

learning focus:

- ✓ approximate the value of an irrational number and locate the value on a number line
- ✓ classify, compare, and order real numbers
- ✓ convert between fractions and decimals and evaluate square roots

REAL NUMBER SYSTEM UNIT

8 DAY CCSS-ALIGNED UNIT

8th
GRADE

REAL NUMBER SYSTEM UNIT
PACING GUIDE

DAY	TOPIC	RESOURCE
DAY 1	Fractions and Decimals	Student Handout 1
DAY 2	Squares and Square Roots	Homework 1
DAY 3	Estimating Square Roots	Student Handout 2
DAY 4	Rational vs. Irrational Numbers	Homework 2
	Classifying Real Numbers	Student Handout 3
		Homework 3
		Student Handout 4
		Homework 4
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		Homework 5

REAL NUMBER SYSTEM UNIT
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23	Squares and Square Roots	Homework 2
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27-28	Estimating Square Roots	Homework 3
29-30	Rational vs. Irrational Numbers	Student Handout 4
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A MANEUVERING THE MIDDLE® RESOURCE

REAL NUMBER SYSTEM



an 8 day CCSS-aligned unit
CCSS: 8.NS.1, 8.NS.2, 8.EE.2

**ready-to-go, scaffolded
student materials**

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student friendly + real-world application

Unit: Real Number System
Student Handout 6

Name _____
Date _____ Pd _____

COMPARING & ORDERING REAL NUMBERS

Krystal and Georgia each have several voicemails saved on their phones. Krystal's voicemail inbox is 63% full while Georgia's is $\frac{7}{12}$ full. Describe the steps you would take to determine whether Krystal or Georgia has a voicemail inbox that is closer to being full.



scaffolded
concepts

COMPARING

- To compare two values, first convert them to the same form.
- Then, compare the values.

Practice converting between the three forms.

FRACTION	$\frac{1}{3}$		
DECIMAL		0.2	
PERCENT			50

In 1-4, compare the two values by writing >, <, or =.

1. $\frac{7}{8}$ <input type="text"/> -0.5	2. 3.5% <input type="text"/> 0.035
--------------------------------------------	------------------------------------

5. It took Kiara 35.25 minutes to finish her chores. Which is faster, 35 $\frac{1}{4}$ minutes or 35.25 minutes?



ORDERING

- Lists of values can be ordered from least to greatest, or greatest to least. Write some other key words or phrases that could be used below.
- Least to greatest: _____
- Greatest to least: _____

Read each problem below and correctly order the values.

6. List the following in descending order. 7. List the following in increasing order.

$\sqrt{121}$, π^2 , 11.1, $\sqrt{130}$

8. List the values from least to greatest.

-5.025, $-\sqrt{25}$, $-5\frac{1}{5}$, $\frac{11}{2}$

10. Faye wrote a list of values in descending order. Which of the following could be the list?

- a. $6\frac{1}{4}$
- b. 60%
- c. 5.8
- d. $\sqrt{23}$

11. Today's low temperature for four cities is shown in the table. List the towns in ascending order according to their low temperatures.

Summarize today's lesson:

Unit: Real Number System
Homework 6

Name _____
Date _____ Pd _____

COMPARING & ORDERING REAL NUMBERS

In questions 1-6, write the correct inequality sign in each blank.

1. 5.6% <input type="text"/> $\frac{1}{15}$	2. 2.35 <input type="text"/> $\frac{11}{5}$	3. $\frac{15}{3}$ <input type="text"/> -4.75
4. 5π <input type="text"/> $\sqrt{225}$	5. 72% <input type="text"/> 0.9	6. $8 + \sqrt{50}$ <input type="text"/> $5 + \sqrt{65}$

7. List the values in ascending order.
 -94% , $\frac{8}{9}$, -0.925 , $-\frac{9}{10}$

8. List the values in decreasing order.
 $\sqrt{170}$, 13.5, $\frac{64}{5}$, $13\frac{7}{8}$

9. Bennett planted four tomato plants in his garden, and he recorded their progress after a few weeks.



PLANT A	$\sqrt{35}$ in.
PLANT B	5.3 in.
PLANT C	$5\frac{1}{2}$ in.
PLANT D	$5\frac{1}{5}$ in.

10. The time that it took four students in Mrs. Alvarez's class to solve a Rubik's Cube is listed in the table below.

MITCHELL	3 min. 33 seconds
ERIN	3 min. 5 seconds
CHELSEA	2 min. 55 seconds
FINN	2 min. 59 seconds

List the plants in ascending order according to their height.

