Lesson 6: Write Expressions Where Letters Stand for Numbers

Let's use expressions with variables to describe situations.

6.1: Algebra Talk: When x is 6

If x is 6, what is:

$x + 4$

$7 - x$

x^2

$\frac{1}{3}x$

6.2: Lemonade Sales and Heights

1. Lin set up a lemonade stand. She sells the lemonade for $0.50 per cup.

   a. Complete the table to show how much money she would collect if she sold each number of cups.

lemonade sold (number of cups)	12	183	c
money collected (dollars)			

   b. How many cups did she sell if she collected $127.50? Be prepared to explain your reasoning.

2. Elena is 59 inches tall. Some other people are taller than Elena.

a. Complete the table to show the height of each person.

person	Andre	Lin	Noah
how much taller than Elena (inches)	4	$6\frac{1}{2}$	d
person's height (inches)			

b. If Noah is $64\frac{3}{4}$ inches tall, how much taller is he than Elena?

6.3: Building Expressions

1. Clare is 5 years older than her cousin.

a. How old would Clare be if her cousin is:

10 years old?

2 years old?

x years old?

b. Clare is 12 years old. How old is Clare's cousin?

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2. Diego has 3 times as many comic books as Han.

   a. How many comic books does Diego have if Han has:

   6 comic books?

   n books?

   b. Diego has 27 comic books. How many comic books does Han have?

3. Two fifths of the vegetables in Priya's garden are tomatoes.

   a. How many tomatoes are there if Priya's garden has:

   20 vegetables?

   x vegetables?

   b. Priya's garden has 6 tomatoes. How many total vegetables are there?

4. A school paid $31.25 for each calculator.

   a. If the school bought x calculators, how much did they pay?

   b. The school spent $500 on calculators. How many did the school buy?

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Are you ready for more?

Kiran, Mai, Jada, and Tyler went to their school carnival. They all won chips that they could exchange for prizes. Kiran won $\frac{2}{3}$ as many chips as Jada. Mai won 4 times as many chips as Kiran. Tyler won half as many chips as Mai.

1. Write an expression for the number of chips Tyler won. You should only use one variable: J, which stands for the number of chips Jada won.

2. If Jada won 42 chips, how many chips did Tyler, Kiran, and Mai each win?

Lesson 6 Summary

Suppose you share a birthday with a neighbor, but she is 3 years older than you. When you were 1, she was 4. When you were 9, she was 12. When you are 42, she will be 45.

If we let a represent your age at any time, your neighbor's age can be expressed $a + 3$.

your age	1	9	42	a
neighbor's age	4	12	45	$a + 3$

We often use a letter such as x or a as a placeholder for a number in expressions. These are called *variables* (just like the letters we used in equations, previously). Variables make it possible to write expressions that represent a calculation even when we don't know all the numbers in the calculation.

How old will you be when your neighbor is 32? Since your neighbor's age is calculated with the expression $a + 3$, we can write the equation $a + 3 = 32$. When your neighbor is 32 you will be 29, because $a + 3 = 32$ is true when a is 29.