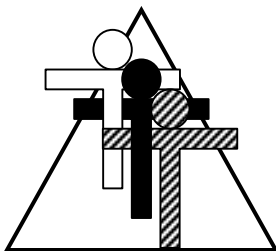


A Seven-Course Meal For Teaching Algebra Readiness

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ACTIVITY 4

Materials:

- paper
- transparency of activity master

Menu Math

Overview: This activity is so easy to teach you might feel guilty for taking a paycheck! Students will quickly pick up on the meaning and use of variables and will be able to substitute values into formulas to solve them.

Vocabulary: variable, formula

PROCEDURE

Skills:

- Using variables
- Solving equations
- Problem solving
- Distributive Property

1. Display the transparency master on the overhead projector as the students get out paper. Use a paper to cover the formulas, revealing only the menu at this time.

2. Slide the paper down to reveal the first formula:

$$h + f = ?$$

Students will raise their hands to tell the answer. One will say, "Two dollars and ninety cents!" Ask the student, "What do you mean?" The response will be that a burger and fry cost two dollars and ninety cents. Ask how the student arrived at that answer. Everyone will think it is obvious that the "h" stands for hamburger and the "f" must represent fries.

3. Display the second formula:

$$c + f + s = ?$$

Again a student will volunteer to explain that a cheeseburger, fries, and small soda costs \$4.15. You may wish to ask how the student decided that the "s" must stand for "small" and not for "soda". Again, the class will see that this is the obvious way to interpret the formula since there are three sizes of sodas.

4. Reveal the third formula:

$$7f = ?$$

Students will say that the cost is now \$7.35. Ask the class how they got that answer. Someone will say that you need to multiply seven times \$1.05. Ask why the student decided to multiply when the formula had no multiplication sign in it? Most students will think the answer is obvious. No other operation would make sense.

5. At this stage, students can solve the next two formulas for

further practice.

6. The final formula requires students to solve for an unknown, which is letter “d” in this case. Once they realize that the “d” is equal to \$1.55, they should see that it represents a large soda. You can then ask what the “d” might stand for. Someone may suggest it stands for “drink”.

7. At this point, continue to ask the students to solve more complex formulas and equations depending on their ability. Some samples are given here:

$$\begin{aligned}3c + 5f + 6s &= & 6f + 4s &= \\8h + 4f + 6x &= & 11c + 8m + 2x &= \\5c + 2h + m + 2s &= & 3h + 2s + m &= \\3h + s &= 2c + d & (\text{What does } d = ?)\end{aligned}$$

Jason gave the clerk a ten dollar bill and received \$3.95 in change. What might he have ordered?



Journal Prompts:



Here is a formula for an order at a restaurant. Write the dialog the customer may have used when placing the order.

$$2h + c + 3f + 2x + m$$

Homework:



Ask students to make up formulas and solve them. These formulas can be created toward the end of class and then copied down by the students to be solved for homework.

Taking a Closer Look:



If you had ten dollars, what different combinations of food could you order? Try to spend as much of the money on each order without exceeding \$10.00. Write each answer as a equation. For example:

$$3h + 3f + m = \$9.95$$

Good Tip!



Students can create their own menus and formulas and exchange them with a partner.

Ask the students to solve this formula:

$$4h + 4s + 4x =$$

This formula can be used to illustrate the distributive property by solving $4(h + s + x) =$ and seeing that the same answer results. You can then have the students practice the distributive property by solving similar formulas.

Assessment:



Students can verify each other's formulas if working in groups.

Homework can be checked through a class discussion.

Menu Math

| | |
|--------------------|--------|
| Hamburger | \$1.85 |
| Cheeseburger | \$2.15 |
| Fries | \$1.05 |
| Sodas: | |
| Small | \$.95 |
| Medium | \$1.25 |
| Large | \$1.55 |
| Extra Large | \$2.05 |

$$h + f =$$

$$c + f + s =$$

$$7f =$$

$$3h + c + f + 3x =$$

$$4c + 3f + s + m + l =$$

$$3c + 3d = \$11.10 \quad \text{What does } d = ?$$

Menu Math

| | |
|--------------------|--------|
| Hamburger | \$1.50 |
| Cheeseburger | \$2.00 |
| Fries | \$1.20 |
| Sodas: | |
| Small | \$.75 |
| Medium | \$1.25 |
| Large | \$1.50 |
| Extra Large | \$2.25 |

Menu Math

Hamburger

Cheeseburger

Fries

Sodas:

 Small

 Medium

 Large

 Extra Large

Write what each customer ordered and calculate how much was paid for each order:

$$3h + 3f =$$

$$3h + f =$$

$$3(h + f) =$$

Which two customers ordered the same food and paid the same price? Write the two orders below:

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

This is called the "Distributive Property."

