BIL Counter Evidence to Ed Reports Alignment, Grade 2

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 Real Life Grade 2 partially meets expectations that the materials develop conceptual understanding of key mathematical concepts, especially where called for in specific standards or cluster headings. Cluster 2.NBT.A addresses understanding place value of ones, tens and hundreds. Students read, write, and count to 1,000. Students skip-count by 5s, 10s, and 100s. Student use base-ten numerals, number names, and expanded form when writing and reading numbers in addressing conceptual understanding. Students also compare two three-digit numbers. Cluster 2.NBT.B addresses understanding place value of ones, tens and hundreds and properties of operations to add and subtract. Topics 5-11 explore ways to demonstrate conceptual understanding of addition and subtraction using properties of operations as well as place value within 1000. 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 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 always include at least one conceptual problem. Also, every Homework & Practice set always contains at least one conceptual problem. For example: Apply and Grow: Practice • ***1.1 #13, page 5*** • 4.4 #13, page 173 • 8.1 #10-11, page 353 • 10.6 #19, page 493 • 14.1 #6, page 665 Practice • 1.2 #5, page 14 • ***4.3 #3, page 170*** • 8.3 #7, page 368 • 10.2 #4, page 472 • 14.3 #5, page 680

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 Real Life Grade 2 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 2.	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 • 5.5 #9, page 234 • 6.4 #16, page 284 • ***10.6 #21, page 494*** Practice • 2.9 #5, page 94 • 7.1 #5, page 318 • ***12.4 #4, page 602*** Performance tasks also give students opportunity to independently engage in non-routine applications. For example: • Chapter 2 #1a-b, page 95 • ***Chapter 9 #4a-b, page 453*** • Chapter 14 #2, page 723

Boldfaced italic type 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 Real Life Grade 2 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 pertaining to specific problems within the lesson and enrich the mathematical content of 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 instances where MPs are over or under-identified in the materials.	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 "What do you notice?" 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. In many cases where problems are labeled MP1, the directions tell students how to solve the problem.	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 • ***2.2 Example and #14-15, page 50*** / • 2.2 #8-9, page 52 • 5.5 Example and #8-9, page 234 / • 5.5 #8-9, page 236 • 11.8 Example and #5, page 568 / • ***11.8 #3, page 570*** Students are encouraged to use problem solving strategies to think through and solve problems. For example: Think and Grow and Show and Grow / Apply and Grow: Practice • ***2.9 Example and #1, page 90*** / • 2.9 #2-3, page 91 • 6.7 Example and #1, page 300 / • ***6.7 #2-3, page 301*** • 14.7 Example and #1-2, page 700 / • 14.7 #3-5, page 701 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: • ***1.3, page T-18*** • 4.1, page T-156 • 4.7, page T-192 • 5.3, page T-222 • 10.8, page T-506

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Indicator 2f -- MP4 is identified in the materials, however, models are given to students. In addition, throughout the materials in Laurie's Notes there is guidance labeled "Model" without explicit connections to MP4.	Modeling with mathematics is covered throughout our program. Every Think and Grow: Modeling Real Life example is directly followed by corresponding problems to engage in MP4. In addition, every Practice set contains opportunities for students to model with mathematics in the Modeling Real Life exercises. For example: Think and Grow: MRL and Show and Grow • ***2.9 Example and #5-6, page 92*** • 4.7 Example and #5-6, page 192 • 7.1 Example and #7-8, page 316 • 9.4 Example and #9-10, page 420 • 10.2 Example and #7-8, page 470 Practice • 2.9 #4-5, page 108 • ***4.7 #4-5, page 194*** • 7.1 #4-5, page 318 • 9.4 #6-7, page 422 • 10.2 #5-6, page 472 The Teaching Edition also encourages teachers to engage with students about how to solve problems. For example: • 3.7, page T-142 • 5.4, page T-228 • ***7.1, page T-316*** • 12.4, page T-597
Indicator 2f -- The instructional materials present few opportunities for student to engage with the full intent of MP5: Choose appropriate tools strategically. In addition, there are limited opportunities for students to engage in MP5 throughout the materials, so they cannot engage with the full intent of the practice. MP5 is identified a total of four times throughout the entire curriculum. At no point in any of these instances are students encouraged to choose their own tool, therefore the full meaning of the MP is not being attended to. MP5 is not found in Chapters 1, 3, 4, 5, 6, 7, 9, 12, 13, and 14.	Students have an opportunity to choose tools strategically. In addition to the specific MP5 labels, the Teaching Edition often encourages students to use familiar tools as needed. For example: • 1.3 Supporting Learners, page T-18 • ***Ch 2, Laurie's Overview, page T-39C*** • 2.1 Additional Support, page T-43 • 3.6 Supporting Learners, page T-134 • 6.2 Teaching Tip, page T-270 • 9.2 Additional Support, page T-407 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 -- In addition, there are limited opportunities for students to engage in MP8 throughout the materials, so they cannot engage with the full intent of the practice. MP8 is identified a total of five times throughout the entire curriculum. These identified instances do not use words "regularity", "repeated", or "reasoning" in places where MP8 is identified. In the Teacher Edition, page vi describes MP8, "students are continually encouraged to check for reasonableness in their solutions." MP8 is not found in Chapters 4, 6, 7, 8, 9, 11, 12, 13, and 14.	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: • 2.8 #23, page 85 • 3.4, page T-121 • ***5.5, page T-231*** • 9.4, page T-417
Indicator 2f -- The instructional materials present few opportunities for students to engage with the full intent of MP7: Look for and make use of structure. The following is an example where materials label "Logic" as a MP7. Question 7 is labeled "MP Logic." The problem states, "Find the missing digits. 32 + 2__ + 24 = 63 + __5." There is not an MP "Logic."	The "Logic" heading correlates with MP3 Construct viable arguments and critique the reasoning of others. See correlation mentioned in Indicator 2e BIL Counter Evidence.

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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 Real Life Grade 2 partially meets expectations that the instructional materials prompt students to construct viable arguments and analyze the arguments of others concerning key grade-level mathematics. Throughout the materials students are presented with “You be the Teacher” problems during Apply and Grow: Practice, where they analyze errors or different representations. The instructional materials present few opportunities for students to construct arguments. MP3 is not identified in the student materials. In most instances, students are asked to explain how they know, but they do not always need to construct a mathematical argument.	We suggest that when explaining or comparing answers, students must use what they have learned in building a logical progression of statements that defends their answer. The ability to critique someone else's reasoning also helps students analyze their own work and formulate good explanations. For example: • 2.1 #11, page 44 • 3.5 #7, page 132 • 6.6 Explore and Grow, page 293 • 8.1 #13, page 354 • 11.4 #7, page 543 • ***11.7 Explore and Grow, page 559*** • 14.6 Explore and Grow, page 693 • 15.8 Explore and Grow, page 773

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.	
Ed Reports Review	**BIL Counter Evidence**
Indicator 2g.ii --The instructional materials reviewed for Big Ideas Math: Modeling Real Life Grade 2 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 analyzing the arguments of others. There are instances where MP3 is identified and guidance is provided to teachers to engage students to explain, rather than construct an argument or analyze the argument of others.	The Teaching Edition contains many instances of probing questions the teacher can ask to engage students in constructing arguments and analyzing the arguments of others. We suggest that when explaining or comparing answers, students must use what they have learned in building a logical progression of statements that defends their answer. These are often indicated with either an MP3 inline head or a red "?" icon. For example: MP3 inline head • 4.3, page T-165, MP3 Construct Viable Arguments: How do students know this is 41? You want to hear an explanation of exchanging or replacing 10 units for 1 rod. The Teaching Edition includes prompts that the teacher can guide students like, "Is one rod and one unit the same as 11 units? How do you model this with your blocks?" By answering these questions, students can construct an argument to answer the original question. • 6.2, page T-269, MP3 Construct Viable Arguments: "How can you tell if you need to regroup?" Students may answer, "I look at how many ones I have in the first number. If the second number is less, I don't have to regroup." Students will demonstrate their argument of whether to regroup by describing it in words. They can also extend their argument by completing the Extension on the page which is to write an example on their whiteboard that does/does not require regrouping. Red "?" icon • 2.1, page T-42 • ***2.2, page T-47*** • 5.3, page T-219 • 10.4, page T-479 • 13.4, page T-631

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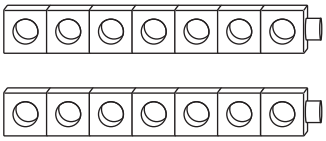
Name _____

Apply and Grow: Practice

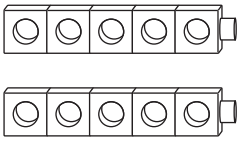
Color cubes to show the number. Circle *even* or *odd.*

5. 13



Even Odd

6. 10



Even Odd

Is the number *even* or *odd*?

7. 1

Even Odd

8. 4

Even Odd

9. 18

Even Odd

10. 17

Even Odd

11. 19

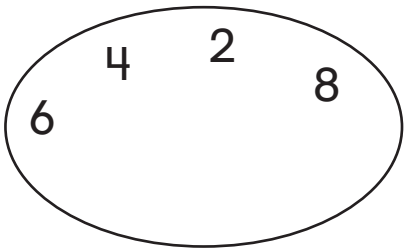
Even Odd

12. 20

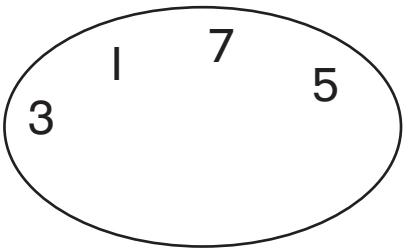
Indicator 2a - In #13, students describe and complete the diagram to demonstrate their conceptual understanding of even and odd numbers.

13. MP **Number Sense** Circle *even* or *odd* to describe each group. Then write each number in the correct group.

Even Odd



Even Odd



13	14	15
16	17	18

Name _____

Apply and Grow: Practice

7. 33 + 39 = ?

+

8. 23 + 71 = ?

+

9. 17 + 64 = ?

+

10. 54 + 25 = ?

+

11. 47 + 39 = ?

+

12. 28 + 26 = ?

+

13. **YOU BE THE TEACHER** Newton finds 26 + 36. Is he correct? Explain.

_____

_____

_____

Name _____

Apply and Grow: Practice

Count by ones.

4. 57, 58, 59, _____, _____, _____, _____, _____

5. _____, 106, _____, 108, _____, _____, _____

Count by fives.

6. 35, 40, 45, _____, _____, _____, _____, _____

7. _____, 80, _____, 90, _____, _____, _____

Count by tens.

8. 12, 22, 32, _____, _____, _____, _____, _____

9. _____, 50, _____, 70, _____, _____, _____

10. MP **Number Sense** Newton counts by ones from 47 to 53. Which numbers does he count?

49 55 40 52

11. MP **Number Sense** Descartes counts by fives from 90 to 115. Which numbers does he count?

120 105 110 92

Name _____

Apply and Grow: Practice

10.

$$\begin{array}{r} 345 \\ -\ 185 \\ \hline \end{array}$$

11.

$$\begin{array}{r} 627 \\ -\ 418 \\ \hline \end{array}$$

12.

$$\begin{array}{r} 916 \\ -\ 723 \\ \hline \end{array}$$

13.

$$\begin{array}{r} 829 \\ -\ 367 \\ \hline \end{array}$$

14.

$$\begin{array}{r} 541 \\ -\ 291 \\ \hline \end{array}$$

15.

$$\begin{array}{r} 351 \\ -\ 182 \\ \hline \end{array}$$

16.

$$\begin{array}{r} 465 \\ -\ 197 \\ \hline \end{array}$$

17.

$$\begin{array}{r} 643 \\ -\ 289 \\ \hline \end{array}$$

18.

$$\begin{array}{r} 673 \\ -\ 498 \\ \hline \end{array}$$

19. DIG DEEPER! Find the missing digits.

$$\begin{array}{r} 451 \\ -\ \square\ 07 \\ \hline 144 \end{array} \qquad \begin{array}{r} 957 \\ -\ 67\ \square \\ \hline 279 \end{array} \qquad \begin{array}{r} 6\ \square\ 2 \\ -\ 158 \\ \hline 484 \end{array}$$

Name _____

Apply and Grow: Practice

Count on to find the total value.

3.

_____, _____, _____ Total value: _____

4.

_____, _____, _____, _____, _____, _____

Total value: _____

5.

Total value: _____

6. **Reasoning** You have 27¢. Which groups of coins could you have?

5. MP **Reasoning** Fill in the blanks using *even* or *odd*.

The sum of two even numbers is _____.

The sum of two odd numbers is _____.

The sum of an even number and an odd number is _____.

6. You do 10 jumping jacks on Saturday and 10 on Sunday. Do you do an even or odd number of jumping jacks in all?

Even Odd

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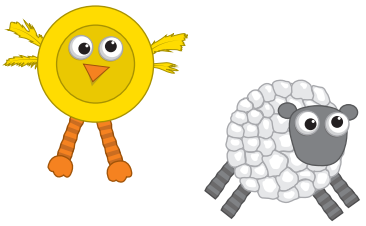
7. **Modeling Real Life** You and your friend each have an even number of googly eyes. Do you and your friend have an even or an odd number of googly eyes in all?



Which equation could match the story?

$3 + 6 = 9$ $4 + 6 = 10$ $5 + 7 = 12$

You have an _____ number of googly eyes in all.

---

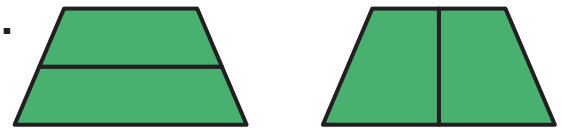
8. DIG DEEPER! You hop an even number of times. You and your friend hop an odd number of times in all. Does your friend hop an even or an odd number of times?

