Math

Students have been working with addition and subtraction. This chapter develops the concept of zero as well as specific strategies for addition and subtraction. Students continue to add and subtract within real-world situations that they should be able to relate to their daily lives. Students are able to access multiple means by which to make sense of and employ various methods for solving problems when working within a story context. As students work within the story contexts, and with multiple strategies, they simultaneously begin to develop number sense, recognizing ways to think about number facts, and develop operational fluency. Students will be introduced to the mathematical vocabulary of *count back, count on, doubles, doubles plus 1, doubles minus 1*, and *number line* within the context of strategies for addition and subtraction.

We want students to continue to use fingers, acting out, pictures, drawings, and manipulatives to make meaning, even within lessons that teach a specific strategy or use a specific model. Most Dig In activities have students acting out a story or strategy before working with another model or paper and pencil. These strategies can all be used as students learn to construct explanations. In first grade, students can use pictures, manipulatives, models, equations, and words to explain.

In this chapter we continue to build mathematical notation including addition and subtraction equations written vertically and horizontally with the sum or difference written to the left of the equal sign ($7 = 5 + 2$). Notation can be confusing for a first grade student, especially as they are learning the meanings of mathematical symbols. Students may be trying to memorize a pattern for writing equations and thus develop misconceptions around the equal sign. Continue to reinforce the meanings of each symbol in an equation regardless of the structure of the equation.

Students continue to work with and think about the connections between addition and subtraction, picking up from Lesson 1.9. This relationship is subtly seen in the sequencing of lessons that use a strategy one day for addition, and a similar strategy the next day for subtraction. All lessons make use of thinking about parts and wholes, with addition using parts to name the whole, and subtraction beginning with the whole and finding a part.

Chapter 2 continues working with the same addition and subtraction problem types and using linking cubes, ten frames, and part-part-whole models, as in Chapter 1. Models are extended with the addition of a number line to help with students' ability to *count on* and *count back.* Number lines can cause confusion for students in first grade. Although they appear to be a concrete model for adults, they are a new representation of numbers for a first grader. Number lines work on a measurement model instead of physical objects that can be moved and counted. Students are supposed to understand the implication of quantity although to them it looks like one thing – a line! Students concentrate on the hash (or tic) marks or the numerals and do not understand the concept of the quantity it represents. If students' answers are always off by 1, they are struggling with this problem.

Laurie's Notes

ELL Support

Model the examples. Then have students practice verbal language using Exercises 1–4. Have one student ask the other, "What is each addend? What is your addition sentence?" Have them alternate roles.

Beginner students may state the number and write out the sentence.

Intermediate students may answer using a number and say their addition sentence.

Advanced students may answer using complete sentences. For example, "The addends are three. Three plus three is six."

Think and Grow

Getting Started

- Students will continue to build foundational knowledge of doubles.

Teaching Notes

- Introduce the vocabulary card **doubles** and ask students to help define it in their own words.
- **Model:** "How many linking cubes are in each tower? How does the equation relate to the linking cubes? Why would these represent a double?"
- **MP3 Construct Viable Arguments:** Discuss Newton's and Descartes's thoughts. "Are they thinking about the same thing? Why or why not?"
- Students continue to practice building *doubles* and writing the related equations.
- **MP2 Reason Abstractly and Quantitatively:** Take two towers of linking cubes and put them side-by-side. Count the cubes two at a time, one from each tower, to find the total. See if students can explain how this shows double reasoning. This reasoning about doubles is not necessary for students to master, but lays a foundation for future work. Do not expect all students to use this strategy. Additionally, students are not expected to memorize doubles facts at this time, although the facts are useful in addition and number sense.
- **Exercises 1 and 2:** Use these to observe students' reasoning. If students show confusion, bring those students together to model Exercises 3 and 4.
- **Supporting Learners:** Some students may not be able to count the cubes on the page, as this is more abstract than counting actual cubes. Provide the linking cubes to count. If students still have difficulty, have them fill in the two rows of a ten frame and count the counters.
- **Extension:** Ask students to compare writing addition equations horizontally and vertically.
- **Extension:** Have students make up a story that involves adding doubles. Tell them to be ready to share it with the class later.

Laurie's Notes

Apply and Grow: Practice

SCAFFOLDING INSTRUCTION

Meeting the needs of all learners.

In these practice problems, only one number line is provided at the top of the page. Students may trace with their fingers on the number line to count on for each problem, or you can prepare extra number lines to have available.

As students progress to being able to *count on* without a number line, they will need to say the numbers in sequence and keep track of how many numbers are being counted on. This is more difficult than drawing on the number line and counting hops. These exercises provide an opportunity to practice *counting on* without the number line.

EMERGING students may not have mastered hops on the number line. They may also mistakenly count the number on which they start as the first "hop." They can use manipulatives as needed.

- **Exercises 7 and 8:** The sum is shown on the left in these equations. Students may need to be reminded that the sum does not have to be on the right in an equation.
- **Exercise 9:** Students may write an equation of $7 + 11$ from the two numbers on the number line. Remind students of the meaning of the number of hops, and what number needs to be added to 7 for a sum of 11. They may not see the relationship of the two problems until they write each equation. Remind students about adding addends in any order.

PROFICIENT students are able to use the number line, but may not be able to add on with larger addends.

- **Exercises 7 and 8:** Remind students that the sum on the left does not change the addition process.
- **Exercise 9:** See if students can write both equations without help.

Additional Support

- Use additional manipulatives such as ten frames to model addition.

Extension: Adding Rigor

- "When counting on, which of the two equations is easiest to use? Why?"

Laurie's Notes

Apply and Grow: Practice

SCAFFOLDING INSTRUCTION

Meeting the needs of all learners.

Students continue to count by tens and then ones to determine and write the number.

EMERGING students may not recognize the difference between counting tens and ones. They may count every block as a ten or as a one. They may be able to count the tens and ones, but get confused when the tens are greater than 100. Writing the numbers greater than 100 can also be confusing since the hundreds place value has not been introduced.

- **Exercises 3 and 4:** These exercises could be used for small groups or individual re-teaching.
- **Exercises 5–7:** Watch as students count the ones following the 10 tens (hundred). See if they correctly write the numbers.
- **Exercise 8:** Students can look back to the Think and Grow when Newton says that 10 tens equal 100. Students can also build the model and then count.

PROFICIENT students can count by tens and then the additional ones. They may have a challenge writing the numbers beyond 100.

- **Exercises 3–7:** Watch to see that students correctly count and write.
- **Exercise 8:** Can students reason about the number without building or sketching it? Do they remember that 10 tens is equal to 100?

Additional Support

- Students should use the 120 Chart for reference. They can count on it by tens and ones (moving down the decade column and then across the next row), and see how to write numbers.

Extensions: Adding Rigor

- Have students describe models of numbers for a partner, and then say the number without using base ten blocks. This would follow the pattern of Exercise 8.
- What would be the model for 120? How would you continue to count and model beyond 120?

Laurie's Notes

ELL Support

Model the example. Point out that the digit in the tens place of the second number tells them how many hops they must make on the line. Since they are subtracting, they will hop to the left. Then have students practice verbal language in pairs using Exercises 1 and 2. Have one student ask another, "How many hops did you move? What is your difference?" Then have them alternate roles for other exercies.

Beginner students may answer only with numbers.

Intermediate students may answer using simple sentences, such as, "I moved three hops."

Advanced students may answer using complex sentences and a detailed description of their process.

Think and Grow

Getting Started

- We now move to subtracting on an open number line. Students will be given the starting point on the line, and will then draw hops to represent subtracting a ten. They fill in the values on the number line, and write the difference.