Use the distributive property to rewrite each order below:

$$4(c + m) =$$

$$2(3h + x) =$$

$$3(c + f + s) =$$

$$5(2c + m + h + 4x) =$$

$$\underline{\hspace{1cm}}(c + x + 2f) = 3c + 3x + 6f$$

$$\underline{\hspace{1cm}}(2h + f + \underline{\hspace{1cm}}s) = 8h + 4f + 16s$$

$$5(\underline{\hspace{3cm}}) = 10c + 15h + 5m$$

$$\underline{\hspace{1cm}}(\underline{\hspace{3cm}}) = 6h + 6x$$

$$\underline{\hspace{1cm}}(\underline{\hspace{3cm}}) = 8c + 4f$$

Write the following orders as algebraic expressions.

I'd like four hamburgers, six orders of French fries, a large soda, two medium sodas, and an extra large soda.

I want three cheeseburgers, one hamburger, a small soda, two fries, a medium soda, and another hamburger.

I want a cheeseburger and an order of fries with a medium soda, my son wants two hamburgers an order of fries, and a medium soda, and my daughter wants a cheeseburger, an order of fries and a large soda. Oh yes, my husband wants two orders of fries, a cheeseburger and a large soda.

Let's see... I think I'd like three hamburgers and a cheeseburger, three fries, a large soda, two medium sodas, and an extra large soda. Add another order of fries on that, and make one of those hamburgers another cheeseburger.

Write a dialog or skit for each of the following algebraic orders.

$$3x + h + c$$

$$2h + 2f + 2m$$

$$(h + 2f) + (2c + x)$$

$$(3h + f + x) + (h + f + s)$$

$$(h + f + m) + (h + f + m) + (h + f + m)$$

$$(2c + f + x) + (2h + f + x)$$

Different members of the same family placed the following orders. Simplify the orders by combining like items.

$$(2h + f) + (c + f + s) + (h + m + f) =$$

$$(x + c) + (2f + c + x) + (m + 2f + c) =$$

$$(h + x + f) + (h + x + f) + (h + x + f) =$$

$$(3h + m) + (2c + f + m) + (c + m + 2f) =$$

$$(4c + f + m) + (3h + f + m) - h + c =$$

$$(3h + 2f + x) + (c + f + m) - (h + m + f) =$$

$$(5h + 3f + 2m) - (h + f + m) + (c + 2x) =$$

$$(3h + f + x) + (h + f + m) - (h + f) + c =$$

Someone used the wrong letter in each of these orders. Can you solve the problem?

$$h + 6w = \$8.15$$

$$8x + 5y = 27.15$$

$$4b + 6l = 13.10$$

$$3m + 6p + 5f = 20.10$$

$$7h + 2f + 3c - 2g = 17.15$$

$$4(h + m) + 6u = 21.70$$

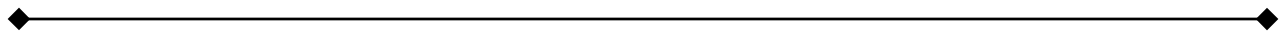
$$8c + 7(s + z) = 19.40$$

Can you find the price of a hamburger and of an order of fries at each of these restaurants?

Restaurant A:

$$3h + 2f = \$11$$

$$h + 2f = \$5$$



Restaurant B:

$$2h + 4f = \$12$$

$$3h + f = \$8$$



Restaurant C: What is the price of a cheeseburger?

$$2h + 3c + f = \$20$$

$$3h + 2c + f = \$19$$

$$h + 5c + 2f = \$27$$

Something spilled on parts of these orders. What are the missing items?

| Quantity | Item | Subtotal |
|----------|---------|----------|
| 3 | fries | \$3.15 |
| 6 | hamb | |
| 5 | | |
| Total: | \$24.50 | |

| Quantity | Item | Subtotal |
|----------|-----------|----------|
| 4 | hamburger | \$7.40 |
| 2 | ch | |
| 5 | | 5.25 |
| 2 | \$ | |
| 4 | | |
| Total: | \$27.45 | |

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