Your friend hops an _____ number of times.

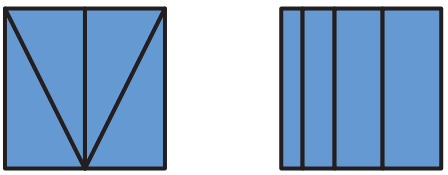
Review & Refresh

Circle the shape that shows equal shares.

9.



10.



Indicator 2a - In #3, students analyze several problems to demonstrate their conceptual understanding of regrouping to add.

3. DIG DEEPER! Do you have to regroup to add?

$43 + 29 = ?$	Yes	No
$54 + 32 = ?$	Yes	No
$33 + 64 = ?$	Yes	No
$17 + 25 = ?$	Yes	No

4. **Modeling Real Life** There are 50 words in a word search. You find 25 words in rows and 18 words in columns. Did you find all of the words?

B	D	W	A	P	A	R	T
E	H	I	G	H	C	H	D
G	T	L	I	E	R	A	R
I	I	D	W	L	Y	Y	Y
N	E	T	H	O	S	E	M
S	I	G	H	T	R	Y	I
G	L	L	I	G	H	T	N
S	T	E	A	K	M	F	D

Yes No

5. **Modeling Real Life** You find 15 white shells and 17 spotted shells. Your friend finds 34 shells. Who finds more shells?

You Friend

Review & Refresh

Compare.

6. 34 ◯ 80

7. 15 ◯ 8

8. 67 ◯ 67

7. **YOU BE THE TEACHER** Newton says the hundreds digit in the numbers shown increases by 1. Is he correct? Explain.

540, 550, 560, 570, 580, 590

_____

_____

8. **Modeling Real Life** A farmer has 467 cornstalks. The farmer grows some more. Now there are 967 cornstalks. How many groups of 100 cornstalks did the farmer add?

_____ groups of 100 cornstalks

9. **DIG DEEPER!** There are 250 people at a party. 3 more tables get filled. Now there are 280 people. How many people can sit at each table?

_____ people

Review & Refresh

10. $8 + 4 =$ _____

11. $15 - 8 =$ _____

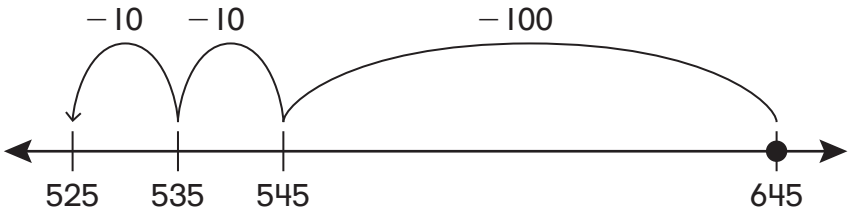
12.
$$\begin{array}{r} 5 \\ +\ 5 \\ \hline \square \end{array}$$

13.
$$\begin{array}{r} 14 \\ -\ 8 \\ \hline \square \end{array}$$

14.
$$\begin{array}{r} 7 \\ +\ 6 \\ \hline \square \end{array}$$

15.
$$\begin{array}{r} 18 \\ -\ 9 \\ \hline \square \end{array}$$

4. **Number Sense** Write the equation shown by the number line.



_____ − _____ = _____

5. **Modeling Real Life** A bee pollinates 955 flowers in a day. A second bee pollinates 150 fewer flowers. How many flowers does the second bee pollinate?

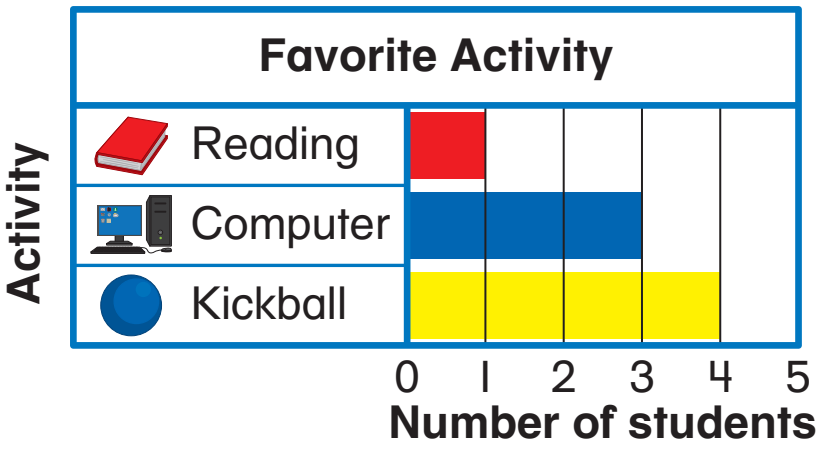
_____ flowers

6. **DIG DEEPER!** A library has 990 books. It has 250 fewer movies than books. It has 410 fewer magazines than movies. How many magazines does the library have?

_____ magazines

Review & Refresh

7.



How many students chose computer?

_____ students

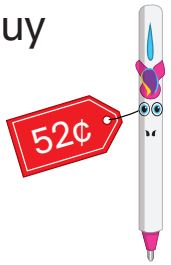
4. **Reasoning** Draw to show 60¢ with only 3 coins.

5. **Structure** Draw to show 42¢ without using dimes.

6. **Modeling Real Life** Newton has 6 dimes and 1 nickel. Descartes uses the fewest number of coins to make the same amount. Draw and label their coins.

Newton	Descartes

7. **Modeling Real Life** You use fewer than 5 coins to buy the pen. Draw and label coins to show how you pay.



Review & Refresh

8. A green scarf is 50 inches long. An orange scarf is 40 inches long. A red scarf is 38 inches long. How much longer is the green scarf than the red scarf?

_____ inches

Think and Grow: Modeling Real Life

How many more pizzas do you sell than Newton?

Equation:

Number of Pizzas Sold	
You	72
Descartes	57
Newton	38

_____ more pizzas

How many fewer pizzas does Newton sell than Descartes?

_____ fewer pizzas

Show and Grow *I can think deeper!*

8. How many more tickets does Newton sell than Descartes?

Number of Tickets Sold	
You	59
Descartes	47
Newton	85

_____ more tickets

9. DIG DEEPER! Your friend picks 49 apples. 11 apples are green and 14 apples are red. The rest are yellow. How many apples are yellow?

_____ yellow apples

Think and Grow: Modeling Real Life

You pick 19 yellow flowers and 24 purple flowers. You give 8 flowers away. How many flowers do you have left?

Step 1: Find the total number of flowers you picked.

Step 2: Subtract the number of flowers you give away from your result in Step 1.

+ _____ − _____

_____ flowers

Show and Grow *I can think deeper!*

15. You bake 36 blueberry muffins and 36 banana nut muffins. You sell 47 muffins. How many muffins do you have left?

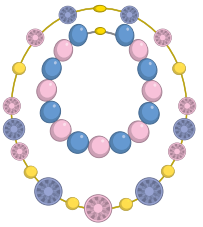
_____ muffins

16. There are 54 ladybugs. 7 fly away. Then 25 join. How many ladybugs are there now?

_____ ladybugs

Think and Grow: Modeling Real Life

A jeweler has 616 bracelets and 668 necklaces. He sells 269 bracelets. How many bracelets are left?



Subtraction equation:

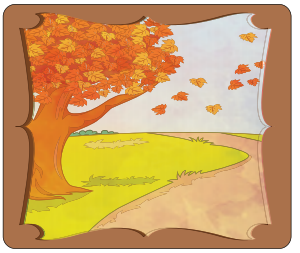
_____ bracelets

Show and Grow *I can think deeper!*

20. A vendor has 354 hats and 294 pairs of sunglasses. She sells 186 hats. How many hats are left?

_____ hats

21. There are 449 watercolor paintings and 373 oil paintings in a school art show. 238 paintings win a ribbon. How many do *not* win a ribbon?



_____ paintings

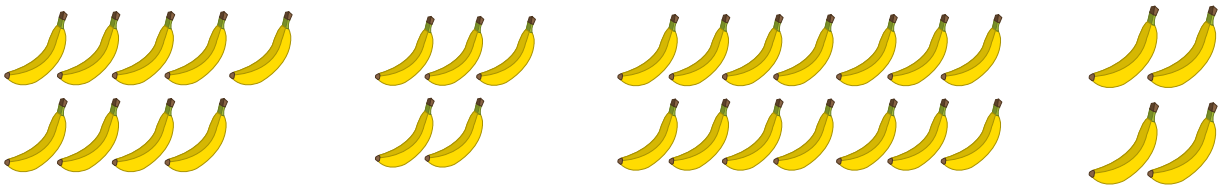
Indicator 2c - #21 is non-routine because students must first add to find the total number of paintings in the show. Then they subtract to find the number of paintings that do not win a ribbon.

22. Explain how Exercises 20 and 21 are different.

_____

_____

3. **Structure** There are 9 bananas in a bunch. A monkey eats some. There are 5 bananas left. Which picture shows how many bananas the monkey ate?



4. **Modeling Real Life** You make 4 snow angels and Newton makes 5. Descartes makes 3 more snow angels. How many snow angels are there in all?

_____ snow angels

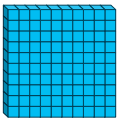
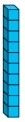
5. **Modeling Real Life** Newton has 9 glitter pens. Descartes has 2 fewer than Newton. How many glitter pens do they have in all?

_____ glitter pens

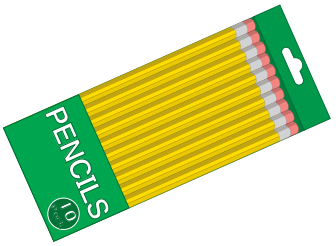
Review & Refresh

6. Which two shapes combine to make the shape on the left?

3. Which One Doesn't Belong? Which does *not* belong with the other three?

700  7  70  70 

4. Modeling Real Life A class has 30 boxes of pencils. Each box has 10 pencils. The class needs 600 pencils. How many more boxes does the class need?



_____ boxes

5. Modeling Real Life You have 10 packages of cards. Each package has 10 cards. You need 200 cards. How many more packages do you need?

_____ more packages

Review & Refresh

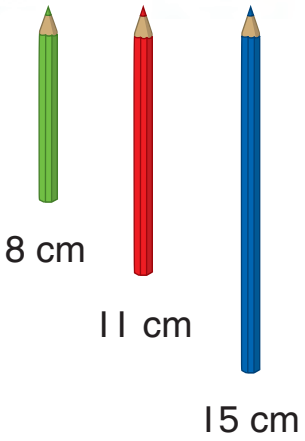
6.

$$\begin{array}{r} 65 \\ +\ 34 \\ \hline \end{array}$$

7.

$$\begin{array}{r} 48 \\ +\ 27 \\ \hline \end{array}$$

2. **Writing** Write and solve a word problem about the colored pencils.



_____

_____

_____

3. **Modeling Real Life** You cast out your fishing line 14 yards less than your friend. Your friend casts out her line 33 yards. How many yards do you cast out your fishing line?

_____ yards

Indicator 2c - #4 is non-routine because students must first add to find the total height of the nightstand and lamp. Then they subtract to find the height of the bed.

4. **Modeling Real Life** Your nightstand is 24 inches tall. You put a 20-inch lamp on it. Now your nightstand and lamp are 19 inches taller than your bed. How tall is your bed?

_____ inches

Review & Refresh

5. Write the number in expanded form and word form.

645

_____ + _____ + _____ _____

6. Write the number in standard form and word form.

800 + 60 + 2

_____ _____

Name _____

Performance Task 2

1. You and your friend check out books from the library as shown in the table.

Type	You	Friend
Science	7	
History	5	8
Adventure		

a. You have one more adventure book than science books. How many books do you have in all?

_____ books

b. You and your friend have the same number of books. Your friend has more science books than history books. Your friend has an even number of adventure books. How many science books and adventure books does your friend have?

_____ science books _____ adventure books

c. How many books do you and your friend have in all that are *not* history books?

_____ books

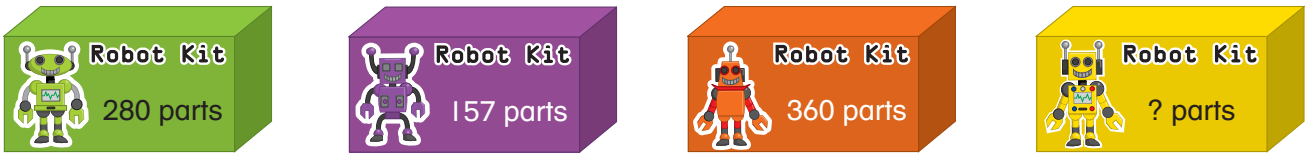
d. You return 3 books on Monday and 6 books on Thursday. How many books do you have left?

_____ books

Name _____

Performance Task 9

A store has four different robot kits.



1. How many parts are there in the green, purple, and orange kits?

_____ parts

2. The orange kit has 183 fewer parts than the yellow kit. How many parts are in the yellow kit?

_____ parts

3. Your friend wants to buy two kits so that he has 700 parts. Which two kits should he buy?

_____

Indicator 2c - #4a and 4b are non-routine because students must add and subtract several times to answer the questions.

4. a. You have some robot parts at home. You buy two purple kits and one orange kit. Now you have 774 parts. How many parts did you have to start?

_____ parts

b. Your cousin has 450 robot parts at home. She buys a kit and now has 36 more parts than you. Which kit did she buy?

_____ kit

Name _____

Performance Task 14

1. a. You have two $1 bills, 1 quarter, 5 dimes, 3 nickels, and 2 pennies. How much more money do you need to buy a subway pass?

_____ cents

b. You find a dime. Do you have enough money to buy the pass now?