Teaching Notes

- **Model:** "Newton and Descartes are subtracting 90 − 40. Newton starts at 90 because it is the number from which we subtract. Notice that Newton draws a big hop on the number line to the left to show he subtracted 10. Draw Newton's first hop of 10, and write −10 above it. Now draw 3 more hops of ten and write −10 above each. How does Newton know to draw four hops?"
- **Model:** "Descartes knows that 40 is the same as 4 tens. To fill in the numbers on the number line, start at 90 and count back by tens. Fill in 80, 70, 60, and 50. So now we know that 90 − 40 = 50."
- Have students anticipate how they will complete Exercise 1. Have them tell their partners how many tens are in 50, and as a result, how many hops back they will show on the number line. Have students draw the hops and label −10 above each hop.
- Once the hops are drawn and labeled, have students count back by tens to fill in the numbers on the number line for each hop. Finally, they can fill in the difference.
- Watch as students complete Exercise 2. Identify areas of difficulty. It is not a concern if students are still having dexterity problems with drawing the hops. However, if students do not understand a hop as a representation of ten, or are not able to label the number line based on hops, this shows potential misconceptions and needs to be addressed. Students showing a lack of understanding or possible misconceptions should be grouped to work through Apply and Grow: Practice Exercise 3

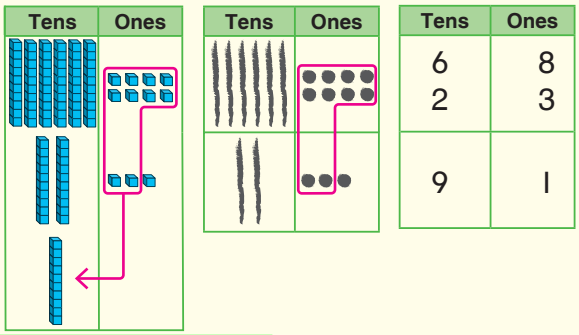
- **Supporting Learners:** Have students model the exercise with base ten blocks. They draw a large hop for each rod subtracted. They can count back by tens with each rod removed to label the number line.
- **Extension:** Give students a starting point and an ending point for the number line. Students determine how many hops are needed (missing change) to reach the difference, and then write the equation.

- **120 Chart or Hundred Chart:** We continue to use a hundred chart or 120 chart for addition, moving vertically to add tens and horizontally to add ones within an equation. The hundred chart can be thought of as a series of stacked number lines. Students will see that adding the ones and then the tens results in the same sum as adding the tens and then the ones. A new strategy that students can use is to show the movement within a hundred chart by arrows, ↓ for + 10, ↑ for − 10, → for +1 and ← for −1. This results in thinking very much like an open number line. The numbers below the arrows show the student count, but normally are not written.

$68 + 23 = 91$

68 ↓ ↓ → → →
(78)(88)(89)(90)(91)

- **Open Number Line:** Students continue to use an open number line to add any two numbers. This strategy will become many students' favorite strategy. In Lesson 9.6, it is used to find missing addends in applications.
- **Place Value Chart:** The place value chart becomes an explicit strategy in this chapter. Students progress from using it as a tool for modeling addends, grouping, and finding a sum with both base ten blocks and quick sketches, to writing the digits of the addends and sum into the same chart. In first grade, these two representations are used side-by-side. The explicit count of the tens and ones matches the digits in the addend, and after regrouping the digits of the sum. You will notice that the numeric place value chart looks like the vertical form of the standard algorithm for addition. We do not teach students how to "carry" a ten or perform the algorithm at this stage. We are still building the conceptual development of addition and place value. Students will record their sums in a vertical format as well, tying all three representations together. They will find their sums from working with the models, and not manipulating the numbers through the algorithm.



Chapter 9 continues to show that students' initial learning of strategies and models for addition are not for any particular group of numbers or situations. All the strategies and models can be used for any addition situation. One specific example is Lesson 9.6 where students solve multiple addition application stories using any strategy they choose. In this lesson, missing addend contexts come back for the first time in a little while. They should connect this to the *add to subtract strategy* that has been used recently. These strategies form the basis for mental math and estimation. The more comfortable they are with a strategy, the more sense they can make with mental strategies. Instead of seeing an algorithm in their heads for addition, they think add tens, gather ones, see it on a hundred chart, etc. Try some mental math problems with your students throughout the day.

Many of the lessons have students explaining their thinking or choice of a strategy as a success criteria. Places to have students tell their thinking to a partner or share out loud for discussion are embedded into lessons. Even so, the more often students "speak math" and explain their thinking, the more proficient mathematicians they become. Having students present their work, answer questions, and model ideas are essential in their mathematics journey. Be sure to find time to let your students be stars!

Laurie's Notes

Apply and Grow: Practice

SCAFFOLDING INSTRUCTION

Meeting the needs of all learners.

The first exercises continue having students identify the time as in Exercises 1–6. They progress to drawing in the hour hand. This may be difficult at first. Remind students that the hour hand is short, so they should not draw the hand all the way to the number. If students become used to drawing a long hour hand, they will be confused when the minute hand is added to the clock.

EMERGING students may have some difficulty determining the exact number the hour hand is pointing to because it does not go all the way to the number. Students can use their fingers to trace the hour hand to the number, or draw a light line to the number. The
corr
say

- **E**
  fr
  p
  th
  h

PRO
base
out

- **E**
  th
  le
- **E**
  th

Indicator 2f - The Teaching Edition indicates that students can continue to use tools as needed.

MP5 Use appropriate tools strategically. Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations.... Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

Additional Support

- Students can use a straight edge to see the number to which the hour hand is pointing.
- Let students work with student clocks and move the hands for clarity.

1.6

Check out the Dynamic Classroom.
BigIdeasMath.com

Laurie's Notes

STATE STANDARDS
1.OA.A.1, 1.OA.C.6, 1.OA.D.8

Learning Target

Solve *compare* word problems by finding how many more.

Success Criteria

- Use matching to find how many more.
- Use subtraction to find how many more.
- Explain that the difference answers the question of how many more.

Warm-Up

Practice opportunities for the following are available in the Resources by Chapter or at *BigIdeasMath.com*.

- Daily skills
- Vocabulary
- Prerequisite skills

ELL Support

Explain that when you count groups of objects you can use the word *more* to describe the relationship between those groups. For example, you say, "two more yellow apples than red apples."

Preparing to Teach

Lesson 1.6 presents a second context for subtraction: comparison. This meaning of subtraction has ramifications for future mathematics, such as understanding subtraction of integers by comparing numbers on a number line. The comparison model of subtraction is always why the answer is called the *difference*.

Materials

- linking cubes
- paper clips
- two-color counters

Dig In (Circle Time)

Review the expectations for circle time if needed.

- Have two students of different heights stand up in the center of the circle. Ask who is taller, and by how much. Discuss the difference in the height of the two students.

◉ Ask students to build a tower of 8 linking cubes and a second tower of 5 linking cubes. "Which tower has more? How many more?"

? "What strategies can you use to determine how many more are in the taller tower?" *Sample answers:* Put them side by side and count the difference, break off the same number from the taller tower as the smaller (in this example, 5), and count the remaining.

◉ "Today we will be comparing two groups of objects and

- Have two groups of students stand in the center of the circle (perhaps a group of 6 and a group of 4). "Which group has more? How do you know?" Have students suggest answers. "How can we be sure our answer is correct?" Have one student from each group pair up. The remaining students are the difference between the groups.

anyone has a different number of pets. Ask the students to tell who has more pets, and how many more. "How did you figure it out?"

◉ Repeat this process with paper clips. Put a pile of 7 paper clips on the carpet and another pile of 4 paper clips next to it. Have the paper clips unorganized. Ask which pile has more, and how many more. Model for students the importance of organizing the objects. It is hard to determine the difference if the paper clips are in piles. Spreading them out can show how to align them to find the difference. Pair the paper clips from the two piles side by side to show the extras.

