

Hi Grade 5!

In the past few weeks, you were given some games to try to start the process of thinking about solving equations to find an unknown. Last week's lesson was about writing equations and solving algebraic problems using addition and subtraction. You were introduced to the idea of solving by one of two ways:

1. Trial and error (also called *Guess and Test*).
2. Inspection.

After trying these strategies, it was most likely apparent that trial and error takes more time. Often, we find it easier to solve by inspection, using our basic facts and knowledge of addition, subtraction and this week - multiplication and division.

To review: given the equation $n + 3 = 7$ we ask ourselves "what number added to 3 gives 7?"

To solve, we know that since $4 + 3 = 7$, then $n = 4$. *Remember too, that every addition sentence has two corresponding subtraction sentences. We can re-write the problem $n + 3 = 7$, as $7 - 3 = n$, proving again that $n = 4$.

This week we will focus on solving equations using multiplication and division. This is one place where all the fact practice becomes useful!

😊 By the same reasoning we used when solving problems with addition and subtraction, we can solve these:

$n \times 4 = 12$ which can also be written as $4n = 12$, where $4n$ means "4 times a number" when there is no operation symbol between a number and an unknown.

To solve: $n \times 4 = 12$ we ask ourselves "what number multiplied by 4
or $4n = 12$ gives 12?"

Knowledge of our basic facts tells us that since $3 \times 4 = 12$, then $n = 3$.

*Remember too, that every multiplication sentence has two corresponding division sentences. We can re-write the problem $n \times 4 = 12$ as $12 \div 4 = 3$ proving again, that $n = 3$.

The same can be done when solving a division problem. For example:
 $n \div 5 = 2$ Again, using our basic facts and asking "what number divided by 5 gives 2?" we solve by $10 \div 5 = 2$ so $n = 10$. *Remember too, that every division sentence has two corresponding multiplication sentences. We can re-write the problem $n \div 5 = 2$ as $2 \times 5 = 10$ proving again, that $n = 10$.

We will begin our practice by reading through the examples given in our text, reminding us too, to write the equation to be solved as we did with our addition and subtraction practice. After this, try the circled questions on the pages that follow. (see next page)

Solving Equations Involving Multiplication and Division

Explore



- Solve this problem:
For a school fund-raiser, Yettis is packing boxes for children in Guyana, South America. Yettis has 48 notebooks. She puts 6 notebooks in each box. How many boxes will have notebooks?
- How many different equations can you write to solve the problem? List each equation.

Show and Share

Share your equations and solution with another pair of classmates. What types of equations did you write? What strategies did you use to solve your equations?



Connect

Clive watched the first snow of the season fall outside his window. Each hour, 3 cm of snow fell. The total snowfall was 15 cm. For how many hours did it snow?

Write an equation to solve this problem. Let t represent the number of hours it snowed. Here are 3 equations we can write and solve.

- Using multiplication

We know that:

Total snowfall = snow that falls in 1 h \times number of hours it snowed

One equation is:

$$15 = 3 \times t$$

Or,

$$15 = 3t$$



$3t$ is a short way to write $3 \times t$.

To solve this equation, think:
Which number do we multiply 3 by to get 15?

We know that: $3 \times 5 = 15$

So, $t = 5$

► Using division

- We know that:

Number of hours it snowed = total snowfall \div snow that falls in 1 h

One equation is:

$$t = 15 \div 3$$

So, $t = 5$

- We also know that:

Snow that falls in 1 h = total snowfall \div number of hours it snowed

Another equation is:

$$3 = 15 \div t$$

To solve this equation, think:

Which number do we divide 15 by to get 3?

We know that: $15 \div 5 = 3$

So, $t = 5$

The snow fell for 5 h.

