



Second Grade Math

Study an Example Problem and Solution

Read this problem about adding to solve real-world problems. Then look at Beau’s solution to the problem.

Robot Motors

Beau wants to build a shelf to store his 20 robot motors. Look at his plan.



Shelf Plan

- Use more than 1 shelf.
- Put the same number of motors on each shelf.



How many shelves should Beau make? How many motors should he put on each shelf?

Show how Beau’s solution matches the checklist.



Problem-Solving Checklist

- | | |
|---|---|
| <input type="checkbox"/> Tell what is known. | a. Circle something that is known. |
| <input type="checkbox"/> Tell what the problem is asking. | b. Underline something that you need to find. |
| <input type="checkbox"/> Show all your work. | c. Draw a box around what you do to solve the problem. |
| <input type="checkbox"/> Show that the solution works. | d. Put a checkmark next to the part that shows the solution works. |



Hi, I'm Beau.
Here's how I solved
the problem.

Beau's Solution

▶ **I know** I have 20 robot motors to put on more than 1 shelf. Each shelf has the same number of motors.

▶ **I need to find** how many to put on each shelf.

▶ **I can skip count** to add the same number to try to get to 20.

By 2s: 2, 4, 6, 8, 10, 12, 14, 16, 18, **20**

By 3s: 3, 6, 9, 12, 15, 18, 21, 24

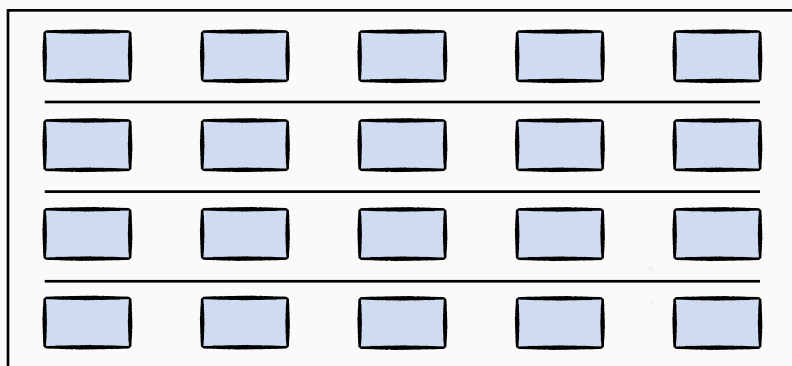
By 5s: 5, 10, 15, **20**

Skip counting
by 3s does not
work, but 2s
and 5s work.

▶ **I will try 5** motors on each shelf.

▶ **I can draw a picture** of 5 motors on 1 shelf.

Then I can draw more shelves with 5 motors on each shelf.



After I drew
4 shelves I had
20 motors.

▶ **I need 4 shelves.**

▶ **Add** all the rows to check. $5 + 5 + 5 + 5 = 20$.

▶ **Use 4 shelves. Put 5 motors on each shelf.**

Try  **Another Approach**

There are many ways to solve problems. Think about how you might solve the Robot Motors problem in a different way.

Robot Motors

Beau wants to build a shelf to store his 20 robot motors. Look at his plan.




Shelf Plan

- Use more than 1 shelf.
- Put the same number of motors on each shelf.



How many shelves should Beau make? How many motors should he put on each shelf?

 **Plan It** Answer this question to help you start thinking about a plan.

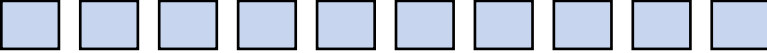
What numbers can you use for the number of shelves?
Explain how you know.

► **Solve It** Find a different solution for the Robot Motors problem. Show all your work on a separate sheet of paper.

You may want to use the problem-solving tips to get started.

Problem-Solving Tips

• Models



• Word Bank

skip count	add	total
array	row	column

• Sentence Starters

- I can use two _____
- Each shelf holds _____ motors.

Problem-Solving Checklist

Make sure that you . . .

- tell what you know.
- tell what you need to do.
- show all your work.
- show that the solution works.

► **Reflect**

Use Mathematical Practices Talk about this question with a partner.

- **Use a Model** What addition equations can you use to check your answer? What do they show?

**Solve the problem on a separate sheet of paper.
There are different ways you can solve it.**

Rock Collection

Beau is sorting some of the rocks in his rock collection. He puts the rocks on the 4 trays below.



Two trays have an even number of rocks.
Two trays have an odd number of rocks.
Each tray can hold 20 or fewer rocks.

even number

odd number

even number

odd number

What are some ways Beau can put rocks on these trays?

► **Plan It and Solve It** Find a solution to Beau's Rock Collection problem.

Use a separate sheet of paper.

- Write two different odd numbers and two different even numbers.
- Show how you know each number is even or odd.

You may want to use the problem-solving tips to get started.

Problem-Solving Tips

• **Questions**

- What are the numbers I can choose from?
- Which numbers can make equal groups?

• **Word Bank**

odd number equal groups doubles
even number leftover doubles + 1

• **Sentence Starters**

- I can make equal groups with _____
- There are _____ in each group.
- Skip count by _____

Problem-Solving Checklist

Make sure that you . . .

- tell what you know.
- tell what you need to do.
- show all your work.
- show that the solution works.

► **Reflect**

Use Mathematical Practices Talk about this question with a partner.

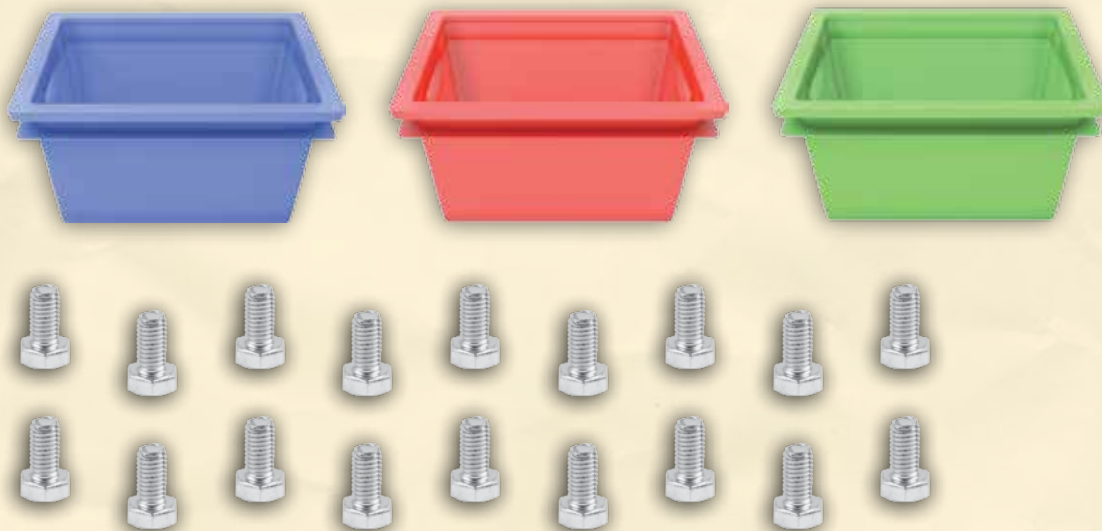
- **Use a Model** How can you use pictures to show that your answers make sense?

