



MISSISSIPPI  
**EXEMPLAR**  
Units & Lessons  
MATHEMATICS

**Grade 4**

Grant funded by:



**MISSISSIPPI DEPARTMENT OF EDUCATION**

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## *Introduction*

### **Mission Statement**

The Mississippi Department of Education (MDE) is dedicated to student success, including the improvement of student achievement in English Language Arts (ELA) and mathematics in order to produce citizens who are capable of making complex decisions, solving complex problems, and communicating fluently in a global society. The Mississippi College- and Career-Readiness Standards (MS CCRS) provide a consistent, clear understanding of what students are expected to know and be able to do by the end of each grade level or course. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that students need for success in college and careers and to compete in the global economy. The goal of the MDE is to provide educators with the training and resources to understand and implement the MS CCRS effectively.

### **Purpose**

In efforts to facilitate implementation and promote understanding of the MS CCRS for ELA and mathematics, the W. K. Kellogg Foundation generously awarded the MDE a grant to secure a cadre of effective educators to develop the MS CCRS Exemplar Units for teachers. Specifically, a group of highly-effective Mississippi educators developed exemplar instructional units and lessons aligned to the MS CCRS for ELA and mathematics. The MS CCRS Exemplar Units address difficult-to-teach standards as determined by teachers and are designed to serve as exemplar models for instructional units, lessons, and resources. The MS CCRS Exemplar Units have been vetted through nationally renowned vendors to ensure exemplar quality.



### **Design Overview**

The MS CCRS Exemplar Units for ELA and mathematics address grade-level specific standards for Pre-Kindergarten-8<sup>th</sup> grade, as well as for Algebra, English I, and English II. The overall unit plan is described in the first section of the ELA and math units. This section includes the unit title, a suggested time frame, the grade level MS CCRS addressed and assessed, a unit overview with essential questions and a summary of lesson tasks, and the culminating/performance task description and rubric.

Though the math and ELA overall unit plan designs are very similar, some design aspects differ in order to accommodate the respective requirements of each content area. For mathematics, the first section also provides a segment designated for the Standards for Mathematical Practices (SMPs) addressed in the unit. For ELA, the first section also includes a text set with links to texts (if in the public domain) and a fresh/cold-read task.

The second section of each unit includes lesson plans. Within the lesson plans, provided are lesson-specific MS CCRS, suggested time frames, learning targets, guiding questions, required resources and materials, vocabulary terms and instructional strategies, teacher directions, instructional supports for students, enrichment activities, student handouts, assessments (formative, summative, pre-, and self-), and additional resources to aid in the implementation of the lessons.

### **Implementation**

The intention of the MS CCRS Exemplar Units for ELA and mathematics is to provide educators with resources to understand and implement the MS CCRS effectively. The implementation of the MS CCRS Exemplar Units for ELA and mathematics is voluntary. Additionally, the MDE will provide ongoing support for implementation of the MS CCRS Exemplar Units with initial regional trainings followed by site-specific support through our regional service delivery model. For regional and site-specific training, please contact the MDE Office of Professional Development.

Grade Level	Unit Title	Duration
4	Let the Games Begin! Tackling Tenths and Hurdling through Hundredths	10 days
Mississippi College- and Career-Readiness Standards for Mathematics		Standards for Mathematical Practice
<p><b>Focus:</b>  <b>4.NF.6</b> Use decimal notation for fractions with denominators 10 or 100. <i>For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.</i>  <b>4.NF.7</b> Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>, and justify the conclusions, e.g., by using a visual model.</p> <p><b>Additional:</b>  <b>4.NF.5</b> Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. <i>For example, express <math>3/10</math> as <math>30/100</math>, and add <math>3/10 + 4/100 = 34/100</math>.</i>  <b>4.NBT.1</b> Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that <math>700 \div 70 = 10</math> by applying concepts of place value and division.</p>		<p><b>SMP.1</b> Make sense of problems and persevere in solving them.</p> <p><b>SMP.2</b> Reason abstractly and quantitatively.</p> <p><b>SMP.3</b> Construct viable arguments and critique the reasoning of others.</p> <p><b>SMP.4</b> Model with mathematics.</p> <p><b>SMP.5</b> Use appropriate tools strategically.</p> <p><b>SMP.6</b> Attend to precision.</p> <p><b>SMP.7</b> Look for and make use of structure.</p>

**4.MD.2** Use the four operations to solve word problems involving

- intervals of time
- money
- distances
- liquid volumes
- masses of objects

including problems *involving simple fractions or decimals*, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

**W.4.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

### Unit Overview

During this unit, students will build on their prior knowledge of expressing a fraction with denominator 10 as an equivalent fraction with denominator 100. Using manipulatives and modeling, students will encounter tasks that require the use of decimal notation for fractions with denominators 10 or 100. Once a conceptual understanding is developed, students will compare two decimals to the hundredths place by reasoning about their size and recognize that comparisons are valid only when the two decimals refer to the same whole. Through a variety of activities associated with the Summer Olympic games, students will compare decimal values with the symbols  $>$ ,  $<$ , and  $=$ , and justify the conclusions by using a visual model, such as a number line.

#### Essential Questions:

- How can models help us compare and order fractions and decimals through hundredths place?
- How can I use decimals in real life?

## Lesson Tasks

### **Lesson 1: Opening Ceremony**

Students will watch a promotional video on for Summer Olympics and discuss the importance of attending to precision. Students will work with base-ten blocks to develop an understanding of decimal fractions.

### **Lesson 2: Modeling Marathon**

Students will continue to work with models, moving from base-ten blocks to money and number grids to represent decimals to the tenths and hundredths place. Students will continue to develop their conceptual understanding of equivalency of decimals to the tenths and hundredths place and make the connections between decimals and fractions.

### **Lesson 3: Plotting Points with Pride**

The teacher will lead a whole group introductory lesson on plotting decimals on a number line and provide opportunities for students to work with teammates to develop the ability to attend to precision on a number line.

### **Lesson 4: And the Winner Is...**

Students will be challenged to determine the winner of Olympic events by comparing decimal numbers to the hundredths place using a variety of tools and manipulatives.

### **Lesson 5: Hurdling through Centers**

Students will rotate through centers to practice modeling and writing equivalent fractions and decimals to the tenths and hundredths place, compare decimals and fractions, and solve word problems involving the Summer Olympics.

### **Lesson 6: Mathletes: Olympic Trials**

For the performance task, students will compete in Olympic trials against their teammates. Students will use their knowledge of decimals and fractions to compare scores and determine which teammate would qualify for the Olympics. Students will then create a newspaper story displaying their scores and demonstrating their understanding of comparing and displaying decimals.

### **Lesson 7: Culminating Task**

Students will work independently to solve a series of math problems dealing with decimal fractions as a final assessment.

## Performance/Culminating Task

### **Mathletes Olympic Trials**

This task allows students demonstrate their understanding of decimal fractions as they compete in their own Olympic trials. During this activity, students will work with their country (group) to compete in three events: Basketball Toss, Javelin Throw, and Tallest Tower. Students will create a table indicating the scores of each of their teammates and then rank them from least to greatest using tools and manipulatives as needed. Students will then create a newspaper article detailing each event and demonstrating their understanding of decimal fractions through writing, models, and pictures.

**Standards Assessed:** 4.NF.6, 4.NF.7

### Student Rubric for Performance/Culminating Task

Level	Mastery Level	Data Collection	Mathematical Accuracy	Article Organization and Writing	Cooperation and Teamwork
4	Exemplifying Mastery (Gold Medal)	My data table contains more than 0 missing or unreasonable values.	My article correctly represents the scores for all three events.	My writing is clear and easy to understand. There are fewer than 2 errors in grammar and mechanics.	I worked well with my teammates, listened to their ideas, and contributed to all areas of the project.
3	Approaching Mastery (Silver Medal)	My data table contains more than 1-2 missing or unreasonable values.	My article correctly represents the scores for two events.	Writing is clear and easy to understand. There are 3-4 errors in grammar and mechanics.	I worked well with my teammates, listened to some of their ideas, and contributed to some areas of the project.
2	Developing Mastery (Bronze Medal)	My data table contains more than 3-4 missing or unreasonable values.	My article correctly represents the scores for one event.	My writing is mostly clear. There are 5 errors in grammar and mechanics.	I worked with my teammates, but contributed little to the project.
1	Not Representing Mastery (No Medal)	My data table contains more than 5 missing or unreasonable values.	My article does not correctly display the scores for the events.	My writing is unclear and I have more than 5 errors in grammar and mechanics.	I did not work with my team or contribute to the project.
0	No Understanding	Nothing was turned in or the work was too messy to read.			

