School-Home Letter

Dear Family,

Throughout the next few weeks, our math class will be learning about operations and algebraic expressions. We will also be learning how to work with exponents.

You can expect to see homework that requires students to write, evaluate, and simplify expressions.

Here is a sample of how your child was taught to evaluate an expression.

Vocabulary

algebraic expression A mathematical phrase that includes at least one variable.

order of operations The process for evaluating expressions.

terms The parts of an algebraic expression that are separated by an addition or subtraction sign.

variable A letter or symbol that stands for one or more numbers.

MODEL   Evaluate Expressions

This is how we will be evaluating $n^2 - 2m$ for $n = 4$ and $m = 3$.

STEP 1

Write the expression. $n^2 - 2m$

STEP 2

Substitute the given values for the variables. $4^2 - 2 \times 3$

STEP 3

Find the value of the number with an exponent. $16 - 2 \times 3$

STEP 4

Multiply. $16 - 6$

STEP 5

Subtract. 10

Tips

Order of Operations

To evaluate an expression, first perform the operations in parentheses, then find the values of numbers with exponents, then perform all multiplication and division from left to right, and then perform all addition and subtraction from left to right.

Activity

You can write algebraic expressions to describe family relationships. Be sure to remind your child to explain what the variable in each expression represents. For example, if a child is 3 years older than her sister, the expression s + 3 represents the child's age, where s is her sister's age.

Carta para la casa

Vocabulario

expresión algebraica Una frase matemática que incluye al menos una variable.

orden de las operaciones El proceso que se usa para evaluar expresiones.

términos Las partes de una expresión algebraica que están separadas por un signo de suma o resta.

variable Una letra o símbolo que representa uno o más números.

Querida familia,

Durante las próximas semanas, en la clase de matemáticas aprenderemos sobre expresiones algebraicas y operaciones. También aprenderemos a trabajar con exponentes.

Llevaré a la casa tareas actividades que requieren que los estudiantes escriban, evalúen y simplifiquen expresiones.

Este es un ejemplo de la manera como aprenderemos a evaluar una expresión.

MODELO Evaluar expresiones

Así evaluamos $n^2 - 2m$ para $n = 4$ y $m = 3$.

PASO 1

Escribe la expresión.

$n^2 - 2m$

PASO 2

Sustituye los valores dados para las variables.

$4^2 - 2 \times 3$

PASO 3

Halla el valor del número que tiene un exponente.

$16 - 2 \times 3$

PASO 4

Multiplica.

$16 - 6$

PASO 5

Resta.

10

Pistas

Orden de las operaciones

Para evaluar una expresión, haz primero las operaciones entre paréntesis. Luego halla los valores de los números con exponentes. Después haz las multiplicaciones y divisiones, de izquierda a derecha. Finalmente, haz las sumas y restas, de izquierda a derecha.

Actividad

Puede escribir expresiones algebraicas para describir relaciones de familia. Asegúrese de recordarles a su niño(a) que expliquen lo que representa la variable en cada expresión. Por ejemplo, si una niña es 3 años mayor que su hermana, la expresión s + 3 representa la edad de la niña, donde la s es la edad de su hermana.

Name _____

Exponents

Use one or more exponents to write the expression.

1. 6×6

$$6^2$$
_____

2. $11 \times 11 \times 11 \times 11$

_____

3. $9 \times 9 \times 9 \times 9 \times 7 \times 7$

_____

Find the value.

4. 9^2

_____

5. 6^4

_____

6. 1^6

_____

7. 5^3

_____

8. 10^5

_____

9. 23^2

_____

10. Write 144 with an exponent by using 12 as the base.

_____

11. Write 343 with an exponent by using 7 as the base.

_____

Problem Solving *Real World*

12. Each day Sheila doubles the number of push-ups she did the day before. On the fifth day, she does $2 \times 2 \times 2 \times 2 \times 2$ push-ups. Use an exponent to write the number of push-ups Shelia does on the fifth day.

_____

13. The city of Beijing has a population of more than 10^7 people. Write 10^7 without using an exponent.

_____

Lesson Check (6.EE.1)

1. The number of games in the first round of a chess tournament is equal to $2 \times 2 \times 2 \times 2 \times 2 \times 2$. Write the number of games using an exponent.

2. The number of gallons of water in a tank at an aquarium is equal to 8^3. How many gallons of water are in the tank?

Spiral Review (6.RP.3a, 6.RP.3c, 6.RP.3d)

3. The table shows the amounts of strawberry juice and lemonade needed to make different amounts of strawberry lemonade. Name another ratio of strawberry juice to lemonade that is equivalent to the ratios in the table.