Persevere On Your Own

Solve the problem on a separate sheet of paper.

Nuts and Bolts

Beau has 18 bolts. He has 3 boxes to put them in.
He wants to put at least 3 bolts in each box.



How many bolts can Beau put in each box?

► **Solve It** Show one way that Beau can put the bolts in the boxes.

- Draw a picture.
- Tell how many bolts to put in each box.
- Explain why your answer works.

► **Reflect**
Use Mathematical Practices Talk about this question with a partner.

- **Make Sense of Problems** How did you decide how many bolts to put in each box?

Science Project

Beau has 17 jars. He needs an even number of jars for a science project. He will put the rest of the jars on a shelf.



How many jars could Beau use for the science project?
How many will be left to put on the shelf?

► **Solve It** Tell how many jars Beau could use and how many will be left to put on the shelf.

- Draw a picture.
- Circle an even number of jars Beau can use.
- Find the number of jars Beau will put on the shelf.
- Show that the total number of jars is 17.

► **Reflect**

Use Mathematical Practices Talk about this question with a partner.

- **Check Your Answer** What did you do to check that your answer makes sense?

Introduction

At A Glance

Students examine a problem about deciding how many shelves to build and how many items to put on each shelf. The math involves skip-counting and repeated addition. Students discuss the problem to understand what it is asking and brainstorm different approaches. Then they refer to a problem-solving checklist to analyze a sample solution and identify what makes it a good solution.

Step By Step

- Read the problem aloud with students.
- Direct students' attention to the numbers given in the problem. Invite volunteers to explain what each number means within the context of the problem. [20 is how many motors, more than 1 shelf could be 2, 3, 4, or any greater number.]
- Invite volunteers to rephrase what Beau wants to do. Ask clarifying questions such as: *How many shelves is "more than 1 shelf?"* [any number more than 1] *Could he put 19 motors on one shelf and 1 on another shelf?* [No, 19 and 1 aren't the same number.]

▶ Mathematical Discourse 1

- Invite students to share their ideas about how they might begin or approach solving this problem. [for example, draw a picture, use 20 counters, try 2 shelves] Write these on the board. Allow students to describe different approaches without carrying through with an actual solution yet.
- Explain that students will look at the sample solution on the next page to see one way the problem could be solved. Then they will read the solution again and discuss what makes it a good solution by using the **Problem-Solving Checklist**.

Study an Example Problem and Solution

Read this problem about adding to solve real-world problems. Then look at Beau's solution to the problem.

Robot Motors

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Shelf Plan

- Use more than 1 shelf.
- Put the same number of motors on each shelf.



How many shelves should Beau make? How many motors should he put on each shelf?

Show how Beau's solution matches the checklist.



Problem-Solving Checklist

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| <input type="checkbox"/> Tell what is known. | a. Circle something that is known. |
| <input type="checkbox"/> Tell what the problem is asking. | b. Underline something that you need to find. |
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| <input type="checkbox"/> Show that the solution works. | d. Put a checkmark next to the part that shows the solution works. |

▶ Mathematical Discourse

- 1 *Can you think of another situation where someone might put things on shelves, or in boxes, with the same number in each group?*
Students might be able to come up with ideas about displaying items, or packing objects. For example, they might put 4 crackers on each plate at snack time, or they might hang pictures on a wall with 3 pictures in each row.

Beau's Solution

▶ **I know** I have 20 robot motors to put on more than 1 shelf. Each shelf has the same number of motors.

▶ **I need to find** how many to put on each shelf.

▶ **I can skip count** to add the same number to try to get to 20.

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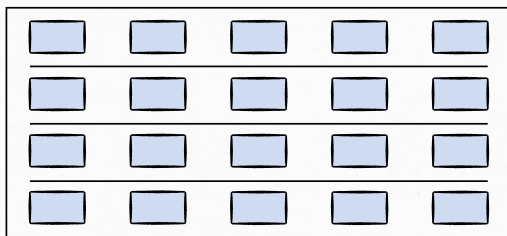
By 3s: 3, 6, 9, 12, 15, 18, 21, 24

By 5s: 5, 10, 15, **20**

▶ **I will try 5** motors on each shelf.

▶ **I can draw a picture** of 5 motors on 1 shelf.

Then I can draw more shelves with 5 motors on each shelf.



▶ **I need 4 shelves.**

▶ **Add** all the rows to check. $5 + 5 + 5 + 5 = 20$.

▶ **Use 4 shelves. Put 5 motors on each shelf.**

Hi, I'm Beau.
Here's how I solved
the problem.

Skip counting
by 3s does not
work, but 2s
and 5s work.

After I drew
4 shelves I had
20 motors.

Step By Step

- Explain that this page shows one way to solve the problem.
- Read through Beau's solution together, one section at a time. Read for understanding, helping students with any language challenges.
- Tell students that the speech bubbles tell what Beau was thinking about as he wrote his solution. Read through the speech bubbles, and help students see how Beau is "talking to us" about what he wrote.
- Make sure students recognize where the '4' and the '5' come from in the solution. [4 shelves, 5 motors on each shelf]

▶ Hands-On Activity

- Be sure everyone agrees that this solution works. Encourage students to recognize that both the drawing and the addition equation help show that it works.

▶ Mathematical Discourse 2 and 3

- Then, as a class, go back to do a close read, using the **Problem-Solving Checklist** to help analyze Beau's solution.
- Explain that a really good answer to a problem like this does all the things on the checklist. Ask: *Where does Beau's answer tell information from the problem?* ["I have 20 robot motors to put on more than 1 shelf."] Have students circle that part.
- Then say: *In a really good answer, you want to write what you are going to figure out. Where did Beau write what he is going to figure out?* ["how many to put on each shelf"] *Underline that.*
- Similarly, lead students to mark where Beau showed his work, and where he checked his work. [Skip counting shows some work, and the drawing shows some work. Both the drawing and the equation show how he checked his work.]
- Tell students that since this is a good answer, they can look at it to get ideas when they write their own answers for this problem.

▶ Hands-On Activity

Act out placing 5 motors on each of 4 shelves.

Materials: 20 buttons or centimeter cubes, 1 sheet of paper

Have students fold the paper in half horizontally and, without unfolding, fold in half horizontally again. The resulting 4 rows will model the 4 shelves. Guide students to place 5 buttons across the top row, counting aloud. Repeat with remaining rows. Have a volunteer count to verify that there are 20 buttons.

▶ Mathematical Discourse

2 *How are the shelves like the rows of an array? How are the robot parts like the columns?*

Students may see that the shelves go across, like rows. If they struggle to connect the motors to columns, have them draw rings around each column of 4 squares in the illustration.

3 *Why is it helpful to use skip counting?*

If there are the same number of motors on each shelf, the total is found by repeated addition. Skip counting is one way to find the sum in repeated addition.

Modeled and Guided Instruction

At A Glance

Students plan and solve the Robot Motors problem from the Introduction using different numbers. Students demonstrate that the problem has more than one solution.

