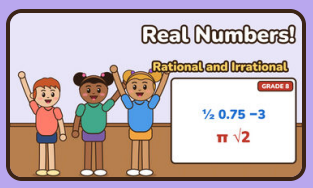
HAKILLO KIDS · TEACHER GUIDE · VIRGINIA SOL EDITION · GRADE 8 · LESSON 1

The Real Numbers



VIRGINIA SOL (2023)
8.NS.1, 8.NS.2

VIDEO LENGTH
4:52 · Common Core edition also available

WATCH THE LESSON FREE
hakillokids.org/math/grade-8#G8-01

PRACTICE ONLINE
learn.hakillokids.org · videos stop for each question, scored automatically

8.NS.1 The student will compare and order real numbers and determine the relationships between real numbers.

8.NS.2 The student will investigate and describe the relationship between the subsets of the real number system.

Materials: Number lines, calculators, a real-number Venn diagram.

Students will

- Classify real numbers as rational or irrational.
- Know that terminating and repeating decimals are rational.
- Know that irrational decimals never end and never repeat (π, √2).
- Compare and order real numbers using decimal approximations.

Key words

real numbers	all the numbers on the number line
rational number	can be written as a fraction of integers
irrational number	cannot be written as a fraction; its decimal never ends or repeats
repeating decimal	a decimal with a digit pattern that repeats forever (0.333…)

Before the video 2 minutes

Ask: “Can every number be written as a fraction? What about π or √2?”

What happens in the video

0:00	Welcome to eighth grade and today's goal: the real numbers
0:19	Rational and irrational numbers
0:43	Terminating, repeating, and never-ending non-repeating decimals
1:07	Ordering 1/2, √2, 2 1/4 and π
1:29	Spot the mistake: repeating decimals are rational
1:51	Your turn! Students answer during each pause (see below)
4:31	Recap and goodbye

Spot the mistake at 1:29

> **Sam:** Zero point three three three goes on forever, so it's irrational!
> **Ivy:** Hmm... do the digits repeat?
> **Mia:** They repeat! Zero point three repeating is one third, a fraction. So it is rational.
> **Sam:** Oops! Repeating decimals are rational.

- Ask: “Do the digits of 0.333... repeat?” (Yes.)
- Divide 1 by 3 on a calculator to show 0.333...
- Conclude: 0.333... = 1/3, so it is rational.

Your-turn pauses students answer out loud, then the characters give the answer

TIME	QUESTION	ANSWER IN THE VIDEO
1:52	Is pi rational or irrational?	Irrational! It never ends and never repeats.
2:07	Is one fourth rational or irrational?	Rational! It's a fraction.
2:21	Is the square root of nine rational or irrational?	Rational! The square root of nine is three.
2:37	Is the square root of five rational or irrational?	Irrational! Five is not a perfect square.
2:53	Which is greater, pi or three point two?	Three point two! Pi is about three point one four.
3:09	Which is greater, the square root of two or one point five?	One point five! The square root of two is about one point four one.
3:27	Is negative seven rational or irrational?	Rational! It's an integer, negative seven over one.
3:44	Zero point six repeating. What fraction is it?	Two thirds! So it's rational.
3:59	Which is less, negative one half or negative one third?	Negative one half! It's farther left.
4:15	Three, pi, and the square root of ten. Which is the greatest?	The square root of ten! It's about three point one six.

Tip: pause the video a little longer on any question your class finds hard, and ask a student to explain how they know.

After the video: talk about it

1. How can you tell if a square root is rational?
2. Is every integer a rational number? Why?
3. Order √10, 3.1 and π.

Go further

Number family tree: students make a poster showing natural, whole, integer, rational and irrational numbers with examples.

Answer key for the practice page

1. Rational (7)
2. Irrational
3. Rational (repeating)
4. 4/9
5. 1.5, √3, 7/4 (1.5, about 1.73, 1.75)
6. From left: -1.5, 2/3, √5 (≈2.24), π (≈3.14)

© 2026 Hakillo Kids · Free to copy for classroom and home use · hakillokids.org
Virginia Standards of Learning © Commonwealth of Virginia, Virginia Department of Education.

HAKILLO KIDS · GRADE 8 · LESSON 1 · PRACTICE

The Real Numbers

Name: _____ **Date:** _____

1. **Is √49 rational or irrational?**

   Answer: _____

2. **Is √7 rational or irrational?**

   Answer: _____

3. **Is 0.121212... rational or irrational?**

   Answer: _____

4. **Write 0.444... as a fraction.**

   Answer: _____

5. **Order from least to greatest: √3, 1.5, 7/4**

   Answer: _____

6. **Place π, √5, -1.5 and 2/3 on a number line.**

   Answer: _____

Watch the lesson free: hakillokids.org/math/grade-8#G8-01
Practice online with Mia, Sam & Ivy: **learn.hakillokids.org**