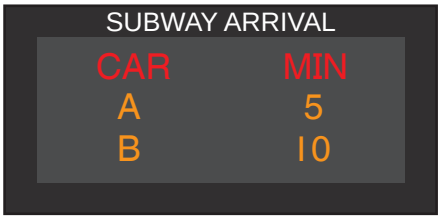
Yes No

2. A weekly subway pass is $32. A customer pays with a $50 bill. Use tally marks to show three different ways that the customer can receive change. What is the total change?

Change		
$10 bill	$5 bill	$1 bill

Total change: _____

3. You arrive at the subway station at quarter to 3. What times will the subways arrive?



Subway A: _____

Subway B: _____

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 place value mats, 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: Modelin

You make 9 mud pies. Your friend makes 1 fewer than you. How many mud pies do you and your friend make in all?

Addition equation:

What double can you use?

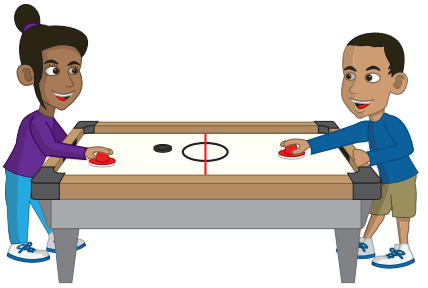
_____

Indicator 2f - The prompts in this example help students make sense of the problem and persevere in solving it.

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.

Show and Grow *I can think deeper!*

14. You score 6 goals. Your friend scores 1 more than you. How many goals do you and your friend score in all?



_____ goals

15. **DIG DEEPER!** You and your friend jump in 13 puddles in all. You jump in 7. How many puddles does your friend jump in?

_____ puddles

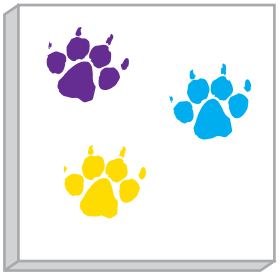
7. **Number Sense** Which doubles can you use to find $8 + 9$?

$4 + 4 = 8$ $\quad$ $9 + 9 = 18$ $\quad$ $8 + 8 = 16$

8. **Modeling Real Life** You tell 5 jokes. Your friend tells 1 fewer than you. How many jokes do you and your friend tell in all?

_____ jokes

9. **Modeling Real Life** Newton paints 3 paw prints. Descartes paints 1 more than Newton. How many paw prints do they paint in all?



_____ paw prints

Review & Refresh

Is the equation true or false?

10. $7 + 8 \stackrel{?}{=} 9 + 6$

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

True $\quad$ False

11. $8 - 4 \stackrel{?}{=} 3 + 2$

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

True $\quad$ False

Think and Grow: Modeling Real Life

How many more pizzas do you sell than Newton?

Equation:

Number of Pizzas Sold	
You	72
Descartes	57
Newton	38

_____ more pizzas

How many fewer pizzas does Newton sell than Descartes?

_____ fewer pizzas

Show and Grow *I can think deeper!*

8. How many more tickets does Newton sell than Descartes?

Number of Tickets Sold	
You	59
Descartes	47
Newton	85

_____ more tickets

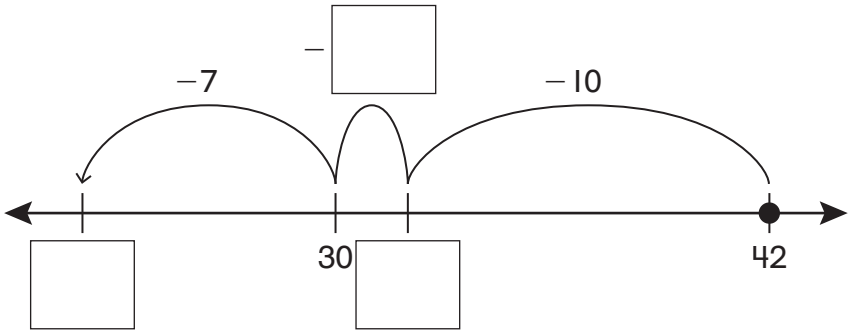
9. DIG DEEPER! Your friend picks 49 apples. 11 apples are green and 14 apples are red. The rest are yellow. How many apples are yellow?

_____ yellow apples

5. _____ = 23 − 14

6. _____ = 68 − 49

7. **Reasoning** Complete the number line and the equation.



_____ − _____ = _____

8. **Modeling Real Life** How many more cups does Descartes sell than Newton?

Number of Cups Sold	
Descartes	62
Newton	21

_____ more cups

9. **DIG DEEPER!** In Exercise 8, 100 cups are sold for the day. Newton sold the rest. How many cups did Newton sell?

_____ cups

Review & Refresh

10. 47 + 32 = _____

11. 74 + 15 = _____

Think and Grow: Modeling Real Life

Whose path to school is longer? How much longer is it?

Addition equations:

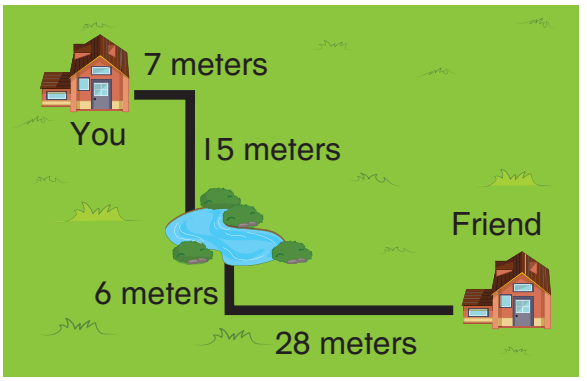
Whose path is longer: Your path Friend's path

Subtraction equation:

_____ yards

Show and Grow *I can think deeper!*

5. Whose path to the pond is shorter? How much shorter is it?



Your path Friend's path

_____ meters

2. DIG DEEPER! The length of a piece of string is 8 inches long. You cut off 5 inches. Draw the length of the string that is left.

3. **Modeling Real Life** Whose path to the playground is longer? How much longer is it?

Your path Friend's path

_____ yards

Indicator 2f - In #3, students use their knowledge of the current chapter to make a plan and persevere to solve a real-life application 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.

_, 76

_, _____

_____, 43, 53, _____, _____, _____, 93, _____

Think and Grow

14 kids are on the bleachers. 5 kids are on the stage. 6 kids are behind the curtain. How many fewer kids are on the stage than on the bleachers?

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

Solve: Kids on bleachers: 14

Kids on stage: 5 9

Use a bar model to help organize the information.

$14 - 5 =$ 9

$5 + 9 = 14$

9 fewer kids

You can use addition or subtraction to solve.

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.

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.

Show and Grow

1. You have 7 more k
   You have 15 keych
   does your friend ho

You:

Friend:

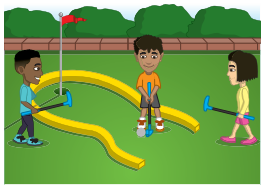
Name _____

Apply and Grow: Practice

2. Some friends are at a community pool. 7 more join them. Now there are 12. How many friends were there to start?

_____ friends

3. Some friends are playing miniature golf. 8 of them leave. There are 6 left. How many friends were there to start?



_____ friends

4. **YOU BE THE TEACHER** Newton has 5 fewer fish than Descartes. Newton has 8 fish. Your friend uses a bar model to find how many fish Descartes has. Is your friend correct? Explain.

Descartes: | 13 |

Newton: | 8 | 5 |

$8 + 5 = 13$

13 fish

_____

_____

_____

_____

Think and Grow

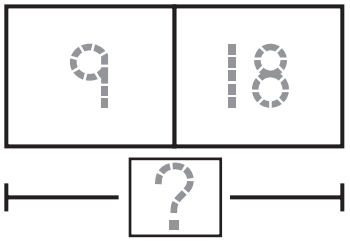
Some birds are on a wire. 9 fly away. There are 18 left.

How many birds were there to start?

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

Solve:

Use a model to help organize the information.



$$\begin{array}{r} ? \\ -\ 9 \\ \hline 18 \end{array} \qquad \begin{array}{r} 18 \\ +\ 9 \\ \hline 27 \end{array}$$

Add the parts to find the whole.

27 birds

Show and Grow *I can do it!*

1. There are 27 more harmonicas than drums in a music room. There are 55 harmonicas. How many drums are there?

Harmonicas:

Drums:

_____ drums

Name _____

Apply and Grow: Practice

2. There are 71 fish crackers. You eat 29 of them. Your friend eats 28. How many fish crackers are left?

_____ fish crackers

3. Newton solves 16 more math problems than Descartes. Newton solves 34 math problems. How many math problems does Descartes solve?

_____ math problems

Indicator 2f - In Exercises #2-3, students use problem solving strategies to help make sense of the problems and persevere in solving them.

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. Your friend
Use the given
ave now.

Step 2:

57 92

92
+ □ − □
□ □

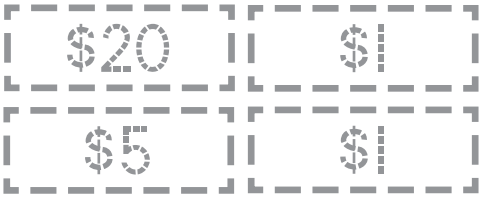
_____ tokens

Think and Grow

Newton has a $20 bill, a $5 bill, and two $1 bills. How much more money does he need to buy a present that costs $40?

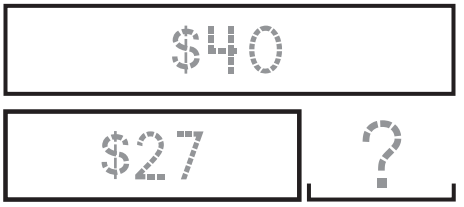
Think: What do you know? What do you need to find?

Step 1: Find how much money Newton has.



$20 + $5 + $2 = $27

Step 2: Subtract to find how much more he needs.



$40 − $27 = $13

Newton needs $13 .

Show and Grow *I can do it!*

1. Descartes has two $10 bills and two $5 bills. He has $21 more than Newton. How much money does Newton have?

Step 1:

Step 2:

_____

2. Descartes has some coins in a jar. He puts in 4 dimes, 1 nickel, and 1 penny. Now he has $1. How many cents were in the jar to start?

_____

Name _____

Apply and Grow: Practice

3. Newton has some money. He loses a $10 bill and three $1 bills. Now he has $19. How much money did he have to start?

_____

4. Descartes has one $20 bill, three $10 bills, and three $5 bills. He spends $50. How much money does he have left?

_____

5. A joke book costs $1. You have 2 quarters and 1 nickel. How much more money do you need to buy the joke book?

_____

6. **YOU BE THE TEACHER** Your friend says that 3 dimes and 2 nickels is 50¢. Is your friend correct? Explain.

_____

_____

Laurie's Notes

ELL Support

Check for understanding of Lesson 1.3. Read each story aloud as students follow along. Clarify unknown vocabulary. Ask the following questions and have students write the answers on a whiteboard and hold them up for your review.

1. How many pencils are there in all?
2. How many notebooks are there in all?
3. How many glue sticks are in each box?

You may want to allow groups to collaborate to discuss and write an answer to Exercise 9. Then discuss it as a class.

Think and Grow: Modeling Real Life

This application allows students to show their understanding of finding the total number of objects in equal groups. The exercises are more challenging because a diagram is not provided. Encourage students to represent their thinking using pictures and repeated addition equations.

? **Preview:** "Underline the important information as we read the exercise. What information tells me the number of groups and what information tells me the number of objects to put in each group?" Have students talk with partners. They can draw a quick sketch. If possible, display several student sketches. "What repeated addition equation matches our sketch?"

- **MP1 Make Sense of Problems:** Ask students to summarize what steps they used in solving this problem. You want the process to make sense to students. Sometimes, after the problem has been solved, going back and talking about the steps is when the process makes sense.
- Circulat
students
strategie
understa
about a
about a
- **Support**
counters
draw the
they rea

Indicator 2f - The Teaching Edition encourages teachers to ask students to summarize how to solve a 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.

Closure

- "Today
Let's try
? Show 3
repeated
? Show 3
addition

Laurie's Notes

ELL Support

Check for understanding of Lesson 4.1. Read each story aloud as students follow along. Clarify unknown vocabulary and cultural references, such as trading cards. Ask the following questions and have students write answers on an erasable whiteboard or piece of paper and hold up for your review.

1. How many pages do you read?
2. How many trading cards do you have?
3. How many flowers do you have?

Think and Grow: Modeling Real Life

These application problems allow students to show their understanding of an additive situation. To find the sum students may use mental math. If they do, they should share their thinking with classmates.

- **Preview:** Read the example. "What do we know in this question? Are we told the total number of pages read? Are we told how many pages were read each day? What must we do to find out the total number of pages read?"
- **MP4 Model with Mathematics:** Ask a volunteer to draw a quick sketch at the board as other students draw at their desk.

? "What numbers do we write in the chart?" 34 and 23 "Which number do we write first? Where do we write it?" Either number can be written first, 34 or 23. You can add in any order. Write the first number in the top two boxes.

Use the language of the success criteria as you summarize and connect the sketch and the addition problem.

- There are no visual supports for the next two problems. You may want to have templates available as needed.
- Exercise 11 is a *put together* situation with three addends. "Tell your partner what your strategy is for solving this problem."
- **MP1 Make Sense of Problems:** When students have had sufficient partner talk time, ask a few students to share their strategy with the whole class. Compare and contrast strategies. "Use a strategy you have heard to solve the problem."
- **Supporting Learners:** With no visual support provided, there are different ways students may solve the problem. If they are stuck, ask them what problem they solved in the past that was similar to these. "What helped you solve [earlier problem]?" Students need to practice identifying what they know about a problem and what would help them when they are stuck.