Practice

1. Solve each equation.

a) $2 \times m = 4$

b) $2 \times m = 6$

c) $2 \times m = 8$

d) $2 \times m = 10$

e) $3 \times m = 18$

f) $3 \times m = 21$

g) $3 \times m = 24$

h) $3 \times m = 27$

2. Solve each equation.

a) $20 = 5c$

b) $2c = 30$

c) $4c = 44$

d) $50 = 5c$

e) $6c = 42$

f) $56 = 7c$

g) $8c = 64$

h) $54 = 9c$

3. Solve each equation.

a) $n = 16 \div 2$

b) $30 \div n = 10$

c) $8 = 48 \div n$

d) $5 = n \div 6$

e) $25 \div n = 5$

f) $6 = 42 \div n$

g) $n = 72 \div 8$

h) $n \div 4 = 8$

4. Solve each equation.

a) $63 \div r = 7$

b) $21 = 7s$

c) $t \div 5 = 7$

d) $36 = 4u$

e) $49 \div 7 = v$

f) $5w = 45$

g) $8 = 40 \div z$

h) $8n = 80$

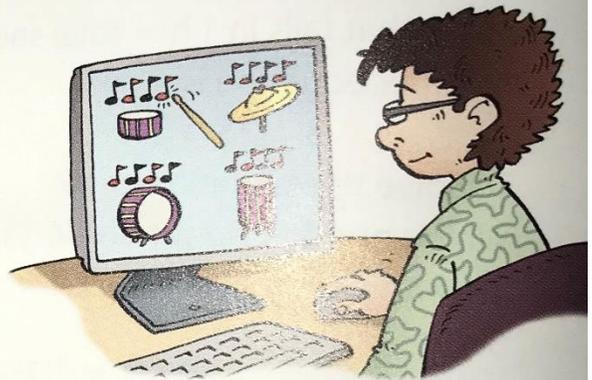
For each of questions 5 to 9, write an equation.
Solve the equation to solve the problem.

5. For a traditional burning ceremony, Cam had 22 bundles of cedar logs.
Each bundle contained 3 logs.
How many logs did Cam have altogether?

6. Holly made a comic book with 8 pages.
She had several copies of the book printed.
Holly paid for 96 pages altogether.
How many comic books did she print?

7. Starkley used his computer to write and record a drum track.
Each bar of the song had 4 beats.
The printout showed 31 bars of music.
How many beats did Starkley record?

8. Kimberly left Edmonton for a long car trip.
She travelled 400 km in 5 h.
About how far did Kimberly travel in 1 h?



9. Teagan picked cranberries for one week.
Each day, he picked 30 baskets of cranberries.
How many baskets did Teagan pick in 7 days?

10. For each equation, write a story problem that could be solved by using the equation.

a) $45 = 5n$

b) $77 \div 7 = r$

c) $6 = 24 \div s$

d) $t \div 7 = 8$

11. a) Write an equation.

- b) Write a story problem that could be solved by solving the equation.

- c) Solve the equation and the problem.

- d) What other equations could you write to solve the story problem?
Show your work.

(see next page)

To follow up with some online practice visit www.netmath.ca and try:

- a. Finding the missing term in an equation (\times and \div)
- b. Writing expressions

For our Tuesday/Thursday activities, lets look at an algebra game and an introduction to some measurement practice.

1. Follow the link to www.mathplayground.com
 - a. Click on Math Games
 - b. Scroll down and click on the blue "More Pre-Algebra Games" bar
 - c. Scroll down and under "Super Starters", choose "Candy Challenge Jr"

2. (taken from the University of Waterloo Investigations in Measurement)

You will need: string, a roll of paper towel, a large cereal box, a small container of popcorn, and a few nickels and dimes

*Note: Where a question asks for an estimate of your class, choose a room in your house or the people in your house.

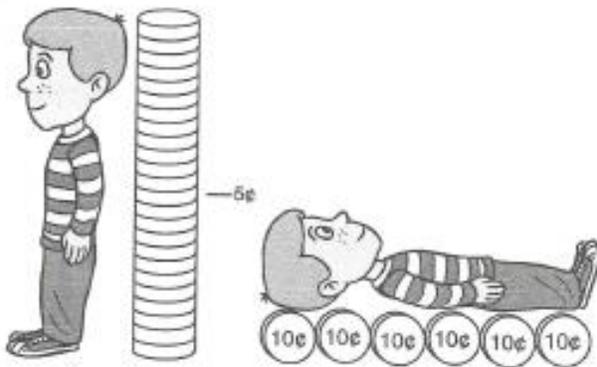
Have fun! (see next page)

BLM 12: When to Estimate

Read the following problems.
Tell whether or not you could determine an accurate answer. Explain why.



1. If you had a piece of string as tall as you are, how many times do you think you could wrap the string around your wrist?
2. Which do you think is greater — the length of your foot or the distance around your wrist? Explain.
3. Is there enough paper in a roll of paper towels to go all the way around your classroom? Explain.
4. Is the height of a large box of cereal greater or less than the distance around the box?
5. How many pieces of popcorn could fit in a wastebasket?
6. Are there more people in school wearing shoes with laces or wearing shoes without laces?
7. If you asked people to name their favourite one-digit number (0, 1, 2, 3, 4, 5, 6, 7, 8, or 9), what do you think would be the most commonly chosen number? Why do you think this?
8. Which do you think would be worth more — a stack of nickels as tall as you or a row of dimes laid edge to edge from your toes to your head as you are lying down?



9. Which would you rather have — your weight in nickels or your weight in quarters?
10. If you were to try spending \$1 000 000.00 by spending \$100.00 every hour, day and night, how long would it take you to spend it all?

Select a problem from 1 to 10 for which you think an accurate answer is possible.
Describe a method you could use to answer it accurately.
Carry out your method if possible. If it is not possible, explain why not.