## Lesson 1: Opening Ceremony

**Focus Standard:** 4.NF.6

**Additional Standard:** 4.NF.5

**Standards for Mathematical Practice:** SMP.4, SMP.5, SMP.7

**Estimated Time:** 45 minutes

**Resources and Materials:**

- Base-Ten Blocks
- Sheet Protectors
- Dry Erase Markers
- Notecard
- Handout 1.1: Pass the Torch
- Handout 1.2: Place Value Mat
- Document Camera or Interactive Base-Ten Blocks: <https://www.mathlearningcenter.org/web-apps/number-pieces/>
- Olympics Promo: <https://www.youtube.com/watch?v=bX1-gLMNuY>
- Olympics Results: <https://www.olympic.org/olympic-results>

**Lesson Targets:**

- Students will use base-ten blocks to model decimal numbers to the tenths place and hundredths place.
- Students will understand the relationship between the tenths place and hundredths place.

**Guiding Questions:**

- What is the relationship between numbers on the place value chart?
- How are numbers to the right of the decimal read and represented?

## Vocabulary


### Academic Vocabulary:

- cubes
- decimal
- equivalent
- flats
- fraction
- hundredth
- rods
- tenth
- units

### Instructional Strategies for Academic Vocabulary:

- Model how to use the words in discussion
- Discuss the meaning of word in a mathematical context
- Create pictures/symbols to represent words
- Write/discuss using the words

**Note:** Vocabulary instruction should be embedded into the lesson each day using the strategies suggested above.

Symbol	Type of Text and Interpretation of Symbol
	Instructional support and/or extension suggestions for students who are EL, have disabilities, or perform well below the grade level and/or for students who perform well above grade level
✓	Assessment (Pre-assessment, Formative, Self, or Summative)



## Instructional Plan

**Understanding Lesson Purpose and Student Outcomes:** Students will use a place value chart and base-ten blocks to develop an understanding of decimal fractions and equivalency.

**Note:** Prior to this lesson, students should be placed into heterogenous ability groups and given a country to represent. These countries will compete throughout the unit to win gold, silver, and bronze medals. (Suggested countries: France, Germany, Italy, Denmark, Belgium, Austria, Ireland.) Display a world map so students can get an understanding of where their country is in relation to the United States.

### **Anticipatory Set/Introduction to the Lesson: Olympics Promo**

Explain to students that this unit will focus on working with decimals and their importance in the real-world. Ask students to watch the video closely and think about how it relates to decimals (SMP.4).

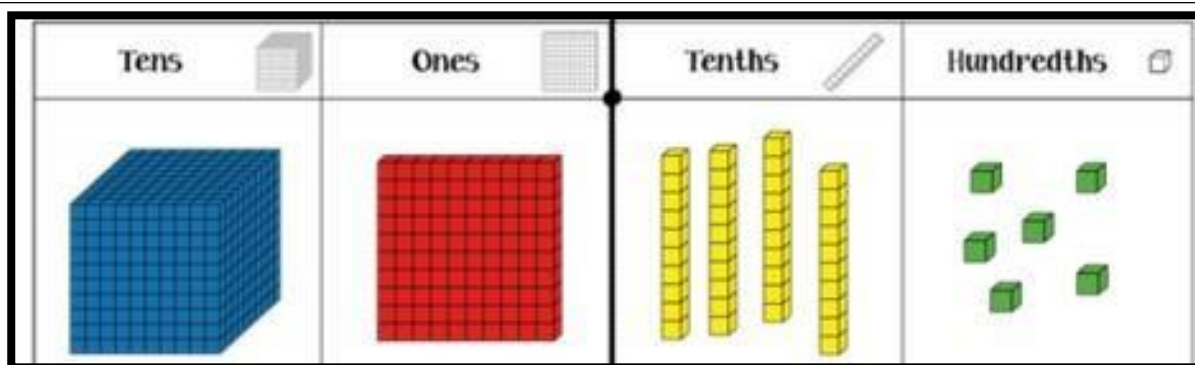
Show [Olympics Promo](#) clip.

Ask students to think about ways that decimals can be used in the Olympic games. Give them one minute to think. Provide one student in the country (group) with a copy of **Handout 1.1: Pass the Torch**. Instruct students to write one of their ideas on the torch and then pass it to the next person to write one of their ideas, and so on. Set the timer for 3 minutes. Once the time is up, allow students to share some of their ideas aloud. Explain to students that further study will be done on the Olympic games as the unit progresses.

### **Activity 1: Tenths and Hundredths with Base-Tens**

Divide the students into pairs. Instruct one student from each partner group to obtain the base-ten blocks and **Handout 1.2: Place Value Mat**, a sheet protector, and a dry erase marker.

Explain to the class that base-ten blocks will now represent different values on the place value mat as the work with decimals begins. Model the use of the new values on the place value mat, indicating that cubes are now tens, flats are ones, rods are tenths, and units are hundredths. Allow the students time to discuss these terms with their partner and discuss the relationship between the blocks.



Project 4 rods and 6 units. (This may be done on an overhead or using [Interactive Base-Ten Blocks](#)) Explain to students that this number is read as forty-six hundredths. There are four tenths and six hundredths. Show the students how to write the number in standard form as 0.46.

T: This number is forty-six hundredths. What's the number?

S: Forty-six hundredths.

T: How many tenths?

S: Four

T: How many hundredths?

S: Six

T: Write the number on your place value mat and read it aloud once more.

S: Forty-six hundredths

Ask students to display 5 rods and 2 units on their place value mat. Project this on the overhead as well.

T: How many tenths?

S: Five

T: How many hundredths?

S: Two

T: Let's read this number together

All: Fifty-two hundredths

Continue this routine with the following numbers:

1. 0.29
2. 0.18
3. 0.05

✓ Next, provide the following numbers to students, stating them orally and having students create a base-ten representation as well as write the numbers in standard form on their place value mat (SMP.5).

1. 0.79
2. 0.25
3. 0.63

**For students who are EL, have disabilities, or perform well below grade level:**

- Using the following sentence frame, state each number and have students repeat. This number is \_\_\_\_\_. It has \_\_\_\_\_ ones, \_\_\_\_\_ tenths and \_\_\_\_\_ hundredths. This number is \_\_\_\_\_.

**Extensions for students with high interest or working above grade level:**

- Jot down a few numbers with values in the tens, hundreds, and thousands place. See if students can accurately read these numbers aloud.

Project 1 flat, 4 rods, and 6 units using base-ten blocks. Explain to students that this number is read as one and forty-six hundredths, pointing out that the decimal will be read as the word “and.” Show the students how to write the number in standard form as 1.46.

T: This number is one and forty-six hundredths. What’s the number?

S: One and forty-six hundredths.

T: How many ones?

S: 1

T: How many tenths?

S: 4

T: How many hundredths?

S: 6

T: Write the number on your place value mat and read it aloud once more.

S: One and forty-six hundredths

Ask students to display 3 flats, 5 rods, and 2 units on their place value mat. Project this on the overhead as well.

T: How many ones? S: Three

T: How many tenths? S: Five

T: How many hundredths? S: Two

T: Let’s read this number together

All: Three and fifty-two hundredths

✓ Continue this routine with the following numbers:

1. 5.29

2. 7.18

3. 2.05

**For students who are EL, have disabilities, or perform well below grade level:**

- Using the following sentence frame, state each number and have students repeat. This number is \_\_\_\_\_. It has \_\_\_\_\_ ones, \_\_\_\_\_ tenths and \_\_\_\_\_ hundredths. This number is \_\_\_\_\_.
- Call students to a teacher-led small group for extra assistance.

**Extensions for students with high interest or working above grade level:**

- Jot down a few numbers with values in the tens, hundreds, and thousands place. See if students can accurately read these numbers aloud.
- Allow students extra time to use manipulatives or visuals to come up with new ways to complete problems.

**Activity 2: Equivalent Decimals**

Project ten units on the overhead.

T: How would you write this number in standard form on the place value chart? How would you read this number?

Allow students to participate in a Think-Pair-Share.

Possible prompting questions for scaffolding:

- Is it possible for me to write 0.10 in the hundredths place on our place value chart? Why not?
- What would we do if we had ten cubes in the ones place?
- What happens each time we reach ten in any place value?

Allow students time to struggle with this concept until they can articulate that 0.10 is the same as 0.1. Lead a discussion, using base-ten blocks as a model, about how the two are of equal values (SMP.7).

Write 0.30 on the board. Ask students to display the visual and written representation on their place value mat. Be prepared for some students to showcase 3 tenths and for others to showcase 30 hundredths.

**Possible Prompting Questions for Scaffolding:**

- How would you read this number?
- I see you displayed 30 hundredths, is there another way to show this?

Lead a classroom discussion about why 0.30 and 0.3 have the same value referring to the previous discussion about the relationship between each place value.

Provide the following additional numbers for students, stating them orally and having students create a base-ten representation as well as write the numbers in standard form on their place value mat.

1. 1.30
  2. 0.20
  3. 0.70
- ✓ Actively monitor students as they model and regroup units into rods to simplify decimals. Use a checklist to mark students who may need additional support with this concept.

**For students who are EL, have disabilities, or perform well below grade level:**

- Orally restate the values and numbers on the place value mats and ask students to repeat.