? Teaching Prompt ◉ Learning Target

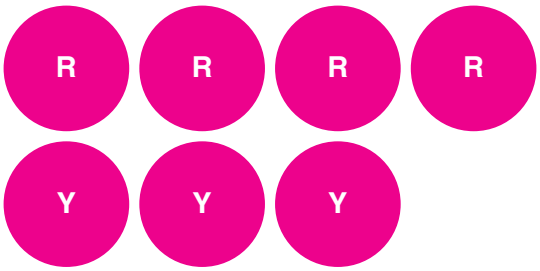
Name _____

Add in Any Order 2.6

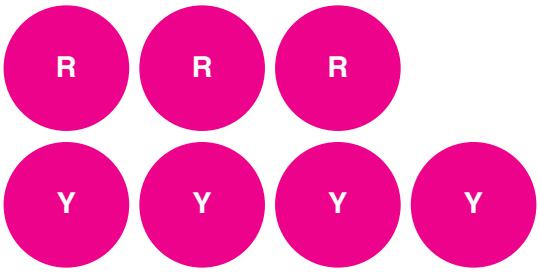
Learning Target: Add in any order to find a sum.

Explore and Grow

Use counters to model each problem. What do you notice?



$4 + 3 = \underline{7}$



$3 + 4 = \underline{7}$

The sums are the same.

Explore and Grow

- Students may use linking cubes in two colors, two-color counters, or rekenreks to model each equation.
- Have students draw or color counters in the space above each equation to record their modeling.
- Discuss with students why the sums for both equations are the same.

Name _____

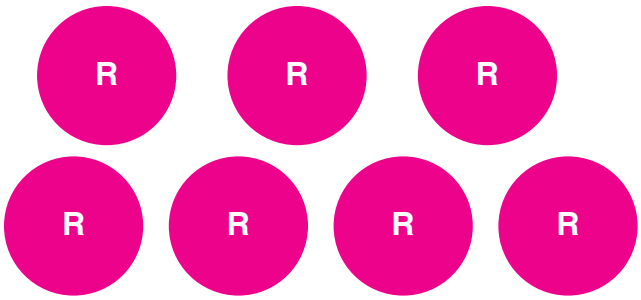
Solve *Take From* Problems with Start Unknown

3.3

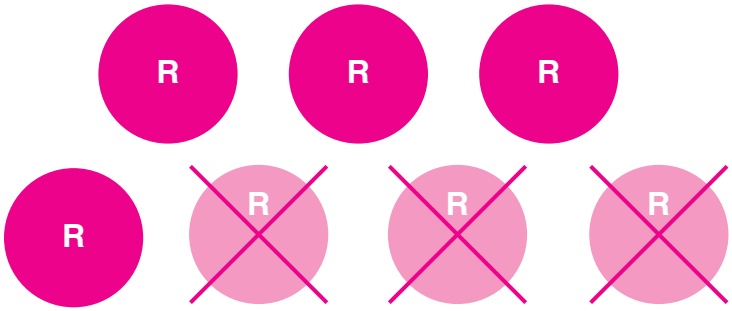
Learning Target: Solve a subtraction equation to find the whole.

Explore and Grow

Use counters to model each problem.



$3 + 4 = \underline{7}$



$\underline{7} - 3 = 4$

Indicator 2f - Teachers are encouraged to reinforce the parts and the whole of the addition and subtraction equations.

MP7 Look for and make use of structure. Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7 × 8 equals the well remembered 7 × 5 + 7 × 3, in preparation for learning about the distributive property.... They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects....

Explore and G

- Watch to see how
on their fingers? C
use any method to
- Ask students how
addition equation
- If a student says to add 3 and 4, ask why that works. Reinforce that the two numbers showing in the subtraction problem are both parts and we are looking for a whole.

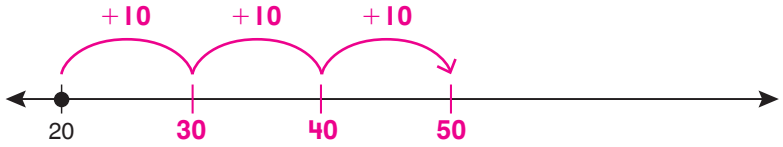
Name _____

8.7 Use Addition to Subtract Tens

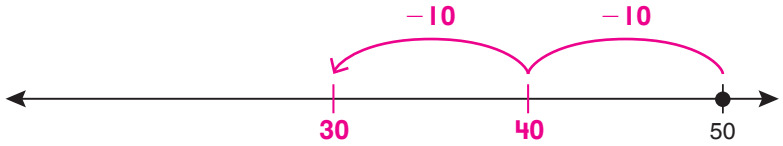
Learning Target: Use addition to subtract tens.

Explore and Grow

Complete each equation. What do you notice?



$20 + \underline{30} = 50$



$50 - 20 = \underline{30}$

Starting at 20 counting forward 3 hops of 10 will yield the same result as starting at 50 and counting backward 2 hops of 10.

Explore and Grow

- Have students solve the two equations using the open number lines. This should be review from previous lessons. Watch as students complete the exercise as a formative assessment. Which students need support in using the number lines?
- Discuss what students notice from the exercise. same answer, same number of hops, opposite directions
- Use student responses to show that you can use addition to subtract. Ask if students think using addition is easier than subtraction. That is why we use the strategy.
- Tell your partners how to use *think addition to subtract* strategy.

Name _____

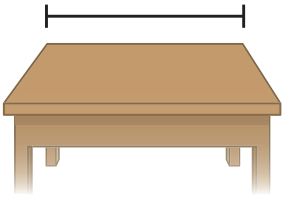
Measure More Lengths 10.4

Learning Target: Measure an object in different ways.

Explore and Grow

Find and measure the objects shown in your classroom two ways. What do you notice?

Check students' work.



Sample answer:
Fewer paper clips than color tiles are needed to measure an object.

Explore and Grow

- Students should use tiles and paper clips to measure the actual objects in your classroom, not the pictures.
- Notice if students consistently use the measurement tools correctly and are

- Tell your partners what you notice about the number of paper clips and the number of tiles it takes to measure the same object.

2.3

Check out the Dynamic Classroom.
BigIdeasMath.com

Laurie's Notes

Learning Target
Add and subtract 1.

Success Criteria
- Add 1 to a number.
- Subtract 1 from a number.
- Explain the patterns of adding and subtracting 1.

Warm-Up
Practice opportunities for the following are available in the Resources by Chapter or at *BigIdeasMath.com*.
- Daily skills
- Vocabulary
- Prerequisite skills

ELL Support
Explain that the word *kid* is another word for *child*. When there is more than one kid you use the word *kids*. However, when you have more than one child, you use the word *children*.

STATE STANDARDS
1.OA.A.1, 1.OA.C.5, 1.OA.C.6, 1.OA.D.8

Preparing to Teach
In our lesson today, students will add and subtract 1. This should be connected to counting. Adding 1 should be seen as the number that comes next and subtracting 1 should be seen as the number that comes before. Students have had experience with adding and subtracting 1 in kindergarten.

Materials
- Large Number Line*
- linking cubes

**Found in the Instructional Resources*

Dig In (Circle Time)
Use the Large Number Line to prepare a floor number line, numbered from 0 to 10.

- "To start our time together today, I want to play 'What's After, What's Before?' I will give you a number and you tell me what number comes after it when you count, and what number comes before it when you count." Do so with several different numbers within 10.

◉ **MP2 Reason Abstractly and Quantitatively:** "Today we are going to add and subtract 1 from a number. What does this have to do with counting?" Students had lessons on this in kindergarten so may have prior knowledge.

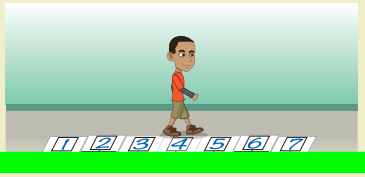
? "If 8 students are in the circle, and one more joins, how many will there be?" Have students suggest answers, then act it out.