Strawberry juice (cups)	2	3	4
Lemonade (cups)	6	9	12

4. Which percent is equivalent to the fraction $\frac{37}{50}$?

5. How many milliliters are equivalent to 2.7 liters?

6. Use the formula $d = rt$ to find the distance traveled by a car driving at an average speed of 50 miles per hour for 4.5 hours.

Evaluate Expressions Involving Exponents

COMMON CORE STANDARD—6.EE.1
Apply and extend previous understandings of arithmetic to algebraic expressions.

Evaluate the expression.

1. $5 + 17 - 10^2 \div 5$

$5 + 17 - 100 \div 5$
$5 + 17 - 20$
$22 - 20$
2

2. $7^2 - 3^2 \times 4$

3. $2^4 \div (7 - 5)$

4. $(8^2 + 36) \div (4 \times 5^2)$

5. $12 + 21 \div 3 + (2^2 \times 0)$

6. $(12 - 8)^3 - 24 \times 2$

Place parentheses in the expression so that it equals the given value.

7. $12 \div 2 \times 2^3$; value: 120

8. $7^2 \times 1 - 5 \div 3$; value: 135

Problem Solving *Real World*

9. Hugo is saving for a new baseball glove. He saves $10 the first week, and $6 each week for the next 6 weeks. The expression $10 + 6^2$ represents the total amount in dollars he has saved. What is the total amount Hugo has saved?

10. A scientist placed fish eggs in a tank. Each day, twice the number of eggs from the previous day hatch. The expression 5×2^6 represents the number of eggs that hatch on the sixth day. How many eggs hatch on the sixth day?

Lesson Check (6.EE.1)

1. Ritchie wants to paint his bedroom ceiling and four walls. The ceiling and each of the walls are 8 feet by 8 feet. A gallon of paint covers 40 square feet. Write an expression that can be used to find the number of gallons of paint Ritchie needs to buy.

_____

_____

2. A Chinese restaurant uses about 225 pairs of chopsticks each day. The manager wants to order a 30-day supply of chopsticks. The chopsticks come in boxes of 750 pairs. How many boxes should the manager order?

_____

_____

Spiral Review (6.RP.3a, 6.RP.3c, 6.RP.3d, 6.EE.1)

3. Annabelle spent $5 to buy 4 raffle tickets. How many tickets can she buy for $20?

_____

4. Gavin has 460 baseball players in his collection of baseball cards, and 15% of the players are pitchers. How many pitchers are in Gavin's collection?

_____

5. How many pounds are equivalent to 40 ounces?

_____

6. List the expressions in order from least to greatest.

$$1^5 \qquad 3^3 \qquad 4^2 \qquad 8^1$$

_____

Write Algebraic Expressions

Write an algebraic expression for the word expression.

1. 13 less than p

$$p - 13$$

2. the sum of x and 9

3. 6 more than the difference of b and 5

4. the sum of 15 and the product of 5 and v

5. the difference of 2 and the product of 3 and k

6. 12 divided by the sum of h and 2

7. the quotient of m and 7

8. 9 more than 2 multiplied by f

9. 6 minus the difference of x and 3

10. 10 less than the quotient of g and 3

11. the sum of 4 multiplied by a and 5 multiplied by b

12. 14 more than the difference of r and s

Problem Solving (Real World)

13. Let h represent Mark's height in inches. Suzanne is 7 inches shorter than Mark. Write an algebraic expression that represents Suzanne's height in inches.

14. A company rents bicycles for a fee of $10 plus $4 per hour of use. Write an algebraic expression for the total cost in dollars for renting a bicycle for h hours.

Lesson Check (6.EE.2a)

1. The female lion at a zoo weighs 190 pounds more than the female cheetah. Let c represent the weight in pounds of the cheetah. Write an expression that gives the weight in pounds of the lion.

2. Tickets to a play cost $8 each. Write an expression that gives the ticket cost in dollars for a group of g girls and b boys.

Spiral Review (6.RP.2a, 6.RP.3a, 6.RP.3c, 6.RP.3d, 6.EE.1)

3. A bottle of cranberry juice contains 32 fluid ounces and costs $2.56. What is the unit rate?

4. There are 32 peanuts in a bag. Elliott takes 25% of the peanuts from the bag. Then Zaire takes 50% of the remaining peanuts. How many peanuts are left in the bag?

