

# Lesson 20: Shipping Trash

## Standards Alignments

Addressing 5.MD.C.5, 5.NBT.B.5, 5.NBT.B.6

### Teacher-facing Learning Goals

- Estimate and calculate products and quotients of whole numbers.

### Student-facing Learning Goals

- Let's estimate volumes.

## Lesson Purpose

The purpose of this lesson is to estimate and calculate products and quotients of whole numbers in order to understand the volume of recyclable plastic the United States ships abroad each year.

This lesson uses the structure of the first lesson in this section where students estimated how much milk different groups of students drink in a day and then how many days it would take the students to drink specified amounts of milk. In this lesson, students make similar estimates and calculations, but now they are estimating the volume of recyclable garbage students at their school produce. Continuing the context of the previous lesson as well as the large numbers, students start to conceptualize how much recyclable garbage the United States produces and ships overseas. They first encountered this context at the end of the first unit and now can use the whole number multiplication and division strategies they learned in this unit to study the situation in greater depth. Because there are a lot of estimates involved, students also see a quotient of numbers much larger than they have seen to this point. They find the value of this quotient using known facts and reasoning about place value.

Throughout the lesson, students make estimates and simplifying assumptions in order to answer complex mathematical questions (MP4).

### Access for:

#### Students with Disabilities

- Engagement (Activity 1)

#### English Learners

- MLR1 (Activity 2)

## Instructional Routines

Number Talk (Warm-up)

## Lesson Timeline

|                  |        |
|------------------|--------|
| Warm-up          | 10 min |
| Activity 1       | 15 min |
| Activity 2       | 20 min |
| Lesson Synthesis | 10 min |
| Cool-down        | 5 min  |

---

## Cool-down (to be completed at the end of the lesson)

 5 min

Ship It

### Standards Alignments

Addressing 5.NBT.B.5, 5.NBT.B.6

### Student-facing Task Statement

- A different shipping container is 40 feet long, 9 feet wide, and 8 feet tall.
  - What is the volume of this container? Explain or show your thinking.
  - A school makes 24 cubic feet of recyclable plastic each day. How many days does it take the school to fill this container? Explain or show your thinking.

### Student Responses

- 2,880 cubic feet. I first found  $40 \times 9 = 360$  and then found  $360 \times 8$ .
  - 120.

$$\begin{array}{r}
 \boxed{120} \\
 20 \\
 100 \\
 24 \overline{)2,880} \\
 \underline{-2,400} \\
 480 \\
 \underline{-480} \\
 0
 \end{array}$$