- **MP2 Reason Abstractly and Quantitatively:** "How does adding 1 relate to counting?"
- "What if there are 8 in the circle and 1 student leaves?" Repeat with reasoning, followed by acting it out.

◉ Repeat the entire process with $7 - 1 = 6$.

? **MP2 Reason Abstractly and Quantitatively:** "How does subtracting 1 relate to counting?"

- Put out the floor number line. "If I take 4 steps, where will I be? What if I take 1 more? What if I take 1 less? How does this relate to counting?"



◉ **MP8 Look for and Express Regularity in Repeated Reasoning:** "Does anyone recognize a pattern when adding and subtracting 1? Will this always be true? Why?"

- "Tell your partner how to know how to add 1 to any number and how to subtract 1 from any number."

Laurie's Notes

ELL Support

Model the example. Then have students practice verbal language in groups using Exercises 1 and 2. Each group should answer the questions, "How many do you add to 10? What is the total? How does that relate to addition with 9?" Have them alternate roles for each exercise.

Beginner students may state the numbers they write.
Intermediate students may answer with sentences, such as, "Add two to ten. The total is twelve."
Advanced students may answer with sentences and explain the relationship between using 10 and 9 for addition.

Think and Grow

Getting Started

- Students will continue making a ten to add 9. Students should be able to see the pattern of taking one from the second addend to make the ten. Students will model with ten frames as well as numerically. Today's lesson is the foundation for tomorrow's lesson when students will make a ten when adding any two addends. Be sure that students understand the regrouping of the second addend to make the ten and the resulting equivalent equation.

Teaching Notes

- Model 9 + 4 with the two ten frames as during the Dig In. "Let's count on from 9 to find the sum. Now let's use our strategy to make a ten."
- "Why do we want to make the 4 into 1 + 3?" Have students move one of the four counters into the open space with nine. "What equation do we have now?"
- **MP2 Reason Abstractly and Quantitatively:** Ask students, "Do 9 + 4 and 10 + 3 have the same sum? If so, why?"
- "Let's look at Exercise 1. Does anyone want to make a prediction of what the new equation with 10 will be? Let's move the counter from 3 into the open square. What is our new equation? What is the sum?"
- **MP8 Look for and Express Regularity in Repeated Reasoning:** Watch as students work on Exercise 2. Their reasoning will continue to develop as they continue working. Students should develop the pattern of adding one to nine and subtracting one from the second addend.
- **Supporting Learners:** Students may not understand why the two equations (e.g., 9 + 3 and 10 + 2) would have the same sum. Ask students if they added or subtracted any counters when you were finding the sum. All that happened was one counter was moved from one location to another. The number of counters did not change. That is why the two equations have the same sum.
- **Extension:** Using two ten frames and 9 + 6 from Exercise 2, create several different equations.

6.4

Laurie's Notes

Check out the Dynamic Classroom.
BigIdeasMath.com

STATE STANDARDS
1.NBT.B.2a, 1.NBT.B.2c

Learning Target
Understand and write decade numbers.

Success Criteria
- Identify a group of ten.
- Explain what a decade number is.
- Write a decade number as groups of ten and 0 ones.

Warm-Up
Practice opportunities for the following are available in the Resources by Chapter or at *BigIdeasMath.com.*
- Daily skills
- Vocabulary
- Prerequisite skills

ELL Support
Explain that the prefix *dec-* means "ten" and words that include this group of letters are often related to the number 10. Point out that in everyday language *decade* refers to ten years.

Preparing to Teach
Today students will revisit the decade numbers and describe them in terms of the numbers of groups of ten. This lesson is to make explicit the connection between counting by tens, groups of tens, and place value.

Materials
- bag
- linking cubes
- 120 Chart*

**Found in the Instructional Resources*

Dig In (Circle Time)
Students will build decade numbers by grouping ten linking cubes, and then counting by tens. As students count by tens, pointing to the decade column on the 120 Chart will reinforce that each ten is a group of ten individual cubes. Prepare a bag of 50 or 60 individual linking cubes. Students will estimate how many are there, and then build towers of 10 cubes to count.

- "I have some linking cubes in my bag." Pour the cubes out in front of you. "How many do you think are there?"
- "We could count them one-by-one, but that's is a lot of counting. Let's use what we know to count by tens! Can I have 5 (or 6) volunteers to build ten towers?"
- Once towers are built, count by tens to determine how many cubes are there. Have another student point at the 120 Chart as tens are counted.

◉ "We have been doing a lot of work with tens. We have counted by tens and built teen numbers in terms of a ten and some extras. Today we are going to talk about tens again, this time looking at decade numbers."

- Have each student build a ten tower with linking cubes. Call on different numbers of students to stand with their towers."

? "How many groups of ten (towers) do we have? Are there any left over? How many linking cubes are there in all?" Have students whisper the total number of cubes to their partners before counting by tens together, and having a student point along the 120 Chart as the group counts.

? "What do we already know about these numbers? What are they called?"

◉ **MP8 Look for and Express Regularity in Repeated Reasoning:** "Tell your partner what connection you see between the decade number and the number of groups of ten."

◉ "Today we will discover how decade numbers are made by forming groups of tens."

? Teaching Prompt ◉ Learning Target

8.2

Check out the Dynamic Classroom.
BigIdeasMath.com

Learning Target

Use mental math to subtract 10.

Success Criteria

- Subtract 10 from a number and write the difference.
- Explain what changes when you subtract 10 from a number.

Warm-Up

Practice opportunities for the following are available in the Resources by Chapter or at *BigIdeasMath.com*.

- Daily skills
- Vocabulary
- Prerequisite skills

ELL Support

Point out the key words *less*, *subtract*, and *difference* all signal subtraction. Explain to students that scanning the page for these words helps them predict what will happen. The words *less* and *subtract* describe the process of subtraction, and the word *difference* describes the result.

Laurie's Notes

STATE STANDARDS
1.NBT.B.2a, 1.NBT.C.5

Preparing to Teach

Today will be just like yesterday's lesson, only with subtraction. We repeat the same thinking and modeling so that students realize that this is not really anything new. We want students to understand that adding 10 and subtracting 10 are not very different and follow the same pattern and thinking.

Indicator 2f - The Teaching Edition indicates that this lesson is similar to the previous lesson and that the repetition helps students understand the new concept.

MP8 Look for and express regularity in repeated reasoning - Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts....As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

of the number, then practice visualizing the problem to find the difference.

- To begin Circle Time, explain to students that today they will subtract 10 from a number. Have students tell the strategies they have developed for subtracting 10 from a number. Have them describe what happens to the digits of a number when they subtract 10. Listen for students to explain that the digit in the tens place of the addend goes down by 1.

? "Let's subtract 39 − 10. One of you model 39 − 10 with base ten blocks, and the other partner show 39 − 10 on the 120 Chart. Did you both get the same answer? How are the digits in the difference different from 39? What stayed the same?"

◉ "Now I want everyone to close their eyes. Imagine 39 in your mind. It can be on the chart, in base ten blocks or just the number. Now subtract 10 from it. What is the difference?" Have students share how they imagined subtracting 10 and finding the difference.

- "When you think of subtracting 10 from a number, you might picture it on the hundred chart and seeing in your mind the number just above. You might think of the base ten blocks, and taking one of the ten rods from the number. Or, you might think of taking the ten digit and subtracting one from it, which is the same as subtracting 10."
- Repeat the process with 46 − 10. Have partners change who uses blocks and the chart. Then have them close their eyes and do the problem mentally.
- Have students share their strategies for subtracting 10 in their minds. They should describe what they imagine or see mentally.

◉ "Today we will be subtracting 10 from a number in our minds. Let's try one more without any modeling. What is 88 − 10?"

? Teaching Prompt ◉ Learning Target

12.1

Check out the Dynamic Classroom.
BigIdeasMath.com

Laurie's Notes

STATE STANDARDS
1.MD.B.3

Learning Target
Use the hour hand to tell time to the hour.

