

Ordering Rational Numbers

Strand: Number and Number Sense

Topic: Compare and order rational numbers

Primary 2023 SOL: **7.NS.2 The student will reason and use multiple strategies to compare and order rational numbers.**

a) Use multiple strategies (e.g., benchmarks, number line, equivalency) to compare (using symbols $<$, $>$, $=$) and order (a set of no more than four) rational numbers expressed as integers, fractions (proper or improper), mixed numbers, decimals, and percents. Fractions and mixed numbers may be positive or negative. Decimals may be positive or negative and are limited to the thousandths place. Ordering may be in ascending or descending order. Justify solutions orally, in writing or with a model.

Materials

- Fractions, Decimals, and Percents Chart (attached)
- Activity Sheets 1–5 (attached)
- Glue sticks
- Scissors

Vocabulary

From earlier grades: *decimal, fraction (proper or improper), equivalency, mixed numbers, greatest, least, percent, integer*

From current grade: *rational numbers*

Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. Place students in pairs. Review converting between fractions, decimals, and percents. The Fractions, Decimals, and Percents Chart will be useful for this review.
2. Place students into small groups and distribute Activity Sheet 1. Ask students to cut out their squares. They should arrange the squares in ascending order. Have students paste the squares in the proper order on their sheet. Circulate around the room and check in on each group, giving assistance as required.
3. Lead a group discussion on how each group approached their task.
4. Distribute Activity Sheet 2. Ask students to cut out their squares and then arrange the squares in descending order. Have students paste the squares in the proper order on their sheet. Circulate around the room and check in on each group, giving assistance as required.
5. Lead a group discussion on how each group approached their task. Ask, “*Was this sort more difficult? Why?*” “*Did you convert the numbers to the same form?*” “*Did you convert all to percents?*” “*Did you convert all to fractions?*” “*Did you convert all to decimals?*” “*Did you use benchmark fractions for comparison?*”
6. Distribute Activity Sheets 3–5 based upon student readiness. Students should follow the same procedures as before, with a group discussion at the conclusion of the tasks.

Assessment

- **Questions**
 - How are fractions, decimals, and percents related?
 - Do you have to convert all your numbers to the same form before ordering them? Why or why not?
- **Journal/Writing Prompts**
 - Explain to another student how to order rational numbers written as fractions, decimals, or percents.
 - Explain which sorting activity was the easiest.
 - Give examples of when you might use fractions, decimals, and percents in real-life situations.
- **Other**
 - Students can create lists of three fractions, decimals, and percents, and ask a partner to place them in ascending or descending order.
 - Students can create three pairs of rational numbers and ask a partner to use the appropriate symbols ($<$, $>$, or $=$) to compare them.

Extensions and Connections (for all students)

- Give students an activity sheet with 10 fractions, decimals, and percents to correctly order.
- Students can work individually or in groups to create a deck of equivalent fraction, decimal, and percent cards. Students can use the deck of cards to play War.
- Give each student a card with a rational number on it, and have students create a human number line.
- Students can work together to develop their own sets of four numbers to compare and order.

Strategies for Differentiation

- Give students a number line written in tenths, with the numbers labeled in decimal, fraction, and percent form.
- Begin the class with a brainstorming vocabulary activity. Place students in small groups and have groups brainstorm to identify terms associated with fractions. One person from each group will write a word on the board. The class will discuss whether that word is a pertinent word associated with fractions and decide whether to accept the word. If it is accepted, each student adds it to their list of words.
- Before this lesson, have students create equivalency cards. Using a sheet of colored paper, label it as 1, $\frac{1}{1}$, and 100%. Use another color, fold the paper in half, and cut on the line. Label each section with the fraction, decimal, and percent. Continue to create equivalencies for one-fourth, one-sixteenth, etc.
- Use grid paper for activity sheets. Students can be encouraged to select a form of conversion to consistently use for comparison.
- On the Fractions, Decimals, and Percents Chart, start with only two columns.

