The Number System

Subtract Integers II

The addition of integers is straightforward and fairly easy for students to perform once they understand how to use the identity property of addition to make zero pairs. Now students add zero pairs to allow them to subtract quantities that result in a remainder of less than zero. Some students may recognize that this technique is similar to the renaming that they did when they learned to subtract a larger digit from a smaller digit in second or third grade.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

■ **Ask:** *What does "Dropped 5°" mean in this context? Can you take away 5 unit blocks?*

■ **Ask:** *Can you take away 3 unit blocks? How many zero pairs would we need to add until we have the 3 unit blocks we need to take away?*

■ **Ask:** *Did you all end up with the correct noon reading of –5°? How many zero pairs did you have to add for the final temperature change?*

Solve It

Reread the problem with students. Ask the students to make a chart similar to the one in the story problem and repeat the entire process, recording the temperature changes as they work through the activity.

More Ideas

For another way to teach about subtraction of integers—

■ Have pairs of students use polyhedral dice as number generators to create integer subtraction problems. The first student designates both dice as positive or as negative or one die as positive and the other as negative. The first student rolls the dice and writes a subtraction problem using the numbers thrown. The second student models the problem on his or her Algeblocks® Basic Mat and gives the answer. The first student checks the answer. Have students trade roles and repeat.

Formative Assessment

Have students try the following problem involving subtraction of integers.

The early morning temperature reading was 9°C. By noon, the temperature had dropped 15°. What was the temperature at noon?

A. –24°C   **B.** –6°C   **C.** 6°C   **D.** 24°C

Try It!   15 minutes | Pairs

Here is a problem about the subtraction of integers.

Ann's class is recording changes in temperature for science class. Students check the temperature readings each hour and determine the change in temperature. The chart shows the changes. What were the readings?

| Time	8 A.M.	9 A.M.	10 A.M.	11 A.M.	Noon
Reading	+6°				
Change		Dropped 5°	Dropped 3°	Dropped 1°	Dropped 2°

Introduce the problem. Then have students do the activity to solve the problem. Write the chart on the board. Distribute the materials.

Materials
- Algeblocks® units
- BLM 4
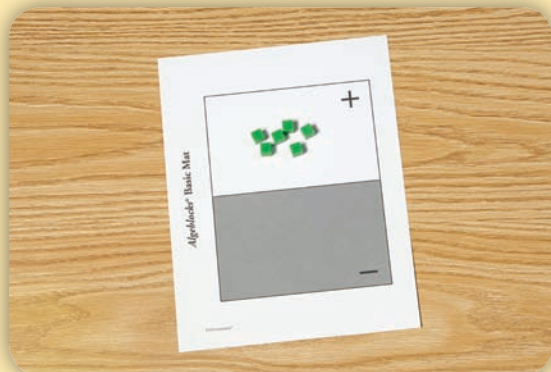
1. Have students place 6 unit blocks on the positive side of the mat. **Say:** *Read the first change in temperature, "Dropped 5°." Take away 5 cubes.* **Ask:** *What was the 9 A.M. reading?*
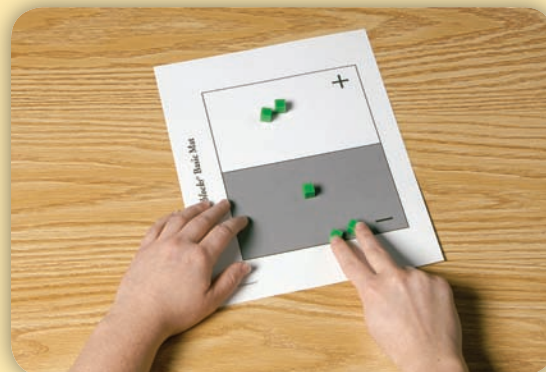
2. Have students read the next change in temperature, "Dropped 3°." **Ask:** *Since we don't have 3 blocks to remove, what should we do?* Instruct students to add zero pairs until they have 3 unit blocks in the positive section so they will have enough blocks to subtract from. **Say:** *You will need to add two zero pairs and then take away 3 blocks from the positive section, leaving 2 blocks on the negative section.* **Ask:** *What was the 10 A.M. reading?*
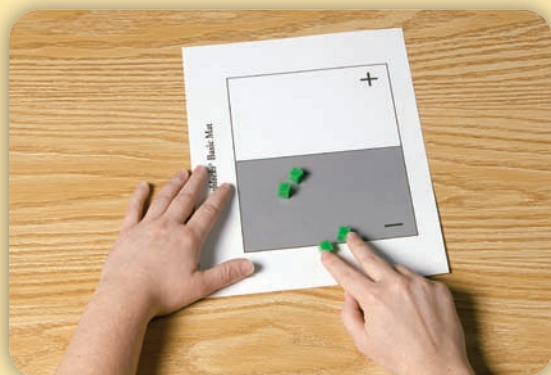
3. Have students read the next change in temperature, "Dropped 1°." **Ask:** *Since we don't have enough blocks to remove from the positive section (to subtract a positive 1), what should we do?* **Say:** *You will need to add one zero pair. Now take away 1 block from the positive side.* **Ask:** *What was the 11 A.M. reading?*
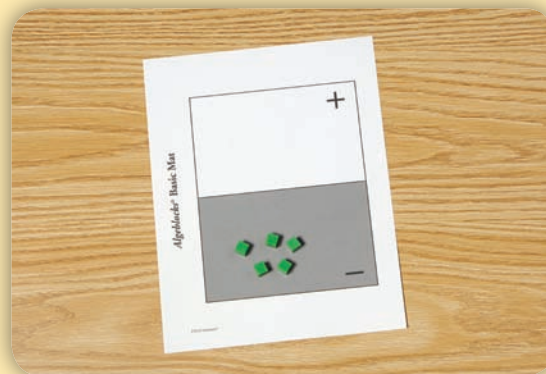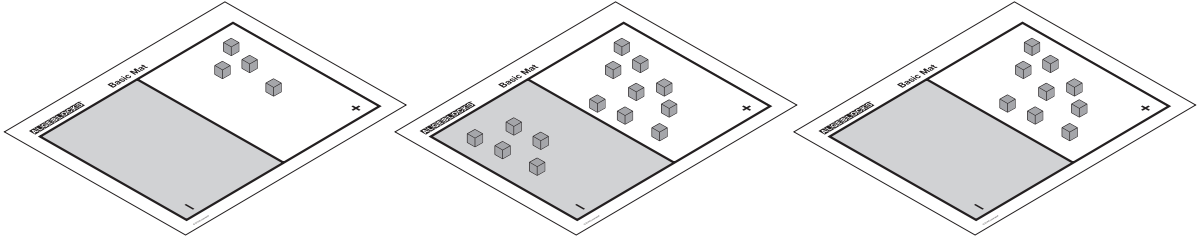