Step By Step

- Review and summarize the steps in Beau's solution. [Skip count to 20 by 2s, 5s, and 10s. Decide how many motors to put on each shelf. The number of shelves is how many times you count that number to get to 20.]
- Have students brainstorm some different steps than these that they might use to solve the problem. They might start by recognizing that 20 is an even number. Or they might begin by trying repeated addition with different numbers.

Plan It

- Read the **Plan It** question aloud. Invite students to share some initial responses. [For example, they might say they can try 5 or 10 shelves since you say 20 when you count by 5s or 10s.]
- Remind students that this problem has many correct answers.

► Mathematical Discourse 1 and 2

- Have students work independently to write an answer to the **Plan It** question. Tell students they will use their answers along with the **Problem-Solving Tips** on the next page to plan their answer.
- As students work on their plan, circulate to provide support and answer questions. Encourage them to look back at the sample solution for ideas.

MP TIP Reason Abstractly and Quantitatively

Encourage students to use numbers and math words in their plans. Ask them to explain what the numbers mean and how these relate to the problem context. (MP 2)

Try Another Approach

There are many ways to solve problems. Think about how you might solve the Robot Motors problem in a different way.

Robot Motors

Beau wants to build a shelf to store his 20 robot motors. Look at his plan.



Shelf Plan

- Use more than 1 shelf.
- Put the same number of motors on each shelf.



How many shelves should Beau make? How many motors should he put on each shelf?

► Plan It Answer this question to help you start thinking about a plan.

What numbers can you use for the number of shelves? Explain how you know.

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► Mathematical Discourse

1 How might skip counting help you answer these questions?

Students should see the connection between skip counting repeated addition, and equal groups.

2 What are some numbers that you can't use? Explain why you can't use them.

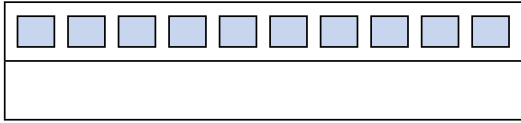
Help students extend their thinking to recognize inappropriate or incorrect solutions. They should be able to provide mathematical reasons why these numbers don't work. For example, you can't have 6 shelves because there is no whole number that you can add six times to get 20. Or, you can't put 8 motors on each shelf, because you will have 4 left over after 2 shelves and you don't have enough to fill 3 shelves.

► **Solve It** Find a different solution for the Robot Motors problem. Show all your work on a separate sheet of paper.

You may want to use the problem-solving tips to get started.

Problem-Solving Tips

Models



Word Bank

skip count add total
array row column

Sentence Starters

- I can use two _____
- Each shelf holds _____ motors.

Problem-Solving Checklist

Make sure that you . . .

- tell what you know.
- tell what you need to do.
- show all your work.
- show that the solution works.

► **Reflect**

Use Mathematical Practices Talk about this question with a partner.

- **Use a Model** What addition equations can you use to check your answer? What do they show?

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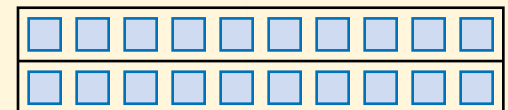
Step By Step

Solve It

- Introduce the **Problem-Solving Tips** as ideas students may use to explain their thinking when they write their solution.
- Invite students to share ideas about how they might use the model shown. Ask if there are other words that might be useful. Solicit suggestions for how they might complete each of the sentence starters.
- Model writing out the full solution shown below on the board or on chart paper.
- Discuss the **Reflect** question about using Mathematical Practices.
- Then have students write their own solutions. (They might be different or the same as the one on the board.)
- Encourage students to work out their ideas on scrap paper and try different approaches as necessary. Have them show their complete solution on a copy of Activity Sheet 23 (Solution Sheet 2).
- Provide materials such as buttons, centimeter cubes, small boxes, and paper rectangles for students to use to model their ideas.
- If time permits, students can explain their solutions to the class.

Possible Solution

I have an even number of robot motors (20). So I know I can use 2 shelves. Using doubles addition facts, I know that $10 + 10 = 20$. So I can put 10 motors on each shelf. The picture shows 2 rows with 10 motors in each row for a total of 20.



Scoring Rubric

Points	Expectations
4	The student's response is accurate and complete. All calculations are correct. The solution steps are complete and correct. Students show their work, including adding the number of motors on each shelf.
3	The solution steps and calculations are correct but might not be complete. The addition equation is correct but the number of motors and number of shelves might be reversed.
2	The student's response contains several mistakes. The explanation is inaccurate and might be missing details. The addition equation does not correctly represent the solution.
1	The student's response contains an incorrect solution. The explanation is incomplete and inaccurate. The student does not represent the solution with an addition equation.


Guided Practice
At A Glance

With **Problem-Solving Tips** as support, students understand, plan, and solve an open-ended, multi-step problem. They choose appropriate models and strategies to solve the problem, checking their thinking with a partner.

Step By Step

- Read the problem aloud with students. As you read, encourage students to ask clarifying questions about the number of rocks.

► Mathematical Discourse 1

- Direct students' attention to the illustration. Emphasize that two trays will hold an even number of rocks and two trays will hold an odd number of rocks. Be sure students understand the meaning of "20 or fewer."
- Discuss with students what they need to do [Write an appropriate number, even or odd, in each tray and explain how they know each number is even or odd].
- Write several numbers on the board, some that are odd and some that are even. Discuss with students.

► Mathematical Discourse 2
MP TIP Model with Mathematics

Encourage students to look for patterns and explain their strategies when identifying odd and even numbers. Some examples: doubles and doubles + 1, skip counting by 2s, making equal groups, drawing arrays, etc. (MP 4)

Discuss **Models and Strategies**

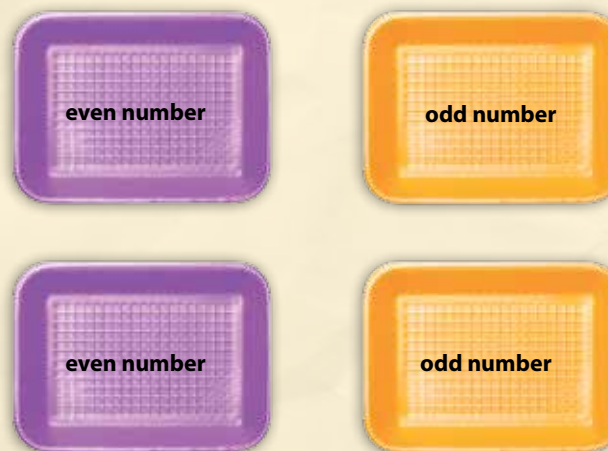
Solve the problem on a separate sheet of paper. There are different ways you can solve it.

Rock Collection

Beau is sorting some of the rocks in his rock collection. He puts the rocks on the 4 trays below.



Two trays have an even number of rocks.
Two trays have an odd number of rocks.
Each tray can hold 20 or fewer rocks.



What are some ways Beau can put rocks on these trays?

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► Mathematical Discourse

- 1 How many rocks do you think Beau has in all? Explain why you think this.

Listen for explanations that address the idea of each tray holding 20 or fewer rocks. Note that Beau can have no more than 78 rocks [max of 20 in the even number trays and max of 19 in the odd number trays].

- 2 Look at these numbers: 35, 16, 98, 42, 7, 63. Which numbers could you write on Beau's trays? How do you know?