"You have learned to write equations for the partial sums in an addition problem. How comfortable are you with solving an addition problem using partial sums? Tell your partner what it means to write partial sums." Ask for thumbs up, sideways, or down.

Closure

- Show the addends written in a partial sums chart. "What numbers are we adding together?" Have students solve and compare their work with their partner.

Laurie's Notes

ELL Support

Check for understanding of Lesson 4.7. Read each story aloud as students follow along. Clarify unknown vocabulary and cultural information. Ask the following questions and have students write answers on erasable whiteboards and hold up for you to review their answers. You may want to allow them to work in pairs.

1. How many links did you start with?
2. How many stickers do you have to start with?
3. How many students are on the third bus?

Think and Grow: Modeling Real Life

These application problems allow students to show their understanding of an additive situation that may involve more than one step.

- The *start unknown* addition situation is one of the more challenging for students to make sense of. It is always helpful to have visual models. Prepare two bags similar to those shown.
- Choral read the problem and then have students read again to themselves. Have students share what they know and what they are trying to solve.

- At the appropriate time, show the first bag. "Here is the paper chain you made. Do you know how many links there are?" Having the chain hidden in the bag is a visual reminder that this number is not known.
- **MP1 Make Sense of Problems:** Place the second bag with the number 24 written on it. "Your friend adds 24 links." Make sure the 24 is visible. "Now there are 57 links." Pause. "Tell your partner if you have an idea of how to solve the problem."
- **MP1 Persevere in Solving Problems:** Students have an entry point. Give them time to talk and share their thinking.
- "Did you have an idea of how to solve the problem when you first read it? What helped you in solving the problem? Were you clear about what information was known?" You want students to reflect on the problem-solving process. Did I learn something about solving problems today? Will I remember to use this strategy again when I'm solving problems?
- Exercise 4 is the same type of problem. Students may be ready to try this independently or with a partner.
- Encourage students to draw a picture for Exercise 5. What known information can be labeled in the picture that will help in solving the problem?
- **Supporting Learners:** Make resources base ten blocks, number line, hundred chart) available as needed.
- "Today we solved story problems by identifying the information in the problem and the question being asked. You had to reason about the situation equation and then you decided on a strategy to solve. Where are you in your learning right now?"

Closure

- Repeat the questions about the markers used in the Dig In. Change the numbers. Have students reflect on whether the questions are easier to solve now.

Laurie's Notes

ELL Support

Check for understanding of Lesson 5.3. Read each story aloud as students follow along. Clarify unknown vocabulary. Ask the following questions and have students write the answers on whiteboards and hold them up for your review. You may also want them to hold up their equations.

1. How many pirates got off the ship?
2. How many pumpkins were picked?
3. How many treats did Descartes take?

Think and Grow: Modeling Real Life

This application allows students to show their understanding of take from problems where the change is unknown. The context helps students think about why you add on to reach the greater number.

- **MP1 Make Sense of Problems:** Model the example with linking cubes. Make a pile of cubes and say, "There are 52 pirates." Grab some of the cubes and say, "Some of them leave." Point to cubes remaining and say, "There are 27 left." Refer to the cubes you grabbed and say, "How many pirates got off the ship?"
- Read the problem. Have students share what they know and what they need to find out. Underline the important information and the question as they share.

? **Model:** "What do you know about the 52 pirates?" how many you start with "What does 27 represent?" how many are left after some leave "How can you find out how many left?" Listen for adding on to 27 to get to 52. Give private think time and then write the subtraction equation and the related addition equation.

- Exercise 10 is a different context but can be solved in a similar fashion to the pirate problem.

? Exercise 11 has an additional step. Have students work with a partner. Ask students to put pencils down and read the question. "Discuss what information you understand. What is the question asking? Do you and your partner agree on the information? Do you have a strategy to get started?"

◉ "How are addition and subtraction related?" addition and subtraction undo each other; related addition and subtraction equations have the same whole and parts

◉ "Where are you in your learning today? Were you able to count from a number to a greater number? Can you explain how to count on to subtract?"

- **Supporting Learners:** During math center time, have emerging learners focus on related subtraction and addition problems.

Closure

- "Today, we studied how to add on to subtract." Write $34 - 18 = \_\_\_$ and $18 + 34 = \_\_\_$. "Do you add 34 on to 18 to answer the subtraction equation? Why or why not?"

Laurie's Notes

ELL Support

Check for understanding of Lesson 10.8. Read each question aloud as students follow along. Discuss unknown vocabulary or unfamiliar cultural references. Explain that a food drive is not related to driving a vehicle to avoid confusion. Ask the following questions and have students write on a whiteboard or piece of paper to hold up for your review.

1. How many bouncy balls were there to start?
2. How many fans were at the baseball game to start?
3. How many cans did the rest of the classes collect?

Think and Grow: Modeling Real Life

These applications allow students to show their understanding of *take from* problems where the start amount is unknown.

- **MP1 Make Sense of Problems:** Model the example with linking cubes or other small manipulatives in a bag. Shake the paper bag of cubes and say, "There are some bouncy balls in the bag." Grab some out the bag and say, "Some are sold." Shake the bag again and say, "There are some left. How many were there to start?" Read the problem. "How does *acting it out* help you think about how to solve the problem?"
- Have students share what they know and what they need to find out. Ask them to draw a part-part-whole model and label the information they know. Do they understand they are looking for the whole?

? **Model:** "What equation can we write to answer the question?" $115 + 227 = ?$ "How do we solve the equation using a number line?" Start at 115 and add on 227. Give students time to solve. Elicit answers to how many bouncy balls there were to start. The answer can be checked by subtraction: $342 - 115 = 227$.

- Exercise 7 has a different context but is solved in a similar fashion to the example.
- Exercise 8 has an additional step. Have students work with a partner. Ask students to put pencils down and read the question. "Discuss what information you understand. What is the question asking? Do you and your partner agree on the information? Do you have a strategy to get started?"

◉ "How are addition and subtraction related?" listen for addition and subtraction undo each other; related addition and subtraction equations have the same whole and parts; addition can be used to check a subtraction problem

◉ "Where are you in your learning today? Let's look at the three success criteria. I want you to think about parts of today's lesson and where you made sense of adding on from a number to a greater number. Were you able to use that equation to solve a related subtraction problem? Can you explain how to add on to subtract?" Continue to ask probing questions so that students are able to reflect on their learning today.

Closure

- "Today we *added on* to solve a subtraction problem. Write $324 - 158 = ?$ and $158 + 324 = ?$. Do you add 324 on to 158 to answer the subtraction equation? Why or why not?"

Think and Grow: Modeling Real Life

15 kids play at a park. 6 of them leave. 9 more kids come to the park. How many kids are at the park now?

Step 1:

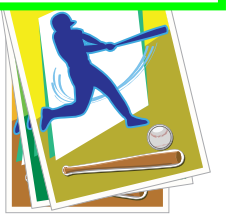
Step 2:

Indicator 2f - In this example and #5-6, students use mathematics to model and solve real-life problems.

MP4 Model with mathematics - Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation.... Mathematically proficient students who can apply what they know... are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

Show and Gro

5. You have 13 baseball cards. You give 5 away. Then you get 4 more. How many baseball cards do you have now?



_____ baseball cards

6. DIG DEEPER! There are 7 adult lions and some cubs in a pride. The pride has 13 lions in all. 3 more cubs are born. How many cubs are in the pride now?

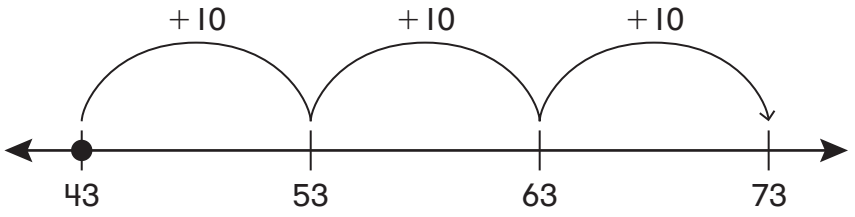
_____ cubs

Explain how you solved this problem.

_____

_____

4. **Number Sense** Write an equation that matches the number line.



_____ + _____ = _____

5. **Modeling Real Life** Newton has 31 stamps and buys 20 more. Descartes has 50 stamps. Who has more stamps?

_____ has more stamps.

6. **DIG DEEPER!** You have 64 rocks. Your friend gives you some more. Now you have 94 rocks. How many rocks did your friend give you?

_____ rocks

Review & Refresh

Is the number even or odd?

7. 15 Even Odd

8. 8 Even Odd

9. 12 Even Odd

Think and Grow: Modeling Real Life

You make a paper chain. Your friend adds 24 links to your chain. Now there are 57. How many links were there to start?

_____ links

Show and Grow *I can think deeper!*

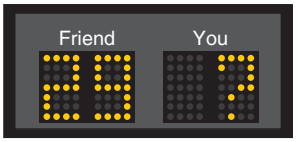
5. You have some stickers. Your friend gives you 32 more stickers. Now you have 58. How many stickers did you have to start?

_____ stickers

6. There are 3 buses. There are 29 students on each of the first 2 buses. There are 88 students in all. How many students are on the third bus?

_____ students

3. **Number Sense** Your friend scores 29 points. You score 16 more points than your friend. Use the given numbers to find how many points you and your friend score in all.



16 74

Step 1:

$$\begin{array}{r} 29 \\ +\ \square \\ \hline \square \end{array}$$

S

Indicator 2f - In #4-5, students use mathematics to model and solve real-life problems.

MP4 Model with mathematics - Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation.... Mathematically proficient students who can apply what they know... are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

4. **Modeling Real Life** You have some plastic bugs. Your friend gives you 37 more plastic bugs. Now you have 59. How many plastic bugs did you have to start?

_____ plastic bugs

5. **Modeling Real Life** There are 3 subway cars. There are 36 people on each of the first 2 subway cars. There are 92 people in all. How many people are on the third subway car?

_____ people

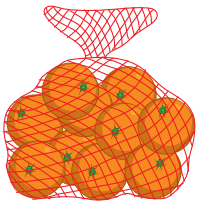
Review & Refresh

6. 50 − 10 = _____

7. 90 − 40 = _____

Think and Grow: Modeling Real Life

A store sells oranges in bags of 10. The store sells 500 oranges. How many bags do they sell?



Make a quick sketch:

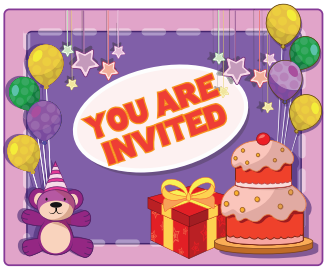
_____ bags

Show and Grow *I can think deeper!*

7. A store sells bottles of glitter glue in boxes of 10. The store sells 600 bottles. How many boxes do they sell?

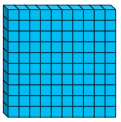
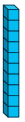
_____ boxes

8. DIG DEEPER! You have 10 packages of invitations. Each package has 10 invitations. You need 300 invitations. How many more packages do you need?

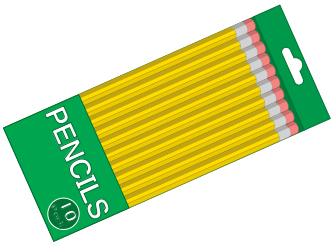


_____ more packages

3. Which One Doesn't Belong? Which does *not* belong with the other three?

700  7  70  70 

4. Modeling Real Life A class has 30 boxes of pencils. Each box has 10 pencils. The class needs 600 pencils. How many more boxes does the class need?



_____ boxes

5. Modeling Real Life You have 10 packages of cards. Each package has 10 cards. You need 200 cards. How many more packages do you need?

_____ more packages

Review & Refresh

6.

$$\begin{array}{r} 65 \\ +\ 34 \\ \hline \end{array}$$

7.

$$\begin{array}{r} 48 \\ +\ 27 \\ \hline \end{array}$$

Think and Grow: Modeling Real Life

You want to raise $500 in 2 days. Do you reach your goal?

Day	Amount Raised
1	$283
2	$205

Addition equation:

Compare: _____ ◯ _____

Yes No

Show and Grow *I can think deeper!*

9. A museum wants a weekend total of 700 guests. Does the museum reach the goal?

Day	Number of Guests
Saturday	338
Sunday	389

Yes No

10. DIG DEEPER! You want to score 400 in 3 bowling games. What score do you need in the third game to reach your goal?

Game	Score
1	107
2	144

_____

5. **YOU BE THE TEACHER** Your friend uses compensation to find 550 + 298. Is your friend correct? Explain.

$$\begin{array}{rcrcl} 550 & + & 298 & = & ? \\ \oplus\ \ 2 & & \oplus\ \ 2 & & \\ \hline 552 & + & 300 & = & 852 \end{array}$$

_____

_____

_____

6. **Modeling Real Life** Newton wants to read 571 pages in two weeks. He reads 321 pages in the first week and 196 pages in the second week. Does he reach his goal?

Yes No

7. **DIG DEEPER!** You need 850 points to get to level 4 in a video game. How many points do you need in level 3 to reach your goal?

Level	Points
1	348
2	297

_____ points

Review & Refresh

8. $\begin{array}{r} 95 \\ -\ 38 \\ \hline \end{array}$

9. $\begin{array}{r} 82 \\ -\ 40 \\ \hline \end{array}$

10. $\begin{array}{r} 59 \\ -\ 21 \\ \hline \end{array}$

Think and Grow: Modeling Real Life

A batting cage has 360 baseballs. There are 130 fewer softballs than baseballs. How many softballs are there?