**Extensions for students with high interest or working above grade level:**

- Encourage students to write the expanded notation of their models below each place value.

Instruct students to organize areas and return manipulatives into plastic bags or containers, etc.

**Reflection and Closing:**

- ✓ Provide students with a notecard. Tell them to fold the card in half. Instruct the students to write 5 tenths in standard form on one half of the card and draw the base-ten representation of this on the other half of the card. Gather the cards and place them in three piles.

2 correct

1 correct

0 correct

Using a class roll, highlight all of the students who scored 100% in green, those who scored 50% in yellow, and those who score 0% in red. This information will be needed for the next day.

## Homework

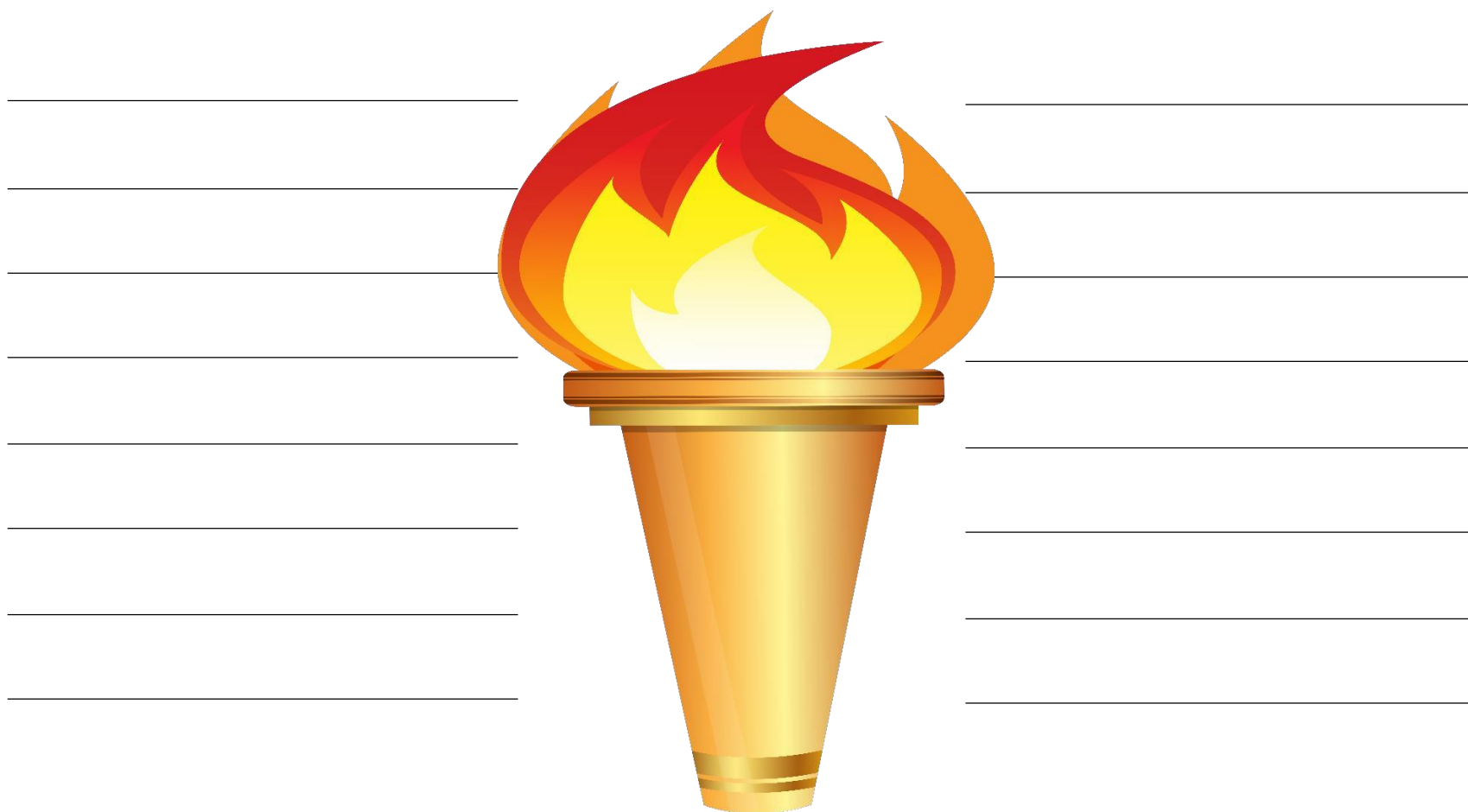
T: Ask students to find out how far Jeff Henderson jumped in the men's long jump competition in the 2016 Summer Olympics and which medal he won.

*(8.38 meters – Gold Medal)*

Results for various events and Olympics can be found at [Olympics Results](#).

Handout 1.1: Pass the Torch

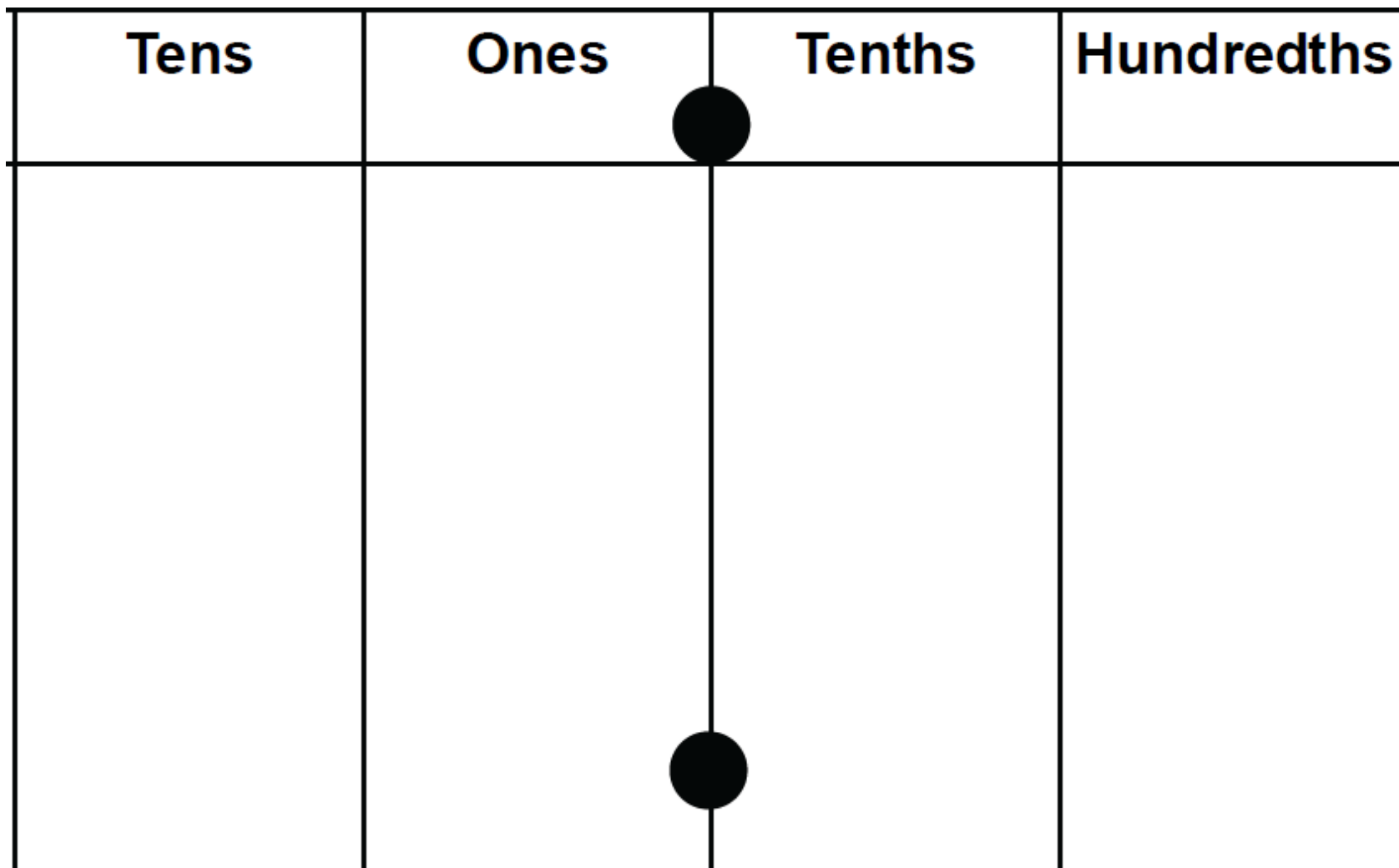
How are decimals used in the Olympic Games?





