

Let's Investigate
Lesson
2-1

Use and Choose Addition Strategies

KEY CONCEPTS

- Mathematics Objective** Solve addition problems by using prior knowledge of models and strategies.
- Language Objective** Explain, orally and in writing, a chosen strategy to solve an addition problem.
- Essential Understanding** Addition problems can be represented and solved in different ways using objects, drawings, and equations.

COHERENCE

- Look Back** Previously, students solved addition facts within 10 by using objects or drawings to represent the problems. They also developed fluency in adding within 5.
- This Lesson** Students build on their understanding of addition by choosing and using appropriate strategies to add numbers.
- Look Ahead** Later, students will explicitly develop students' skill in addition within 10 by exploring the models and strategies in more depth and applying them to different kinds of problems.

BALANCE

- Conceptual Understanding** Students continue to develop their skill in solving addition problems by using strategies that involve working with objects and pictures. They relate those representations to the numbers and symbols they can use to write equations and find sums.

Reinforce Vocabulary

equation

Materials

none

Student Resources

-  Family Engagement

Teacher Resources

Available at
Savvas Realize®

-  Editable Lesson Plan
-  Lesson Presentation Slides
-  Slow Reveal Slides
-  Sample Student Work
-  Exit Ticket and Teacher Support
-  enVision on the Go: Planning Support



Texas Essential Knowledge and Skills (TEKS)

- Number and operations. The student applies mathematical process standards to develop and use strategies for whole number addition and subtraction computations in order to solve problems. The student is expected to:
- 1.3E** explain strategies used to solve addition and subtraction problems up to 20 using spoken words, objects, pictorial models, and number sentences.
- 1.3D** apply basic fact strategies to add and subtract within 20, including making 10 and decomposing a number leading to a 10.

Mathematical Process Standards

- The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
- 1.1E** create and use representations to organize, record, and communicate mathematical ideas.
- 1.1F** analyze mathematical relationships to connect and communicate mathematical ideas.
- 1.1G** display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

-  **Targeted ELPS Support Writing 4C**
-  **College and Career Readiness Standards I.A.2, VII.A.2**

Step 1 Investigate



15-25 min

Investigate

Scout Observational Assessment

Name _____

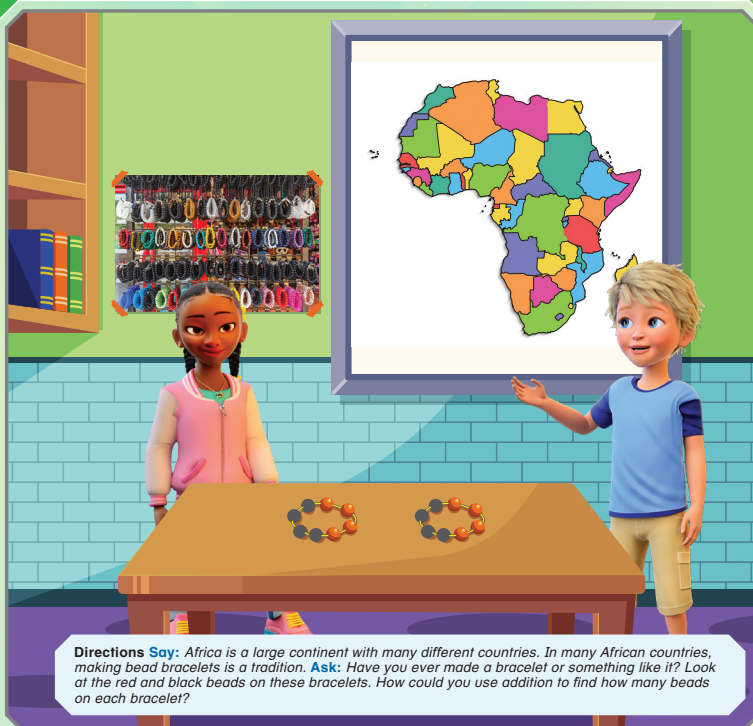
Use and Choose Addition Strategies

Let's Investigate

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I can ... investigate different ways to solve addition problems.

TEKS 1.3E The student is expected to explain strategies used to solve addition and subtraction problems up to 20 using spoken words, objects, pictorial models, and number sentences. Also **1.3D** Mathematical Process Standards 1.1E, 1.1F, 1.1G

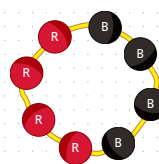


Directions Say: Africa is a large continent with many different countries. In many African countries, making bead bracelets is a tradition. **Ask:** Have you ever made a bracelet or something like it? Look at the red and black beads on these bracelets. How could you use addition to find how many beads on each bracelet?

