

Brain Game

1.1 Using Variables and Expressions

MATERIALS • game cards

HOW TO PLAY

- Your teacher will distribute a game card to each student in your class.
- Each card contains a statement and a question, like the one below:

Answer: 5
Next question: If $n = 12$ then $n - 8$ is _____?

- Your teacher will begin the game by reading the question on his or her card. Then you will answer the question by evaluating the expression. The student whose card contains the correct answer will identify the answer. Then that student will read the question that is on his or her card aloud to the class.
- This process is repeated until all the cards are used.

PRACTICE

In Exercises 1–16, find the value of the expression when $x = 2$, 0, and 1.

1. $x + 4$

2. $x + 5$

3. $8 - x$

4. $6 - x$

5. $4x$

6. $2x$

7. $5x$

8. $7x$

9. $\frac{1}{2}x$

10. $\frac{1}{4}x$

11. $18 - x$

12. $11 - x$

13. *Describe* the steps you take to evaluate an algebraic expression.

GAME CARDS

<p>Answer: 22</p> <p>Next question: If $n = 20$ then $n + 5$ is ____?</p>	<p>Answer: 11</p> <p>Next question: If $n = 9$ then $10 + n$ is ____?</p>	<p>Answer: 17</p> <p>Next question: If $n = 32$ then $n + 19$ is ____?</p>
<p>Answer: 6</p> <p>Next question: If $n = 13$ then $28 - n$ is ____?</p>	<p>Answer: 1</p> <p>Next question: If $n = 4$ then $n + 7$ is ____?</p>	<p>Answer: 2</p> <p>Next question: If $n = 9$ then $n - 1$ is ____?</p>
<p>Answer: 3</p> <p>Next question: If $n = 11$ then $6n$ is ____?</p>	<p>Answer: 4</p> <p>Next question: If $n = 3$ then $13n$ is ____?</p>	<p>Answer: 5</p> <p>Next question: If $n = 11$ then $2n$ is ____?</p>
<p>Answer: 7</p> <p>Next question: If $n = 12$ then $\frac{n}{4}$ is ____?</p>	<p>Answer: 8</p> <p>Next question: If $n = 8$ then $n + 9$ is ____?</p>	<p>Answer: 9</p> <p>Next question: If $n = 21$ then $27 - n$ is ____?</p>
<p>Answer: 10</p> <p>Next question: If $n = \frac{1}{3}$ then $n + \frac{2}{3}$ is ____?</p>	<p>Answer: 18</p> <p>Next question: If $n = 16$ then $n + 12$ is ____?</p>	<p>Answer: 19</p> <p>Next question: If $n = 10$ then $30 + n$ is ____?</p>
<p>Answer: 40</p> <p>Next question: If $n = 15$ then $22 - n$ is ____?</p>	<p>Answer: 25</p> <p>Next question: If $n = 7.5$ then $n + 2.5$ is ____?</p>	<p>Answer: 28</p> <p>Next question: If $n = \frac{1}{4}$ then $16n$ is ____?</p>
<p>Answer: 39</p> <p>Next question: If $n = \frac{1}{2}$ then $4n$ is ____?</p>	<p>Answer: 51</p> <p>Next question: If $n = 16$ then $n - 7$ is ____?</p>	<p>Answer: 66</p> <p>Next question: If $n = 5$ then $n + 13$ is ____?</p>