## Handout 1.2: Place Value Mat

<b>Tens</b>	<b>Ones</b>	<b>Tenths</b>	<b>Hundredths</b>



## Lesson 2: Modeling Marathon

**Focus Standard:** 4.NF.6

**Additional Standards:** 4.NF.5, 4NBT.1

**Standards for Mathematical Practice:** SMP.2, SMP.4, SMP.5, SMP.7

**Estimated Time:** 45 minutes

**Resources and Materials:**

- Chart Paper
- Dry Erase Markers
- Play (or Real) Money
- Sheet Protectors
- Handout 2.1: Base-Ten Buddies
- Handout 2.2: Hundredths Grid
- Handout 2.3: Tenths Grid
- Handout 2.4: Decimal Displays
- Olympic Results <https://www.olympic.org/olympic-results>

**Lesson Targets:**

- Students will discover the relationship between decimal fractions and fractions.
- Students will create pictorial representations of decimal fractions and fractions.

**Guiding Question:**

- What is the relationship between decimals and fractions?

## Vocabulary

### Academic Vocabulary:

- cubes
- decimal fraction
- equivalent
- flats
- hundredth
- rods
- tenth
- units

### Instructional Strategies for Academic Vocabulary:

- Introduce words with student-friendly definitions and pictures
- Model how to use the words in discussion
- Discuss the meaning of word in a mathematical context
- Create pictures/symbols to represent words
- Write/discuss using the words

**Note:** Vocabulary instruction should be embedded into the lesson each day using the strategies suggested above.

### Symbol



### Type of Text and Interpretation of Symbol

Instructional support and/or extension suggestions for students who are EL, have disabilities, or perform well below the grade level and/or for students who perform well above grade level

✓

Assessment (Pre-assessment, Formative, Self, or Summative)

## Instructional Plan

### Understanding Lesson Purpose and Student Outcomes:

Students will use money and tenths and hundredths grids to make the connection between decimal fractions and fractions.

### Anticipatory Set/Introduction to the Lesson: Base-Ten Buddies

Pass out the individual cards from **Handout 2.1: Base-Ten Buddies**. Tell students to take a moment to determine how to read their value out loud.

For students who scored 0 on the previous day's exit ticket, take time to do a quick huddle and ensure they can read the value on their card. For students who scored 50% or 100% on the previous day's exit ticket, allow them to form their own group huddle and work together to determine the values of their own cards.

Give students a few moments to find their Base-Ten Buddy. Have a quick discussion about each place value.

- ✓ Using the classroom roll checklist, make a + or – for students who can find their partners and express their numbers orally.

Ask students to hold onto their card until end of class.

### **Activity 1: Show Me the Money**

Tell students that the day's lesson will focus on representing decimal fractions in multiple ways and that they will begin by using money to represent these decimal fractions (SMP.4).

Place students in their country/group. Provide each group with a bag of pennies, nickels, dimes, and quarters. Students will also need dollar bills (SMP.2).

T: For this task, we will only need two coins. One coin we need will represent the tenths place and one coin will represent the hundredths place. Work with your group to determine which two coins we will need. Think about the base-ten blocks we used yesterday to help you make this connection.

Possible Prompting Questions:

- Which of these coins would represent the same as a unit?
- We need one hundred units to make a whole, which coin would we need 100 of to make a whole?
- Which of these coins would represent the same value as a rod?
- We need ten rods to make a whole, which coin would we need 10 of to make a whole?

T: You have correctly chosen pennies to represent the hundredths place and dimes to represent the tenths place. Please remove these from the bag and put the bag to the side.

Write 0.01 on the board. Ask students to use their coins and place value chart to show this number using money (SMP.5). Ask students how many pennies would be needed to make a dime and how many pennies would be needed to make a dollar. Write 0.10 on the board. Ask students to use their coins and place value chart to show this number using money. Ask students how many dimes would be needed to make a dollar.

Write 0.52 on the board. Ask the students to create this number using coins and practice reading it as both a money value as well as a decimal fraction.

T: How many tenths do you have?

S: 5

T: How many hundredths do you have?

S: 2

T: How do you read this number as a money value?

S: Fifty-two cents

T: How do you read this number as a decimal fraction?

S: Fifty-two hundredths

Talk to students about the relationship between the root *cent* and 100. *Cent* can mean “100 of something,” like *century* (100 years) or “one hundredth of something,” like *centimeter* (one hundredth of a meter) or *percent* (one hundredth of anything). 52 cents is  $\frac{52}{100}$  of a dollar or 0.52 of a dollar. At this time, provide dollar bills to students. Write 4.28 on the board, and ask students to create this number using money. Have students practice reading it both as a money value as well as a decimal fraction. Follow the same questioning as above.

Instruct students to use their Base-Ten Buddy card and create the value using dimes and pennies. Have them find their Base-Ten Buddy to check to see if both partners have the same answer.

**For students who are EL, have disabilities, or perform well below grade level:**

- For students who received a – on the checklist during the previous activity, ask those students to bring their card to the teacher table and provide additional support with reading the number and identifying the tenths and hundredths place.

**Activity 2: Hundredths Grids and Tenths Grids**

Provide students with **Handout 2.2 Hundredths Grid**, **Handout 2.3: Tenths Grid**, sheet protectors, and dry erase markers. Tell students they will move from the concrete objects of base-ten blocks and money to the pictorial representations using tenths and hundredths grids to display numbers in both decimal and fraction form.

Display the tenths and hundredths grid on the overhead. Lead students through a Think-Pair-Share to answer the following questions:

1. What does one entire grid now represent?
2. What does one rod represent?
3. What does one unit represent?

Shade in 30 units on the hundredths grid on the overhead.

T: How many total units are on this grid?

S: 100

T: How many units did I shade?

S: 30

T: How can I represent this in fraction form?

S:  $30/100$

T: *Write  $30/100$  next to the grid*

T: How can I express this in decimal form?

S: 0.30

Shade in 3 rods on the tenths grid on the overhead.

T: How many total rods are on this grid?

S: 10

T: How many rods did I shade?

S: 3

T: How can I represent this in fraction form?

S:  $3/10$

T: How can I represent this in decimal form?

S: 0.3

T: Talk to your neighbor about what you notice about the two grids.

Lead students to make the connections between this pictorial representation and the concrete objects (SMP.7).

T: We know that 30 units and 3 rods are equivalent. We also know that 30 pennies and 3 dimes have the same value. The same goes for these fractions  $30/100$  and  $3/10$ .

Write  $80/100$  on the board. Ask students to shade in this fraction on the hundredths grid. Then ask them to create the same representation on their tenths grid and write the fraction represented. Lead a discussion about the equivalency of the two numbers. Have students assist in writing both as decimal fractions.

T: Let's practice representing a few more numbers using grids:

Write 0.57 on the board.

T: What is this number?

S: Fifty-seven hundredths.

T: Which grid do I need to shade in this number?

S: The hundredths grid (or a combination of the tenths grid and hundredths grid)

T: How many tenths or columns will need to be shaded?

S: 5

T: How many hundredths?

S: 7

T: What is this number again?

S: Fifty-seven hundredths

T: How can I write this number as a fraction?

S:  $57/100$

- ✓ Have students use their Base-Ten Buddy card to color in the value on their appropriate grid. For students with numbers larger than 1, provide them with an extra grid and scaffold appropriately. Share this fractional representation with the class. Then have students stand behind their chairs leaving the grid and Base-Ten cards visible. Have them rotate around their country/group and check their team's answers. If they agree, they will write a 😊 if they disagree, they will write a ☹️. Provide the teams a few minutes to help their teammates with any misconceptions after all have returned to their original sheet.

**For students who are EL, have disabilities, or perform well below grade level:**


- Allow students to use base-ten blocks to create a concrete representation of their card to use as a guide for shading.

**Activity 3: Anchoring Understanding**

Pass out **Handout 2.4: Decimal Displays**. Tell students that they will work together to create an anchor chart that can be used as a reference for the remainder of the unit. Write the table below on chart paper. Show the students how to represent three-tenths in word form, decimal form, fraction form, and base-ten form.

Complete eight-tenths with the class, making sure students are able correctly verbalize and represent the number in each form. Write the following values on the anchor chart for students to complete with their groups before sharing out:

1. 1.19
2. Eighty-two hundredths
3.  $\frac{71}{100}$

Word Form	Decimal Form	Fraction Form	Base-Ten Representation
Three-tenths	.3	$\frac{3}{10}$	



**Reflection and Closing:**

- ✓ Have students fold a sheet of paper two times to create four equal sections and label them as follows. Tell the students to express their Base-Ten Buddy card in each of the four ways.

Word Form	Standard Form
Fraction Form	Base-Ten Representation

Again, use a checklist or classroom roll to determine which students score below 50% and may need additional help.

