

Finding Volume of Similar Figures

Summary

Identify the relationship between the corresponding sides in two similar figures and their volumes.
Find volumes of similar figures.

Materials

Linker cubes for each team

Scissors

card stock

tape

Worksheets: [Investigating Similar Figures](#), [Volumes of Similar Figures](#), [Scale Factors and Volume With Linking Cubes](#), [Jenga Game](#)

Background for Teachers

Enduring Understanding (Big Ideas):

Indirect measures for similar figures

Essential Questions:

How can we describe the relationship between the corresponding sides of similar figures and their volumes?

How can this relationship help us determine the volume for similar figures?

Skill Focus:

Use the relationship between corresponding sides of similar figures to find volume.

Vocabulary Focus:

Corresponding sides, similar figures, volume

Ways to Gain/Maintain Attention (Primacy):

Manipulatives, cheer, games, foldable

Instructional Procedures

Starter:

Find the area of rectangle

These rectangles are similar. What is the scale factor?

Use the scale factor to find the area for the larger rectangle

Write 3, 200,000 using scientific notation

Lesson Segment 1: How can we describe the relationship between the corresponding sides of similar figures and their areas?

Give each team of students 100 linking cubes. They will be building similar prisms and comparing the ratio of corresponding sides to the ratio of the volumes. Work with them to build prisms as they complete the "Investigating Similar Figures, Scale Factors and Volume With Linking Cubes" investigation worksheet. If they have difficulty building a rectangular prism, remind them to first build the base by forming lw , and then stack the number of layers for h .

As they work together in small groups, ask them to rotate roles: Builder (handles the cubes), Coach (tells builder how it should look and suggest ideas for building), Draftsman (reminds all to sketch the prisms helping each of them with the drawing), Encourager (makes sure there are no put-downs and that each person is taking a turn with the roles). Have students build and sketch, and discuss the answers to the questions as a class.

Predicting and testing the hypotheses: Remind students that in the last lesson, when finding area (or the number of squares needed to cover a similar figure), they used the scale factor squared. Ask

students to predict what might happen with the scale factor when finding volumes of similar figures. Have them look for a pattern that relates the scale factor to the number of cube units in each prism. Make sure student focus on the relationship between the scale factor and the new volume. They should begin to see that the units of volume in the larger figure are always the original volume multiplied by the cube of the scale factor. When they write the ratio for each make this explicit: The volume of the larger figure is the cube of the scale factor multiplied by the volume of the smaller figure. Help them make the connection between volume being measured in cubed units and the scale factor being cubed when finding the volume of the larger prism.

Lesson Segment 2: How can the relationship between volumes of similar figures help us find missing areas?

Teach the students the following cheer. Have them compare this cheer to the cheer for area from the last lesson. How are the procedures the same? Different?

Similar figures? I don't cry. I can find <u>volume</u> if I try. <i>Cube the scale factor</i> and multiply By the smaller volume! My oh My!
Similar figures? I'm not scared! I'll find <u>area</u> if I'm dared. Multiply the <i>scale factor squared</i> By the smaller area-I'm prepared!

Play Lie Detector again for completing the worksheet, Volume of Similar Figures.

Materials: Give each small group a Smart Pal with blank paper or large team board and marker

Procedure: Divide the class into two teams, A and B. Team members work together to complete one assigned part of the worksheet. Give students a little time to check with team members and to work the part of the worksheet correctly. The team should then decide if they are going to tell a lie or tell the truth. If they choose to tell the truth, a scribe writes the responses to the worksheet correctly on the Smart Pal or Team Board. If they decide to tell a lie, the scribe writes part of their response incorrectly on the Smart Pal or team board. Teacher selects one person from team A to be The Presenter. The Presenter stands in the front of the room shows the team board and explains what was done (either telling the truth, or telling a lie about the problem). The class is given a little time to discuss the response in small groups. The Presenter then chooses one person from Team B to be the Lie Detector and to tell whether they believe the explanation was truth or lie. If The Lie Detector thinks the explanation was a lie, he/she has to explain where the lie occurred and correct it. If the Lie Detector is correct, Team B gets a point. If not, The Presenter tells whether their explanation was the truth or a lie. If it was a lie, The Presenter tells why. The game proceeds with each team taking a turn to be Presenter and Lie Detector.

Journal:

Students should make the foldable and fill in the blanks to show each step.

Application review of the affect of scale factor on length, area, and volume.

Have student play Jenga as described on the attached worksheet.

Assessment Plan

Performance task, observation of student groups, questions

Bibliography

This lesson plan was created by Linda Bolin.

Authors

[Utah LessonPlans](#)