5. Hank earns $12 per hour for babysitting. How much does he earn for 15 hours of babysitting?

6. Write an expression that represents the area of the figure in square centimeters.

7 cm

2 cm

7 cm
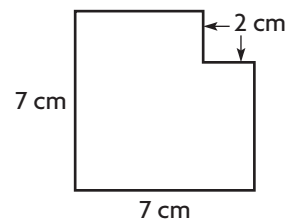
Name _____

Identify Parts of Expressions

Identify the parts of the expression. Then write a word expression for the numerical or algebraic expression.

1. $(16 - 7) \div 3$

The subtraction is the difference of 16 and 7. The division is the quotient of the difference and 3. Word expression: the quotient of the difference of 16 and 7 and 3

2. $20 + 5 \times 9$

_____

_____

_____

_____

_____

3. $2e - f$

_____

_____

_____

_____

_____

_____

4. $8 + 6q + q$

_____

_____

_____

_____

_____

_____

Identify the terms of the expression. Then give the coefficient of each term.

5. $11r + 7s$

_____

_____

6. $6g - h$

_____

_____

![Problem Solving Real World]

7. Adam bought granola bars at the store. The expression $6p + 5n$ gives the number of bars in p boxes of plain granola bars and n boxes of granola bars with nuts. What are the terms of the expression?

_____

8. In the sixth grade, each student will get 4 new books. There is one class of 15 students and one class of 20 students. The expression $4 \times (15 + 20)$ gives the total number of new books. Write a word expression for the numerical expression.

_____

_____

Lesson Check

1. A fabric store sells pieces of material for $5 each. Ali bought 2 white pieces and 8 blue pieces. She also bought a pack of buttons for $3. The expression $5 \times (2 + 8) + 3$ gives the cost in dollars of Ali's purchase. How can you describe the term $(2 + 8)$ in words?

2. A hotel offers two different types of rooms. The expression $k + 2f$ gives the number of beds in the hotel where k is the number of rooms with a king size bed and f is the number of rooms with 2 full size beds. What are the terms of the expression?

Spiral Review

3. Meg paid $9 for 2 tuna sandwiches. At the same rate, how much does Meg pay for 8 tuna sandwiches?

4. Jan is saving for a skateboard. She has saved $30 already, which is 20% of the total price. How much does the skateboard cost?

5. It took Eduardo 8 hours to drive from Buffalo, NY, to New York City, a distance of about 400 miles. Find his average speed.

6. Write an expression that represents the value, in cents, of n nickels.

Name _____

Evaluate Algebraic Expressions and Formulas

COMMON CORE STANDARD—6.EE.2c
Apply and extend previous understandings of arithmetic to algebraic expressions.

Evaluate the expression for the given values of the variables.

1. $w + 6$ for $w = 11$

$11 + 6$

17

2. $r - 9$ for $r = 20$

3. $17 - 2c$ for $c = 7$

4. $b^2 - 4$ for $b = 5$

5. $(h - 3)^2$ for $h = 5$

6. $x + x^2$ for $x = 6$

7. $m + 2m + 3$ for $m = 12$

8. $9a - 5a$ for $a = 7$

9. $4 \times (21 - 3h)$ for $h = 5$

10. $7m - 9n$ for $m = 7$ and $n = 5$

11. $d^2 - 9k + 3$ for $d = 10$ and $k = 9$

12. $3x + 4y \div 2$ for $x = 7$ and $y = 10$

Problem Solving Real World

13. The formula $P = 2\ell + 2w$ gives the perimeter P of a rectangular room with length ℓ and width w. A rectangular living room is 26 feet long and 21 feet wide. What is the perimeter of the room?

14. The formula $c = 5(f - 32) \div 9$ gives the Celsius temperature in c degrees for a Fahrenheit temperature of f degrees. What is the Celsius temperature for a Fahrenheit temperature of 122 degrees?

Lesson Check

1. When Debbie baby-sits, she charges $5 to go to the house plus $8 for every hour she is there. The expression $5 + 8h$ gives the amount she charges. How much will she charge to baby-sit for 5 hours?

2. The formula to find the cost C of a square sheet of glass is $C = 25s^2$ where s represents the length of a side in feet. How much will Ricardo pay for a square sheet of glass that is 3 feet on each side?

Spiral Review

3. Evaluate using the order of operations.

$$\frac{3}{4} + \frac{5}{6} \div \frac{2}{3}$$

4. Patricia scored 80% on a math test. She missed 4 problems. How many problems were on the test?

5. What is the value of 7^3?

6. James and his friends ordered b hamburgers that cost $4 each and f fruit cups that cost $3 each. Write an algebraic expression for the total cost of their purchases.