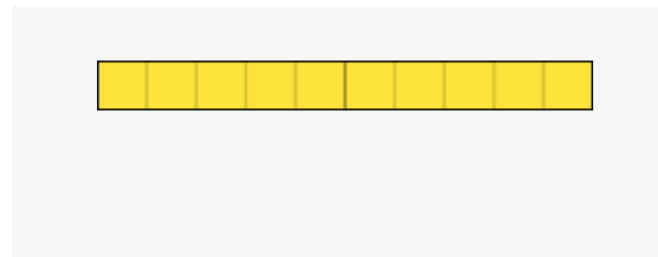
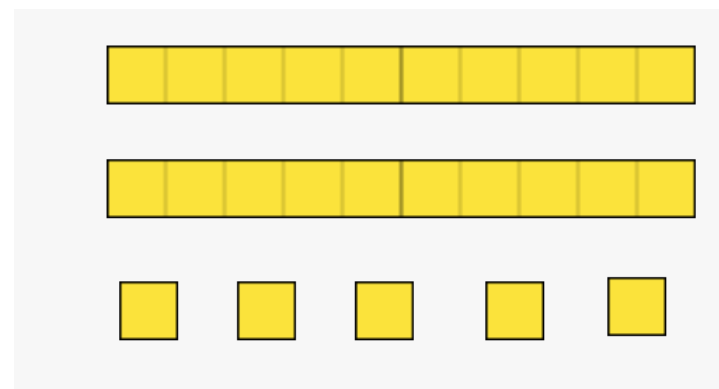
### Homework

Provide students with this question: Which country outscored Team USA by 0.13 on the men's pole vault in the 2016 Summer Olympics and won the gold?

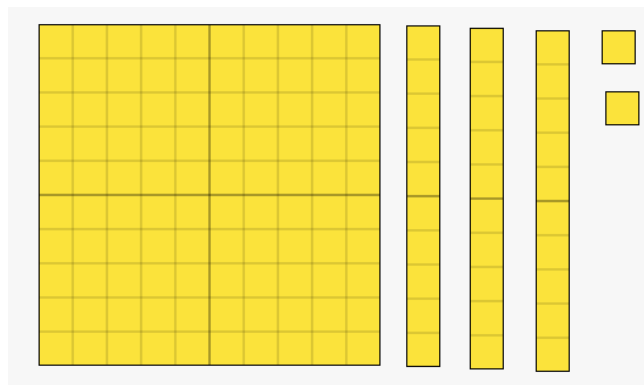
*(Team France)*

Pole Vault results found at [Olympics Results](#)

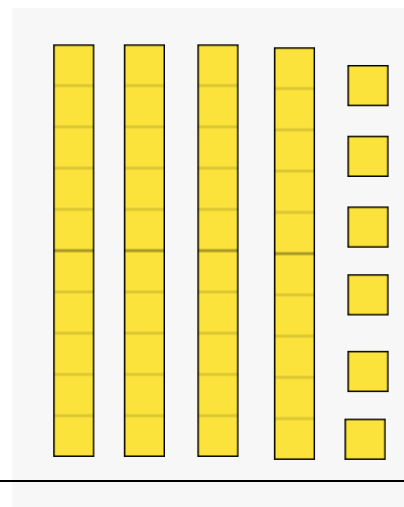
## Handout 2.1: Base-Ten Buddies

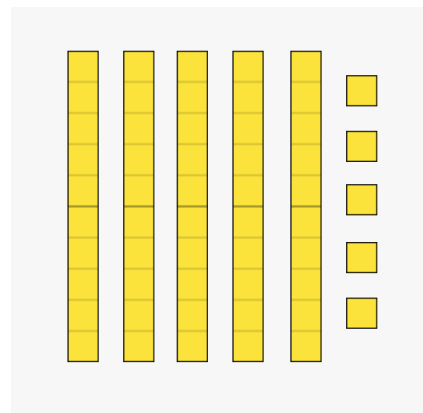
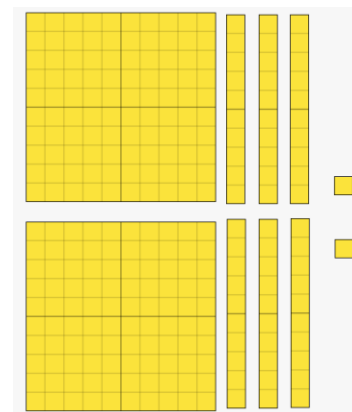
 $0.1$  $0.25$ 

1.32

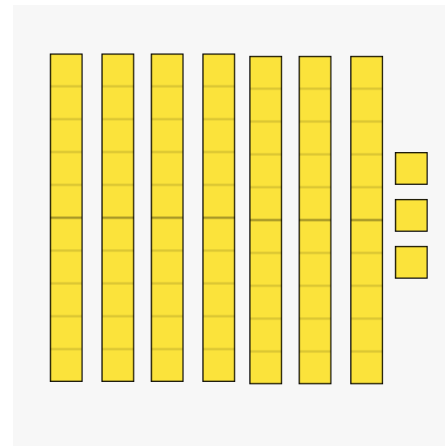


0.46

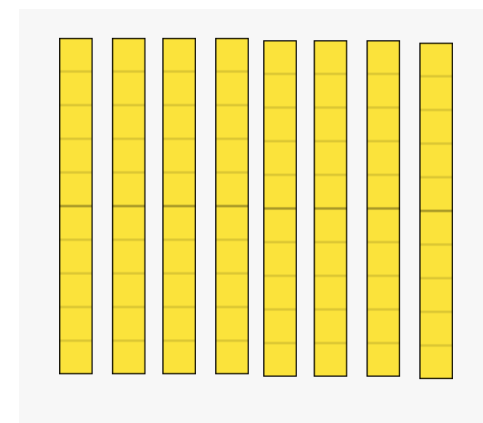


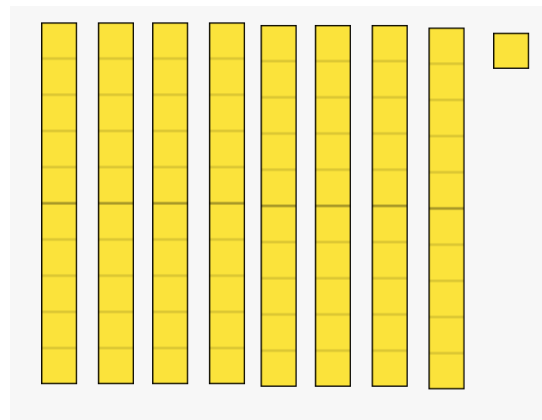
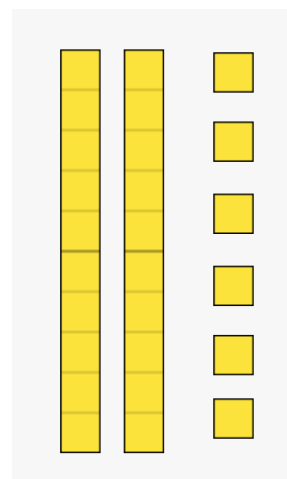
$0.55$  $2.62$ 

0.73

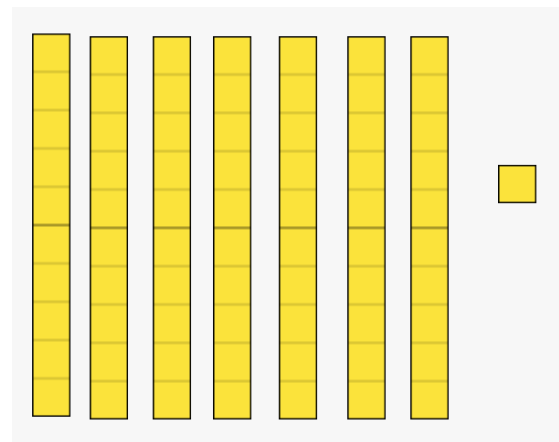


0.8

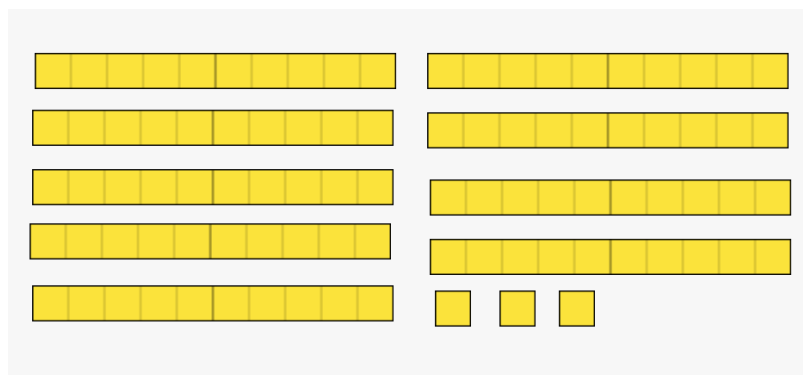


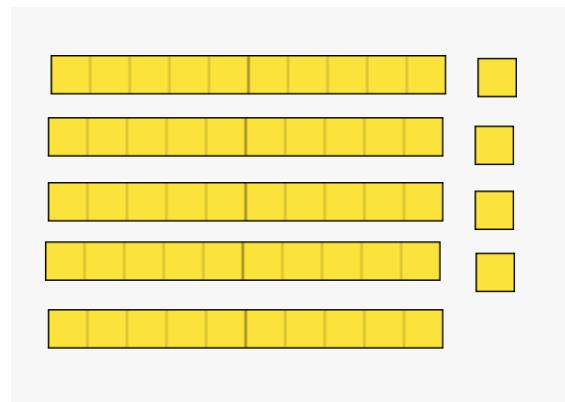
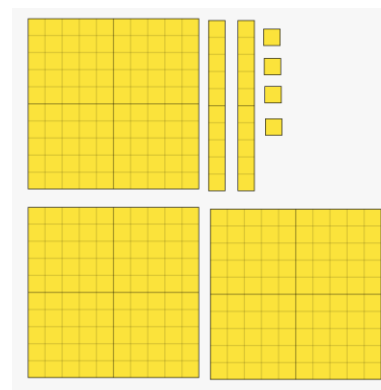
$0.91$  $0.26$ 

