Unit 4, Lesson 19

Shipping Trash

Let's estimate volumes.

Warm-up

Number Talk: Three Factors

Find the value of each expression mentally.

- 8×4
- 8×8
- $8 \times 8 \times 2$
- $8 \times 8 \times 20$

Activity 1

What a Waste

1. Estimate the value of each quantity.
   a. The number of cubic feet that the class recycling bin holds.

   b. The number of cubic feet that the school recycling bins hold.

2. About how many cubic feet of recyclable materials does your school produce in each amount of time?
   a. a day

   b. a week

   c. a month

   d. a year

3. Do you think the recyclable materials your school produces in a year fit in your classroom? Explain or show your reasoning.

Activity 2

Plastic-palooza

Estimate if it is possible for all of the elementary schools in the United States to produce enough recyclable plastic to fill the cargo containers that the U.S. ships to other countries each year.

1. A standard cargo container for a ship measures 20 feet long, 8 feet wide, and 8 feet tall. What is the volume of the container?

2. Each school produces about 40 cubic feet of recyclable plastic in 1 day. How many days does it take for a school to fill one cargo container?

3. In 2018, the United States exported about 210,000 cargo containers of plastic. There are about 70,000 elementary schools in the U.S. How many cargo containers does each school need to fill in order to fill all the containers?

4. Do you think all the schools in the country produce enough plastic recyclables to fill the cargo containers that the U.S. ships? Explain or show your reasoning.

Section C Summary

We learned to use multiplication and division of whole numbers to estimate large quantities and to solve real-world problems. We first estimated the volume of milk we drink in one day. We used that estimate to find the volume of milk our class, our grade, our school, and 10 schools would drink. Then we determined how many days it would take each group to drink 10,000,000 cubic centimeters of milk.

Next, we solved problems about the area of the Great Pacific Garbage Patch. We calculated the areas of different U.S. states and compared those to the area of the Great Pacific Garbage Patch. We found that the area of the Great Pacific Garbage Patch is much greater than most U.S. states!

Finally, we recognized the amount of recyclable garbage the United States produces and ships overseas. We estimated the volume of recyclable garbage that our school produces in a day, a week, a month and a year. Then we used estimation to determine if it's possible for all of the elementary schools in the country to produce enough recyclable plastic to fill the cargo containers that the U.S. ships each year.