Mathematics Instructional Plan – Grade 7

- Provide worked examples of converting among fractions, decimals, and percents with guiding explanations for students to use as a reference.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

Fractions, Decimals, and Percents Chart

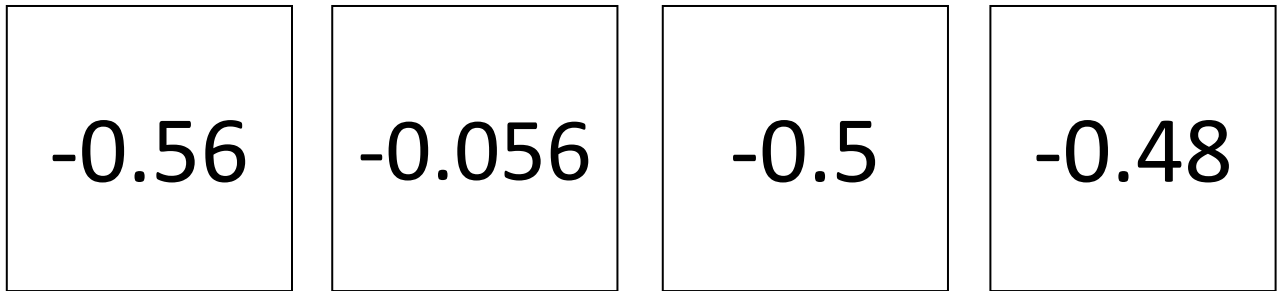
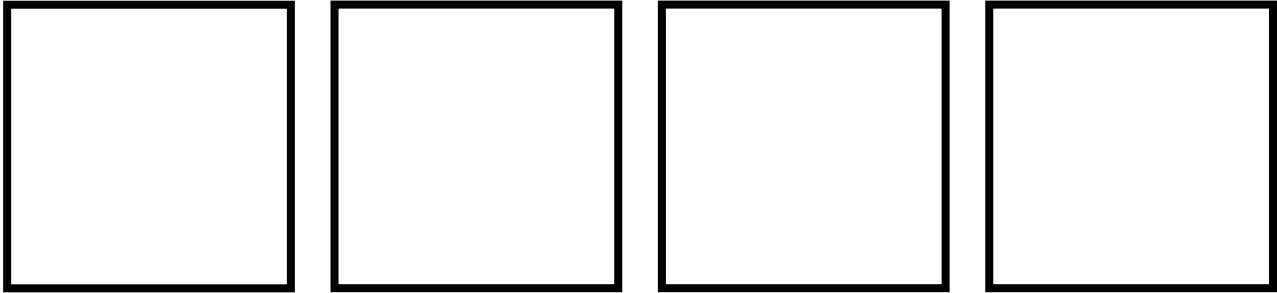
Name _____ Date _____

Fraction	Decimal	Percent
$\frac{7}{28}$		
	0.007	
		125%
$\frac{3}{2}$		
		0.5%

Activity Sheet 1

Name _____ Date _____

Cut out the squares at the bottom of this sheet. Glue them in the boxes in **ascending** order.



Activity Sheet 2

Name _____ Date _____

Cut out the squares at the bottom of this sheet. Glue them in the boxes in **descending** order.

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$2\frac{4}{7}$	$.25\%$	$\frac{2}{5}$	$-\frac{5}{2}$
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Activity Sheet 3

Name _____ Date _____

Cut out the squares at the bottom of this sheet. Glue them in the boxes in **ascending** order.