0.71

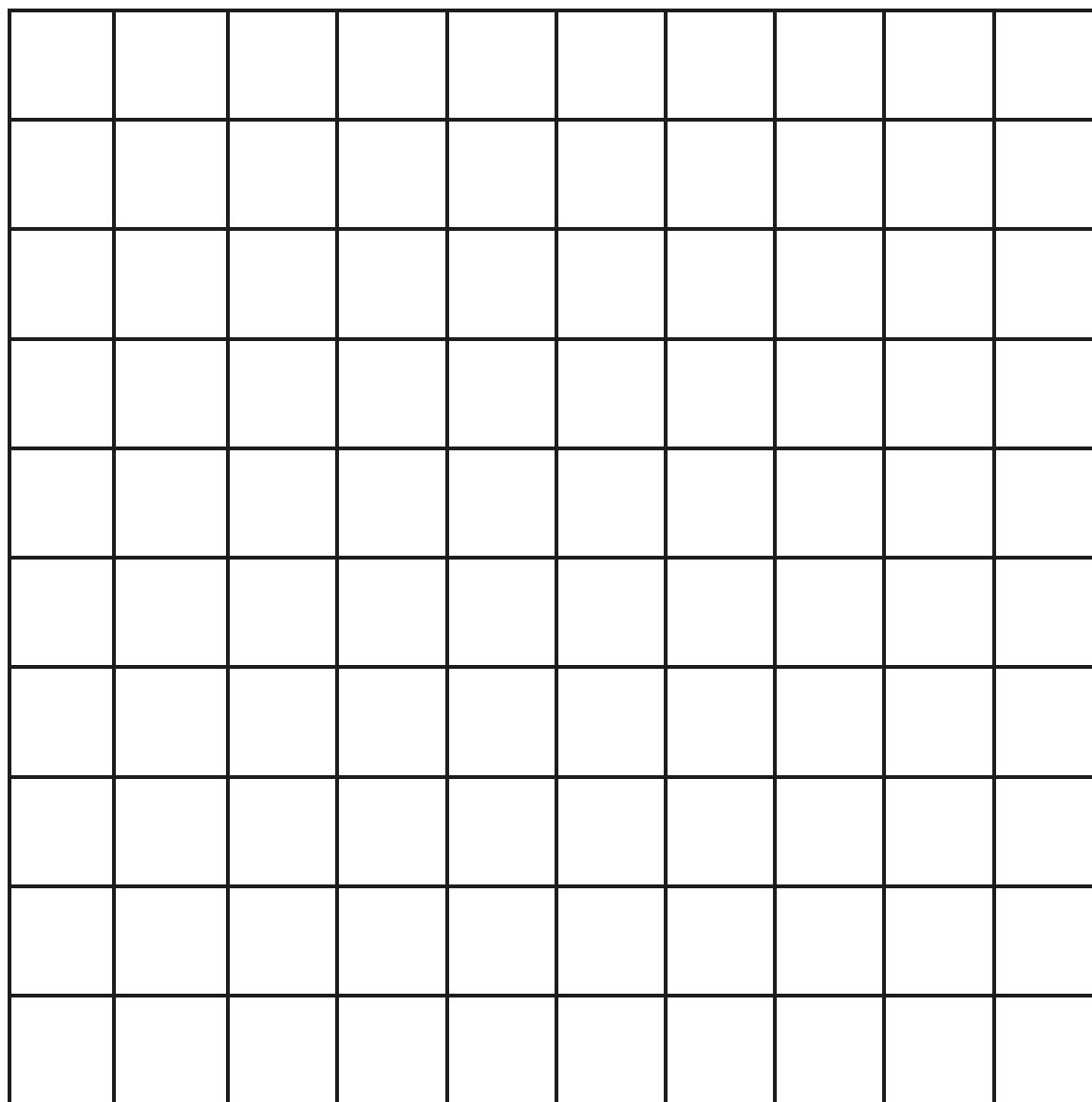


0.93

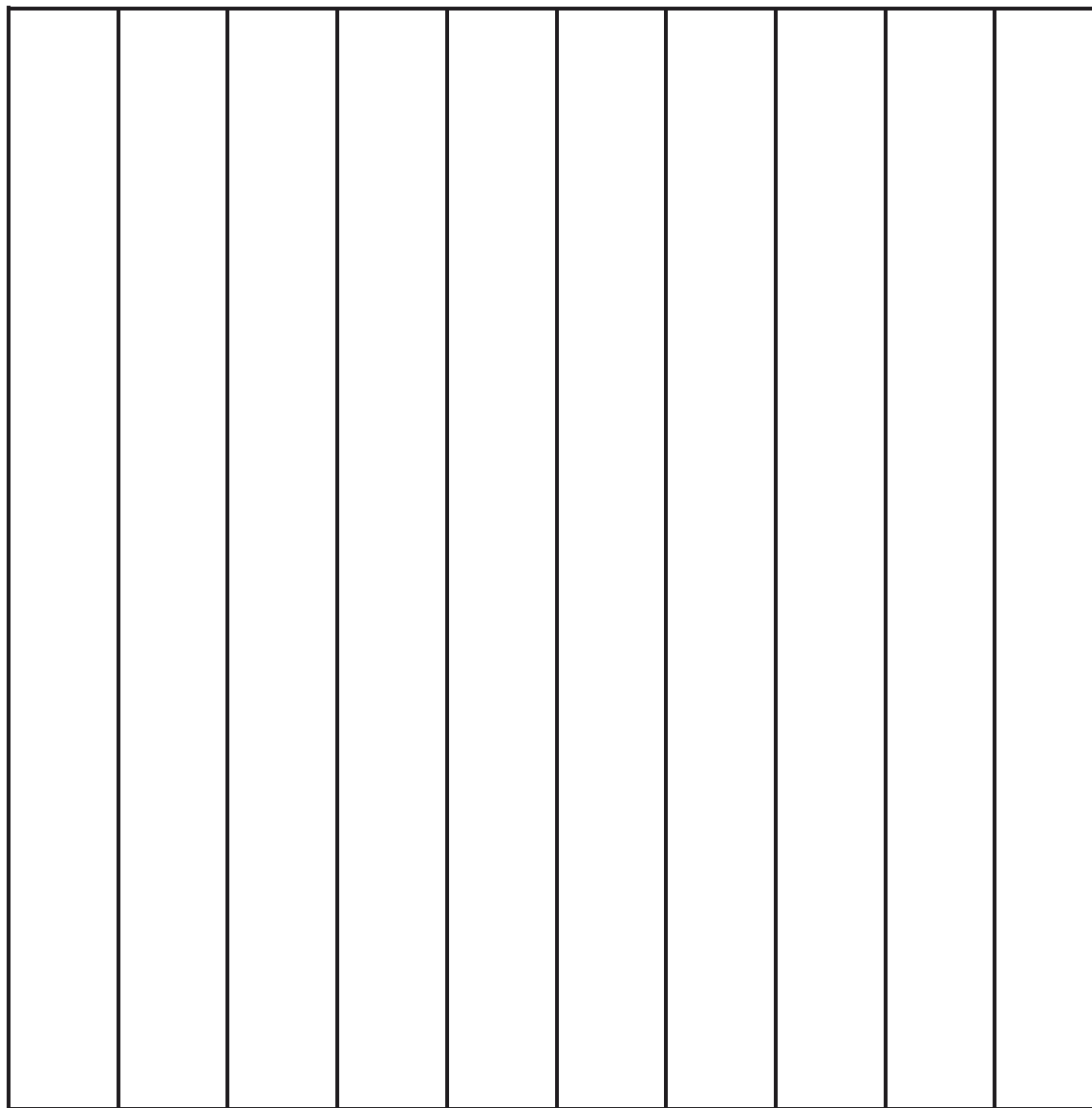


$0.54$  $3.24$ 



**Handout 2.2: Hundredths Grid**

**Handout 2.3: Tenths Grid**



**Handout 2.4: Decimal Displays**

<b>Word Form</b>	<b>Standard Form</b>	<b>Fraction</b>	<b>Base-Ten Representation</b>

## Lesson 3: Plotting with Pride

**Focus Standards:** 4.NF.6; 4.NF.7

**Additional Standard:** 4.NF.5

**Standards for Mathematical Practice:** SMP.2, SMP.3, SMP.4, SMP.5, SMP.7

**Estimated Time:** 45 minutes

**Resources and Materials:**

- Painter's Tape
- Dry erase markers
- Paper
- Sheet Protectors
- Math Journals
- Handout 3.1: Plotting Points
- Handout 3.2: Number Line Assessment
- Handout 3.3: Olympic Rings Graphic Organizer

**Lesson Targets:**

- Students will locate a decimal on a number line.
- Students will be able to label a number line appropriately

**Guiding Questions:**

- How do you know where to plot a decimal number on a number line?
- How does a number line help us understand the value of a number?