Students should recognize that only numbers that are 20 or less can go in the trays.

► **Plan It and Solve It** Find a solution to Beau's Rock Collection problem.

Use a separate sheet of paper.

- Write two different odd numbers and two different even numbers.
- Show how you know each number is even or odd.

You may want to use the problem-solving tips to get started.

Problem-Solving Tips

• **Questions**

- What are the numbers I can choose from?
- Which numbers can make equal groups?

• **Word Bank**

odd number equal groups doubles
even number leftover doubles + 1

• **Sentence Starters**

- I can make equal groups with _____
- There are _____ in each group.
- Skip count by _____

Problem-Solving Checklist

Make sure that you . . .

- tell what you know.
- tell what you need to do.
- show all your work.
- show that the solution works.

► **Reflect**

Use Mathematical Practices Talk about this question with a partner.

- **Use a Model** How can you use pictures to show that your answers make sense?

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Scoring Rubric

Points	Expectations
4	The student's response is accurate and complete. All explanations are correct. It tells what is known and what the problem asks. The solution steps are complete and correctly explain the odd and even numbers in the solution. There is an accurate picture that verifies the solution.
3	The solution is substantially complete and reflects the information given. The solution steps are correct but do not completely explain the solution. The picture shows correct numbers but does not identify them as odd or even.
2	The student's response contains several mistakes. It does not identify the known information or the task. The steps do not explain how to identify the odd and even numbers. The diagram shows rocks but does not identify odd or even numbers.
1	The student's response contains an incorrect solution. The diagram is only partially completed and the numbers and drawings in the boxes do not reflect understanding of odd and even numbers.

Step By Step

Plan It and Solve It

- Discuss the **Problem-Solving Tips** as ideas students may use to explain their thinking when they write their solution.
- Invite students to share ideas about answers to the questions, other words they might use, and how they might complete the sentences. It can also be helpful to look back at Beau's solution.
- Put students in pairs to discuss solution ideas. Ask them to also discuss the **Reflect** questions about Mathematical Practices.
- Discuss a variety of approaches as a class.
- When students are confident that their plans make sense, tell them to write their complete solution on a copy of Activity Sheet 23 (Solution Sheet 2) or a blank sheet of paper.
- If time permits, share and discuss student solutions or the one below.

Possible Solution

20 or fewer rocks go in each tray. Two trays get odd numbers and two get even numbers.

Skip count by 2s starting from 0 to find the even numbers.

2, 4, 6, 8, 10, 12, 14, 16, 18, 20

All the other numbers are odd.

1, 3, 5, 7, 9, 11, 13, 15, 17, 19

For even numbers, use 6 and 8. For odd numbers, use 9 and 5. Draw rocks in two rows to show if the numbers are even or odd. Even numbers have equal rows. For odd numbers, one row has 1 more than the other row.

<p>even number</p> <p>6</p>	<p>odd number</p> <p>9</p>
<p>even number</p> <p>8</p>	<p>odd number</p> <p>5</p>

Independent Practice

Persevere On Your Own

At A Glance

Students find and share solutions to multi-step, open-ended problems.

Step By Step

Solve It

- Have students read the problem. Help them with any language issues. Encourage them to come up with some ideas, and ask any questions they may have.
- Then put students in pairs to discuss their preliminary solutions. When they are confident that their plan will work, have students independently write their solutions on a copy of Activity Sheet 23 (Solution Sheet 2) or a blank sheet of paper.
- After students complete their solutions, put them in pairs to discuss the **Reflect** question about Mathematical Practices.
- If time permits, invite various students to explain their solutions for the class to discuss, compare, and critique. Alternatively, share the solution below and invite the class to discuss.

Possible Solution

I have 18 bolts and need to put them into 3 boxes, with at least 3 in each box.

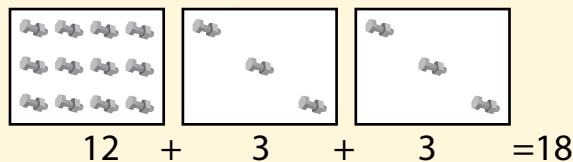
Start by putting 3 bolts into each box.

$3 + 3 + 3 = 9$. $9 + 9 = 18$ so I have 9 left.

I put all of them into one of the boxes. This box now has $3 + 9 = 12$ bolts.

The other boxes each have 3 bolts.

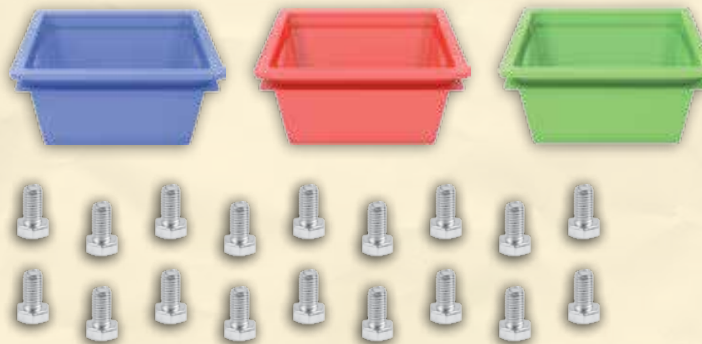
$12 + 3 + 3 = 18$.



Solve the problem on a separate sheet of paper.

Nuts and Bolts

Beau has 18 bolts. He has 3 boxes to put them in. He wants to put at least 3 bolts in each box.



How many bolts can Beau put in each box?

► Solve It Show one way that Beau can put the bolts in the boxes.

- Draw a picture.
- Tell how many bolts to put in each box.
- Explain why your answer works.

► Reflect

Use Mathematical Practices Talk about this question with a partner.

- **Make Sense of Problems** How did you decide how many bolts to put in each box?

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Scoring Rubric

Points	Expectations
4	The student's response is accurate and complete. It tells what is known and what the problem asks. The steps are complete and calculations are accurate. The picture accurately shows how many are in each box. The explanation is clear and includes an appropriate mathematical rationale.
3	The solution is substantially complete and reflects the information given. The picture shows correct quantities but there may be some numbers missing. The explanation might not be thorough.
2	The student's response contains several mistakes. It does not identify the known information or the task. The picture is partially correct but it is incomplete. The explanation is unclear or incomplete.
1	The student's response contains an incorrect solution. The steps are incorrect and do not match the picture. The picture is incomplete and does not accurately reflect a correct solution. The explanation is incomplete and incorrect.

Science Project

Beau has 17 jars. He needs an even number of jars for a science project. He will put the rest of the jars on a shelf.



How many jars could Beau use for the science project?
How many will be left to put on the shelf?

► **Solve It** Tell how many jars Beau could use and how many will be left to put on the shelf.

- Draw a picture.
- Circle an even number of jars Beau can use.
- Find the number of jars Beau will put on the shelf.
- Show that the total number of jars is 17.

► **Reflect**

Use Mathematical Practices Talk about this question with a partner.

- **Check Your Answer** What did you do to check that your answer makes sense?