4. Say: *Now, represent the final temperature change of "Dropped 2°."* **Ask:** *What was the noon reading?*

Use Algeblocks unit blocks and a Basic Mat to model the integer subtraction sentence. Make zero pairs. Write the difference. Explain your work.

(Check students' work.)

1. 4 – (–5) = ___9___

Place 4 unit blocks on the positive side of the mat. Because there are not 5 unit blocks to remove from the negative side of the mat, add 5 zero pairs to the mat. Now take away 5 unit blocks from the negative side. That leaves 9 unit blocks on the positive side of the mat.

Using Algeblocks unit blocks and a Basic Mat, model each subtraction sentence. Sketch the model. Make zero pairs. Write the difference.

2. –6 – 4 = ___–10___

3. –9 – 7 = ___–16___

Find each difference.

4. –3 – (–1) = ___–2___

5. 13 – (–7) = ___20___

6. 8 – (–12) = ___20___

7. –5 – 11 = ___–16___

8. –1 – 6 = ___–7___

9. 9 – (–8) = ___17___

10. 14 – (–16) = ___30___

11. –15 – (–15) = ___0___

Answer Key

Challenge! For the following subtraction problems, which ones require you to place additional unit blocks that equal zero pairs so that you can take away the number being subtracted? Explain.

$$7 - 1 \qquad -7 - 1 \qquad 7 - (-1) \qquad -7 - (-1)$$

Challenge: (Sample) $-7 - 1$ and $7 - (-1)$

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Name _____

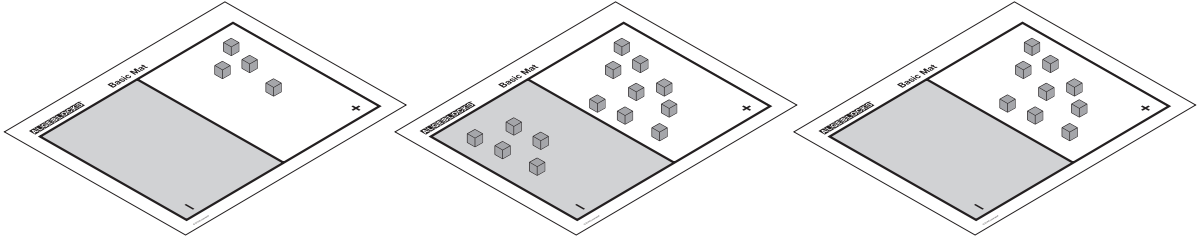**Use Algeblocks unit blocks and a Basic Mat to model the integer subtraction sentence. Make zero pairs. Write the difference. Explain your work.**

1. 4 – (–5) = _____

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Using Algeblocks unit blocks and a Basic Mat, model each subtraction sentence. Sketch the model. Make zero pairs. Write the difference.

2. –6 – 4 = _____

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Find each difference.

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5. 13 – (–7) = _____

6. 8 – (–12) = _____

7. –5 – 11 = _____

8. –1 – 6 = _____

9. 9 – (–8) = _____

10. 14 – (–16) = _____

11. –15 – (–15) = _____

Name _____

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$$7 - 1 \qquad -7 - 1 \qquad 7 - (-1) \qquad -7 - (-1)$$

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Name _____

Algeblocks® Basic Mat

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