Success Criteria
- Tell what number the hour hand is pointing to.
- Explain how to tell time to the hour.
- Draw to show the time to an hour.
- Tell what one hour earlier or later is.

Warm-Up
Practice opportunities for the following are available in the Resources by Chapter or at *BigIdeasMath.com*.
- Daily skills
- Vocabulary
- Prerequisite skills

ELL Support
Most students will be familiar with the word *hand* from talking about parts of the body, so they may find talking about telling time with an analog clock somewhat confusing at first. Explain that when they look at an analog clock, there are two arrows known as hands, an hour hand and a minute hand. Draw a clock and point out the short hour hand and longer minute hand.

Preparing to Teach
Students have heard about time and the language of time. Most students do not understand time or know how to tell time on an analog clock. In this lesson, students are introduced to telling time to the hour. They learn about the hour hand and telling time as o'clock.

Materials
- student clocks
- demonstration clock

Dig In (Circle Time)
Students have a lot of vocabulary to learn and practice during the Dig In. They will compare an analog clock with two hands to practicing with a one-handed clock. They will describe what they see on the clock. Students experience "o'clock" and the meaning of the hour hand.

- Distribute student clocks.
- "We talk about time a lot. Tell me some things you know about time and clocks. What words do you hear that mean time?"
- "When we talk about time we often say things like, dinner will be ready at six o'clock. When we say o'clock that means 6 is the hour. Today we are going to only talk about hours and we will use the phrase o'clock to mean the time to the hour."
- "Let's look at our clocks. What do you notice?" Students point out the numbers and two hands. Tell students the name of the hands, but let them know that today we are only going to work with the hour hand. Have them point the minute hand to the 12 and leave it there.
- ◉ "We start school at about 9 o'clock. To show 9 o'clock, the hour hand points to the 9. Show 9 o'clock on your clocks."
- ◉ "Every time the hour hand points to a number, that is the time in o'clock. I will show you time on my clock, and you tell your
- ? Practice several different times with you showing the time on the demonstration clock and students telling you what time it is. Ask, "To what number is the hour hand pointing? What time is it?"
- ◉ "This time I will tell you a time, and you show me the time on your clocks." Give several times for students to model.
- ◉ "Today we will learn how to tell time to the hour. Tell your partner one thing you already know."

? Teaching Prompt ◉ Learning Target

Laurie's Notes

ELL Support

Discuss the examples. Then have students work in pairs as they practice language while completing Exercises 1–4. Have one student ask the other, "How many straight sides are there? How many vertices?" Then have them alternate roles for the other exercises.

Beginner students may answer with numbers.
Intermediate students may answer with simple sentences, such as, "There are three."
Advanced students may answer with compound sentences, such as, "There are three straight sides and three vertices."

Think and Grow

Getting Started

- Introduce the vocabulary cards **trapezoid** and **rhombus**. Remind students of the vocabulary cards *edge, side vertex*, and *two-dimensional shape*.
- If you have been building an anchor chart, add the two new shapes.

Teaching Notes

? "Look at our six shapes. What do they all have in common? What are some differences?"

? **Model:** Hold up a triangle from Dig In. "Let's look at the triangle. How many sides does it have? Trace them with your finger. Fill in the number of sides. How many vertices does it have? Touch each one with your finger. Fill in the number of vertices."

- Repeat this process with the rectangle, square, and hexagon.

? **Model:** Hold up a trapezoid. "Let's look at the trapezoid. This is a new shape for us. How many sides does it have? Trace them with your finger. What do you notice about the sides of a trapezoid? Fill in the number of sides. How many vertices does it have? Touch each one with your finger. Fill in the number of vertices."

? **Model:** "Let's look at the rhombus. This is our other new shape. How many sides does it have? Trace them with your finger. Fill in the number of sides. How many vertices does it have? Touch each one with your finger. Fill in the number of vertices. A rhombus has sides that are the same length, just like a square. But a rhombus doesn't have to have L-shaped vertices."

- **MP6 Attend to Precision:** "Our vocabulary word is *side*, not straight side. Remember that all sides are straight. This helps us as we are learning that sides are straight line segments and not curves."
- Notice the right triangle in Exercise 3. This may be the first time students see this type of triangle. Discuss the L-shaped vertex in the triangle to show it can be in other shapes besides rectangles and squares.
- Students will trace each shape and fill in the number of sides and vertices. Have students trace the sides and point to the

? **MP8 Look for and Express Regularity in Repeated Reasoning:** "What do you notice about the number of sides and vertices for each shape?"

Supporting Learners: Students have the shapes from the Dig In. They can rotate the physical shapes to match the orientation on the page, especially the trapezoid in Exercise 2.

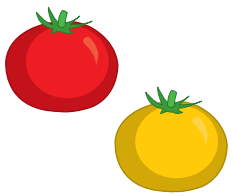
- **Extension:** Find other shapes around the room to fit the categories.

5. MP **Number Sense** Use the numbers shown to write two addition equations.

8 10 2

___ + ___ = ___ ___ + ___ = ___

6. **Modeling Real Life** You have 7 tomatoes. 2 are red. The rest are yellow. How many yellow tomatoes do you have?



Which equations describe your tomatoes?

$2 + 5 = 7$ $5 + 2 = 7$

$7 + 2 = 9$ $2 + 7 = 9$

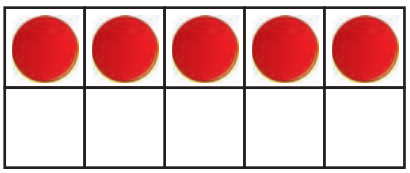
Show how you know:

You have ____ yellow tomatoes.

Review & Refresh

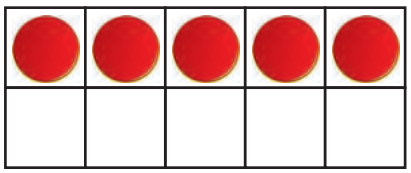
Use the ten frame to complete the equation.

7.



$5 + \_\_\_\_ = 8$

8.



$5 + \_\_\_\_ = 10$

4. DIG DEEPER! Circle two ways you can solve 8 + 9. Show how you know.

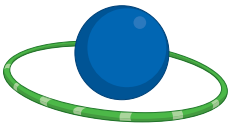
8 + 8 and 1 more

8 + 8 and 1 less

9 + 9 and 1 more

9 + 9 and 1 less

5. **Modeling Real Life** There are 6 balls. There is 1 more toy hoop than balls. How many toys are there?



Which doubles can you use to find the sum?

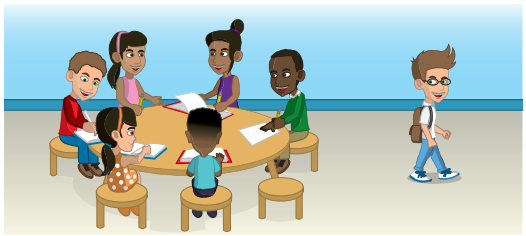
7 + 7 8 + 8 6 + 6

____ toys

Review & Refresh

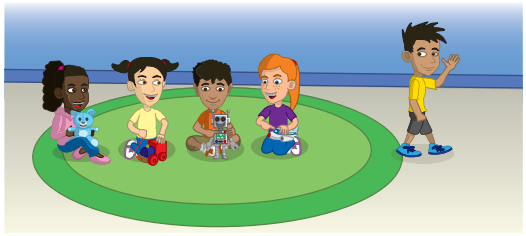
Use the picture to write an equation.

6.



____ − ____ = ____

7.



____ − ____ = ____

5. Write the missing numbers from the chart. Then count on by tens to write the next three numbers.

1	2	3	4	5		7	8	9	10
11	12	13	14	15		17	18	19	20

_____, _____, _____, _____, _____

6. **DIG DEEPER!** You count to 50. You only count 5 numbers. Did you count by ones or by tens? Show how you know.