## Vocabulary


### Academic Vocabulary:

- Decimal fractions
- Hundredths
- Plotting
- Tenths

### Instructional Strategies for Academic Vocabulary:

- Introduce words with student-friendly definitions and pictures
- Model how to use the words in discussion
- Discuss the meaning of word in a mathematical context
- Create pictures/symbols to represent words
- Write/discuss using the words

**Note:** Vocabulary instruction should be embedded into the lesson each day using the strategies suggested above.

Symbol	Type of Text and Interpretation of Symbol
	Instructional support and/or extension suggestions for students who are EL, have disabilities, or perform well below the grade level and/or for students who perform well above grade level
✓	Assessment (Pre-assessment, Formative, Self, or Summative)

## Instructional Plan

### Understanding Lesson Purpose and Student Outcomes:

Students will learn to plot decimals on a number line.

Students will make visual connections between fraction and decimal equivalents on a number line.

### Anticipatory Set/Introduction to the Lesson:

T: Today, we will learn how to find decimal numbers on a number line. But first, let's review what we have already learned about decimals (SMP.5).

Pass out cards from **Handout 3.1: Plotting Points**. Have students complete **Handout 2.4: Decimal Display** with their number. Choose one student to share their results with the class. Tell students they will continue to use this card throughout the lesson to determine its placement on a number line.

**For students who are EL, have disabilities, or perform well below grade level:**

- For students who struggled on the previous day's exit ticket, ask them to gather for a quick mini-lesson around the anchor chart.

**Activity 1: Plotting Points: Tenths**

On the whiteboard or overhead, draw a number line, labeling 0 and 1 between the arrows at each end. Thoroughly explain various ways to label number lines to showcase number placement.

Possible prompting questions (SMP.7):

- How many sections will there be between 0 and 1 if you are dividing the line into tenths?
- Which tenth will be closest to 0?
- What will the other tenths numbers be, in order?
- What tenth number will be closest to 1?
- Will all tenths fit between 0 and 1? (SMP.3)

Allow students to reproduce the number line in their math journals as a reference.

Provide students with a sheet protector, a blank piece of paper, and dry erase marker. Have students draw a number line on the paper and divide the line into tenths (SMP.4). Tell them they are not to label the number line. Have students place the number line into the sheet protectors.

Write 0.2 on the board. Have students orally read the number. Keep a checklist close by to mark if any students are struggling. Be sure to ask students to state the number out loud. Conduct a Think-Aloud to place the number on the number line.

T: I need to know which two whole numbers 0.2 lies between. I know that 0.2 is greater than 0, but it is also less than 1. (Label the chart.) Now, I have 8 more marks to label. These marks have the line divided into tenths. The first line must be 0.1 that makes the next line 0.2. Here is where I find 0.2. Ask students how to represent 0.2 as a fraction.

Ask students to finish labeling the number line. Tell students you want to plot 0.8, work together as a class to locate this position, discussing that it also falls between 0 and 1, and writing it as a fraction.

- ✓ Have students plot a point at 0.3, write the number as a fraction, and hold their number line in the air to be quickly checked. Place a - on the classroom checklist for students who need additional support.

Tell students to erase the labels from their number line. Write 3.2 on the board. Provide students with time to conduct a Think-Pair-Share to determine where this number may fall on the number line. Listen carefully to each group and select a student(s) to share their thinking process aloud. While they speak, label a new number line on the board. Once this point is plotted, ask students to work with a partner to label 3.8. Review this with the class.

Have students erase the labels.

- ✓ Write 1.9 on the board. Ask students to plot this point and label their number line appropriately. Use the checklist to track student progress.

**Note:** If students are continuing to struggle with this concept, continue working on plotting tenths before moving to the hundredths.

### **Activity 2: Plotting Points: Hundredths**

Write the number 0.34 on the board. Ask students to spend a few moments trying to determine where this point should be plotted on their tenths number line. Ask students which two numbers 0.34 falls between on the tenths number line (0.3 and 0.4) and lead a discussion about which value it should be closer to. If students struggle with this concept, draw a new number line and label the ends as 0.3 and 0.4, remind students that 0.3 is the same as 0.30 and 0.4 is the same as 0.40. Relate these numbers to whole numbers or money to help students see that 0.34 falls slightly closer to 0.3.

Plot 0.82 on the number line with the students. Then have partners work together to plot 0.77 on the number line.

- ✓ Write 0.94 on the board. Ask students to plot this point and label their number line appropriately. Use the checklist to track student progress.

Tell students to erase the labels from their number line. Write 3.27 on the board. Provide students with time to conduct a Think-Pair-Share to determine where this number may fall on the number line. Listen carefully to each group and select a student(s) to share their thinking process aloud. While they speak, label a new number line on the board. Once this point is plotted, ask students to work with a partner to label 3.17. Review this with the class.

- ✓ Write 5.21 on the board. Ask students to plot this point and label their number line appropriately. Use the checklist to track student progress.

**Activity 2: Decimals on a Number Line**

Working with their country, allow students to create a giant number line using painter's tape on the floor. Have them divide the number line into tenths and label with sticky notes. Then allow students to work together to place their Plotting Points cards on the appropriate locations on the line.

**Reflection and Closing:**

- ✓ Provide students with **Handout 3.3: Olympic Rings** and complete the graphic organizer with their Decimal Dots card (SMP.2).

**Homework**

Provide students with **Handout 3.2: Number Line Assessment** to complete.



