

Lesson Title: A Problem of Volume Designer: Jason Lineberger

Discipline: Math Grade Level: 4-5

Activity 1: Estimating Volume

(Appropriate for AFTER the Broadcast Lesson)

Activity Goal: Practice calculating volume and estimating volume.

Targeted Math Skills: Estimation, multi-step multiplication.

Materials: Ruler or measuring tape, scissors, and paper cube ([First Palette Printable](#)).

Steps:

1. Print, cut out, and fold the paper cube.
2. Using a ruler or measuring tape, measure the length of a side of the cube, then determine the volume.
3. Using that cube as a reference point, estimate the volume of a variety of rectangular figures around the house and community. Start small with items like shoe boxes. Then, go bigger with items like refrigerators.
4. Use a measuring tape to determine the actual volume of those figures and check that against the estimated volume using the paper cube.

Activity 2: Volume Under Construction

(Appropriate for AFTER the Broadcast Lesson)

Activity Goal: Understanding Volume.

Targeted Math Skills: Volume, estimation, multi-step multiplication.

Materials: Cardboard, scissors, tape, and a measuring stick/tape.

Steps:

1. Start with a given volume such as 20 cubic centimeters.
2. The goal is to create a rectangular prism, using cardboard and tape to hold it together, that will have that exact volume. If necessary, give the measurement of one of the sides.
3. Given the total volume and a single side, students will be able to determine the length of the other two sides, measure their cardboard, cut it out, and produce models with the given volume.

Bonus Challenge: Students can create a second rectangular prism with different measurements that has the same volume.

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Additional Resources for Lesson-Related Extension Activities:

- **Student-Facing**
 - Volume of a cube (UNC TV/PBS Learning Media) - <https://unctv.pbslearningmedia.org/resource/mgbh.math.md.rubiks/rubiks-cube-volume/>
 - Volume of rectangular prisms (UNC TV/PBS Learning Media) - <https://unctv.pbslearningmedia.org/resource/mgbh.math.md.volume/volume-of-right-rectangular-prisms/>
 - Representing volume with cubes (UNC TV/PBS Learning Media) - <https://unctv.pbslearningmedia.org/resource/mgbh.math.md.rectprism/representing-volume-of-right-rectangular-prisms-with-unit-cubes/>
 - Dunk Tank - Finding liquid volume game (UNC TV/PBS Learning Media) - <https://unctv.pbslearningmedia.org/resource/7303d289-bbfd-4769-a79e-f4c8b1b34019/7303d289-bbfd-4769-a79e-f4c8b1b34019/>
- **Teacher-Facing**
 - Estimating volume using candy with a lesson plan (UNC TV/PBS Learning Media)- <https://unctv.pbslearningmedia.org/resource/mgbh.math.md.candy/candy-volume/>
 - Lesson plan: What is volume? (Education.com) - <https://www.education.com/lesson-plan/what-is-volume/>