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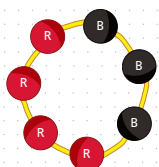
A.



Student strategies will vary.

$$4 + 4 = 8$$

8 beads

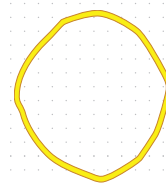


Student strategies will vary.

$$4 + 3 = 7$$

7 beads

B.



Student strategies, equations, and number of beads will vary.

Build G.R.I.T.
Grow confidence.

$$\underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$$

_____ beads

Directions A. Tell students to use any strategy to add the two different colors of beads on the bracelets. Ask them to complete the equations to show how many beads in all and to explain their strategy. **B.** Have students draw beads to make their own bracelet. Tell them they can use any two colors, but not more than 10 beads. Tell them to use any strategy to add and complete the addition equation to tell how many beads in all. Ask them to explain their strategy.

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Anticipate

Anticipate students' solution strategies. Think of various ways students might use their prior knowledge to solve the problems. See the next page for sample student work.

Introduce the Investigation



Use the Slow Reveal Slides

You might use the slides to reveal part of the information. Then ask: **What do you notice? What do you wonder?**

Elevate Student Voice: Engage Students in the Context

Have students bring their own unique experiences and ideas to the situation by using prompts like these:

- What do you think of when you hear "Africa?"
- If you could make a bead bracelet for someone special, who would it be for? What colors of beads would you use?
- Imagine you are using two colors of beads to make a bracelet. How can you use math to help you find the total number of beads?

Check for Understanding

Language Routine: Three Reads

Have students read the task by themselves. Ask:

- What is the task about?
- How can you describe the task without using numbers?

Have students read the task a second time. Ask:

- What math quantities and relationships are in the task?
- What information is given? What do you need to find?

Have students read the task a third time. Say:

- Think to yourself about how you might solve the problem.

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Step 1 Investigate *continued*

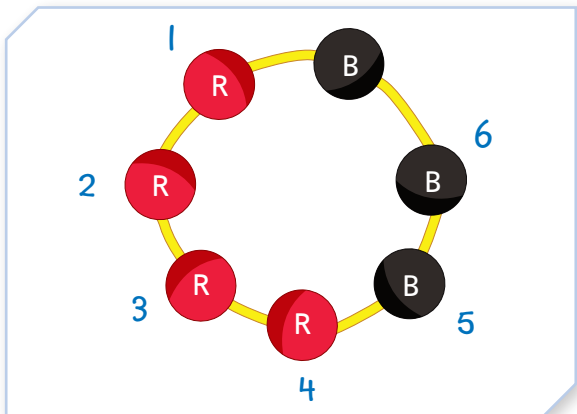
Sample Student Work Available at Savvas Realize®

Problem A

Each bracelet has two colors of beads that can be joined to find how many beads are in the whole bracelet (unknown result). Show how to use addition to add the two different color beads on the bracelets. Complete the equations to show how many beads in all.

- **Daniel counted all the beads to find the total, but he miscounted.** He did not count one of the black beads in each bracelet.

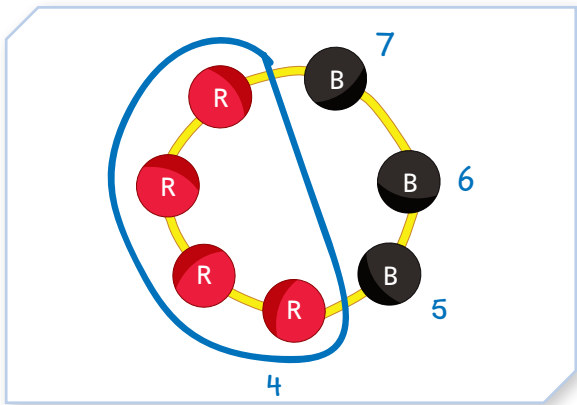
Daniel's Work



You might ask Daniel: Try touching each bead as you count. How many red beads and black beads are there in the first bracelet? In the second bracelet? [Listen for: "4 red beads and 4 black beads in the first bracelet, and 4 red beads and 3 black beads in the second bracelet."]