7. **Modeling Real Life** You have 30 points. On your next turn, 4 balls stick to the wall. How many points do you have now?

_____ points

Review & Refresh

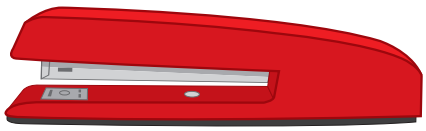
8. 3 + 1 = _____

9. 5 − 1 = _____

Name _____

Apply and Grow: Practice

3. Draw a line through the shorter object.



Indicator 2g.i - In #5, students must use what they have learned to explain which object is longer.

MP3 Construct viable arguments and critique the reasoning of others. Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and -- if there is a flaw in an argument -- explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades.... Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

5. DIG DEEPER! Which object is longer? Explain.

2. Writing How do you know which category has the least when looking at a picture graph?

_____

_____

_____

_____

3. Modeling Real Life Use the picture graph.

Favorite Drink at Lunch									
Milk	☺	☺	☺						
Water	☺	☺	☺	☺					
Juice	☺	☺	☺	☺					

Each ☺ = 1 student.

Is the number of students who chose water greater than, less than, or equal to the number of students who chose juice?

greater than less than equal to

Review & Refresh

4. 31 + 40 = _____

5. 62 + 20 = _____

Laurie's Notes

ELL Support

Check that students know the names of the items on this page and the next. Model the example. Then have students practice verbal language. Have Intermediate and Advanced students alternate reading each story aloud in pairs. Beginners will focus only on questions and answers. Have one student ask the ot
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Advanced students may answer using complete sentences, such as, "There are two butterflies inside the jar."

Think and Grow

Getting Started

- Students draw pictures to show partner numbers for a given sum. They also write addition equations with the sum on the left.
- Discuss with students why it was possible to have different partner numbers that equaled 8 and 5 in the circle time. There were different equations we can write with 8 as the sum!

Teaching Notes

- Have students describe the picture of the butterflies. "How many are there in all? In the jar? Outside the jar?"

? "Look at the equation under the jar. What do you notice is different?" The equation is in a different order from what we have been writing.

- **Common Misconception:** Many students think that an equal

Indicator 2g.ii - The Teaching Edition encourages teachers to have students explain and analyze strategies.

MP3 Construct viable arguments and critique the reasoning of others. Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and -- if there is a flaw in an argument -- explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades.... Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

whole (sum) and not a part (addend).

◉ **MP3 Construct Viable Arguments and Critique the Reasoning of Others:** Have students explain their strategies for finding partner numbers and have others respond if they agree with the strategy.

? **MP2 Reason Abstractly and Quantitatively:** "How can we have all drawn 7 cherries but have different numbers of cherries in the tree and on the ground?"

- **Extension:** Challenge students to see if they can find all possible partner numbers for 7. How will they know if they have them all?

Laurie's Notes

ELL Support

Check that students know the phrase *at the gym*. Model the example. Then have students practice verbal language using Exercises 1 and 2. Have one student ask the other, "How many children are at the gym? How many leave/arrive? What is your sentence?" Then have them alternate roles for the other exercises.

Beginner students may state the number and write out the sentence.

Intermediate students may answer using a phrase, such as, "seven children," and say their sentence.

Advanced students may answer using complete sentences and say their sentence. For example, "There are seven children at the gym. One leaves."

Think and Grow

Getting Started

- Students will now apply their reasoning about one more and one less and the related equations. Introduce the vocabulary cards **count on** and **count back**.

Teaching Notes

- **Model:** "How many students are playing on the merry-go-round? Do you see the student running toward them? This student is joining the kids playing. How many will there be when the student joins them?"
- **MP3 Construct Viable Arguments:** Discuss Newton's thought about adding 1. "Is he correct or not? How do you know?"
- **Model:** "Look at the next picture. The student leaving the merry-go-round was there before he decided to leave. "How many children were playing at first? How many are leaving? How many are still playing?"
- **MP3 Construct Viable Arguments:** Discuss Descartes' thought about subtracting 1 and ask students if they agree with him
- **Exercises 1 and 2:** Use these to observe students' reasoning. Students may need help reasoning about the initial number of students exercising before one student leaves in Exercise 1.
- **Supporting Learners:** If students are having difficulty adding or subtracting one, check to see if they are able to count in sequence and have one-to-one correspondence. If so, use the number line to add one more, or subtract one. Linking cubes may also help connect counting, the number line, and adding or subtracting one.
- **Extension:** Ask students to write a "One More and One Less Rule."
- **Extension:** "What would happen if 8 students were playing together, one joined them and then another one left. How many students would be left playing?" Model on a number line or with linking cubes.

Laurie's Notes

ELL Support

Model the examples. Then have students practice verbal language using Exercises 1–4. Have one student ask the other, "What is each addend? What is your addition sentence?" Have them alternate roles.

Beginner students may state the number and write out the sentence.

Intermediate students may answer using a number and say their addition sentence.

Advanced students may answer using complete sentences. For example, "The addends are three. Three plus three is six."

Think and Grow

Getting Started

- Students will continue to build foundational knowledge of doubles.

Teaching Notes

- Introduce the vocabulary card **doubles** and ask students to help define it in their own words.
- **Model:** "How many linking cubes are in each tower? How does the equation relate to the linking cubes? Why would these represent a double?
- **MP3 Construct Viable Arguments:** Discuss Newton's and Descartes's thoughts. "Are they thinking about the same thing? Why or why not?"
- [illegible] related equations.
- **MP2 Reason Abstractly and Quantitatively:** Take two towers of linking cubes and put them side-by-side. Count the cubes two at a time, one from each tower, to find the total. See if students can explain how this shows double reasoning. This reasoning about doubles is not necessary for students to master, but lays a foundation for future work. Do not expect all students to use this strategy. Additionally, students are not expected to memorize doubles facts at this time, although the facts are useful in addition and number sense.
- **Exercises 1 and 2:** Use these to observe students' reasoning. If students show confusion, bring those students together to model Exercises 3 and 4.
- **Supporting Learners:** Some students may not be able to count the cubes on the page, as this is more abstract than counting actual cubes. Provide the linking cubes to count. If students still have difficulty, have them fill in the two rows of a ten frame and count the counters.
- **Extension:** Ask students to compare writing addition equations horizontally and vertically.
- **Extension:** Have students make up a story that involves adding doubles. Tell them to be ready to share it with the class later.

Laurie's Notes

ELL Support

Model the example. Then have students practice verbal language using Exercises 1 and 2. Have one student ask the other, "What number is missing? What is your subtraction sentence?" Then have them alternate roles for the other exercises.

Beginner students may state the numbers. **Intermediate** students may answer using sentences, such as, "Three is missing. Four minus three is one." **Advanced** students may answer demonstrating different sentence options, such as, "Four minus three equals one."

Think and Grow

Getting Started

- Students will continue to use the part-part-whole model to find the missing subtracted part (also called a subtrahend). As students work with the model, they may use several different methods to determine the missing part.

Teaching Notes

- **Model:** We want to know what number is subtracted from 4 to have a difference of 1. Descartes says to draw more dots to
- **MP3 Construct Viable Arguments:** Why will this work? What is Descartes thinking? Descartes is using addition to solve subtraction.

you could have students check their answers by counting back as they touch the dots they drew to see if the difference is correct. (Count 3, 2, 1 as you touch the 3 dots in the first part of the model.)

- **Common Misconception:** Students may start connecting that they can use subtraction of the whole (also called a minuend) minus the difference to find the missing part. Be careful they do not connect this reasoning with the commutative property of addition. Reasoning about $4 - 1 = \_\_\_$ when trying to determine $4 - \_\_\_ = 1$ is not the same as thinking $4 - 1$ is the same as $1 - 4$.
- Observe students as they work on Exercises 1 and 2. If there are misconceptions shown, be sure to work with a small group again as they try Exercises 3 and 4.
- **Supporting Learners:** Some students may need to continue using the part-part-whole model with counters in order to determine the missing addend.
- **Extension:** Have students create story problems that could be solved by Exercises 1 and 2.
- **Extension:** Challenge students to solve problems without the model, by using number lines, counting back in their head, and keeping track of how many numbers they have counted, or using a method they know or create.