Name _____

Use Algebraic Expressions

Jeff sold the pumpkins he grew for $7 each at the farmer's market.

1. Write an expression to represent the amount of money Jeff made selling the pumpkins. Tell what the variable in your expression represents.

7*p*, where *p* is the number
of pumpkins

2. If Jeff sold 30 pumpkins, how much money did he make?

_____

An architect is designing a building. Each floor will be 12 feet tall.

3. Write an expression for the number of floors the building can have for a given building height. Tell what the variable in your expression represents.

_____

_____

4. If the architect is designing a building that is 132 feet tall, how many floors can be built?

_____

Write an algebraic expression for each word expression.
Then evaluate the expression for these values of the variable: 1, 6, 13.5.

5. the quotient of 100 and the sum of *b* and 24

_____

6. 13 more than the product of *m* and 5

_____

Problem Solving *Real World*

7. In the town of Pleasant Hill, there is an average of 16 sunny days each month. Write an expression to represent the approximate number of sunny days for any number of months. Tell what the variable represents.

_____

8. How many sunny days can a resident of Pleasant Hill expect to have in 9 months?

_____

Lesson Check

1. Oliver drives 45 miles per hour. Write an expression that represents the distance in miles he will travel for h hours driven.

_____

_____

_____

2. Socks cost \$5 per pair. The expression $5p$ represents the cost in dollars of p pairs of socks. Why must p be a whole number?

_____

_____

_____

Spiral Review

3. Sterling silver consists of 92.5% silver and 7.5% copper. What decimal represents the portion of silver in sterling silver?

_____

4. How many pints are equivalent to 3 gallons?

_____

5. Which operation should be done first to evaluate $10 + (66 - 6^2)$?

_____

6. Evaluate the algebraic expression $h(m + n) \div 2$ for $h = 4$, $m = 5$, and $n = 6$.

_____

Problem Solving • Combine Like Terms

COMMON CORE STANDARD—6.EE.3
Apply and extend previous understandings of arithmetic to algebraic expressions.

Read each problem and solve.

1. A box of pens costs $3 and a box of markers costs $5. The expression $3p + 5p$ represents the cost in dollars to make p packages that includes 1 box of pens and 1 box of markers. Simplify the expression by combining like terms.

$$3p + 5p = 8p$$

2. Riley's parents got a cell phone plan that has a $40 monthly fee for the first phone. For each extra phone, there is a $15 phone service charge and a $10 text service charge. The expression $40 + 15e + 10e$ represents the total phone bill in dollars, where e is the number of extra phones. Simplify the expression by combining like terms.

_____

3. A radio show lasts for h hours. For every 60 minutes of air time during the show, there are 8 minutes of commercials. The expression $60h – 8h$ represents the air time in minutes available for talk and music. Simplify the expression by combining like terms.

_____

4. A publisher sends 100 books to each bookstore where its books are sold. At each store, about 3 books are sold at a discount to employees and about 40 books are sold during store weekend sales. The expression $100s – 3s – 40s$ represents the approximate number of the publisher's books sold at full price in s stores. Simplify the expression by combining like terms.

_____

5. A sub shop sells a meal that includes an Italian sub for $6 and chips for $2. If a customer purchases more than 3 meals, he or she receives a $5 discount. The expression $6m + 2m – 5$ shows the cost in dollars of the customer's order for m meals, where m is greater than 3. Simplify the expression by combining like terms.

_____

Lesson Check

1. For each gym class, a school has 10 soccer balls and 6 volleyballs. All of the classes share 15 basketballs. The expression $10c + 6c + 15$ represents the total number of balls the school has for c classes. What is a simpler form of the expression?

2. A public library wants to place 4 magazines and 9 books on each display shelf. The expression $4s + 9s$ represents the number of items that will be displayed on s shelves. Simplify this expression.

Spiral Review

3. A bag has 8 bagels. Three of the bagels are cranberry. What percent of the bagels are cranberry?

4. How many kilograms are equivalent to 3,200 grams?

5. Toni earns $200 per week plus $5 for every magazine subscription that she sells. Write an expression, in dollars, that represents how much she will earn in a week in which she sells s subscriptions.

6. At a snack stand, drinks cost $1.50. Write an expression that could be used to find the total cost of d drinks.

Generate Equivalent Expressions

Use properties of operations to write an equivalent expression by combining like terms.