- **Margaret used her prior knowledge of counting forward from a given number to find the total number of beads in each bracelet.** She started by finding the number of red beads. Then she counted forward using the number of black beads.

Margaret's Work



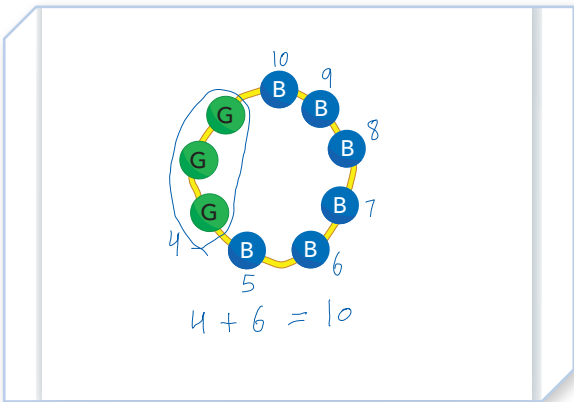
You might ask Margaret: Can you think of a way to use your first equation, $4 + 4 = 8$, to find the sum in your second equation, $4 + 3 = \underline{\quad}$? [Listen for: "Since 3 is 1 less than 4, I can say that $4 + 3$ is 1 less than 8, or 7."]

Problem B

Draw beads to make your own bracelet. Use any two colors but not more than 10 beads. Show how you will add the two colors and complete the addition equation to tell how many beads are in the bracelet.

- **Ana used her prior knowledge of counting forward from a given number to find the total, but she miscounted.** She counted 4 green beads, instead of 3.

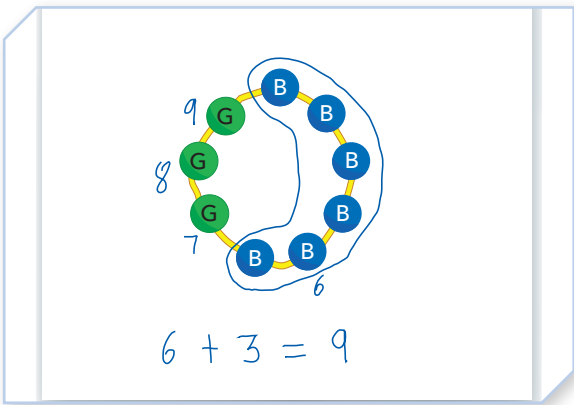
Ana's Work



You might ask Ana: Which group of beads did you start counting forward from? How many beads are in that group? [Listen for: "I started counting from the group of green beads. Oh, there are 3 beads, not 4. I should have started counting from 3."]

- **Joel started with the larger number of beads, and then counted forward using the smaller number of beads to find the total.** He started with 6, and then counted forward 3 numbers like so: 7, 8, 9.

Joel's Work



You might ask Joel: Why did you start counting forward from the group of blue beads? [Listen for: "If I start from the larger number of beads, there are fewer numbers to count to find the total. Since there are more blue beads, I started with that group."]

Step 1 Investigate *continued*

Step 2 Connect



10-15 min

Monitor SMALL GROUP

Monitor Students at Work Ask questions to assess and advance students' thinking.

Assessing Questions

Questions for Students to Understand Their Thinking

- Can you tell/show me what you did?
- How does each picture of a bracelet relate to the numbers that you use in each equation?

Questions for You as You Observe

- What addition strategies do the students already know?
- How do students choose the strategy to use when writing and solving each equation? Do they use a different strategy or the same strategy for each problem?

Advancing Questions

Questions to Ask Students Who Need Help

- If students cannot get started, ask: *In each bracelet, how many beads of each color do you see? How many beads are there in all?*
- If students' work is incorrect, ask: *How did you get that answer?* Listen for understandings and build on what they know.

Questions to Help Students Think More Deeply

- Why is it important to learn different strategies for solving addition facts?
- Can you give one more example of how to use an addition fact that you know to solve another addition fact?

Early Finishers

Ask: I want to make a bracelet using a total of 10 beads of two different colors. What equation could possibly model this situation? How would you use a strategy to check that the sum in your equation is correct? [Sample answer: $7 + 3 = 10$. I start from 7, and then count forward 3 numbers like so: 7, then 8, 9, 10. The sum is 10.]

Select and Sequence SMALL GROUP

Select and Sequence Students' Solutions for them to present with the goal of building understanding of key concepts.

