# Mathematics Station Activities

**for Texas Essential Knowledge and Skills (TEKS)**

Grade 7





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# Introduction

This book includes a collection of station-based activities to provide students with opportunities to practice and apply the mathematical skills and concepts they are learning. It contains sets of activities for each of the Texas Essential Knowledge and Skills (TEKS) Mathematics strands: Number, Operation, and Quantitative Reasoning; Geometry and Spatial Reasoning; Measurement; Patterns, Relationships, and Algebraic Thinking; and Probability and Statistics. You may use these activities in addition to direct instruction, or instead of direct instruction in areas where students understand the basic concepts but need practice. The Discussion Guide included with each set of activities provides an important opportunity to help students reflect on their experiences and synthesize their thinking. It also provides guidance for ongoing, informal assessment to inform instructional planning.

## Implementation Guide

The following guidelines will help you prepare for and use the activity sets in this book.

### Setting Up the Stations

Each activity set consists of four stations. Set up each station at a desk, or at several desks pushed together, with enough chairs for a small group of students. Place a card with the number of the station on the desk. Each station should also contain the materials specified in the teacher's notes, and a stack of student activity sheets (one copy per student). Place the required materials (as listed) at each station.

When a group of students arrives at a station, each student should take one of the activity sheets to record the group's work. Although students should work together to develop one set of answers for the entire group, each student should record the answers on his or her own activity sheet. This helps keep students engaged in the activity and gives each student a record of the activity for future reference.

### Forming Groups of Students

All activity sets consist of four stations. You might divide the class into four groups by having students count off from 1 to 4. If you have a large class and want to have students working in small groups, you might set up two identical sets of stations, labeled A and B. In this way, the class can be divided into eight groups, with each group of students rotating through the "A" stations or "B" stations.

### Assigning Roles to Students

Students often work most productively in groups when each student has an assigned role. You may want to assign roles to students when they are assigned to groups and change the roles occasionally. Some possible roles are as follows:

- Reader—reads the steps of the activity aloud
- Facilitator—makes sure that each student in the group has a chance to speak and pose questions; also makes sure that each student agrees on each answer before it is written down
- Materials Manager—handles the materials at the station and makes sure the materials are put back in place at the end of the activity
- Timekeeper—tracks the group's progress to ensure that the activity is completed in the allotted time
- Spokesperson—speaks for the group during the debriefing session after the activities

### Timing the Activities

The activities in this book are designed to take approximately 15 minutes per station. Therefore, you might plan on having groups change stations every 15 minutes, with a two-minute interval for moving from one station to the next. It is helpful to give students a "5-minute warning" before it is time to change stations.

Since the activity sets consist of four stations, the above timeframe means that it will take about an hour and 10 minutes for groups to work through all stations. If this is followed by a 20-minute class discussion as described below, an entire activity set can be completed in about 90 minutes.

### Guidelines for Students

Before starting the first activity set, you may want to review the following "ground rules" with students. You might also post the rules in the classroom.

- All students in a group should agree on each answer before it is written down. If there is a disagreement within the group, discuss it with one another.
- You can ask your teacher a question only if everyone in the group has the same question.
- If you finish early, work together to write problems of your own that are similar to the ones on the student activity sheet.
- Leave the station exactly as you found it. All materials should be in the same place and in the same condition as when you arrived.

### Debriefing the Activities

After each group has rotated through every station, bring students together for a brief class discussion. At this time you might have the groups' spokespersons pose any questions they had about the activities. Before responding, ask if students in other groups encountered the same difficulty or if they have a response to the question. The class discussion is also a good time to reinforce the essential ideas of the activities. The questions that are provided in the teacher's notes for each activity set can serve as a guide to initiating this type of discussion.

You may want to collect the student activity sheets before beginning the class discussion. However, it can be beneficial to collect the sheets afterward so that students can refer to them during the discussion. This also gives students a chance to revisit and refine their work based on the debriefing session.

# Materials List

**Class Sets**

- calculators
- protractors
- rulers

**Station Sets**

- 15 one-inch square tiles
- clay
- fun-size bag of M&Ms® for each student
- integer chips
- marshmallows (at least 12)
- newspaper article—150 words or less
- number cubes (numbered 1–6); at least two different colors
- paper towel roll
- pencils (at least 4)
- pennies (at least 5)
- plastic knives
- printer paper
- rectangular prism
- scissors (at least 4 pairs)
- scrap paper (several sheets)
- tape

**Ongoing Use**

- graph paper
- index cards (filled out as directed within particular stations)

# Number, Operation, and Quantitative Reasoning

## Set 1: Comparing and Ordering Rational Numbers

**Instruction**

Goal: To provide opportunities for students to develop concepts and skills related to comparing and ordering numbers

**Texas Essential Knowledge and Skills (TEKS)**

1. Number, operation, and quantitative reasoning. The student represents and uses numbers in a variety of equivalent forms. The student is expected to:
   a. compare and order integers and positive rational numbers.
   b. convert between fractions, decimals, whole numbers, and percents mentally, on paper, or with a calculator.