55

Scoring Rubric

Points	Expectations
4	The student's response is accurate and complete. It tells what is known and what the problem asks. The solution steps are complete and calculations are accurate. The picture accurately shows the even number of jars that were used and the odd number on the shelf. The explanation is clear and shows that the sum is 17.
3	The solution reflects the information given. The steps are correct but do not completely explain how the problem was solved. The picture shows correct quantities. The student shows the correct sum but does not explain the numbers used.
2	The student's response contains several mistakes. It does not identify the known information or the task. The steps do not adequately explain what the student did. The picture shows the correct number of jars but the jars are not arranged correctly. The student did not correctly show that the total is 17.
1	The student's response contains an incorrect solution. The steps are incorrect. The picture does not match the steps and does not reflect a correct solution. The student did not show that the total is 17.

Step By Step

Solve It

- Have students work through this problem entirely on their own.
- Remind students that there are many different ways to solve a problem.
- Invite them to look back at the **Problem-Solving Checklist** to get started and help them stay on track. They might also want to look at the **Problem-Solving Tips** and sample solution on other pages to get some ideas for how to start. Have students write their complete solution on Activity Sheet 22 (Solution Sheet 1) or a blank sheet of paper.
- After students complete their solutions, put them in pairs to discuss the **Reflect** question about Mathematical Practices. Students may also describe other Math Practices they used.
- If time permits, invite various students to explain their solutions for the class to discuss, compare, and critique. Alternatively, share the solution below and invite the class to discuss.

Possible Solution

There are 17 jars. I need to use an even number of the jars that is less than 17. The rest of the jars go on a shelf.

10 is an even number because $5 + 5 = 10$. That's two equal groups.

I started with 17 jars and used 10. $17 - 10 = 7$. So put 7 jars on the shelf. $10 + 7 = 17$.



10 jars



7 jars

Differentiated Instruction

► Intervention Activity

Provide support for the Independent Practice.

Nuts and Bolts

Make a tally chart to organize information.

Demonstrate for students how a tally chart like the one below could help them plan a solution. Across the top, label the 3 different boxes. In the next row, write *Start with 3* and show 3 tally marks. Then, in the next row, write *Add more* and show additional tally marks. In the last row, write *Total* and show the equation for the tally marks in that box. Here is one example, showing too few nuts:

	Box #1	Box #2	Box #3
Start with 3			
Add more			
Total	$3 + 5 = \underline{\quad}$	$3 + 1 = \underline{\quad}$	$3 + 2 = \underline{\quad}$

Students can use this example to help them think about correct ways to fill the boxes.

Science Project

Help students think about ways to represent a solution.

This problem is about separating a whole [the jars] into two parts, so it focuses on subtraction. Help students understand this aspect of the problem by discussing visual models and equations. Discuss the following before assigning independent work:

- *How can you model the jars that Beau used?* [Draw a circle around the jars he used, or cross out each jar he used.]
- *How can you write an equation to show how many jars are left after he used those jars?* [$17 - \text{used jars} = \text{jars left}$.]
- *What equation could you use to show that the total number of jars is 17?* [$\text{used jars} + \text{jars on shelf} = 17$.]

► Challenge Activity

Solve extensions to the Independent Practice.

Nuts and Bolts

Extension

Beau finds another box, so now he has 4 boxes. He still wants at least 3 nuts and bolts in each box. Take some nuts and bolts out of the other boxes and put them in the new box. Tell how many nuts you took from each box and how many are now in each box. Show that your answer works.

Possible Solution

Assume that there were 6 nuts and bolts in each box. Take 3 out of the first box and put them in the new box. Take 2 out of the second box and put them in the new box. Keep the 6 in the third box. Now the first box has $6 - 3 = 3$. The second box has $6 - 2 = 4$. The third box has $6 - 0 = 6$. And the new box has $3 + 2 = 5$. $3 + 4 + 6 + 5 = 18$, so this works.

Science Project

Extension

Beau needs more jars for his science project. He takes 3 jars from the shelf. Now does he have an even number or an odd number of jars left on the shelf?

Possible Solution

Beau starts with an odd number of jars on the shelf. When he removes 1 jar from the shelf, he has an even number of jars. When he removes a second jar, he now has an odd number left. But if he removes one more, for a total of 3, he will have an even number of jars on the shelf.



Second Grade Social Studies

2nd Grade Geography Review Activities

*There will be a short video lesson of a Knox County second grade teacher to accompany this task available on the KCS YouTube Channel and KCS TV.

Topic: Geography

Lesson Goal: To review land features, water features, and continents

- **Vocabulary Card Memory**
 - Cut out the Vocabulary Card Memory cards that are attached. Mix them up and lay them face down. Turn two cards over to match the word with its definition or illustration. If the cards are a match, keep them and choose again. Continue playing until all matches have been found.

- **Create a Trip Around the World Itinerary**
 - Imagine you are going to visit all 7 continents. Create an itinerary or list in order the continents you would visit. Explain how you would travel to each continent (airplane, drive, boat, train). Write or talk about what you think you would see and do when you visit each continent.

- **Continent Find or Toss**
 - Draw the continents on a beach ball or balloon. (Use the continent shapes from the vocabulary cards to help you draw.)
 - Toss the ball or balloon and tell the continent that your thumb lands on
 - If you don't have a balloon or ball, draw the continents on paper. Close your eyes and point to a continent. Last, name the continent.








- **Create a Map**
 - Create a map of your neighborhood, house, school, classroom, or an imaginary island. Create a legend and compass rose. Create and answer questions to determine locations on the map. Create a treasure map and directions to find a hidden treasure.

- **Drawing Activities**
 - Draw a picture in the box next to the physical feature. (island, lake, mountain, ocean, peninsula, plain, plateau, river, valley)
 - Draw a map with all 7 continents and label each continent. Hint: you can use the continent pictures from the vocabulary memory match game to help you.

Optional Enrichment Activity

- **Regions Research**
 - Choose a region of the United States and research climate, physical features, and population and how the location of regions affects the way people live, including their: food, clothing, shelter, transportation, and recreation. Write or tell about what you learned. You could even create a video.

Vocabulary Card Memory

North America		Europe	
Africa		South America	
Australia		Antarctica	
Asia		Continent	A landmass comprised of rock, water, and living organisms
Map Legend	A visual explanation of the symbols used on a map	Compass Rose	A drawing showing different directions on a map (North, South, East, West)

Africa



Africa

Africa is the second largest **continent**. This huge landmass covers more than 11 million square miles (30 million square kilometers). Only Asia is larger. Most of Africa lies above the **equator**.

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Climate

Africa is made up of **deserts**, **rain forests**, and **savannas**. Sometimes **desert** areas don't get rain for months. **Rain forests** in central Africa get rain nearly every day. **Savannas** are hot grasslands that receive little rain.

Landforms

The world's largest hot **desert** is in Africa. The Sahara **Desert** is about the size of China. Africa is also home to the Nile River. The river flows from Burundi to Egypt. Mount Kilimanjaro is Africa's tallest mountain. It was once an active **volcano**.

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Animals

Some of the world's fastest and largest animals live in Africa. Lions chase zebras through the hot **savannas**. Elephants roll in the mud. Giraffes stretch their long necks to eat leaves. Chimpanzees and gorillas live in the **rain forests**.

