4.NBT Thousands and Millions of Fourth Graders

Alignments to Content Standards: 4.NBT.A.1  4.OA.A.1  4.NBT.B.5

Task

There are almost 40 thousand fourth graders in Mississippi and almost 400 thousand fourth graders in Texas. There are almost 4 million fourth graders in the United States.

We write 4 million as 4,000,000. How many times more fourth graders are there in Texas than in Mississippi? How many times more fourth graders are there in the United States than in Texas? Use the approximate populations listed above to solve.

There are about 4 thousand fourth graders in Washington, D.C. How many times more fourth graders are there in the United States than in Washington, D.C.?

IM Commentary

The purpose of this task is to help students understand the multiplicative relationship between commonly used large numbers (thousands and millions) by using their understanding of place value. This task also connects to students' work on multiplicative comparison (see 4.OA.A.1). The task 4.NBT Threatened and Endangered is a good task to do before this one as it requires the same kind of reasoning but the numbers are smaller. The numbers in this task come from the National Center for Educational Statistics:

The Standards for Mathematical Practice focus on the nature of the learning experiences by attending to the thinking processes and habits of mind that students need to develop in order to attain a deep and flexible understanding of mathematics. Certain tasks lend themselves to the demonstration of specific practices by students. The practices that are observable during exploration of a task depend on how instruction unfolds in the classroom. While it is possible that tasks may be connected to several practices, only one practice connection will be discussed in depth. Possible secondary practice connections may be discussed but not in the same degree of detail.

This particular task supports the demonstration of Mathematical Practice Standard 6, Attend to precision. Fourth graders apply their understanding of place value and multiplicative reasoning to compare thousands and millions in this task. They need to pay close attention to precision to determine the value of each digit in each number and to compare the two numbers. They make use of the fact that the value of each place is ten times the value of the place immediately to the right and are able to explain this using precise language.

**Solution**

We write 4 thousand as 4,000

We write 40 thousand as 40,000

We write 400 thousand as 400,000

The value of each place is ten times the value of the place immediately to the right.
So:

40,000 is 10 times 4,000

400,000 is 10 times 40,000.

4,000,000 is 10 times 400,000.

Thus, 400,000 = 10 \times 40,000, and there are about 10 times as many fourth graders in Texas as there are in Mississippi.

Also, 4,000,000 = 10 \times 400,000, and there are about 10 times as many fourth graders in the US as there are in Texas.

Finally, to go from 4,000 to 4,000,000, we have to multiply by 10 three times. We see that

\[10 \times 10 \times 10 = 10 \times 100 = 1000\]

So there are about 1,000 times as many fourth graders in the US as there are in Washington DC.