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$$2\frac{1}{3}$$

$$-2.3$$

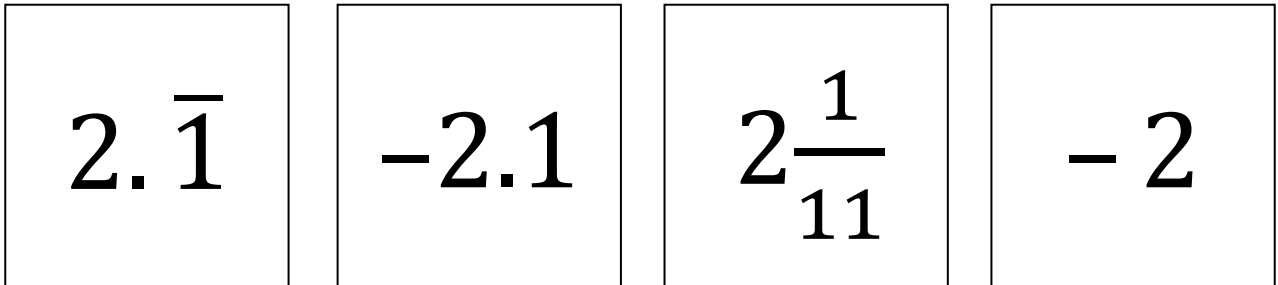
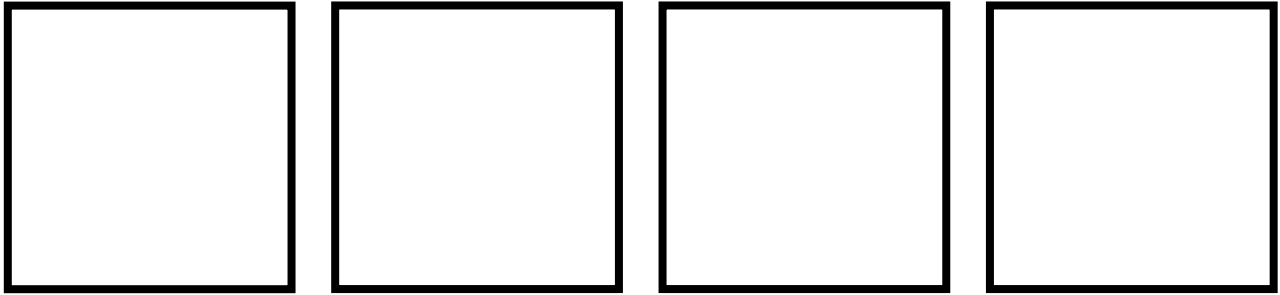
$$23.5\%$$

$$\frac{25}{9}$$

Activity Sheet 4

Name _____ Date _____

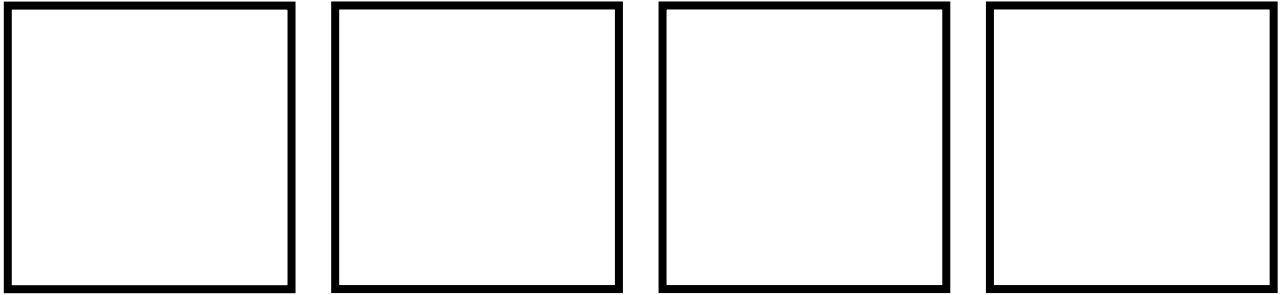
Cut out the squares at the bottom of this sheet. Glue them in the boxes in **descending** order.



Activity Sheet 5

Name _____ Date _____

Cut out the squares at the bottom of this sheet. Glue them in the boxes in **descending** order.



$$\sqrt{25}$$

$$500\%$$

$$-6\frac{3}{8}$$

$$-\frac{25}{4}$$