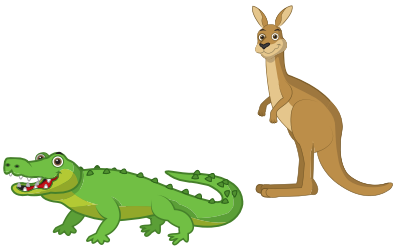
Subtraction equation:

Model:

_____ softballs

Show and Grow *I can think deeper!*

7. A crocodile weighs 535 pounds. A kangaroo weighs 340 pounds less than the crocodile. How much does the kangaroo weigh?

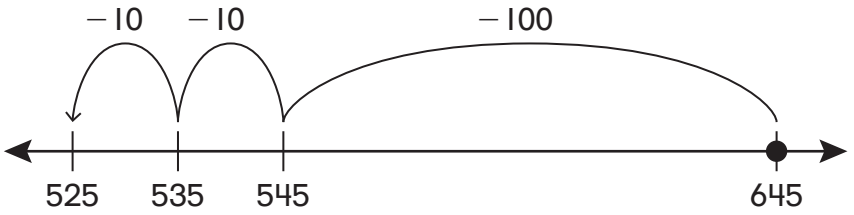


_____ pounds

8. DIG DEEPER! A train has 850 seats. A plane has 390 fewer seats than the train. A bus has 370 fewer seats than the plane. How many seats does the bus have?

_____ seats

4. **Number Sense** Write the equation shown by the number line.



_____ − _____ = _____

5. **Modeling Real Life** A bee pollinates 955 flowers in a day. A second bee pollinates 150 fewer flowers. How many flowers does the second bee pollinate?

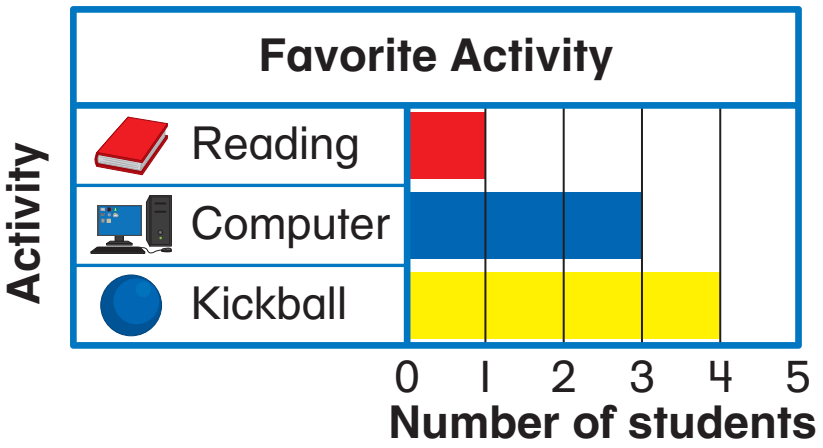
_____ flowers

6. **DIG DEEPER!** A library has 990 books. It has 250 fewer movies than books. It has 410 fewer magazines than movies. How many magazines does the library have?

_____ magazines

Review & Refresh

7.



How many students chose computer?

_____ students

Laurie's Notes

ELL Support

Check for understanding of Lesson 3.7. Read each story aloud as students follow along. Clarify unknown vocabulary and cultural information. Ask the following questions and have students write the answers on whiteboards and hold up for your review. You may also want to review their addition sentences.

1. How many people are at the craft fair?
2. How many pens do you and your friend have?
3. How many seeds do you and your friend plant?

Think and Grow: Modeling Real Life

This application allows students to show their understanding of solving two-step addition problems by using the addition strategies learned in this chapter. Students apply their understanding to modeling compare bigger unknown problems that use the word *more*.

- **Preview:** In mathematics, the word *more* can be used in many situations involving addition. It can identify how much the greater one amount is in comparison to another. Read through each question. Asking, "Will the number of adults or children be greater at the fair? Will you or your friend have a greater number of pens? Of seeds?"
- **MP4 Model with Mathematics:** Circle and underline according to the instructions. Divide the space into two steps, Step 1 and Step 2. Remind students that Step 2 will be the last step that answers the question asked. "How will we find the total people at the fair? Write under Step 2, number of children + number of adults. Do we have both of those numbers? Which one do we need to find in Step 1? Fill in 31 under children and draw a blank line under adults. In Step 1, write *Find the number of adults*. Work together to produce 31 + 20 as the number representing adults. Solve. Return to Step 2 and fill 51 in the blank with assistance from students.
- **Supporting Learners:** Rewrite Exercises 5–8 to show three questions with space to answer each. "1. How many xxx do you have? 2. How many xxx does your friend have? 3. How many xxx do you and your friend have together?"
- "You have learned to use two-steps to solve addition problems. Think about the problems you solved. Tell your partner what you think is the most difficult part of two-step problems. What is the easiest part."

Closure

- "Today you learned to solve two-step problems. We had to use information from two different addition sentences to be able to answer the question asked."
- Write "Solving Two-Step Problems" and draw an oval around it. "What things does someone need to know to complete a two-step problem?" Encourage students to brainstorm skills, helpful hints, directions, etc. Record their responses on spokes off of the oval. read the problem, circle information, write an addition sentence, find missing information, use strategies, label steps, etc. "Partner pair share the 3 you think are most important."

Laurie's Notes

ELL Support

Check for understanding of Lesson 5.4. Read each story aloud as students follow along. You may want to discuss unknown vocabulary or cultural references. Allow time to complete each problem. Then ask the following questions and have students hold up the answer for your review.

1. How many comic books do you have?
2. How many tricks can you do?
3. How many minutes was Newton's walk?

Think and Grow: Modeling Real Life

This application allows students to show their understanding of using partner numbers to subtract back to a decade number. The story problems involve contexts with the word *fewer*.

? **Preview:** Read the example. "Who has more comic books, you or your friend? How do you know?" The word *fewer* means you have less than your friend. "How many less?" 8.

- **MP4 Model with Mathematics:** Use linking cubes to act out the following. "These represent the comic books that your friend has. How can you show how many comic books you have? Tell your partner." Give time for students to discuss. Solicit ideas.
- **Model:** Write the subtraction equation suggested by students, $45 - 8 = \_\_\_$. "What strategy have you learned today that will help us find the difference?" Students should suggest breaking 8 apart into 5 and 3. Talk through the steps, modeling how you reason about the operations of subtracting 5 and then subtracting 3.
- **Extension:** "Explain why you would not use 2 and 6 as partner numbers in the problem $45 - 8$."
- **Think-Pair-Share:** "Read Exercise 12 and think about how you would solve it. When you are ready, talk with your partner." When students finish ask for several volunteers to talk about their work.
- Exercise 13 needs to be read slowly and perhaps more than once. Probe student understanding of what 8 minutes longer means when comparing the time each walked.
- **Supporting Learners:** Help students record the information in each problem using a bar model. This helps them see the comparison between the two numbers.

? "You used partner numbers today. For the problem $35 - 7$, how confident are you that know what number to break part? Use your thumb signals." Pause. "Are you confident you know what partner numbers to use and which you would subtract first?"

Closure

- "Let's try the problem you just thought about. Use your whiteboards to find the difference $35 - 7$."
- Students hold up their whiteboards when finished.

Laurie's Notes

ELL Support

Check for understanding of Lesson 7.1. Read each story aloud as students follow along. Clarify unknown vocabulary and explain unfamiliar objects. Allow time to complete each exercise. Ask for the answer to each exercise and have students write on a whiteboard or piece of paper to hold up for your review.

Indicator 2f - In the Teaching Edition, teachers are encouraged to engage with students about how to solve real-life problems.

MP4 Model with mathematics - Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation.... Mathematically proficient students who can apply what they know... are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

Think and Grow: Modeling Real Life

These application problems allow students to show their understanding of identifying groups of tens as hundreds.

? **Preview:** Read the problem. "What information do we know in this problem?" As a student describes the problem, grab a rod to represent a bag of 10 oranges. Repeat the action with more rods to act out the store selling oranges in bags of 10. "What are we trying to find out?" how many bags they sell

- Discuss the problem with students. Have students discuss with their partners how they might figure out the number of bags needed to sell 500 oranges.

? "Should we draw 500 oranges? How else could we draw something to help us find out how many bags they sold?" Have several students share their ideas.

- Students can draw a segment to represent a bag of 10 oranges, and then count by tens until there are 500. Some students may recognize that they need 50 bags of 10 oranges to represent 500 oranges. Other students will need to draw 50 segments.
- "Discuss with your partner how your drawing shows the number of tens." How are students counting to 500? Are they counting by tens or do they circle the 10 groups of ten and say 1 hundred, 2 hundred, and so on?
- Exercise 7 is the same type of problem as the example. Are students able to apply what they learned in the example with bags oranges to the boxes of bottles of glitter glue?

? **MP4 Model with Mathematics:** For Exercise 8, hold a rod and say, "Let's pretend that this represents a package of 10 invitations. You have 10 of these packages. Take out 9 more rods. "How many invitations do the 10 rods represent?" 100 "How many more invitations do you need?" 200 "How many packages of 10 is this?" 20

? Use your thumb signals to show how confident you are in recognizing groups of 10 tens. Use your thumb signals to show how confident you are naming a hundreds number if you know how many groups of 10 tens there are."

Closure

- "We have been discussing groups of 10 tens and hundreds numbers."
- "Take turns with your partner. The partner who has longer hair names a hundreds number. The other partner tells how many groups of 10 tens. High five if you agree with your partner. Switch roles."

12.4

Check out the Dynamic Classroom.
BigIdeasMath.com

Learning Target

Solve length word problems.

Success Criteria

- Identify what information is given in the word problem.
- Identify what the question is asking.
- Choose a strategy to solve.
- Explain the strategy I used to solve.

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 understand the meaning of word parts, it helps you understand the meanings of words. For example, *meter* is the basic metric unit for measuring length. The prefix *centi-* refers to one hundred, and there are 100 centimeters in a meter. Point out that *centi-* is related to *cents*, and there are 100 cents in one dollar.

Laurie's Notes

STATE STANDARDS
2.MD.B.5

Preparing to Teach

This lesson is a combination of the first three lessons in the chapter. The problems in the chapter resemble problems in the other sections. It serves as a review of the problem solving strategy to identify the given and identify what the question is asking. The problems in this section require various strategies. They are all mixed together.

Materials

- centimeter ruler

Dig In (Circle Time)

Students represent a missing length problem using a centimeter ruler as a model.

- Pass out centimeter rulers and tell students they will use the rulers to make a number line that solves a missing length problem.
- Read this problem to the class. "Descartes has a 15-centimeter length of ribbon. He gives Newton 6 centimeters of the ribbon. What length of ribbon does Descartes have left?"
- **MP4 Model with Mathematics:** Show the length of Descartes' ribbon as a line from 0 to 15. Then mark the ribbon length he gave to Newton as a line from 15 back to 9.
- ? "What do we know? What do we need to find out?"
- ? **MP3 Construct Viable Arguments:** "Who can explain how long a ribbon Descartes has left? Who can show an equation that solves for Descartes' ribbon?" $15 - 6 = ?$
- ? "Let's try another one. Dave has a chain that is 18 centimeters long. He cuts off a 6-centimeter piece of chain to give to Juan. How long is the chain that Dave has left? Be sure to write an equation."
- Have student volunteers share the answer and the equation they used.
- ◉ "We have shown how to use what you know and what you need to find in a word problem to help you solve the problem."

? Teaching Prompt ◉ Learning Target

Laurie's Notes

ELL Support

Check for understanding of Lesson 1.3. Read each story aloud as students follow along. Clarify unknown vocabulary. Ask the following questions and have students write the answers on a whiteboard and hold them up for your review.

1. How many pencils are there in all?
2. How many notebooks are there in all?
3. How many glue sticks are in each box?

You may want to allow groups to collaborate to discuss and write an answer to Exercise 9. Then discuss it as a class.

Think and Grow: Modeling Real Life

This application allows students to show their understanding of finding the total number of objects in equal groups. The exercises are more challenging because a diagram is not provided. Encourage students to represent their thinking using pictures and repeated addition equations.

? **Preview:** "Underline the important information as we read the exercise. What information tells me the number of groups and what information tells me the number of objects to put in each group?" Have students talk with partners. They can draw a quick sketch. If possible, display several student sketches. "What repeated addition equation matches our sketch?"

- **MP1 Make Sense of Problems:** Ask students to summarize what steps they used in solving this problem. You want the process to make sense to students. Sometimes, after the problem has been solved, going back and talking about the steps is when the process makes sense.
- Circulate as students work on Exercise 7. Observe strategies students are using. Take time for students to share their strategies with the whole class. You want students to understand that there are often different ways you can think about a problem, and that is okay. We can approach, or think about a problem in different ways.
- **Supporting Learners:** If needed, provide linking cubes or counters. For Exercise 8 students might need to be guided to draw the 4 groups and then place 1 "stick" in each group until they reach 16.

Closure

- "Today we found the total number of objects in equal groups. Let's try two more problems."

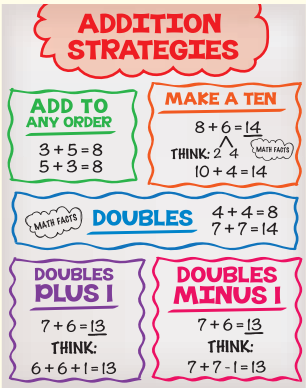
? Show 3 groups of 3 and 1 group of 4. "Can we solve this using repeated addition? Tell your partner."

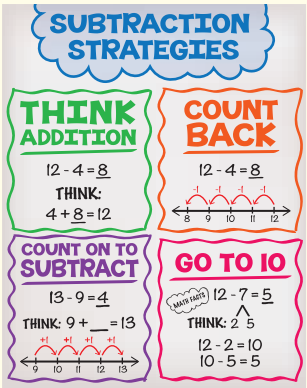
? Show 3 groups of 4. "Can we solve this using repeated addition? Tell your partner."

