



OPENING

Introduction to the Project

- ✓ Today you will choose a topic for a ratio project. The topic you choose must incorporate working with ratios in some way.
- ✓ You will work on this project with your group over the course of the unit. You will be given some class time to work on your project, but you will also work on it at home.
- ✓ At the end of the unit, your group will present your project to the class. Your teacher will use a project rubric to evaluate all of the projects. Look at the rubric and discuss it with your classmates.

Rubric

Project Rubric





Ratio Project Ideas

Glide Ratios Project

Make different model airplanes and determine which has the best glide ratio.

Research on the internet to learn about glide ratios and to get some ideas for how to go about doing this project.

Golden Ratio Project

The golden ratio is a special number that appears throughout geometry, art, architecture, and nature. Research the golden ratio and prepare a presentation about your findings. Your presentation can be in poster, oral, or video form. Or, use one of the suggestions below for a more specific project topic dealing with the golden ratio.

Research how the golden ratio works and can be used to model natural growth on the internet.

You can work on a visually appealing art project about the golden ratio using either of these two ideas:

— Golden rectangles (rectangles whose side lengths are

in the golden ratio) appear over and over again in famous architecture—for example, in the Great Pyramid of Giza and in the 20th century buildings of architect Le Corbusier. Prepare a poster, slide show, or video that illustrates how the golden ratio is used in famous architecture.

— Many famous painters throughout history have used the golden ratio in their paintings, and some painters choose to paint on canvases in the shape of the golden rectangle. Examples include Michelangelo, Leonardo da Vinci, and Piet Mondrian. Prepare a collage, slide show, or video that shows how painters have used the golden ratio in their paintings.

Recipe Project

Choose a family recipe, or find a recipe on the Internet or in a cookbook. The recipe should make at least 4 servings, but not more than 12 servings. Adjust the quantities in the recipe so that it will serve the number of people in your class, including your teacher (1 serving per person). Make a poster, video, or pamphlet to present the recipe.

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Ratio Project Ideas

Your presentation should include the following:

- The original recipe
- The recipe scaled for 1 serving (for example, if the original recipe uses 1 teaspoon of salt and serves 4, the recipe for 1 serving would use $\frac{1}{4}$ teaspoon of salt)
- The recipe scaled for your class (1 serving for each person in the class, including your teacher)
- The factor you used to scale the original recipe to the class recipe
- An explanation of the math you used, including a description of your strategies for working with ratios

Round your measurements as needed to make the recipe more manageable.

Be creative! Use diagrams, drawings, photos, video, and/or audio to explain your strategies for working with ratios.

Erupting Volcano Project

When vinegar and baking soda are mixed together, they produce a chemical reaction that mimics an erupting volcano. Conduct a research project to find out what ratio of vinegar to baking soda produces the most explosive volcanic eruption.

Find instructions for making a baking soda volcano—either on the Internet or in a book of science projects. There are a variety of methods for making the volcano (although all methods use baking soda and vinegar). Research and find a method for building a volcano.

In deciding which method to use, consider the following:

- Remember that the goal of the project is to determine what ratio of vinegar to baking soda produces the most explosive eruption. Thus, you will need to make more than one volcano in order to compare the effects of different ratios. Choosing a simpler method with fewer materials will save you time and make it easier for you to concentrate on the goal of the project.





Ratio Project Ideas

- Make sure you have access to all of the materials in the instructions. For example, one of the possible recipes you can use will require flour, salt, cooking oil, detergent, baking soda, vinegar, red food coloring, a soda bottle, and a baking pan. If you will have trouble accessing any of the materials in the method you choose, you might want to find another method.
- Make a video, slide show, or poster with photos to present your results.

Gears Project

Gears are amazing mechanisms that are used in many different ways in many different industries. Prepare a presentation about gears, using the specific suggestions below or a theme of your choice. Your presentation must clearly show how ratios relate to the way gears work.

Here are some specific ideas that you can focus on:

— Design a machine that uses gears.

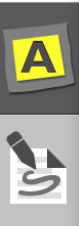
— Explore how gear ratios are used in bicycle sprockets. Prepare diagrams, pictures, and/or videos that illustrate how the gear ratios work.

— Find videos on the Internet of machines that make use of gears. Prepare a poster with text and diagrams that explains the videos. In your presentation to the class, show some of the videos and then present your poster.

Scale Model Project

Choose a toy that is a scaled-down version of a real-life object (for example, a stuffed bear, toy car, toy dinosaur, toy building). Your task is to find the scale of the toy (scale is a ratio of the measurements of a model or drawing of something to the measurements of the real thing). To find the scale of the toy, you will need to conduct research to determine the average corresponding measurements of the real-life object.

Think carefully about what tools and units you should use to measure the toy. Also consider which parts of the toy would be best to measure.





Ratio Project Ideas

Your Own Idea

Make a proposal to your teacher for a ratio project that you would like to work on.

1. Select a topic for your project.
2. Decide whether you want to work solo or with a group of students. If you decide to work with a group, determine who will be in the group.
3. Write a description of your project. Include a list of the students in your group.
4. Submit your proposal to your teacher for approval.