Living in Africa

Nigeria, Egypt, and Ethiopia all have large **populations**. More than 21 million people live in Lagos, Nigeria. It is Africa's largest city. About 1,000 different languages are spoken in Africa. Arabic, Swahili, and Hausa are the most common languages.

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Glossary Terms

climate - the usual weather in a place
savanna - a flat, grassy area with few trees
volcano - an opening in the ground that sometimes sends out hot lava, steam, and ash
equator - an imaginary line around the middle of Earth; it divides the northern and southern hemispheres
desert - a dry area with little rain
continent - one of Earth's seven large landmasses
rain forest - a thick area of trees where rain falls almost every day
population - a group of people, animals, or plants living in a certain place

"Africa." *Social Studies*. Capstone, www.pebblego.com. Accessed 31 Mar. 2020.

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Antarctica



Antarctica

Antarctica is the fifth largest **continent**. A thick layer of ice covers its land. Antarctica's cold **climate** makes it very different from other **continents**. No one lives there. But many people come to visit.

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Climate

Antarctica is the coldest place on Earth. The coldest temperature recorded there was minus 144 degrees Fahrenheit (minus 98 degrees Celsius). Antarctica is also the world's driest place. Only a little snow falls each year. But cold temperatures keep the snow from melting.

Landforms

Huge ice chunks float around Antarctica in the Southern Ocean. Its coast is connected to two floating ice sheets. The Transantarctic Mountains divide the **continent**. The South Pole is near these mountains.

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Animals

Many ocean animals live in the water around Antarctica. But few visit the icy land. Seals and penguins go to Antarctica to raise their young. During summer, more than 40 types of birds nest on Antarctica.

Research

People around the world have agreed that no one should own Antarctica. But many countries have **research** stations on the **continent**. They send scientists to **research** the animals, land, and weather.

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Glossary Terms

climate - the usual weather in a place

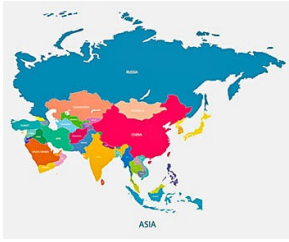
research - to study and find out about a subject by reading about it or doing experiments

continent - one of Earth's seven large landmasses

"Antarctica." *Social Studies*. Capstone, www.pebblego.com. Accessed 31 Mar. 2020.

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Asia



Asia

Asia is the largest **continent**.

It is almost twice as large as North America.

Asia connects to Europe and Africa.

Most of the landmass is north of the **equator**.

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Climate

Northern parts of Asia are cold and icy. Southern areas are hot and rainy. Central Asia has snowy mountain **climates** and dry **desert climates**. **Deserts** also cover parts of southwest Asia. Heavy rains fall in Asia's **rain forests**.

Landforms

The world's highest mountain is in Asia. Every year people try to climb Mount Everest. West of this mountain is the salty Dead Sea. The world's largest lake is also in Asia. Many **species** of fish live in the Caspian Sea.

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Animals

Asia's hot **rain forests** are full of animals. Playful orangutans swing from tall trees.

Asian elephants munch on plants.

Pandas and tigers make their homes in Asia's forests.

Arctic foxes and reindeer live in cold, northern areas.

Living in Asia

Many people in Asia live in large cities. About 36 million people live in and around Tokyo, Japan.

Most people live in tall apartment buildings. Living outside the big cities is different.

People live in small wood or mud homes.

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Glossary Terms

climate - the usual weather in a place

species - a group of animals with similar features

equator - an imaginary line around the middle of Earth; it divides the northern and southern hemispheres

desert - a dry area with little rain

continent - one of Earth's seven large landmasses

rain forest - a thick area of trees where rain falls almost every day

"Asia." *Social Studies*. Capstone, www.pebblego.com. Accessed 31 Mar. 2020.

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Australia



Australia

Australia is the smallest **continent**. It is only a little smaller than the United States. Australia is often called the "land down under." That's because the whole **continent** is south of the **equator**.

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Climate

Northern Australia is **tropical** all year. The middle of Australia is made up of mostly **deserts**. This area is called the Outback. Southern Australia has a mild **climate**. It has warm summers and cold winters.

Landforms

Much of Australia is dry and flat. **Minerals** in the dirt turn the ground red. A popular Australian landmark is Uluru. It was once known as Ayer's Rock. The giant sandstone rock is taller than the Eiffel Tower.

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Animals

Australia is home to unique animals. Kangaroos hop across **deserts**. Koalas sleep in eucalyptus trees. Emus are large birds. They can't fly, but they can run fast. Colorful fish swim along Australia's beaches.

Living in Australia

Australia is both a **continent** and a country. It is divided into six states. About 25 million people live in Australia. Most live in larger cities in the southeast. Australia's largest city is Sydney.

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Glossary Terms

climate - the usual weather in a place

equator - an imaginary line around the middle of Earth; it divides the northern and southern hemispheres

desert - a dry area with little rain

continent - one of Earth's seven large landmasses

mineral - a solid in the ground made by nature that is not a plant or animal; minerals are found in rocks and soil

tropical - having to do with the hot, wet areas near the equator

"Australia." *Social Studies*. Capstone, www.pebblego.com. Accessed 31 Mar. 2020.

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Europe



Europe

Europe is one of the smallest **continents**. Only Australia is smaller. Though small, more than 700 million people live there. Millions more people visit each year. Its art and **architecture** amaze people worldwide.

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Climate

All of Europe is above the **equator**. Temperatures in Europe are not extreme. Warm ocean winds keep most of Europe from getting cold. But Europe does have its cold spots. Snow and ice cover parts of Iceland year-round.

Landforms

Europe is bordered by the Atlantic Ocean and many seas. The Volga River flows from Russia to the Caspian Sea. Skiers enjoy Europe's largest mountain range, the Alps.

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Animals

Foxes, squirrels, and other small animals run across Europe's land. Moles and badgers make tunnels underground. Huge schools of fish swim in the oceans near Europe. Reindeer can be found in colder areas.

Living in Europe

Millions of people live in Europe's large cities. Nearly 12 million people live in Moscow, Russia. Other large cities include Berlin, Germany, and London, England. More than 50 languages are spoken in Europe. English, French, and German are the most common.

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Glossary Terms

equator - an imaginary line around the middle of Earth; it divides the northern and southern hemispheres
continent - one of Earth's seven large landmasses
architecture - the science and art of designing buildings

"Europe." *Social Studies*. Capstone, www.pebblego.com. Accessed 31 Mar. 2020.

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North America



North America

North America is the world's third largest **continent**.

This huge landmass covers more than 9.3 million square miles (24.2 million square kilometers). All of the land is above the **equator**.

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Climate

North America has everything from icy islands to **tropical rain forests**. Northern areas tend to stay frozen. Southern areas are warm and wet. Areas in between have four **seasons**.

Landforms

Lakes, rivers, and mountains are found throughout North America. Lake Superior is the world's largest freshwater lake. The Rocky Mountains stretch from western Canada through the United States.

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Animals

North America is home to many kinds of animals. Polar bears and caribou live in the cold, northern parts. Jaguars hunt in the steamy **rain forests**. Gila monsters live in the hot, dry areas. American bison roam the Great Plains.