Laurie's Overview

About the Math

Students have been working with addition and subtraction within 20. This chapter reviews previously learning strategies and introduces new strategies. 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. Making an anchor chart of the strategies will be helpful not only in this chapter but throughout the year. It provides a reminder to students of different ways to think about problems.



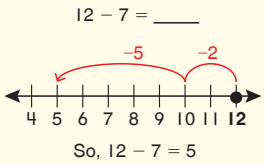


We want students to continue to use fingers, acting out, pictures, drawings and manipulatives to make meaning, even within lessons that teach a specific strategy or use a specific model. Most Dig In times at the beginning of the lesson have students acting out a story or strategy before working with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

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.

with. The open number line allows students to show the jumps back without counting by ones. Students use the *get to* 10 strategy first and then use their math facts to subtract the remaining amount from 10. Embedded in this strategy is knowing partner numbers and understanding what amount must be subtracted first to get to 10.



Laurie's Notes

Meeting the needs of all learners.

Apply and Grow: Practice

SCAFFOLDING INSTRUCTION

Students will progress from using linking cube trains and the Addition Fact Chart, to working with equations alone. Are students fluent with their addition facts or do they need the chart or manipulatives? Can they use the same addends to write two expressions that have the same sum? Do they use the Commutative Property to find the answer or are they doing a separate problem each time? Can they use the vocabulary words to describe the parts of an equation?

EMERGING students will treat each equation as if they are unrelated. They may count all in order to find sums. They may not understand that you can add in any order (Commutative Property).

- **Exercises 5–9:** The first equation is to find the sum. Students use that equation to write the second by changing the order of the addends. If students do not recognize the pattern of the Commutative Property, have them build the first equations with linking cubes and rotate the tower around to see the second equation.
- **Exercise 10:** Some students may think the equal sign means "makes" or "is the result of." This exercise reinforces that the equal sign means "is the same as."

PROFICIENT students will be able to find sums and write the related equation where the order of the addends has been changed.

- **Exercises 5–9:** It will become apparent if students understand that the order of the addends can be changed when writing the second equation. If students do not write it correctly, they may be trying to memorize a pattern without understanding. Use a model to physically demonstrate changing the order of the addends.
- **Exercise 10:** Ask students what the equal sign means. Listen for "is the same as."

Additional Support

- Rekenreks can also be used, as well as a number bond or the part-part whole mat to see that the order of the addends does not change the sum.

Extension: Adding Rigor

- Have students explain in their own words or with drawings why the order of the addends does not change the sum.

Laurie's Notes

ELL Support

After reviewing the example, have students work in groups to complete Exercises 1–4. You may suggest that half of each group use one strategy, and half use another. Have them discuss and compare their processes and answers. Monitor discussion and expect them to perform according to their language proficiency level.

Beginner students may write out problems and state numbers.
Intermediate students may use simple sentences to explain.
Advanced students may use complex sentences and help guide discussion.

Think and Grow

Getting Started

- Direct students to the example, noticing that Newton and Descartes are not present. "As we work the example, we are going to develop what Newton and Descartes might say to us." Students can even partner pair as Newton and Descartes to alternate speaking the steps as they trace the numbers.

Teaching Notes

- Students are shown more than one method for solving the example 42 + 29. Students can be directed to use at least two different strategies throughout the exercises.

? **Model:** Review the steps of the first way, asking students to fill in Newton's or Descartes' thoughts at each step as they trace the numbers. "Which of the four methods on our posters does this example show? How can you tell?" Listen for talk about how both addends are broken into tens and ones. Repeat for the second method, the steps, thoughts, and method used.

? Note the example didn't use compensation. Show the base ten visual for the equation. "What happens if we try to add 8 to 42 to make it 50?" Show it is possible. A student may suggest moving 2 from 42 to make it 40. This does work and could be used even though previous focus was on making the *next* decade number.

? **Turn and Talk:** "This example could also be solved using an open number line. Which number would you start with? How many jumps of 10 would you then take? How many jumps of 1?"

- **Supporting Learners:** Provide base ten blocks, hundred chart, access to example posters made during Circle Time.

For each set of two exercises, suggest two methods. Have the class choose by vote which they will use on the first problem, defaulting to the second strategy for the next problem.
In Exercises 1–2, use an open number line or break apart one addend. In Exercises 3–4, use compensation or break apart both. Together, work the problems using the chosen method, reviewing the steps and asking students what steps to take next or what Newton and Descartes might say at various steps.

◉ **MP3 Construct Viable Arguments:** "Choose one of the exercises. Explain to your partner the strategy we used. Tell whether or not you think this was the best strategy to use or if another strategy would work better." Encourage partners to ask why.

Laurie's Notes

ELL Support

After completing the examples, have students work in pairs to complete Exercise 1. Have one student ask another, "When regrouping, how many tens do you draw? How many ones? How many tens are left? How many ones? What is the answer?" Have them alternate roles when asking and answering questions.

Beginner students may answer with numbers.
Intermediate students may answer with phrases, such as, "one ten."
Advanced students may answer with sentences, such as, "I regroup by drawing one ten and 13 ones."

Think and Grow

Getting Started

- Students have used an addition chart to represent the regrouping of 10 ones as 1 ten. Explain that the subtraction chart helps us show that we are renaming 1 ten as 10 ones.

Teaching Notes

- **Teaching Tip:** Keep base ten blocks available for all students. A hundred chart and an open number line are also helpful.
- **Model:** "We want to find 23 − 5. Will we need to regroup?" Yes "Circle a ten in the quick sketch and show how it is exchanged for 10 ones." Pause as students trace. "How many tens do we have?" 1 "How many ones do we have?" 13
- **Model:** Point to the subtraction chart and say, "This is how we record regrouping the 1 ten for 10 ones in the quick sketch. We cross out the 2 in the tens place and record a 1. This shows that there is now 1 ten left instead of the original 2 tens. The 1 ten that we regrouped as ones now makes a total of 13 ones. We write 13 in this box to remind us we have 13 ones." Connect this to the quick sketch.
- **Model:** "We have 1 ten and 13 ones. Now we can subtract 5 ones. Show that in the sketch." Pause as students cross out 5 ones. "In the chart we can subtract 5 ones from 13 ones and the difference is 8 ones. We also have the 1 ten."
- Give time for students to discuss the quick sketch and subtraction chart. This is a big idea and you want to help students make sense of the representation. Base ten blocks also help.
- "How do we show 1 ten regrouped as 10 ones?" Students may mention exchanging 1 rod for 10 units, or circling 1 ten and adding 10 ones to the quick sketch. "Where did we show 1 ten regrouped as 10 ones in our written problem?"
- Work through Exercise 1 in the same manner. Students make a quick sketch and then solve the written problem. Probe their understanding of why regrouping will be necessary. How is it shown in the quick sketch? How is it shown in the written problem?
- **Supporting Learners:** Have students model the problem with base ten blocks. As they model, record what they are doing in a subtraction chart.
- "You made a quick sketch of a subtraction problem and you are also learning to record what you have done. How are you doing with your learning today? Show with your thumb signal."

Laurie's Notes

Meeting the needs of all learners.

Apply and Grow: Practice

SCAFFOLDING INSTRUCTION

Students have learned to model addition of groups of hundreds and tens on the open number line. Continue to relate the model to the action that takes place when counting on in groups of 100 and groups of 10, emphasizing place value. Can students break apart the second addend into several jumps? Are they able to label the number after each jump?

EMERGING students have difficulty determining how many jumps of 100 and how many jumps of 10 to make. Keeping track of the sum of the jumps and labelling the number line may be challenging.

- **Exercises 3–5:** Have students make and label jumps on the number line before trying to label the number line for each jump. If needed, have students model the beginning number with base ten blocks or a quick sketch. For each jump, add a block or sketch and label the partial sum on the number line for the jump. Continue until the sum is reached.
- **Exercise 6:** Students who add tens by one jump of ten at a time may have difficulty determining the final jump. Have students label the number line from the two jumps of 100 first, then count by tens until reaching 960. This will help them find the final jump, and write the addition equation.

PROFICIENT students are able to label the size of the jumps and correctly label the number line. They most likely are able to combine the hundreds in a single jump and the tens in a single jump with few errors.

- **Exercise 6:** Have students explain how they find the size of the last jump. Ask them to show one jump for the hundreds, and ask what the size would be.

Additional Support

- Have students model jumps with base ten blocks or quick sketches and label the number line for each partial sum. They may also be able to make single jumps for the hundreds and tens using models as support.

Extension: Adding Rigor

- Draw an open number line with the starting number, jumps, and final sum. Trade with a partner and write the size of the jumps and the addition equation that the number line models.

Name _____

Apply and Grow: Practice

7. $4 + 0 = \square$

8. $3 + 7 = \square$

9. $15 - 7 = \square$

10. $17 - 8 = \square$

11. $10 + 10 = \square$

12. $8 - 0 = \square$

13. $9 + 2 = \square$

14. $18 - 9 = \square$

15. _____ $= 9 + 1$

16. _____ $= 4 + 5$

17. _____ $= 11 - 8$

18. _____ $= 9 - 5$

19. _____ $= 7 + 9$

20. _____ $= 7 - 1$

21. _____ $= 8 + 4$

22. _____ $= 14 - 7$

23. MP **Repeated Reasoning** Find the missing addend. Explain how you solved.

$$8 + \_\_\_\_\_ = 13$$

_____

_____

Check out the Dynamic Classroom.
BigIdeasMath.com

3.4

Laurie's Notes

STATE STANDARDS
2.OA.A.1, 2.NBT.B.5

Learning Target

Break apart a number to add.

Success Criteria

- Beak apart an addend into tens and ones.
- Add the tens to the first addend, then add the ones.
- Write the sum.

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 *compose* means "put together." It is often used to describe creating a piece of music or writing. The prefix *de-* indicates separation. So, when you *decompose*, you separate or break apart.

Preparing to Teach

In this lesson, students break apart only one addend to add two non-decade numbers, adding tens to the first number and then adding the ones. This is similar to what students did with the hundred chart, beginning with one value, then moving down one row for each group of 10, and over for each unit of 1. Now students will use symbolic notation to record the process and find the sum.

Materials

- Hundred Chart*
- base ten blocks

**Found in the Instructional Resources*

Dig In (Circle Time)

Place 3 rods and 7 unit cubes where all students can see. Students use base ten blocks to observe the patterns to the tens digit when a group of ten is added.

? "What number is represented by the base ten blocks?" Add another rod. "How much did I just add to the number?" Redirect answers of 1 rod to recognizing it as a value of 10. "Now how much do you see? Let's continue adding a group of 10 and say together the new total every time I add another rod." Starting at 47, add one rod at a time and choral count together 57, 67, 77, 87, 97. Write the numbers on the board. "What do you notice about the tens digits?"

? Reset the rods and cubes to 37. "What if this time we add 2 rods each time. How much will we be adding?" Repeat the action of adding rods and saying the resulting number in unison, 37, 57, 77, 97." Students may be counting the rods in the visual representation to say the next number, that is okay. Write the numbers just stated on the board.

? **Turn and Talk:** Point to the numbers on the board. "When we counted by 20s, we repeatedly added 20. Tell your partner how the tens digit changes each time. What happens to the ones digit? Why?" Listen for statements that indicate that the ones digit doesn't change because no ones units were added.

- **MP8 Look for and Express Regularity in Repeated Reasoning:** Next write 37, 67, 97 on the board. "Which value changes the tens or the ones? If we start at 37 and count these numbers, what number was added each time?" Help students see that the tens value increases by 3 tens each time, therefore 30 is added. To verify, show adding 3 rods to 37 and counting the tens in the new sum.
- **Extension:** How do the numbers in the sequence 21, 42, 63, 84 change? If you wanted to count to these numbers starting at 21, how much would you need to add each time?

? Teaching Prompt Learning Target

Check out the Dynamic Classroom.
BigIdeasMath.com

5.5

Laurie's Notes

STATE STANDARDS
2.OA.A.1, 2.NBT.B.5

Learning Target

Break apart two-digit numbers to subtract.

Success Criteria

- Break apart the number being subtracted into tens and ones.
- Subtract the tens.
- Break apart the ones to get to a decade number.
- Subtract the other partner number to find the difference.

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 *break apart* is a phrasal (compound) verb. Sometimes the words of a phrasal verb cannot be separated. However, the verb *break apart* can be used two ways: with words together or separated. "I break apart the number. I break the number apart."

Preparing to Teach

Students extend the strategy of the last lesson and break apart a two-digit subtrahend. The subtraction equation is done in several steps that should be familiar to students. Having a visual image of where the numbers are located on the hundred chart is a helpful tool. The hundred chart also helps students make sense of the steps involved as they are subtracting.

Materials

- whiteboards
- Hundred Chart*
- colored pencils

**Found in the Instructional Resources*

Dig In (Circle Time)

Display a Hundred Chart for students to see and provide a Hundred Chart for each pair of students. Students use their whiteboards to record a sequence of problems.

- "Use your hundred chart to solve 36 − 14." Do students recall to circle 36, jump up one row, and then jump back 4 to the left? "Write the problem and your answer on your whiteboard."

? **MP2 Reason Abstractly and Quantitatively:** Repeat this two more times, finding the differences 35 − 14 and 34 − 14. "How are these problems alike? How are they different?" All are subtracting 14; the starting number is going down by one each time; the difference is going down by one each time.

- **MP8 Look for and Express Regularity in Repeated Reasoning:** "What do you think will happen if we try another problem, 33 − 14?" Give think time. Elicit responses. Listen for understanding that it is not possible to jump 4 to the left without moving up one row and going all the way to the right to 20, a decade number.