1. $7h - 3h$

$4h$

2. $5x + 7 + 2x$

3. $16 + 13p - 9p$

4. $y^2 + 13y - 8y$

5. $5(2h + 3) + 3h$

6. $12 + 18n + 7 - 14n$

Use the Distributive Property to write an equivalent expression.

7. $2(9 + 5k)$

8. $5(3m + 2)$

9. $6(g + h)$

10. $4d + 8$

11. $21p + 35q$

12. $18x + 9y$

Problem Solving `Real World`

13. The expression $15n + 12n + 100$ represents the total cost in dollars for skis, boots, and a lesson for n skiers. Simplify the expression $15n + 12n + 100$. Then find the total cost for 8 skiers.

14. Casey has n nickels. Megan has 4 times as many nickels as Casey has. Write an expression for the total number of nickels Casey and Megan have. Then simplify the expression.

Lesson Check

1. Tickets to a museum cost $8. The dinosaur exhibit costs $5 extra. The expression $8n + 5n$ represents the cost in dollars for n people to visit the museum and the exhibit. What is a simpler form of the expression is $8n + 5n$?

2. What is an expression that is equivalent to $3(2p - 3)$?

Spiral Review (6.RP.3c, 6.RP.3d, 6.EE.2b, 6.EE.3)

3. A Mexican restaurant received 60 take-out orders. The manager found that 60% of the orders were for tacos and 25% of the orders were for burritos. How many orders were for other items?

4. The area of a rectangular field is 1,710 square feet. The length of the field is 45 feet. What is the width of the field?

5. How many terms are in $2 + 4x + 7y$?

6. Boxes of cereal usually cost $4, but they are on sale for $1 off. A gallon of milk costs $3. The expression $4b - 1b + 3$ can be used to find the cost in dollars of buying b boxes of cereal and a gallon of milk. Write the expression in simpler form.

Identify Equivalent Expressions

COMMON CORE STANDARD—6.EE.4
Apply and extend previous understandings of arithmetic to algebraic expressions.

Use properties of operations to determine whether the expressions are equivalent.

1. $2s + 13 + 15s$ and
$17s + 13$

<u>   equivalent   </u>

2. $5 \times 7h$ and $35h$

3. $10 + 8v - 3v$ and $18 - 3v$

4. $(9w \times 0) - 12$ and $9w - 12$

5. $11(p + q)$ and
$11p + (7q + 4q)$

6. $6(4b + 3d)$ and $24b + 3d$

7. $14m + 9 - 6m$ and $8m + 9$

8. $(y \times 1) + 2$ and $y + 2$

9. $4 + 5(6t + 1)$ and $9 + 30t$

10. $9x + 0 + 10x$ and $19x + 1$

11. $12c - 3c$ and $3(4c - 1)$

12. $6a \times 4$ and $24a$

Problem Solving Real World

13. Rachel needs to write 3 book reports with b pages and 3 science reports with s pages during the school year. Write an algebraic expression for the total number of pages Rachel will need to write.

14. Rachel's friend Yassi has to write $3(b + s)$ pages for reports. Use properties of operations to determine whether this expression is equivalent to the expression for the number of pages Rachel has to write.

Lesson Check (6.EE.4)

1. Ian had 4 cases of comic books and 6 adventure books. Each case holds *c* comic books. He gave 1 case of comic books to his friend. Write an expression that gives the total number of books Ian has left.

_____

2. In May, Xia made 5 flower planters with *f* flowers in each planter. In June, she made 8 flower planters with *f* flowers in each planter. Write an expression in simplest form that gives the number of flowers Xia has in the planters.

_____

Spiral Review (6.RP.3c, 6.RP.3d, 6.EE.2c, 6.EE.3)

3. Keisha wants to read for 90 minutes. So far, she has read 30% of her goal. How much longer does she need to read to reach her goal?

_____

4. Marvyn travels 105 miles on his scooter. He travels for 3 hours. What is his average speed?

_____

5. The expression $5(F - 32) \div 9$ gives the Celsius temperature for a Fahrenheit temperature of *F* degrees. The noon Fahrenheit temperature in Centerville was 86 degrees. What was the temperature in degrees Celsius?

_____

6. At the library book sale, hardcover books sell for $4 and paperbacks sell for $2. The expression $4b + 2b$ represents the total cost for *b* hardcover books and *b* paperbacks. Write a simpler expression that is equivalent to $4b + 2b$.

_____