List the students' names in order, beginning with the fastest time.



skill application

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CCSS: 8.NS.1, 8.NS.2, 8.EE.2

streamline your planning
process with unit overviews

REAL NUMBER SYSTEM OVERVIEW



STANDARDS

8.NS.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2).

8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

BIG IDEAS

- All real numbers can be ordered.
- All real numbers are either rational or irrational.

ESSENTIAL QUESTIONS

- How are sets of real numbers related?
- How can the value of an irrational number be approximated?
- Where do you see irrational numbers in the real world?



key vocabulary



vertical alignment



sample
pacing
calendar

REAL NUMBER SYSTEM UNIT PACING GUIDE



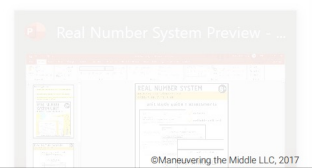
DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Fractions and Decimals	Squares and Square Roots	Estimating Square Roots	Rational vs. Irrational Numbers	Classifying Real Numbers
Student Handout 1 Homework 1	Student Handout 2 Homework 2			
DAY 6	DAY 7			
Classifying and Estimating Real Numbers Quiz	Comparing and Ordering Real Numbers			
Quiz	Student Handout 6 Homework 6			

REAL NUMBER SYSTEM UNIT OVERVIEW



TOPIC	TEACHING TIPS
Squares and Square Roots	• Search http://illuminations.nctm.org for "In Search of Perfect Squares" for a hands-on exploration of perfect squares and the relationship between the area of a square and its side length.
Fractions and Decimals	• Begin the lesson with a discussion about when it is more helpful to use fractions vs. decimals in the real world, and vice versa.
Rational vs. Irrational Numbers	• Display a list of rational and irrational values on the board before teaching the lesson and have students predict and record which numbers they think are irrational. Then, come back to the list at the conclusion of the lesson to compare their predictions with their learning.
Classifying Real Numbers	• Display a large image of a graphic organizer for the sets of real numbers on the board. Then, have students write a real number on a sticky note. They can then give their sticky note to a classmate to place in the correct section of the graphic organizer.
Comparing and Ordering Real Numbers	• Give students an index card with a value written on it (fraction, decimal, square root, integer, etc.) and have them order themselves in a line. This could be done within small groups or as an entire class.

teaching
ideas



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unit study guide + assessments



quizzes



editable unit test

Unit: Real Number System
Quiz 1

Name _____
Date _____ Pd _____

QUIZ: CLASSIFYING AND ESTIMATING REAL NUMBERS

Answer each question and show work when necessary.

1. Which of the following represents a fraction that converts to a repeating decimal with a value less than one?

a. $\frac{1}{2}$ b. $\frac{4}{3}$ c. $\frac{9}{10}$

2. Which of the following sets does not contain only real numbers?

a. $\{-5, 12, \pi, 30\}$ c. $\{1, 2, 3, 4, 5\}$
b. $\{\sqrt{80}, 100, 6.56\}$ d. $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

3. Raphael's neighborhood kiddie pool is approximately 10 feet wide and 12 feet long. What is the approximate side length of the pool? (Be sure to show your work.)

4. Heather is putting together a square bulletin board. The area of the bulletin board is 196 cm². What is the side length of the bulletin board?

5. Estimate the value of $\sqrt{13}$. (Between what two consecutive integers does it lie?)

6. Which of the following correctly classifies the number $\sqrt{16}$? (Select all that apply.)

a. Real, Irrational
b. Real, Rational, Integer

Unit: Real Number System
Review

Name _____
Date _____ Pd _____

REAL NUMBER SYSTEM STUDY GUIDE

Solve each of the problems below. These represent the types of questions on your test. Be sure to ask questions if you need more help with a topic.

I CAN EVALUATE SQUARE ROOTS OF SMALL PERFECT SQUARES.

1. Evaluate the following:

a) $2\sqrt{49} =$ _____
b) $-\sqrt{100} =$ _____
c) $10 + \sqrt{169} =$ _____

2. Find the side length of a square with an area of 144 square units.

I CAN REPRESENT RATIONAL NUMBERS AS DECIMALS.

4. Give an example of a fraction that represents a repeating decimal.

6. Ricky ran $\frac{7}{16}$ of a mile before stopping for his shoe. Represent the distance he ran as a decimal. Then, state if the decimal is terminating or repeating.

I CAN REPRESENT DECIMALS AS FRACTIONS.

8. Express 0.125 as a fraction in simplest form.

10. Express $0.\overline{5}$ as a fraction in simplest form.

EIGHTH GRADE CURRICULUM

REAL NUMBER SYSTEM

UNIT ONE: ANSWER KEY

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answer keys
included

