Chapter 2

Lesson 1

Representing Numbers

You will need

- a place value chart
- counters

GOAL

Represent numbers to one million using a place value chart, numerals, and words.

In 1997, David Huxley pulled an airplane with a mass of about 187 000 kg a distance of 91 m.
In 1999, Juraj Barbaric pulled a train with a mass of about 892 851 kg a distance of 4.5 m along a railway.

How can you model, read, and write these masses?

Tyler's Model

I can model the numbers using counters on a place value chart. This will help me read and write the numbers.

A place value chart has **periods** of three.

First, I'll model the number for the mass of the airplane.

187 000 is in **standard form**.

Thousands			Ones		
Hundreds	Tens	Ones	Hundreds	Tens	Ones
●	● ● ● ● ● ●	● ● ● ● ● ●			

I can read and write this number as *one hundred eighty-seven thousand*.

period

A group of hundreds, tens, and ones of a unit in a numeral

There are two periods in a six-digit whole number. The thousands period has hundred thousands, ten thousands, and one thousands. The ones period has hundreds, tens, and ones.

standard form

The usual way that numbers are written

For example, 766 921 is in standard form.

A. How are the two periods on the place value chart similar? How are they different?

B. What is the place value of each digit in 187 000?

C. Why didn't Tyler place any counters in the hundreds, tens, and ones columns?

D. Model 892 851 on a place value chart. Describe or sketch your model.

E. Write 892 851 in words.

Reflecting

F. Tyler included a space when he wrote 187 000 in standard form. How is the space shown on the place value chart?

G. How do the periods of three help you read numbers?

Checking

1. Kevin Fast pulled a truck with a mass of 24 640 kg.

a) Model the number 24 640 on a place value chart. Sketch or describe your model.

b) Write the number 24 640 in words.

Practising

2. Model each number on a place value chart. Then write each number in standard form.

a) four hundred seventeen thousand twenty-five

b) six hundred ninety-one thousand six hundred fifty-nine

c) one hundred thirty-six thousand two hundred nineteen

3. Write each number in words and in standard form.

a)

Thousands			Ones		
Hundreds	Tens	Ones	Hundreds	Tens	Ones
●● ●●		●●● ●●● ●	●●● ●●●	●	●●● ●●

b)

Thousands			Ones		
Hundreds	Tens	Ones	Hundreds	Tens	Ones
●●●		●●● ●●● ●		●●● ●	

4. Rose had 245 counters in the one thousands column of a place value chart. She regrouped each set of 10 counters to put 1 counter in the ten thousands column. Then she regrouped each set of 10 counters in the ten thousands column to put 1 counter in the hundred thousands column.

a) Sketch or describe Rose's final model.

b) How would you read this number?

5. In the book *A Million Dots*, Andrew Clements says, "If you brush your teeth about two minutes a day, during the past five years you've moved your toothbrush up and down and back and forth about 839 500 times."
   a) Model the number 839 500 on a place value chart. Sketch or describe your model.
   b) Write the words for this number.

6. In *A Million Dots*, Andrew Clements also says, "More than 265 000 different kinds of moths and butterflies live on Earth. More than 300 000 different kinds of beetles live on Earth."
   a) Model each number on a place value chart.
   b) Write each number in words.

7. Model 186 999 on a place value chart. Add 1 to this number, and then regroup to model the sum. Describe what happens.

8. Place a counter in the ones column of a place value chart, and write the number. Move the counter to the tens column, and write this number. Continue moving the counter and writing the new number. What pattern do the numbers make?

9. a) Find at least 3 numbers between 100 000 and 999 999 in newspapers, magazines, or books, or on the Internet. Copy the sentence where each number appears.
   b) Model each number on a place value chart. Sketch or describe your model.
   c) Write each number in words.

10. What is the greatest number that you can create using any six digits? Explain.