Have students [illegible] poin

◉ Refe subt will ones with

Indicator 2f - The Teaching Edition prompts teachers to ask students what they think will happen when they find 33-14. Students are to use their prior knowledge of 36 - 14, 35 - 14, and 34 - 14 from above and repeated reasoning to solve this problem.

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.

? Teaching Prompt ◉ Learning Target

9.4

Check out the Dynamic Classroom.
BigIdeasMath.com

Laurie's Notes

STATE STANDARDS
2.NBT.B.7

Learning Target

Use compensation to add.

Success Criteria

- Explain how to use compensation to add.
- Add to or take from an addend to make a hundred.
- Write the sum.

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

Remind students that they learned the word *compensation* in Chapter 3. Ask what they remember. Remind them that compensation involves an exchange. For example, in exchange for work a person is given money. The money is the worker's compensation.

Preparing to Teach

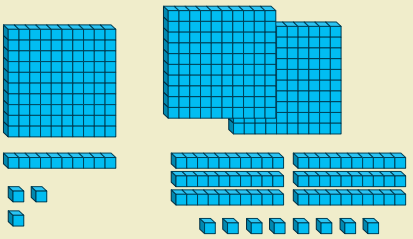
In this lesson, students use compensation to add. The Dig In Activity reminds students that adding and taking away the same amount from two addends will not affect the sum. Students practice adding and taking away to make one group of a hundred.

Materials

- base ten blocks
- whiteboards

Dig In (Circle Time)

Each partner models a three-digit number using base ten blocks. One partner is asked to give some of their blocks to the other partner so that their number will be easy to add using mental math.



? Partner A models 113 and Partner B models 268. "How can you use your blocks to add these two numbers?" Push the blocks together and count. "What is the sum?" 381

- Have students take their blocks back so the two numbers, 113 and 268 are obvious.

? "What numbers are easy to add in your head?"

? "Let's add the numbers again, but I'm going to ask Partner A to give 13 blocks to Partner B first. Why would I ask Partner A to do this?" They only have 100 left, and that's easy to add. "Partner B, what number do you have now?" 281 "Can you add 100 + 281 in your head?" yes "What is the sum?" 381 "We found a sum of 381 both ways! Let's record what you just did." Write the compensation notation.

$$\begin{array}{rcr} 113 & + & 268 \\ -\ 13 & & +\ 13 \\ \hline 100 & + & 281 \end{array}$$

? **MP8 Look for and Express Regularity in Repeated Reasoning:** "What if the problem was 148 + 297? How could we make this an easier problem to add?" Pause. If students are unsure, ask, "Which addend is close to a hundred?"

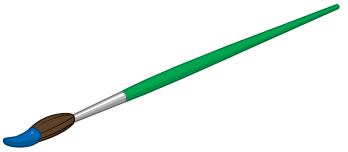
- Have students model the problem 148 + 297. Do students understand that by subtracting 3 from 148 and adding 3 to 297, the sum is the same, 445?

◉ "Do you recall what we call it when we subtract some from one addend and add it to the other addend to make the problem easier to add?" Pause. "We are going to use compensation today to add two numbers."

? Teaching Prompt ◉ Learning Target

Think and Grow: Modeling Real Life

You paint 12 shapes. 8 are rectangles. The rest are circles. How many circles do you paint?



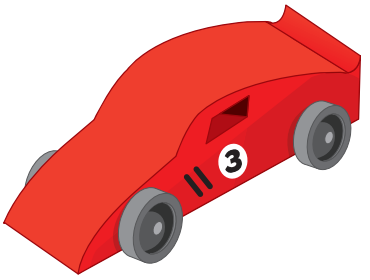
Write two equations that describe your shapes:

____ + ____ = ____ ____ + ____ = ____

____ circles

Show and Grow *I can think deeper!*

11. There are 13 race cars. 6 of them have numbers. The rest do not. How many race cars do *not* have numbers?



Write two equations that describe your cars:

____ + ____ = ____ ____ + ____ = ____

____ cars

Explain how you know your answer is correct.

_____

_____

_____

Use compensation to add.

5. 75 + 6 = ____

○ ____ ○ ____

____ + ____ = ____

6. 44 + 38 = ____

○ ____ ○ ____

____ + ____ = ____

7. **Writing** Explain why you make one addend a decade number when using compensation to add.

_____

_____

_____

8. **Modeling Real Life** You want to read 50 pages. You read 18 on Monday and 27 on Tuesday. Do you reach your goal?

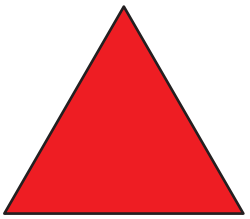
Yes No

Review & Refresh

Draw one line to show the parts.

9. 2 squares

10. 2 triangles



Name _____

Practice Two-Digit Subtraction 6.6

Learning Target: Subtract two-digit numbers.

Explore and Grow

Work with a partner. Choose different strategies to find 76 − 29.

Subtraction Strategies

Subtract on an Open Number Line

Add On to Subtract

Break Apart

Compensation

Model and Regroup to Subtract

Compare your strategy to your partner's. Are your answers the same? Which strategy do you prefer? Why?

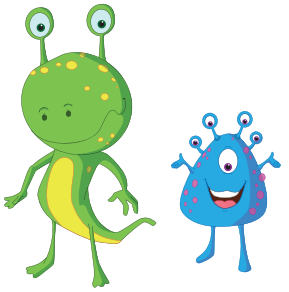
_____

_____

_____

Think and Grow: Modeling Real Life

Newton has 65 points. He captures small aliens worth 5 points. Descartes has 25 points. He captures large aliens worth 10 points. Who needs to capture more aliens to reach 100 points?

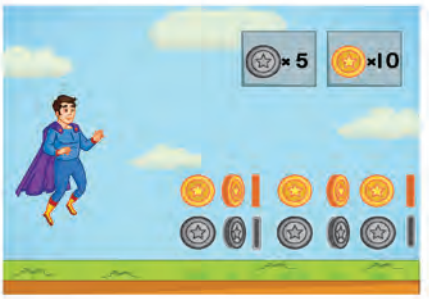


Models:

Who needs more aliens? Newton Descartes

Show and Grow *I can think deeper!*

12. Newton has 55 points. He collects gold coins worth 10 points. Descartes has 70 points. He collects silver coins worth 5 points. Who needs to collect more coins to reach 100 points?



Newton Descartes

13. You and your friend count from 30 to 70. You count by fives. Your friend counts by tens. Who says more numbers? Explain.

_____

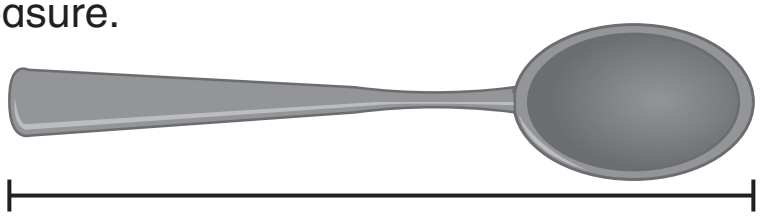
_____

Name _____

Apply and Grow: Practice

Measure.

4.



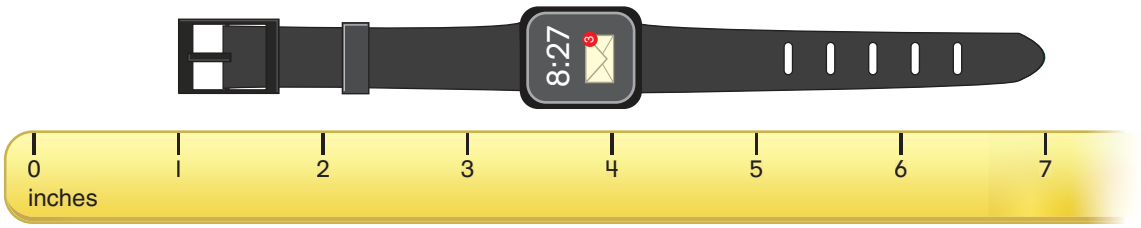
about _____ inches

5.

about _____ inches

6. Draw a crayon that is about 4 inches long.

7. **YOU BE THE TEACHER** Your friend says the watch is about 6 inches long. Is your friend correct? Explain.



_____

_____

Name _____

Measure Objects Using Different Length Units

11.7

Learning Target: Measure the same object using two different measurement units.

Explore and Grow

Measure the length of the string in inches then in centimeters.

_____ inches

_____ centimeters

Are there more inches or centimeters? Why?

Indicator 2g.i - In the Explore and Grow, students must use what they have learned to build a logical argument about why there are more centimeters.

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.

Name _____

Find Total Values of Bills 14.6

Learning Target: Find the total value of a group of bills.

Explore and Grow

Model the story.
Descartes has three $5 bills and three $1 bills. How much money does he have in all?

_____ dollars

Explain how you solved.

_____

_____

_____

_____

Name _____

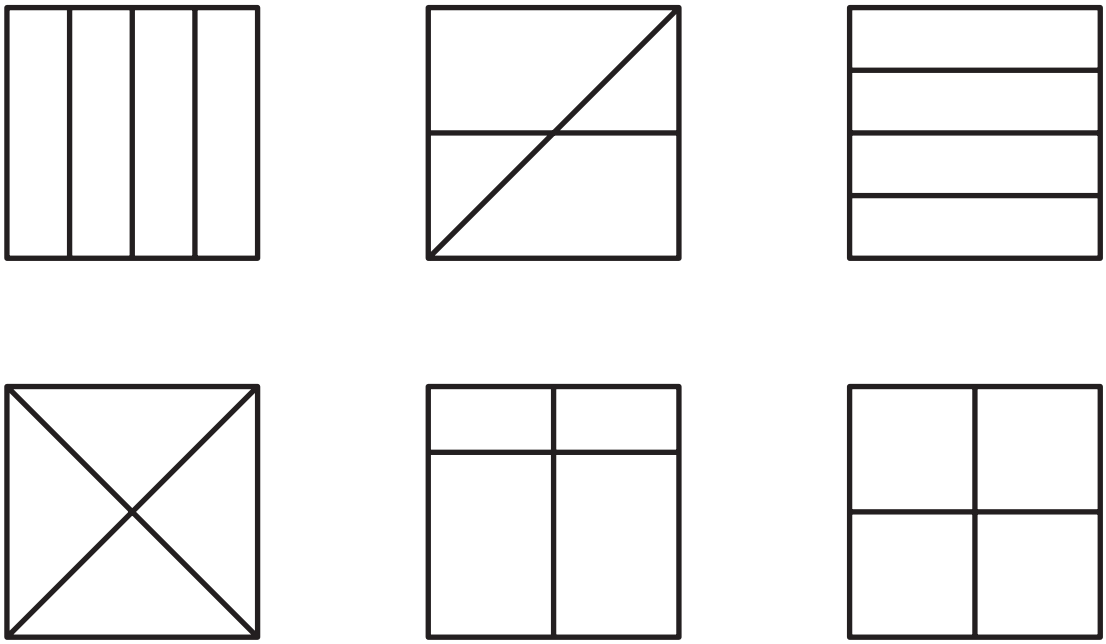
Analyze Equal Shares of the Same Shape

15.8

Learning Target: Draw to show halves, thirds, and fourths in different ways.

Explore and Grow

Color the squares that show equal shares.



How are the squares you colored the same?
How are they different?

_____

_____

_____

Check out the Dynamic Classroom.
BigIdeasMath.com

4.3

Laurie's Notes

STATE STANDARDS
2.OA.A.1, 2.NBT.B.5

Learning Target
Use regrouping to add.

Success Criteria
- Make quick sketches to show regrouping.
- Show 10 ones regrouped as 1 ten.
- Solve the addition problem.

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

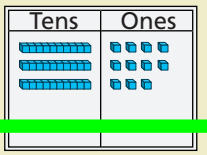
ELL Support
Students should be familiar with the word *group*. Explain that the prefix *re-* means "again." Ask them what they think *regroup* means.

Preparing to Teach
Students have modeled, sketched, and recorded addition of 2 two-digit numbers. The partial sums have helped them think about and make sense of what it means to add two numbers. The big step today is taking the partial sum that resulted in a teen number and thinking of it as a group of 10 plus some more ones. This is called *regrouping* when we record the process in the standard algorithm.

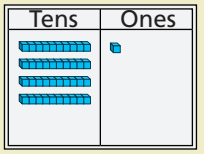
Materials
- base ten blocks
- Place Value Mat 1 or 2*

* *Found in the Instructional Resources*

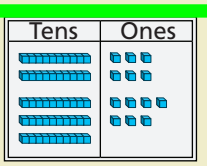
Dig In (Circle Time)
Begin with a quick game of *What's My Number?* Students then use base ten blocks to model the sum of 2 two-digit numbers on a Place Value Mat. They exchange 10 ones for a rod when needed.



- Use a Place Value Mat to display rods and units for the numbers 52, 48, and 23. For each, ask "What's my number?"
- On the fourth example, use 3 rods and 11 units.
- **MP3 Construct Viable Arguments:** How do students know this is 41? You want to hear an explanation of exchanging or replacing 10 units for 1 rod.



? "Is one rod and one unit the same as 11 units?" yes "How do you model this with your blocks?"
- **MP1 Model with Mathematics:** Now that students have modeled exchanging 10 units for 1 rod they try an addition problem where an exchange is needed.



- "Use your blocks to model 26 + 37." Note: This problem was modeled in the last lesson but without a Place Value Mat. "Tell your partner how you solved this problem." Listen for 50 + 13 is the same as 60 + 3 when you exchange the 10 ones for a ten.
- Listen for discussion about the partial sum of 13 ones. Students should make the connection that they can remove 10 units from the mat and exchange them for 1 rod in the tens column.
- Ask for volunteers to demonstrate how they solved. Listen for the language of exchanging 10 units for 1 rod.

