

Lesson 12: Lots and Lots of Garbage (Optional)

Standards Alignments

Addressing 5.MD.C.5

Teacher-facing Learning Goals

- Find the volume of rectangular prisms with standard units of measure by multiplying the base times the height or multiplying the length times the width times the height.

Student-facing Learning Goals

- Let's investigate what happens to garbage.

Lesson Purpose

The purpose of this lesson is for students to use their understanding of volume of rectangular prisms to solve a real world problem. Students make a model to visualize large amounts of garbage.

This lesson is optional because it does not address any new mathematical content standards. This lesson does provide students with an opportunity to apply precursor skills of mathematical modeling.

In previous lessons, students computed volumes. They packed unit cubes inside boxes and found the volume of the box by multiplying the side lengths of the box. In this lesson, they will investigate a real world problem using those ideas.

In the warm-up, students read a short paragraph from an article about garbage exports. Students are asked to visualize 3,300 tons or 60 containers of garbage. Mathematizing the world by recognizing math in everyday life is an important step of mathematical modeling.

In the first activity, students find different arrangements of 60 shipping containers, assuming that they are cubes. While real shipping containers are not cubes, we can simplify the situation by using figures that are easier to work with. This step of making simplified assumptions is an important part of mathematical modeling. Students are asked to draw a diagram of one of their arrangements.

In the second activity, students estimate the number of shipping containers on a fully loaded cargo ship from a picture. When students estimate quantities and make assumptions, they model with mathematics. Students circle back to the question of garbage by computing together how much garbage could fit on a fully loaded cargo ship. When students translate a mathematical answer back into the real-world situation, they model with mathematics (MP4).

Access for:

Students with Disabilities

- Engagement (Activity 1)

English Learners

- MLR7 (Activity 1)

Instructional Routines

Notice and Wonder (Warm-up)

Materials to Gather

- Connecting cubes: Activity 1
- Patty paper: Activity 1
- Tools for creating a visual display: Activity 1

Lesson Timeline

Warm-up	10 min
Activity 1	25 min
Activity 2	20 min
Lesson Synthesis	10 min

Teacher Reflection Question

Who got to do math today in class and how do you know? Identify the norms or routines that allowed those students to engage in mathematics. How can you adjust these norms and routines so all students do math tomorrow?