Laurie's Notes

ELL Support

Check for understanding of Lesson 5.2. Read each story aloud as students follow along. Allow time to complete each exercise, then ask the following questions. Have students write the answer on a whiteboard or piece of paper and hold it up for your review.

1. How many people got off the elevator?
2. How many people got off the subway car?

Think and Grow: Modeling Real Life

These application problems allow students to continue subtracting by thinking about adding. For each of the story problems, students will write the related subtraction equation. They can either write the equation first or model with the number line first. Whatever each student feels makes most sense first is how they should attack the problem.

- Discuss the story with students. Have several students retell the story. Have students discuss what operation is being used. Discuss the related equation.
- Have students explain how to use the number line to solve
- **MP3 Construct Viable Arguments:** Ask students to discuss if they think it is easier to model the problem on the number line first and then write the equation, or vice versa. Have them explain why they feel that way.
- You may need to explain what a subway car is in Exercise 3.
- "Today we *added to subtract*. Who can explain how the strategy works? Using thumb signals, how well can you find the difference to a subtraction problem by adding?"

Closure

- Give each pair of students one number line on which they will write. Pose a subtraction problem. Have partner 1 write the related addition equation and explain the relationship between addition and subtraction. Partner 2 then uses the number line to find the difference. Give a second subtraction equation and have the students switch roles.

Laurie's Notes

ELL Support

Check for understanding of Lesson 10.2. Read each story aloud as students follow along. Clarify unknown vocabulary if necessary. Ask the following questions and have them answer using a thumbs up or thumbs down signal for *yes* or *no*.

1. Is the green crayon longer than the yellow crayon?
2. Is it shorter than the yellow crayon?
3. Is the yellow ribbon longer than the blue ribbon?
4. Is it shorter than the blue ribbon?

Think and Grow: Modeling Real Life

These applications follow the same reasoning as yesterday's applications as students compare two different items to a third item. They draw to problem solve and determine if a given item is longer or shorter than another.

- Read and discuss the crayon example with students. Ask students to describe what they know and what they are trying to find out. You might ask students how crayons out of the same box could be different lengths.

? **Model:** "We are going to use the same strategy to solve these stories as we did yesterday. Let's start with the first sentence. Draw a line for the green crayon and a line for the blue crayon that is shorter than the green." Pause. "Now draw a line for the yellow crayon. The blue crayon is shorter than the yellow. So, will the yellow crayon be longer or shorter than the blue?" Pause. "Is the green crayon longer or shorter than the yellow?" Pause. "Circle shorter."

- Review the directions with students for Exercise 6. Have them tell their partners their strategy for solving the exercise before they begin. They should guess what the answer will be, and

MP3 Construct Viable Arguments: "Explain to your partners how you can tell if an object is longer or shorter than another just by using a piece of string. Tell what to do if both objects are longer or shorter than the string."

Closure

- **Guess and Check:** Choose pairs of items around the room that seem to be approximately the same length to compare using string.
  - Cut two pieces of string the same length.
  - Name two objects to compare.
  - Give a piece of string to two students to use to measure an object.
  - Have the class decide which of the objects is longer or shorter.
  - Repeat with various objects. Have some of the objects both be longer or shorter than the string length.

Laurie's Notes

ELL Support

Check for understanding of Lesson 11.1. Allow students time to familiarize themselves with each tally chart. Then ask the following questions and have students answer by holding up the appropriate number of fingers or a thumbs up/down signal to answer yes/no.

1. How many sunny days are there?
2. Is the number of cloudy days greater than the number of rainy days?
3. How many sunflowers are there?
4. Is the number of roses less than the number of daisies?

Think and Grow: Modeling Real Life

These application problems allow students to show their understanding of tally charts. They can determine the number in each category from the tallies and use the chart to answer questions.

? **Preview:** "What do you see on this page? What are the charts comparing?" If you keep track of the weather on a calendar during morning meeting, you could make your own class tally chart like the example.

- Remind students that they count tallies like they count with ten frames. "Let's count the number of sunny days. 5, 6, 7, 8. Fill in 8 days. Let's count the number of cloudy days. 1, 2, 3, 4. Now the rainy days. 1, 2, 3. Is the number of cloudy days greater or less than the number of rainy days? Tell your partner."
- Review the directions with students for Exercise 4. Have them tell their partners what they are trying to decide to be sure they

- **MP3 Construct Viable Arguments and Critique the Reasoning of Others:** Ask different students to share if the number of roses is greater than or less than the number of daisies. Have them explain how they know. Ask other students to agree or disagree, and how they know.

number of objects in a category with tally marks. The chart that you make is called a tally chart. Can you explain to your partner how a tally chart is helpful? How do you read tallies?" Students might say it is easier to use tallies than having to work with the objects or that tallies are easy to count.

Closure

- Show students a tally chart that you have made based on your own students, or use the one shown.
- Have students ask each other questions from the chart and call on another student to answer.

Pets	
Dogs	𝍸 𝍸 ||
Cats	𝍸 𝍸 ||||
None	𝍸

Laurie's Notes

ELL Support

Check for understanding of Lesson 12.1. Read each story aloud as students follow along. Ask the following questions and have students hold up the appropriate number of fingers to answer.

1. What time do you eat dinner?
2. What time does math class start?

Think and Grow: Modeling Real Life

The applications require students to not only recognize the time on a clock, but also reason about an hour before and an hour later. This should be related to adding or subtracting 1 to a number, for in fact it is adding or subtracting one hour.

- **Preview:** "Does anyone know what time they usually eat dinner? People eat at various times… some families eat early around 5:00. Some families eat late, around 7:00. Families in other countries eat dinner very late – around 10:00 at night!" Discuss the story with students.
- "If you eat dinner 1 hour later than your friend, we need to know what time your friend eats. Tell your partner what time your friend eats dinner."
- "If you eat 1 hour later, that is like adding one hour. Your friend eats at 5:00. Tell your partner what time an hour late is." Model drawing the hour hand for 6:00 and fill in 6 in the blank.
- Review the directions with students in Exercise 14. Ask if 1 hour earlier would add or subtract an hour from the time science class starts. You can say that math class begins 1 hour before
- **MP3 Construct Viable Arguments:** Explain why an hour later would add 1 hour and an hour earlier would subtract 1 hour.
- have only looked at telling time to the hour with the hour hand. Use your thumb signals to show how well you can tell time to the hour by looking at the hour hand."

Closure

- "Alternate with a partner telling one thing you know about telling time so far. Go back and forth until you run out of things to say."

Laurie's Notes

ELL Support

Check for understanding of Lesson 3.4. Read each story aloud as students follow along. Allow time to complete each exercise. Have students hold up the appropriate number of fingers as you ask the following.

1. How many flowers does your friend have?
2. How many flowers do you have?
3. How many shirts does your friend have?
4. How many shirts do you have?

Have students write each of their equations on a piece of paper and hold up for your review.

Think and Grow: Modeling Real Life

These problems are multi-step comparison problems. Instead of giving the *given group*, students will calculate how many are in this group. The rest of the problem follows the same process as

? Ask students how many are in the *given group*. "How do you know? Would it be okay to use either 1 or 2 for your friend's flowers? Why not?"

Common Misconception: Sometimes students will automatically fill in a model assuming problems remain in the same pattern. Students may want to use 1 for the *given group* and 2 for the number more because they are the first 2 numbers in the problem. They might even assume the 3 in the problem is their number of flowers.

◉ Have students complete the exercise. Pay attention to the addition equations to see if they are connecting the model.