Start with solutions that show a common error of miscounting objects or pictures that students use to represent addition problems. (Daniel, Ana)

Then show solutions that show how students can use their prior knowledge of counting forward from any given number to help them solve different addition problems. (Margaret)

Finally, show solutions that show how to choose and use more efficient addition strategies like counting forward from the larger addend in an addition problem, instead of starting from the smaller addend. (Joel)

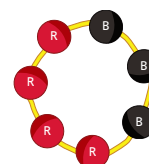
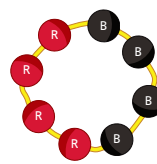
Connect INDIVIDUAL WHOLE CLASS

Name _____

Connect

How is this bracelet different?

1. **Analyze** Find how many in all.

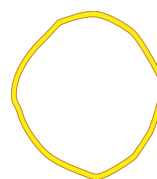


Student responses will vary.

$$4 + 4 = 8 \quad 4 + 3 = 7$$

8 beads 7 beads

2. **Represent** Show your own bracelet.
Add the the beads.



Student responses will vary.

$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

_____ beads

Directions 1. Show how to add to find how many beads in all for each bracelet. Tell a classmate how finding how many in all in the first bracelet can help with the second one. 2. **Say**: Draw your own bracelet again. This time, show a different way to use addition to show how many beads there are in all. **Talk About Math Ideas Say**: Why might it be helpful to know different ways to add?

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Connect Solution Strategies Discuss students' work. Ask how the solutions are similar and different. Help students see that both Margaret and Joel used their prior knowledge of counting forward from any given number to find the total number of beads. Margaret started with the smaller addend, and then counted forward using the larger addend. Joel started with the larger addend, and then counted forward using the smaller addend. Joel's strategy is more efficient because he counted fewer numbers to find the sum.

Connect to Key Concepts Use the Connect questions to build understanding of key concepts in the lesson. Use the Reflection on the next page to further this understanding.

Talk About Math Ideas

Have students engage in a think-pair-share to discuss different ways to solve addition problems. Listen for students who prefer to represent addition problems with objects, pictures, or equations, and then use their understanding of efficient ways of counting groups of objects to find sums. Other students might prefer to use their knowledge of some addition facts to solve other addition facts.

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Step 3 Practice and Problem Solving

10-15 min

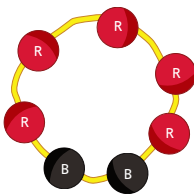
Interactive Practice

Adaptive Practice

Practice and Problem Solving



3. Explain Add.

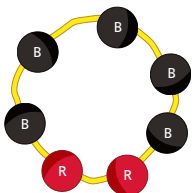


Student strategies will vary.

$5 + 2 = 7$

7 beads

4.

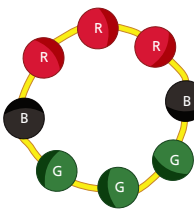


Student strategies will vary.

$2 + 5 = 7$

7 beads

5.



Student strategies will vary.

Sample equation: $3 + 2 + 3 = 8$

8 beads

Directions Remind students that the key concept in this lesson is that you can add in different ways. Have students write an equation and solve each problem. **Say:** 3. Show how you could add to find the number of beads in all. 4. Think about what you did to add in Item 3 to solve Item 4. 5. How could you add using three different colors of beads? Show your thinking.

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Targeted ELPS Support WRITING 4C

Pre-Production Show 7 red counters and 2 yellow counters. Say aloud each number of counters and have students point to and say aloud each number.

Beginning Have students draw 7 red counters and 2 yellow counters. Have them write the number of counters below each group of counters. Have students record how they can count the counters to find the number of counters in all.

Intermediate Have students draw 7 red counters and 2 yellow counters. Have them write the number of counters of each color, and the sum, in an addition equation.

High Intermediate Have students draw 7 red counters and 2 yellow counters. Have them write the number of counters of each color, and the sum, in an addition equation. Have them label each number and symbol in the equation. Provide the following word bank: *addend, plus sign, equal sign, sum.*

Advanced Have students in pairs take turns modeling addition problems using drawings. Have them record the strategy they use to solve, and write an addition equation.

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Reflection

Reflect on key concepts in the lesson with students. Have students recall and explain different strategies they already know and use to add numbers. **How do you use objects or pictures to represent an addition problem?** [Sample answer: I use or draw different color counters to show the numbers I need to add. Then I put the counters together to show the total.] **How do you use your understanding of counting forward from any given number to add?** [I start with one of the addends. Then I count forward using the other addend. The last number I count is the sum.] **What other addition strategies do you use often?** [Sample answer: I use the addition facts that I already know to solve other addition facts.]