## Student Activities Overview and Answer Key

### Station 1

Each student holds a sheet of paper that shows a decimal between 0 and 1. Students work together to line up so that the decimals are in order from least to greatest. When the students are in a line, they work together to check that the numbers have been ordered correctly.

**Answers**

0.02, 0.05, 0.1, 0.2, $0.\overline{2}$, 0.5, 0.51, $0.\overline{5}$

First write out several digits of the repeating decimals (e.g., $0.2 = 0.22\overline{2}\ldots$). Order the decimals by comparing the tenths digits of the numbers. If the tenths digits are the same, compare the hundredths digits.

### Station 2

Students use a penny and a number cube to create a set of five decimals that may be positive or negative. Then they work together to put the five decimals in order from least to greatest.

**Answers**

Answers will vary depending upon the numbers rolled.

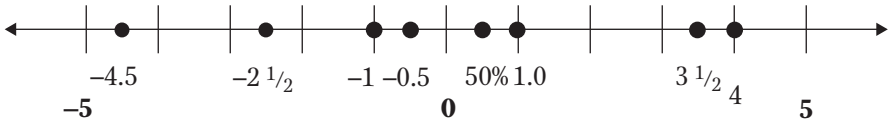
Possible strategies: Any negative decimal is less than any positive decimal. If two decimals have the same sign, first compare the units digits. If these are the same, compare the tenths digits.

**Station 3**

Students are given eight positive and negative numbers in the form of fractions, decimals, and percents. The numbers are written on index cards and students work together to arrange the cards so the numbers go from least to greatest. Then they work together to plot the numbers on a number line.

**Answers**

$-4.5, -2\frac{1}{2}, -1, -0.5, 50\%, 1.0, 3\frac{1}{2}, 4$




Possible strategies: Convert all the numbers to decimals; first order the negative numbers by placing them to the left of 0 on the number line, then order the positive numbers by placing them to the right of 0 on the number line.

**Station 4**

Students are given ten numbers in the form of fractions and decimals. The numbers are written on index cards and students work together to find pairs of cards that represent equal numbers. Then students write equality statements based on the pairs of matching cards.

**Answers**

$1\frac{1}{3} = 1.\overline{3}$; $\frac{2}{3} = 0.\overline{6}$; $\frac{4}{5} = 0.8$; $2\frac{3}{10} = 2.3$; $1\frac{1}{5} = 1.2$

Possible strategies: Find familiar benchmarks (e.g., $\frac{2}{3} = 0.\overline{6}$); convert the fractions to decimals; convert the decimals to fractions.

## Materials List/Setup

**Station 1** 8 sheets of paper with the following numbers written on them (large enough to be seen from a distance):
0.02, 0.05, 0.1, 0.2, $0.\overline{2}$, 0.5, 0.51, $0.\overline{5}$
The sheets should be shuffled and placed face down on a desk or table at the station.

**Station 2** a penny; number cube (numbered 1–6)

**Station 3** 8 index cards with the following numbers written on the cards:

$-4.5, -2\frac{1}{2}, -1, -0.5, 50\%, 1.0, 3\frac{1}{2}, 4$

**Station 4** 10 index cards with the following numbers written on the cards:

$1\frac{1}{3}, 1.\overline{3}, \frac{2}{3}, 0.\overline{6}, 2\frac{3}{10}, 2.3, \frac{4}{5}, 0.8, 1\frac{1}{5}, 1.2$

## Discussion Guide

To support students in reflecting on the activities and to gather some formative information about student learning, use the following prompts to facilitate a class discussion to "debrief" the station activities.

### Prompts/Questions

1. What are some different strategies that you can use to help you compare various types of numbers?
2. How do you compare two decimals?
3. What can you say about two numbers if one is positive and the other is negative?
4. How can you compare a fraction and a decimal to decide which is greater?

### Think, Pair, Share

Have students jot down their own responses to questions, then discuss with a partner (who was not in their station group), and then discuss as a whole class.

### Suggested Appropriate Responses

1. Plot the points on a number line; convert different types of numbers (e.g., fractions, decimals, percents, etc.) to the same form so they can be compared more easily.
2. Compare the digits from left to right. For example, for decimals between 0 and 1, first compare tenths digits. If these are the same, compare hundredths digits. If these are the same, compare thousandths digits, and so on.
3. The positive number is greater than the negative number.
4. Convert the fraction to a decimal. Then compare the two decimals. Alternatively, compare the fraction and decimal to familiar benchmark values.