- Watch as students complete Exercise 5. Are students adding to find the *given group*? Are they completing the problem correctly? If you see a consistent error, address it as you summarize and have students self-evaluate.

? "Today we worked with a new model in order to compare different groups. What was easy? What was tricky or confusing? Was anything difficult?"

◉ "Using your thumb signals, how are you at knowing how to fill in a bar model given a comparison? How are you at finding the larger group?"

Closure

- "I have 3 cats for pets. My friend has 2 more cats than I have. Can you draw a bar model to show my cats and my friend's cats? Can you tell me how many cats my friend has?"
- If drawing is too difficult, draw the bars as students describe what it should be. The closure is to see if they recognize the greater quantity (top and longer bar), lesser quantity, and the comparison value.

Name _____

Count to 120 by Tens

6.2

Learning Target: Count to 120 by tens.

Explore and Grow

Count to 10. Circle the number. Count 10 more. Circle the number. Continue until you reach 120.

1	2	3	4	5	6	7	8	9	(10)
11	12	13	14	15	16	17	18	19	(20)
21	22	23	24	25	26	27	28	29	(30)
31	32	33	34	35	36	37	38	39	(40)
41	42	43	44	45	46	47	48	49	(50)
51	52	53	54	55	56	57	58	59	(60)
61	62	63	64	65	66	67	68	69	(70)
71	72	73	74	75	76	77	78	79	(80)
81	82	83	84	85	86	87	88	89	(90)
91	92	93	94	95	96	97	98	99	(100)
101	102	103	104	105	106	107	108	109	(110)
111	112	113	114	115	116	117	118	119	(120)

Explore and Grow

- "We are going to count across the rows, and clap at the decade numbers."

? "What do you notice about the decade numbers at the end of each row? What happens with the digits?" First row goes from 1 to 2 digits; tens place increases by 1

tens." Listen for an understanding that you are not saying each number, and each number is ten more than the last number said.

Laurie's Notes

ELL Support

Check for understanding of Lesson 8.8. Read the example aloud as students follow along. You may want to discuss snowballs with students who are unfamiliar with snow. Ask them to share their experiences if they have them. Allow time to complete the exercise. Ask the following questions and have students display answers on a whiteboard or with a thumbs up or down signal to answer yes/no questions.

1. How many birds do you count?
2. Do you count more birds than your friend?
3. How many snowballs does your friend make?
4. Do you make more snowballs than your friend?

Think and Grow: Modeling Real Life

The application stories today involve two steps to solve. Students will also need to make a comparison of the two numbers in the story. These are similar to the applications in Lesson 8.4.

? **Preview:** "When you are outside, do you ever try to count anything? What do you count?"

- Discuss the story. Have students tell partners how to determine how many birds you counted in all. Write the equation. Students

? "If you count 48 birds and your friend counts 45 birds, who counted more? How do you know? Which is the correct symbol to use?" Finally, answer the question.

the snowball matters. Do not let them worry about the size of the snowball but how many snowballs get made.

- Students can talk to their partners to share which numbers they should add together, and how they are choosing to add.

◉ "Today we will use fist to five to describe how you are doing in adding tens to any two-digit number. If you are totally confused, show your fist. If you are excellent, show five. You can be anywhere in between as well. How are you at adding tens to a two-digit number using base ten blocks? using a quick sketch? using a 120 Chart? using an open number line? not using any model?"

Closure

- Have students find a partner who likes to use a different model than they like, and sit back-to-back. Each student should have a whiteboard.
- Give partners an addition expression to solve, such as $28 + 60$. Students use their favorite model or strategy to solve.
- When partners have had enough time to work, cue students to turn around and compare their answers. Are they the same? If not, can they find an error?

? "Suppose you are just adding the numbers and have no tools or models. How could you add $28 + 60$ just based on the digits? Share ideas with your partners."

11.3

Learning Target

Understand the data shown by a bar graph.

Success Criteria

- Read the data in a bar graph to answer questions.
- Compare the data in a bar graph.

Warm-Up

Practice opportunities for the following are available in the Resources by Chapter or at *BigIdeasMath.com.*

- Daily skills
- Vocabulary
- Prerequisite skills

ELL Support

Point out that in this lesson students will read and interpret bar graphs. They may know the word *interpret* as the use of one language to explain the meaning of another language. Explain that when you interpret a graph, you explain in words what the graph shows by using visuals. So instead of interpreting from one language to another, you are interpreting visuals by using language.

Check out the Dynamic Classroom.
BigIdeasMath.com

Laurie's Notes

STATE STANDARDS
1.MD.C.4

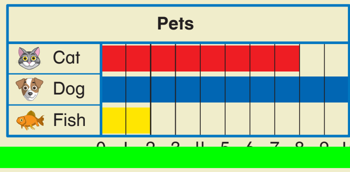
Preparing to Teach

Students have now experienced two representations for organizing data and answering questions from them. Today, we show another representation that is one of the most commonly used, and will be used throughout the rest of their mathematics career: bar graphs.

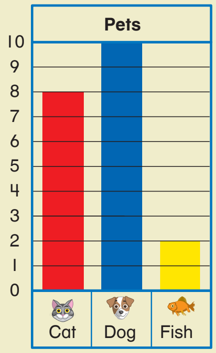
Dig In (Circle Time)

Students will create a bar graph based on yesterday's tally chart and picture graph.

- "We've learned about tally charts and picture graphs to show data. Share what you think is good or not as good about each."
- ◉ "Today, we are going to learn about and use another graph called a bar graph. It is almost like a combination of both: it tells the number in each category like a tally chart, and it shows comparisons and rows like a picture graph."
- ◉ Display the tally chart and picture graph from Lesson 11.2. "This is our tally chart and picture graph from yesterday. To make it a bar graph, you color in a row to make it look like a bar to show how many there are. Instead of having a key like the picture graph, you have the numbers on the bottom. Let's make a bar graph from our class data." Note: Keep this bar graph for Lesson 11.3.



- ? "As you look at the three representations, how are they alike? How are they different? What else do you notice?"
- "Which graph would you use to tell how many people like dogs? Which graph would you use to tell how many more people like cats than fish? Why?"
- ◉ Ask a few questions about the charts such as, "how many more people prefer ___ than ___?"
- ◉ "One more thing about a bar graph: bars can go across or horizontally, or up and down or vertically. Let me show you. Tell how the two bar graphs are alike and how they are different. It doesn't matter which one you look at, they work the same way."



- Ask students one more opinion question with three answer options and create a bar graph. Have students pose questions to the group to answer.
- ◉ "Today, we are going to use bar graphs to show how many are in a group and to answer questions."

? Teaching Prompt ◉ Learning Target

Laurie's Notes

ELL Support

Review the example. Then have students practice verbal language in groups using Exercises 1–4. Have groups discuss the following questions: "Where do we draw the lines? How does the shape look?" Monitor discussion and expect students to perform according to their proficiency level.

Beginner students may use single word answers or indicate by drawing.
Intermediate students

Think and Grow

Getting Started

- Students will divide the shapes with one line to form two specific shapes.
- Students will benefit from having shapes to manipulate and then sketch in how the shape is divided.

Teaching Notes

- There are four exercises, each with the same direction line. Students will show how to make the first shape in step 1, then use two of the shapes just made to make the final shape in step 2.
- **Teaching Tip:** Give students a straw to divide the shapes before drawing lines.

Model: "Look at the directions. We are going to draw one line to divide the rectangle into two rectangles. We can draw a line horizontally through the middle of the rectangle to form two

Model: "Descartes says that there are two more ways to divide the rectangle. Tell your partner if Descartes is correct. Do those lines also show two rectangles?"

Indicator 2g.ii - The Teaching Edition encourages teachers to ask probing questions to engage students in constructing and analyzing arguments.

MP3 Construct viable arguments and critique the reasoning of others. Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and -- if there is a flaw in an argument -- explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades.... Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.