Living in North America

Today, more than 560 million people call North America home. The largest city on the **continent** is Mexico City. The country in North America with the most people is the United States. It has more than 300 million people. Most people in North America speak English or Spanish.

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Glossary Terms

equator - an imaginary line around the middle of Earth; it divides the northern and southern hemispheres

continent - one of Earth's seven large landmasses

tropical - having to do with the hot, wet areas near the equator

rain forest - a thick area of trees where rain falls almost every day

season - one of the four parts of a year; spring, summer, fall, and winter

"North America." *Social Studies*. Capstone, www.pebblego.com. Accessed 31 Mar. 2020.

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South America



South America

South America is the fourth largest **continent**. It is smaller than Asia, Africa, and North America. A small part of it is above the **equator**. Most of the land lies below the **equator**.

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Climate

South America has some of the world's wettest areas. It also has some of the driest areas. **Rain forests** in Colombia get rain almost every day. **Desert** areas may only get rain three days each year.

Landforms

The Andes Mountains stretch along the west coast. This is the world's longest mountain range. South America also has one of the world's longest rivers. The Amazon River flows through the **rain forests**. The Amazon **rain forest** is home to thousands of kinds of plants and animals.

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Animals

A large number of the world's **species** live in South America. Colorful birds, snakes, and insects make their homes in the Amazon **rain forest**. Alpacas and llamas live in the cold, mountain areas.

Living in South America

About half of all South Americans live in Brazil. São Paulo, Brazil, is the continent's largest city. Other big cities include Lima, Peru, and Buenos Aires, Argentina. Most people live in crowded cities on the coasts. The rest live in small villages.

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Glossary Terms

species - a group of animals with similar features

equator - an imaginary line around the middle of Earth; it divides the northern and southern hemispheres

desert - a dry area with little rain

continent - one of Earth's seven large landmasses

rain forest - a thick area of trees where rain falls almost every day

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Continents



Cut out these continents to use with the
Continent Find or Toss Activity.

Island		Lake	
Mountain		Ocean	
Peninsula		Plain	
Plateau		River	
Valley		Physical Feature	A natural feature on the Earth's surface, such as, a mountain, valley, lake, island

Draw a picture of the physical feature in the blank box to create cards for a memory game

Additional Links for More Information

Brainpop Jr. Videos

You can register for a free account at www.jr.brainpop.com

- Log in and type Geography in the search bar to find videos.
 - Continents and Oceans
 - Landforms
 - Reading Maps
 - At the bottom of each video there are additional activities that can be completed.

Studies Weekly Videos

You can register for a free account at www.studiesweekly.com

- Log in and click the Extras link on the top toolbar.
- Then select New K-2 Videos
 - Directions and Compass Rose
 - Earth's Hemispheres
 - Locating Places on a Map
 - Maps and Globes
 - Types of Maps
 - United States Regions
 - Using a Map Legend
 - Land Forms, Bodies of Water, and Physical Features



Second Grade

ELA

2.ELA.Week 1

There will be a short video lesson of a Knox County 2nd Grade Teacher to accompany this text available on the KCS YouTube Channel and KCS TV.

Tennessee's English Language Arts (ELA) standards ask students to read, talk, and write about a variety of texts. In this activity packet, your child will have the chance to do just that as they work to solve a mystery.

First, your child will encounter a letter introducing them to the idea of becoming a "Super Sleuthhound." You can discuss the picture clues – camera, keys, flashlight, compass. Think about how these things might be tools for a detective or sleuth.

In this week's text, your child will be looking for specific clues about:

TOPIC: Our Changing World

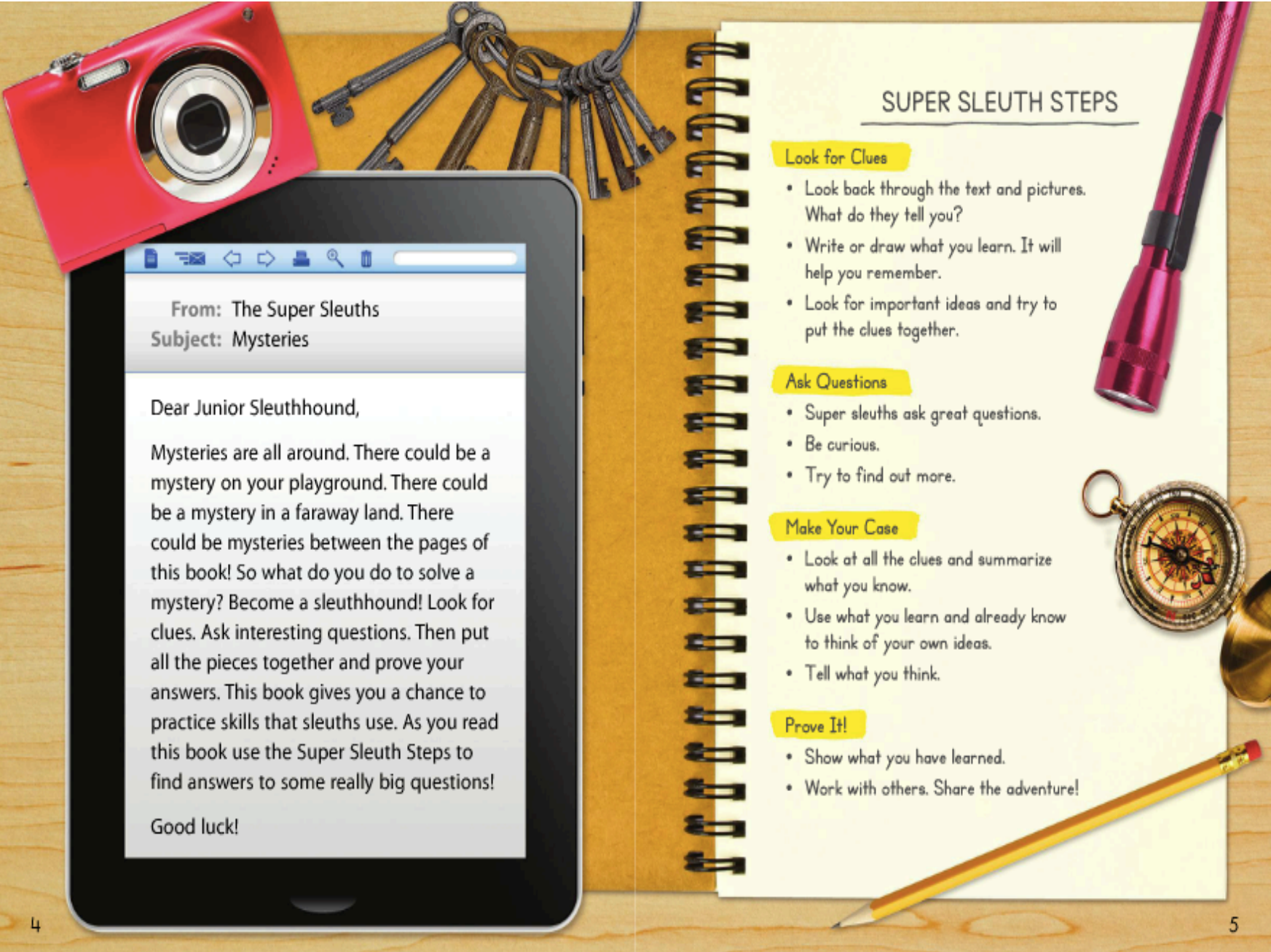
ESSENTIAL QUESTION: How can familiar things help us with changes?

