



# Investigate Rational or Irrational Numbers

By: Amanda Martin

Elementary school music teacher; M.A.Ed. In Curriculum and Instruction

Math  
Grades 9–12



## Introduction

What are rational and irrational numbers? Students will investigate sums and products of various problems to determine if their properties are either rational or irrational.

## Learning Objectives

([CCSS.MATH.CONTENT.HSN.RN.B.3](#)) Students will explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

## Materials Needed

- Notebooks/journals/notebook paper
- Highlighters

## Procedure

1. Inform students that they will be conducting mathematical experiments in this lesson. Do not introduce the lesson's key terms, rational and irrational numbers, at this time. They will be introduced after the lesson's "experiments."
2. Divide students into groups of 2 or 3. Students will travel around the room to solve several problems including rational and irrational numbers (problems should be placed in various locations throughout the classroom by the teacher before students arrive; examples are provided below). Student groups will copy the problem onto a sheet of notebook paper or journal and solve it before moving to the next one.
3. Students should return to their seats and continue working with their small group. Students will analyze the sums or products of each problem to find similarities or differences. Ask groups to use two highlighters of different colors to color code those that are similar and those that are different.
4. Introduce and define the lesson's key terms: rational and irrational numbers. Then, students should revisit their problems from the group activity. They should check for two things: 1. Which are rational or irrational? 2. Are the similarities and differences that were found depicting rational and irrational numbers? Students should make any changes or corrections to their findings.

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## Example Problems:

$$\frac{1}{2} + \frac{3}{4} \qquad \frac{5}{9} - \frac{9}{10}$$

$$1900 \times \frac{1}{16} \qquad (2 \times 4) + 22$$

$$\frac{165}{19} + 14 \qquad \frac{2}{4} - \frac{1}{16}$$

## Evaluation

Students will work in small groups to solve various problems and determine whether they are rational or irrational numbers. Please use the following checklist to evaluate student work:

Rational and Irrational Numbers	Complete?
Did groups correctly solve each problem?	
Do groups have the sums/products classified as rational or irrational correctly?	