◉ "You modeled how to exchange 10 units for 1 rod. You regrouped 13 ones as 1 ten and 3 ones. We call this regrouping. Do you think you can draw a quick sketch to show how to regroup?"

? Teaching Prompt ◉ Learning Target

Check out the Dynamic Classroom.
BigIdeasMath.com

6.2

Learning Target

Use models to subtract a one-digit number from a two-digit number.

Success Criteria

- Tell whether I need to regroup.
- Exchange 1 ten for 10 ones if regrouping.
- Solve for the difference.

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 students will work with one-digit and two-digit numbers. Point out that the words *one-digit* and *two-digit* are each made using two words with a line (hyphen) between them. Hyphenated words use the meanings of more than one word to express an idea. Use the 41 and the 3 as examples of two-digit and one-digit numbers, counting each digit as you explain what they are.

Laurie's Notes

COMMON CORE STATE STANDARDS
2.OA.A.1, 2.NBT.B.5

Preparing to Teach

Students have now modeled and sketched the subtraction of a one-digit number from a two-digit number. Some of the problems required regrouping. In this lesson students learn to record their work in a subtraction chart which will look similar to an addition chart. For this reason, remind students that the operation symbols (+ and −) are very important and must be drawn clearly. Problems are still a two-digit number minus a one-digit number.

Materials

- whiteboards and markers

Dig In (Circle Time)

Students are shown a subtraction problem and use thumbs up if regrouping is needed or thumbs down if regrouping is not needed.

- "I am going to write a subtraction problem on my board. I want you to visualize what it would look like with base ten blocks or a quick sketch. If you can do the problem without regrouping, meaning exchanging 1 ten for 10 ones, give a thumbs down. If you had to regroup to do the problem, give a thumbs up. If you are not sure, show a sideways thumb."
- Write problems on your whiteboard. Display to the students.
- **Think Time:** Tell students to give think time before using their thumbs. You want all students to have sufficient think time before any student reveals their thinking.

38 - 5 = _____
23 - 9 = _____
44 - 6 = _____
37 - 7 = _____
30 - 4 = _____

- **MP3 Construct Viable Arguments:** "How can you tell if you need to regroup?" Students may answer, "I look at how many ones I have in the first number. If the second number is less, I don't have to regroup." This is not precise and some students may comment on this. They might also note that if the second number (subtrahend) is the same as the value of the ones digit in the first number (minuend), you don't need to regroup.
- **Extension:** Students write an example on their whiteboard that does/does not require regrouping.
- "You are very good at telling when you need to regroup when we have a subtraction problem. Today you are going to learn how to record the regrouping when you subtract. That is the second success criterion."

? Teaching Prompt Learning Target

Laurie's Notes

ELL Support

After completing the example, have students work in pairs to complete Exercises 1 and 2. Have one student ask another, "What is the order of addends in the first example? in the second? What is the answer?" Have them alternate roles for each exercise.

Beginner students may answer with numbers.
Intermediate students may answer with phrases or simple sentences, such as, "four, then seven."
Advanced students may answer with more detailed sentences, such as, "The addends are four, then seven."

Think and Grow

Getting Started

- Discuss the vocabulary words **addend**, **sum**, and **expression**. *Addition, plus, equals, equation* and *count on* might need to be reviewed as you move through this lesson.
- Although the Commutative Property seems obvious as adults, students will still need to test and confirm the property through the exercises. In later grades, students often believe the Commutative Property is true for sums within 10, but not true for greater values. For this reason, helping students reason about why the Commutative Property works is equally important as finding the sums. Remember, referencing the property by name is optional, and understanding its meaning is the goal.

Teaching Notes

- Students first use linking cube trains to write equal expressions using the same addends.
- Newton and Descartes are discussing the equations and make a conclusion. "Who can say their thinking in another way?"
- **Model:** "Tell your partner what the red and blue linking cube trains are modeling." $4 + 7 = 11$ and $7 + 4 = 11$. Have students say it with you emphasizing the *and* between the two equations. "What do you think is easier, adding four plus seven or seven plus four?" Listen for the strategy of counting on from the greater addend.
- **Extension:** Write the expressions $4 + 7$ and $7 + 4$ vertically and ask if you can add in any order when you write the problem vertically.
- As students complete Exercises 1 – 2, observe if students are correctly writing the two equations as modeled by the linking cubes. Students may not recognize the connection between the order of the colors in the cubes and the order of the addends.
- Circulate as students complete the exercises. How are students finding the sums? Are they counting all or counting on? Stress the efficiency of counting on from the greater addend.
- **Supporting Learners:** Some students will automatically understand the Commutative Property. Others will treat each equation as a separate problem. Help them reason about the cube train, asking if any cubes were added or removed. If needed, build the trains and have students rotate the train around for themselves. Ask if the total number of cubes has changed.
- **Extension:** Challenge students to create pairs of commutative equations with sums greater than 20 (horizontal and vertical).

Check out the Dynamic Classroom.
BigIdeasMath.com

2.2

Laurie's Notes

STATE STANDARDS
2.OA.A.1, 2.OA.B.2

Learning Target

Use the *doubles plus 1* and *doubles minus 1* strategies to find a sum.

Success Criteria

- Identify when to use a *doubles plus* (or *minus*) *1* strategy.
- Use a double to help find the sum.
- Exp
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Preparing to Teach

Our lesson today will continue to use the Addition Fact Chart to explore doubles facts to add *near doubles*. Students used this strategy in Grade 1 and may recall that near doubles are when we are adding two numbers that differ by 1. So the addition problem 5 + 6 is near the doubles facts 5 + 5 and 6 + 6. We want students to reason that if they choose the doubles fact 5 + 5, they need to add 1 to answer 5 + 6. If they choose the doubles fact 6 + 6, they need to subtract one to answer 5 + 6.

Materials

- Addition Fact Chart*
- crayons

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

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.

Warm

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Think-Pair-Share: "Today we are going to use a strategy that uses doubles. How can we use 3 + 3 to help us find 3 + 4?" Give sufficient think time before partner sharing. During the whole class share, probe student reasoning with questions such as, "Is 3 + 4 more or less than 3 + 3? How do you know? Can you find 3 + 3 and 3 + 4 on the Addition Fact Chart? Can 4 + 4 be used to find 3 + 4? How?"

Record the relationship of adding or subtracting 1 based on the chosen double. To make it very clear, use one color for the double (3 + 3 or 4 + 4) and another color for the plus or minus 1.

$3 + 4 = 7$

$3 + 3 + 1 = 7$

- Practice with other addition problems. Students should state which double they are using and if they are adding or subtracting 1.

ELL Support

There are many uses for the word *double*. One is having two of the same thing. For example, when you roll a double on a pair of dice, the two dice show the same number.

Teaching Prompt Learning Target

5.3

Check out the Dynamic Classroom.
BigIdeasMath.com

Laurie's Notes

STATE STANDARDS
2.OA.A.1, 2.NBT.B.5

Learning Target

Use addition to subtract on an open number line.

Success Criteria

- Count on from a number to a greater number.
- Explain how to count on to subtract.
- Write the difference.

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

Review the concept of opposites. Write the following words on the board and read aloud as students repeat: add, addition, closed, open, subtract, subtraction. Have them work with a partner to pair the opposites. Then review how each word functions, as a noun (name), a verb (action), or an adjective (description).

Preparing to Teach

Students should have a familiarity with the inverse relationship of addition and subtraction. In Lesson 2.5, they counted on and counted back to subtract. In this lesson, students *add on* from a number and model this on an open number line. Since students have gone over a decade number when adding on, there will be subtraction problems in this lesson that go over a decade number.

Materials

- Hundred Chart*
- Part-Part-Whole Mat*
- linking cubes

**Found in the Instructional Resources*

Dig In (Circle Time)

Students see a hundred chart model of a problem and are asked to write the problem. There are two, the related addition and subtraction equations.

- Display a Hundred Chart similar to the one shown.

31	32	33	34	35	36	37	38	39	40
51	52	53	54	55	56	57	58	59	60

? "What problem does this hundred chart show? Explain."

- **Turn and talk:** Give time for students to talk with a partner. You want to hear 33 + 23 = 56 and 56 − 23 = 33.
- **MP3 Construct Viable Arguments and Critique the Reasoning of Others:** "I think it is 56 − 23 = 33. The circled 56 is the starting number. If you move up two rows, that is subtracting 20. Then move back 3 ones and that is 33, the answer (difference)." Have students critique the reasoning. A similar argument should be made for counting on from 33 to 56.
- Now show another hundred chart and ask similar questions. The difference now is the problem requires going over a decade number.

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

- **MP3 Construct Viable Arguments:** "I think it is 28 + 16 = 44. If you start at 28 and move down one row that is adding 10. Then move right 2 to 40 and that's adding 2. Then you move down to the next row and count from 41 to 44 and that is adding 4. So, 10 + 2 + 4 = 16."
- It is important to discuss the steps in subtracting back from 44: move up one row (−10), move to the left three (−3), and now move up one row but you have to start at the right side and count 30, 29, 28 (−3). Spend sufficient time with this counting process.

◉ "You have used a hundred chart to model related subtraction and addition problems. Today, we will use the number line to *add on* to solve a subtraction problem."

? Teaching Prompt ◉ Learning Target

10.4

Laurie's Notes

Check out the Dynamic Classroom.
BigIdeasMath.com

STATE STANDARDS
2.NBT.B.7

Learning Target

Use compensation to subtract.

Success Criteria

- Add to or subtract from both numbers.
- Write the numbers that make it easier to subtract.
- Write the difference.
- Explain how to use compensation to subtract.

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

Remind students that they used the strategy of compensation in Chapter 9. Review that compensation involves an exchange. In this chapter they will learn how to apply the compensation strategy to subtracting three-digit numbers.

Preparing to Teach

In this lesson, students use compensation to subtract. They should find the reasoning to be the similar to how compensation is used in addition. Students practice subtracting an amount greater (or less) than what a problem states and then compensate by adding (or subtracting) the same amount to (from) the difference.

Materials

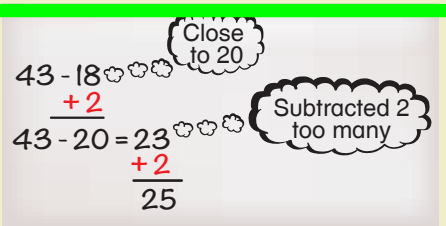
- whiteboards and markers

Dig In (Circle Time)

Students practice compensation with two-digit numbers.

? "We are going to practice a subtraction strategy that you learned earlier this year. Who can explain compensation?"

"Let's practice a compensation problem together. Talk through the mental math decision of subtracting 20 because it is a decade number close to 18."



- "Now it is time for you to try a few. You can write the problem on your whiteboard. Use mental math to find the answer or record your thinking. This is not about being fast at subtraction. I want you to think about the process."

  Problems to try: 46 − 9; 62 − 37; 79 − 43; 79 − 52
- For each problem, ask at least one student share their thinking.

? **MP8 Look For and Express Regularity in Repeated Reasoning:** "What if the problem were 243 − 198? How could we make this an easier problem to subtract?" Pause. Ask a few students to share how they think about compensation with three-digit numbers.

◉ "When you used compensation with two-digit numbers you wanted to make the number you were subtracting a decade number. Today we are going to use compensation to subtract three-digit numbers. Do you think your reasoning will be similar?"

13.4

Laurie's Notes

Check out the Dynamic Classroom.
BigIdeasMath.com

STATE STANDARDS
2.MD.D.10

Learning Target

Understand the data shown by a bar graph.

Success Criteria

- Use a bar graph to answer questions.
- Explain how to use 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

Students may be familiar with the word *bar* as it is used to describe a candy bar, bar of soap, or an exercise bar. Explain that in the phrase *bar graph*, the word *bar* describes the columns in the graph. Ask students to draw the shape of a bar and display it for your review. If they are unfamiliar with it, draw one on the board.

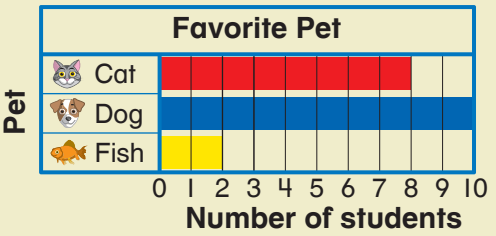
Preparing to Teach

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.

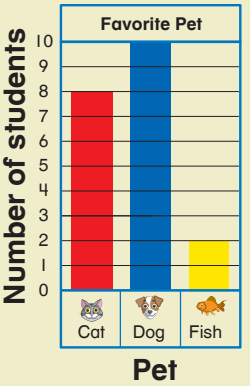
Dig In (Circle Time)

Students will compare the tally chart and picture graph from Lesson 13.2 with a bar graph of the same data.

- "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 13.2. Begin making a bar graph of the data on the board, or chart paper. "This is our tally chart and picture graph from the other day. To make it a bar graph, 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 along the edge of the graph. What do these numbers at the bottom of the graph look like?" a number line



- "As you look at the three representations, how are they alike? different? What else do you notice?"
- "Think about the Tile Colors picture graph from yesterday. Which graph would you use to tell how many tiles are red? Which graph would you use to tell how many more tiles are blue than yellow? Why?"
- Ask a few questions about the graphs such as, "How many tiles are there altogether? How many more tiles are red than blue?"
- "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." Notice the numbers along the edge so you know how many are in each category.
- "Today, we are going to use bar graphs to show how many are in a group and to answer questions about the group."



? Teaching Prompt ◉ Learning Target