algebraforall

elizabeth warren Ph D

Sample Activity Red

ORIGO EDUCATION

Following Orders

Using brackets or parentheses ( ) to indicate the order of operations

AIM

Students will use a real-world situation to investigate why the order in which they apply operations is important. They will then use brackets or parentheses ( ) to show the order that should be followed.

MATERIALS

- 1 copy of the blackline master (opposite) for each student

TEACHING NOTE

The examples in this lesson were chosen because many international studies show that students tend to figure out 28 – 5 + 3 by adding the 5 and 3 and then subtracting 8 from 28. They also add before multiplying in the example 9 + 5 × 12.

REFLECTION

Discuss the order in which to perform operations. Reinforce that the operation in brackets ( ) is done first. Multiplication and division are completed before addition and subtraction. Operations at the same level are completed working left to right.

1 Write the equation and prices shown below on the board.

28 – 8 + 3 = ___ ***$28*** ***$8*** ***$3***

Ask, *What is the answer? How do you know?* Invite students to create stories for the equation using the 3 amounts of money, for example, "Jo had $28. She spent $8 and was then given $3." Highlight the fact that subtracting and then adding gives a different answer to adding and then subtracting. Explain that brackets ( ) help indicate the order to follow. Further explain that if there are no brackets, and the operations are "at the same level" (for example, addition and subtraction or multiplication and division), then the answer is calculated by working left to right.

2 Read Question 1 on the blackline master with the class. Say, *Imagine that you buy 1 CD and 5 DVDs. How much will you pay? What equation matches the thinking you used?* Invite individuals to describe their thinking and write equations. Discuss equation examples, such as 9 + 5 × 12 = ___ or 5 × 12 + 9 = ___, to show that working left to right will give different answers and that the first answer does not make sense. Reinforce that multiplication is performed before addition (or subtraction).

3 Repeat the discussion, saying, *Mary buys 9 DVDs and Meg buys 5 DVDs. What will they pay in total?* For this situation, discuss how the equations below can be used to show the thinking.

(9 + 5) × 12 = ___

or

9 × 12 + 5 × 12 = ___

4 Have the students complete the blackline master. Ask volunteers to share their answers.

Following Orders

Name _____

Digital Sale

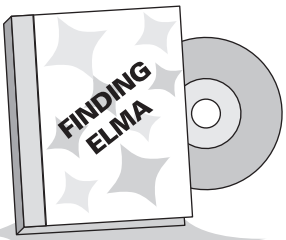
Music CDs

$9 each

DVDs

$12 each

eBooks



$7 each

Games

$15 each

1. Write an equation to show how you would figure out the total cost of each purchase. Then write the answer.

a. 1 DVD and 7 eBooks _____	b. 5 eBooks and 1 CD _____
c. 4 Games and 4 DVDs _____	d. 6 CDs and 1 DVD _____
e. 8 eBooks and 6 Games _____	f. 1 eBook and 5 CDs _____
g. 7 CDs and 1 Game _____	h. 3 CDs and 3 eBooks _____

2. Write the answers to these equations.

a. $16 + 8 - 4 =$ _____

b. $29 - 6 + 11 =$ _____

c. $8 + 36 \div 4 =$ _____

d. $3 \times 9 - 4 \times 2 =$ _____

e. $2 \times 32 \div 8 =$ _____

f. $48 \div 6 \times 2 =$ _____