Remind your child that something familiar is well known. Ask your child what things or people are familiar to them at home or at school. Tell them as they read, they'll be looking for clues to explain how familiar things can help us when changes occur.

You may choose to take turns reading the text with your child, read the text at the same time, or have your child read independently.

At the end of the text, there is a "Be a Sleuth" section containing questions to discuss and write about the text.

- Look for Clues – You may ask your child to underline evidence for this question or you can discuss how what Dad and Elias wrote were similar and different. Be sure that students refer back to the details in the text. Also, refer back to the essential question – How can familiar things help us with changes?
- Ask Questions – This question is always a good question to discuss. As your child generates a question, you may choose to add a question you have as well. If your child struggles to ask a question, you may make a question as a model and then create one together.
- Make Your Case – This question is a written task. Your child should be able to write 4-5 sentences introducing their topic, supplying reasons or evidence, and providing some sense of closure. They can also create an illustration of their writing



From: The Super Sleuths
Subject: Mysteries

Dear Junior Sleuthhound,

Mysteries are all around. There could be a mystery on your playground. There could be a mystery in a faraway land. There could be mysteries between the pages of this book! So what do you do to solve a mystery? Become a sleuthhound! Look for clues. Ask interesting questions. Then put all the pieces together and prove your answers. This book gives you a chance to practice skills that sleuths use. As you read this book use the Super Sleuth Steps to find answers to some really big questions!

Good luck!

SUPER SLEUTH STEPS

Look for Clues

- Look back through the text and pictures. What do they tell you?
- Write or draw what you learn. It will help you remember.
- Look for important ideas and try to put the clues together.

Ask Questions

- Super sleuths ask great questions.
- Be curious.
- Try to find out more.

Make Your Case

- Look at all the clues and summarize what you know.
- Use what you learn and already know to think of your own ideas.
- Tell what you think.

Prove It!

- Show what you have learned.
- Work with others. Share the adventure!

Unit 4

Our Changing World



Hi, Sleuthhounds!

In this unit, you will be looking for clues about how things change. Here are some sleuth tips to help you. You're on the right track!

Sleuth Tips

Look for Clues

How do sleuths remember clues?

- Sleuths don't expect to remember everything. They write down important details.
- Sleuths use many ways to remember clues. They might write a list or draw a picture.

Ask Questions

Why do sleuths ask questions?

- Sleuths ask questions to gather facts. These are often the easiest questions to answer.
- Sleuths also ask questions to make everyone think.

Make Your Case

How do sleuths work with other sleuths?

- Sleuths ask other people questions to find areas where everyone agrees.
- Sleuths want to hear ideas from others.

Prove It!

What do sleuths think about before showing what they have learned?

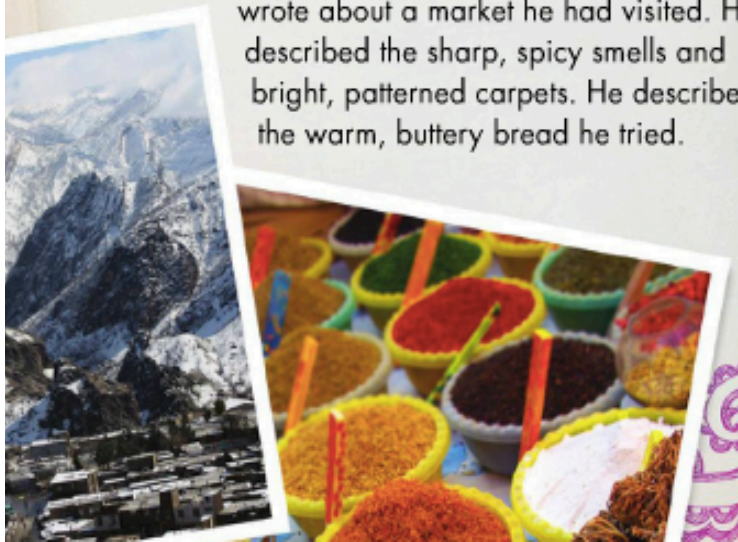
- Sleuths review what they have learned to decide what's important and what's not.
- Sleuths think about the best order to put things in before sharing them.

The Blank Book

Elias's dad was in the army. He was leaving home to be stationed in another country. As he said good-bye, Dad gave Elias a book. "I want you to read this when you get home," Dad said.

Elias didn't feel like reading, but he opened the book anyway . . . and what a surprise! Every page was blank except the first one. There, Dad explained that they would take turns writing in the book, mailing it back and forth while Dad was gone.

Elias began writing immediately, telling his dad how much he missed him, and then he mailed the book. Three weeks later, the book came back. Dad wrote about a market he had visited. He described the sharp, spicy smells and bright, patterned carpets. He described the warm, buttery bread he tried.



Elias and his dad wrote often. Dad described what life was like on the base. Sometimes he invented silly stories or drew neat pictures. Elias wrote about home and school. He drew colorful pictures. They had to get another book before long, and then another!

When Dad came home, he had a new book with him. "I thought we could keep going," Dad said, grinning. Elias nodded. This was definitely a tradition he wanted to keep.



Be a Sleuth

Look for Clues Find clues that show how what Dad wrote in the book was similar to and different from what Elias wrote.

Ask Questions If you were Elias, what questions might you want to ask Dad about where he was living?

Make Your Case What is the best way to communicate with family members or friends who are far away? Provide reasons to support your answer.



Second Grade Science



Can You Build a Better Nest Than a Bird?

Directions: Read the passage below with an adult and then follow the directions.



It is spring time in Tennessee and you may have noticed a lot of birds chirping and singing outside. Those birds are busy building their nests. Birds build their nests in the spring because it is warm and birds can find the food and nest building materials they need. Bird nests are made of many different materials. Some birds weave together grass and twigs. Other

birds use mud and water to hold the nest together. In this design challenge you will build a bird nest using only natural materials that you find outside.

Your Challenge: Build a bird nest that can safely hold one egg. You can only use natural materials that you find outside.

Step 1: Make a plan. What materials do you think would make a good nest? What can you collect outside that will keep an egg warm are safe? Draw your idea in the box below. Label important parts of your nest.

Step 2: Go outside to collect materials for your nest. Can you spot things birds need to have in their habitat? Check the box of the things you find. Adult supervision required.

Things to eat:

- Worm
- Nuts or seeds
- Insects like a beetle or caterpillar

Nest Materials:

- Thin sticks or twigs
- Grass, straw, leaves
- Water or mud
- Find something the size of an egg like a pinecone or small rock.


A place to live (a shelter):

- Nest



Step 3: Build a nest that can safely hold one egg.

Step 4: Test your nest. Gently blow on your nest like the wind.

	Circle one	
Did the egg fall out?	YES	NO
Did your nest fall apart?	YES	NO

Step 5: How could you make your nest better? Draw your idea for a better nest.

 You can share your nest with us by tweeting a picture to @KCSScience