Answer Key

<p>Answer: 22</p> <p>Next question: If $n = 20$ then $n + 5$ is <u>25</u>?</p>	<p>Answer: 11</p> <p>Next question: If $n = 9$ then $10 + n$ is <u>19</u>?</p>	<p>Answer: 17</p> <p>Next question: If $n = 32$ then $n + 19$ is <u>51</u>?</p>
<p>Answer: 6</p> <p>Next question: If $n = 13$ then $28 - n$ is <u>5</u>?</p>	<p>Answer: 1</p> <p>Next question: If $n = 4$ then $n + 7$ is <u>11</u>?</p>	<p>Answer: 2</p> <p>Next question: If $n = 9$ then $n - 1$ is <u>8</u>?</p>
<p>Answer: 3</p> <p>Next question: If $n = 11$ then $6n$ is <u>66</u>?</p>	<p>Answer: 4</p> <p>Next question: If $n = 3$ then $13n$ is <u>39</u>?</p>	<p>Answer: 5</p> <p>Next question: If $n = 11$ then $2n$ is <u>22</u>?</p>
<p>Answer: 7</p> <p>Next question: If $n = 12$ then $\frac{n}{4}$ is <u>3</u>?</p>	<p>Answer: 8</p> <p>Next question: If $n = 8$ then $n + 9$ is <u>17</u>?</p>	<p>Answer: 9</p> <p>Next question: If $n = 21$ then $27 - n$ is <u>6</u>?</p>
<p>Answer: 10</p> <p>Next question: If $n = \frac{1}{3}$ then $n + \frac{2}{3}$ is <u>1</u>?</p>	<p>Answer: 18</p> <p>Next question: If $n = 16$ then $n + 12$ is <u>28</u>?</p>	<p>Answer: 19</p> <p>Next question: If $n = 10$ then $30 + n$ is <u>40</u>?</p>
<p>Answer: 40</p> <p>Next question: If $n = 15$ then $22 - n$ is <u>7</u>?</p>	<p>Answer: 25</p> <p>Next question: If $n = 7.5$ then $n + 2.5$ is <u>10</u>?</p>	<p>Answer: 28</p> <p>Next question: If $n = \frac{1}{4}$ then $16n$ is <u>4</u>?</p>
<p>Answer: 39</p> <p>Next question: If $n = \frac{1}{2}$ then $4n$ is <u>2</u>?</p>	<p>Answer: 51</p> <p>Next question: If $n = 16$ then $n - 7$ is <u>9</u>?</p>	<p>Answer: 66</p> <p>Next question: If $n = 5$ then $n + 13$ is <u>18</u>?</p>

PRACTICE

1. 6, 4, 5

2. 7, 5, 6

3. 6, 8, 7

4. 4, 6, 5

5. 8, 0, 4

6. 4, 0, 2

7. 10, 0, 5

8. 14, 0, 7

9. 1, 0, $\frac{1}{2}$

10. $\frac{1}{2}$, 0, $\frac{1}{4}$

11. 16, 18, 17

12. 9, 11, 10

13. To evaluate a variable expression for a given value, substitute the given value of the variable into the expression and perform the indicated operations.

Teacher Notes

ACTIVITY PREPARATION AND MATERIALS

- You will want to prepare the cards before class. Because you must collect all of the cards in order to reuse them, you may prefer to create a set for each class.
- There may be too few or too many game cards provided with this activity. If there are too few, you can have some students work in pairs. If there are too many, you can give students multiple cards.
- You can also make additional cards if there are too few students. However, if you make additional cards, you will need to use the answer from an existing card on one of your new cards. The answer on the existing card should change to the final answer in your additional set. Check carefully that no answer is repeated and that the cards make one complete cycle.

ACTIVITY MANAGEMENT

- After handing out the cards, take time to answer questions that students may have.
- For the visual learner, you may wish to write the expressions on the board as they are read aloud.
- Students may want a sheet of paper so that they can write down the expressions as they are read and then solve them.
- **A-level Alternative** Edit the cards so that there are no expressions with fractions.
- **C-level Alternative** Edit the cards so that they contain more fractions or decimals.
- If you do edit the cards, you will need to be sure that the game still works and that each question has an answer.
- **Common Error**
Students may have trouble working with fractions. Take extra time when evaluating expressions with fractions.

Activity and Closure Questions

Ask these questions as a class.

1. Evaluate the expressions when $x = 0, 2,$ and 10 .

a. $x + 8$

b. $11 - x$

c. $12x$

Answer: a. 8, 10, 18

b. 11, 9, 1

c. 0, 24, 120

2. List the steps you take to evaluate a variable expression for a given value.

Answer:

To evaluate a variable expression for a given value, substitute the given value(s) of the variable into the expression and perform the indicated operations.

LESSON TRANSITION

This game can be played after Lesson 1.1 to review concepts and skills learned in Lesson 1.1.