Error Intervention Item 5

If students are having difficulty determining what addition strategy to use when working with three addends, **then** guide them in understanding that they have to add any two numbers first using any known strategy, and then add the sum of those two numbers to the third number using either the same strategy or a possibly more efficient strategy.

Items 3 and 4 Have students relate and compare the two equations that they wrote, and then explain why numbers can be added in any order.

Item Analysis: Connect; Practice and Problem Solving

Item	DOK	TEKS	
		Content	Process
1	2	1.3D, 1.3E	1.1F
2	2	1.3D, 1.3E	1.1E
3	2	1.3D, 1.3E	1.1G
4	2	1.3D, 1.3E	
5	2	1.3D, 1.3E	

Quick Check

Formative Assessment

✓ Assess lesson content with the Quick Check. Check marks in Practice and Problem Solving indicate items for prescribing differentiation. Items 3 and 4: 1 point each. Item 5: up to 3 points. See the Item Analysis on the previous page. The online Quick Check is **automatically scored** and **remediation, practice, or enrichment** will be assigned based on student performance.

0-3 points: Intervention Activity (below) and Reteach to Build Understanding Activity

4-5 points: Enrichment Activity

In addition, **emergent bilingual students** may benefit from the Build Mathematical Literacy Activity.

Differentiation Library

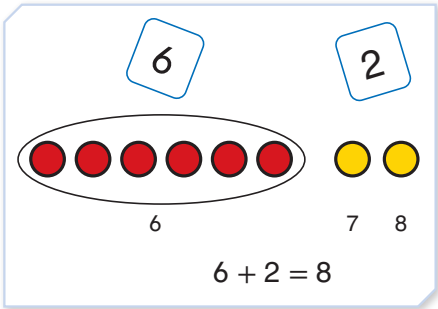
DL

- Additional Differentiation Library resources are described at the start of this topic.
- Differentiation resources that support diverse learning styles are online and in the Differentiation Library Teacher’s Guide.

Intervention Activity

Materials Number cards (Teaching Tool 84), two-color counters (or Teaching Tool 77)

- Have students work in pairs. Provide each pair with two number cards that show numbers with a sum within 10.
- Ask students to find the sum of the numbers individually using any strategy they know. Tell them they can use counters or draw pictures if they need to.



- Have each student explain or show to their partner how they found the sum of the two numbers.
- In case both students used the same strategy to find the sum, have them work together to think of another strategy.

Video Tutorial

Available at Savvas Realize®

Students can access this video anytime to reinforce lesson content.

Another Look Video

Additional Practice

Printable or autoscored at Savvas Realize®.

Name _____

Use and Choose Addition Strategies

Additional Practice

2-1

HOME ACTIVITY Provide your child with simple addition problems such as 2 + 2, 2 + 3, 4 + 1, and 1 + 4. Provide small objects to help add. Encourage your child to explain any strategies used and solutions to the problems.

Another Look!

1. 3 + 4 = 7

Student strategies will vary.

2. 4 + 3 = 7

Directions Read and review the Another Look! example with students. Tell students that there are different ways to solve addition problems. Have them trace over the answer. 1-2, Say: Show how to solve each problem any way you choose.

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3. Represent

Jon has 5 large beads.
Jenn has 1 small bead.
How many in all?

Student strategies will vary.

6 beads

4. Higher Order Thinking

Choose one to solve.
X the other one out.
Show your work.

Student choices and strategies will vary.

1 + 5 = 6 5 + 2 = 7

5. Assessment Practice

6 big stones.
3 small stones.
How many in all?

☐ A 7 stones ☐ B 8 stones
☒ C 9 stones ☐ D 10 stones

Directions 3. Say: Jon has 5 large beads. Jenn has 1 small bead. How many beads do they have in all? Solve any way you choose. Show your work. 4. Say: Think about how you solved Question 3. Choose one of these equations to solve. X out the other one. Show your work. 5. Say: There are 6 big stones and 3 small stones by a pond. Which answer shows how many stones there are in all?

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Item Analysis: Additional Practice

Item	DOK	TEKS	
		Content	Process
1-2	2	1.3D, 1.3E	
3	2	1.3D, 1.3E	1.1E
4	2	1.3D, 1.3E	
5	1	1.3D, 1.3E	