### Possible Misunderstandings/Mistakes

- Assuming longer decimals represent greater numbers (e.g., that 0.55 is greater than 0.6)
- Incorrectly converting fractions to decimals
- Comparing signed numbers without taking the signs into account (e.g., stating that –7.5 is greater than 7.4)

# Number, Operation, and Quantitative Reasoning

## Set 1: Comparing and Ordering Rational Numbers

### Station 1

You will find some sheets of paper at this station. Each student in your group should choose one of the sheets of paper. (It's okay if there are some sheets of paper left over.)

1. Each student should hold his or her sheet of paper so everyone can see the number on it.
2. Work as a group to line up so that the numbers are in order from least to greatest.
3. When everyone is in a line, work together to check that the numbers are in order.
4. Write the numbers in order on the line below.

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Write at least three strategies you could use to put the numbers in order.

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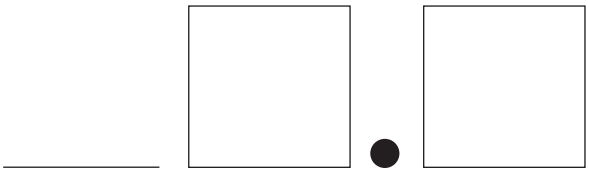
# Number, Operation, and Quantitative Reasoning

## Set 1: Comparing and Ordering Rational Numbers

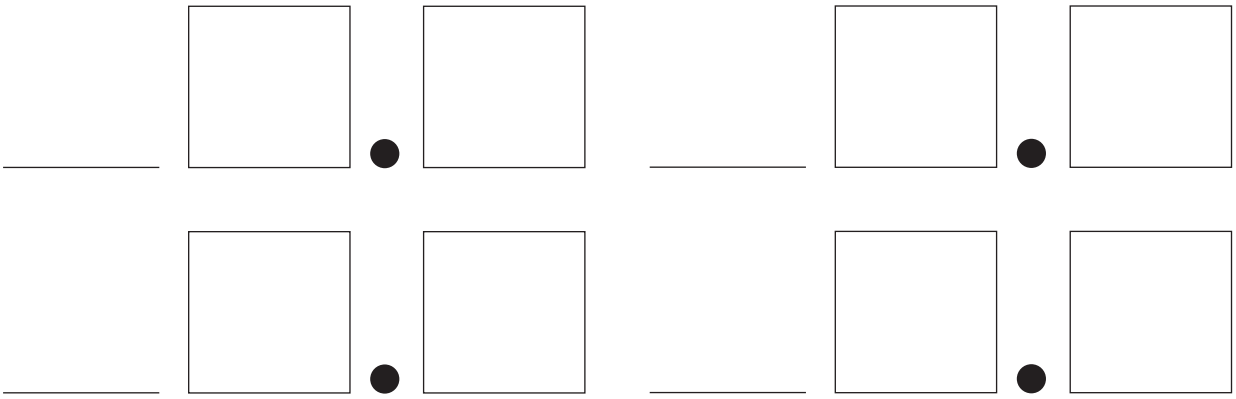
### Station 2

You will find a penny and a number cube at this station. You will use these to create positive and negative decimals.

Flip the penny. If it lands heads up, write "+" on the line. If it lands tails up, write "–"on the line. Then roll the number cube two times. Write the numbers in the two boxes below.



Repeat the process to create four more decimals.



Work as a group to put your five decimals in order from least to greatest. Write the decimals in order below.

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Explain how you put the numbers in order.

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# Number, Operation, and Quantitative Reasoning

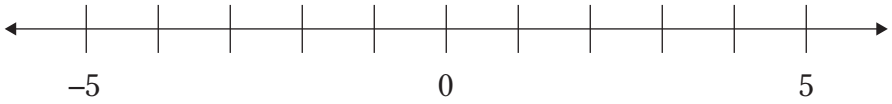
## Set 1: Comparing and Ordering Rational Numbers

### Station 3

At this station, you will find a set of cards with the following numbers written on them:

$1.0 \qquad -0.5 \qquad -2\frac{1}{2} \qquad 3\frac{1}{2} \qquad -1 \qquad 4 \qquad 50\% \qquad -\frac{4}{5}$

Work with other students to put the cards in order so the numbers go from least to greatest. Then plot and label the numbers on the number line. Work as a group to make sure the numbers are all plotted correctly.




Write at least three strategies you could use to help you decide how to put the numbers in order.

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# Number, Operation, and Quantitative Reasoning

## Set 1: Comparing and Ordering Rational Numbers

### Station 4

At this station, you will find a set of cards with the following numbers written on them.

$\frac{4}{5}$ $2\frac{3}{10}$ $0.\overline{6}$ $1\frac{1}{3}$ $1\frac{1}{5}$ $2.3$ $1.2$ $0.8$ $1.\overline{3}$ $\frac{2}{3}$

Work with other students to find pairs of cards that show the same number. When you have paired up the cards, work as a group to check that the numbers in each pair are equal.

Write five statements that use an equal sign (=) to list the pairs of equal numbers.

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Write at least three strategies you could use to help you decide which numbers are equal.

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