## Handout 3.1: Plotting Points

2.23	0.8
0.91	2.34

2.12

1.87

0.79

0.65

0.5

0.2

1.31

0.88

0.03

2.19

0.22

0.47

0.58

0.69

0.7

0.82

0.94

1.24

0.36

0.1

0.99

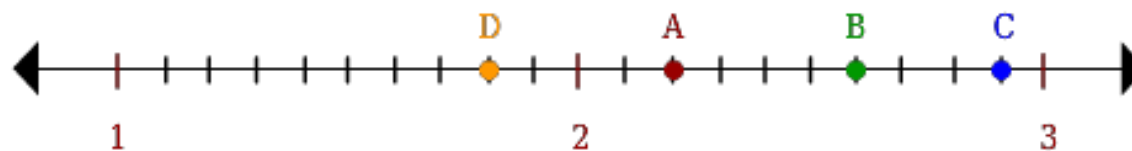
1.0

0.07

0.58

**Handout 3.2: Number Line Assessment**

Name: \_\_\_\_\_ Date: \_\_\_\_\_



What is the value of A? \_\_\_\_\_

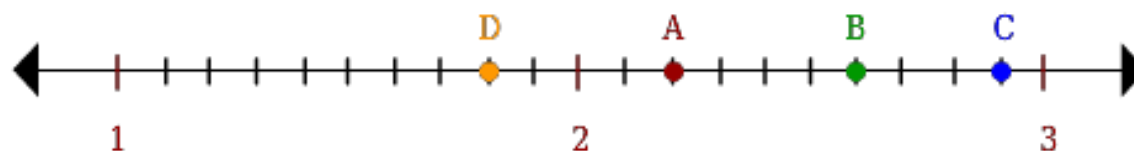
What is the value of B? \_\_\_\_\_

What is the value of C? \_\_\_\_\_

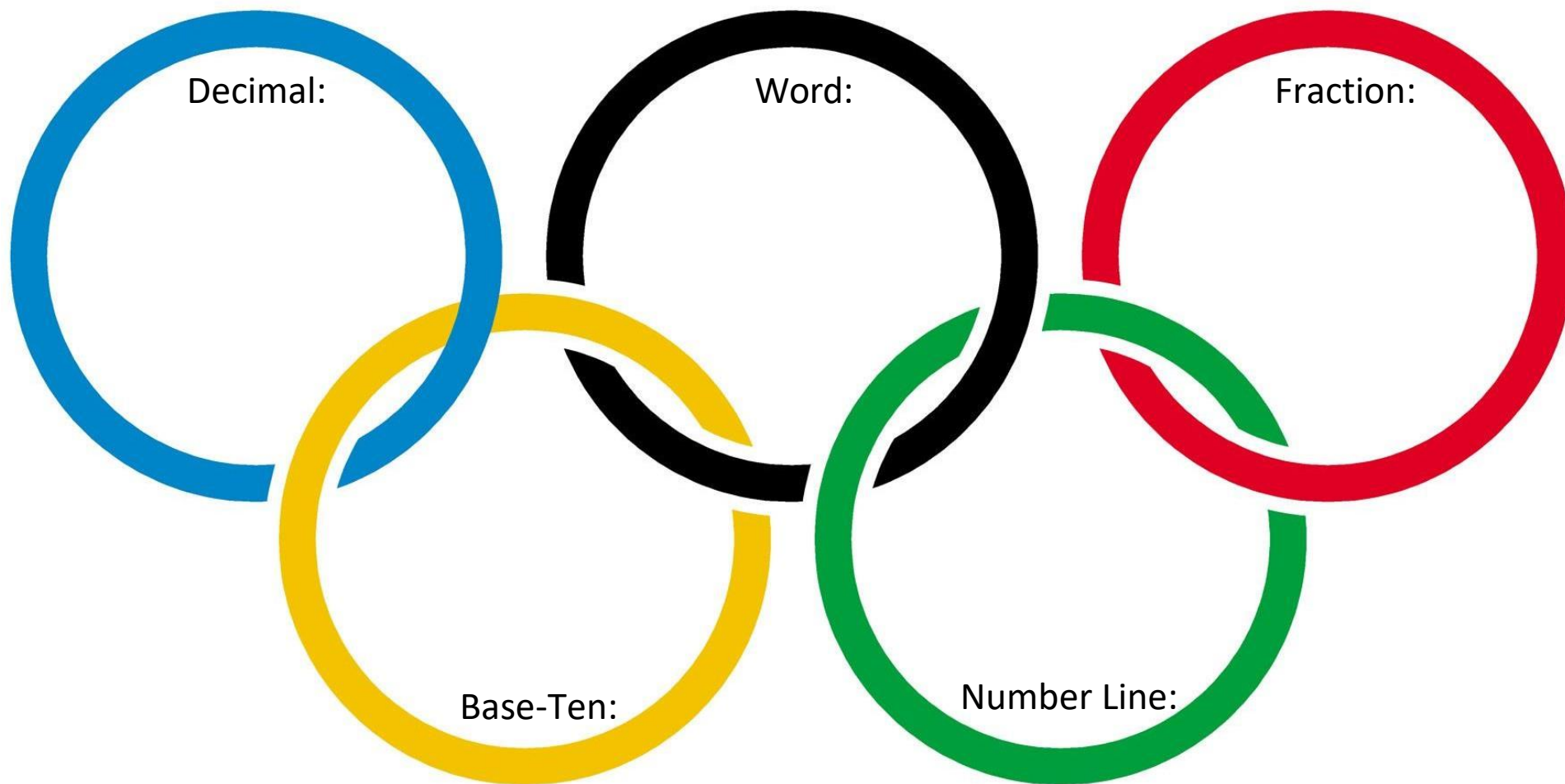
What is the value of D? \_\_\_\_\_

## Handout 3.2: Number Line Assessment - Key

Name: \_\_\_\_\_ Date: \_\_\_\_\_

What is the value of A? 2.2What is the value of B? 2.6What is the value of C? 2.9What is the value of D? 1.8

Handout 3.3: Olympic Ring Graphic Organizer





## Lesson 4: And the Winner Is...

**Focus Standard:** 4.NF.7

**Standards for Mathematical Practice:** SMP.3, SMP.5, SMP.6

**Estimated Time:** 45 minutes

**Resources and Materials:**

- Base-Ten Blocks
- Chart Paper
- Index Card
- Markers
- Money (dollars, dimes, and pennies)
- Painter's Tape
- Sticky Notes
- Handout 1.2: Place Value Mat
- Handout 4.1: And the Winner Is....
- Handout 4.2: Comparing Decimals

**Lesson Targets:**

- Students will compare two decimals to hundredths by reasoning about their size.
- Students will recognize that comparisons are valid only when the two decimals refer to the same whole.
- Students will record the results of comparisons with the symbols  $>$ ,  $=$ , or  $<$ .
- Students will justify comparisons of two decimals to the tenths place or hundredths place.

**Guiding Questions:**

- How can you use your understanding of place value to compare decimal fractions?
- How can various tools help you to compare decimal fractions?

## Vocabulary

### Academic Vocabulary:

- Decimal fraction
- Hundredths
- Inequality signs
- Tenths

### Instructional Strategies for Academic Vocabulary:

- Introduce words with student-friendly definitions and pictures
- Model how to use the words in discussion
- Discuss the meaning of word in a mathematical context
- Create pictures/symbols to represent words
- Write/discuss using the words

**Note:** Vocabulary instruction should be embedded into the lesson each day using the strategies suggested above.

### Symbol

### Type of Text and Interpretation of Symbol



Instructional support and/or extension suggestions for students who are EL, have disabilities, or perform well below the grade level and/or for students who perform well above grade level



Assessment (Pre-assessment, Formative, Self, or Summative)

## Instructional Plan

### Understanding Lesson Purpose and Student Outcomes:

Students will learn to compare decimals using a variety of tools.

### Anticipatory Set/Introduction to the Lesson:

Explain to students that they are almost ready for their own Olympic trials, but first must learn to compare decimals. Write 0.42 and 0.98 on the board. Have students talk with a partner about different ways to determine which number has a greater value.

**Activity 1: Comparing Decimals Using a Place Value Chart**

Provide students with a place value chart and dry erase marker. Review what each place is called. Ask students to write 0.42 in the appropriate location on the place value chart.

Point to 0.42

T: What is this number?

S: Forty-two hundredths

T: How many tenths?

S: 4

T: How many hundredths?

S: 2

T: What is this number again?

S: Forty-two hundredths

Point to 0.98 and follow the same procedure, asking students to write the number under 0.42.

T: When we are comparing numbers, how do we determine which is greater? Do we start from the left side or right side?

Show students how to write the comparison statement, reminding them how to write  $>$ ,  $<$ , and  $=$ .

- ✓ Complete this again with the numbers 1.32 and 5.3, reminding students that 5.3 is the same as 5.30 and addressing any misconceptions students may have.

**Activity 2: Manipulative Mania**

Explain to students that they have been using a number of tools and manipulatives this week to explore the world of decimal fractions, and they will learn to use those same tools to compare and order decimal fractions (SMP.5).

Place the following tools and manipulatives out for students to access: **Handout 1.2: Place Value Mat**, base-ten blocks, money (dollars, dimes, and pennies), painter's tape, sticky notes, and chart paper for each group with the following displayed:

Place Value Chart		
Base-Ten Blocks		
Money		
Number Line		
Comparison Statement		

- ✓ Each student will also need a card from **Handout 4.1: The Winner Is...** Review the chart with the students, explaining that they must first use the manipulatives before drawing a pictorial representation of each value. Each team member must also be responsible for leading the group and recording at least one manipulative.

Actively monitor students working together in groups, making sure that students are stating the numbers correctly.

Possible prompting questions for scaffolding:

- Which number is in the ones place?
- Which number is in the tenths place?
- Which number is in the hundredths place?
- Which tool do you find most useful with this type of problem?
- Which tool do you find the most difficult to use for this problem?
- How do you read this number?
- What would these numbers look like as fractions?

Once all students have completed their charts, allow groups to participate in a Carousel Activity in which they rotate around the room with their country and check the work of their classmates. Each group should be given a different colored marker to make notes (SMP.3). Have them place a + in each box they feel is correct and a – with an explanation for the boxes they feel are incorrect. Allow students to fix their own chart if needed (SMP.6).

**Reflection and Closing:**

- ✓ Have students write one sentence on a notecard explaining why decimals are an essential part of the Olympics.

**Homework**

Provide students with **Handout 4.2: Comparing Decimals** to complete.

## Handout 4.1: And the Winner Is...

During the 2012 Summer Olympics, Mitchell Watt jumped 8.16 meters and Greg Rutherford jumped 8.31 meters on the men's long jump. Who won the gold?



During the 2012 Summer Olympics, Brittney Reese jumped 7.12 meters and Elena Sokolova jumped 7.07 meters on the women's long jump. Who won the gold?



Team France reached 5.97 meters on the men's pole vault during the 2012 London Olympics. Team Germany reached 5.91 meters. Who won the gold?



Team USA reached 4.75 meters on the women's pole vault during the 2012 London Olympic Games. Team Russia scored 4.7. Who won the gold?



**Handout 4.2: Comparing Decimals**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Kayla explained to her math group that 0.13 is greater than 0.5 because 13 is greater than 5. Tony disagreed with Kayla. He stated that 0.5 is greater than 0.13 because 5 is greater than 3. Write your response to these statements on the lines provided.

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2. Roman completed his homework and set it on the kitchen table. His twin brother, Rico, walked by and noticed that Roman wrote  $0.4 > 0.48$ . Rico told Roman he was incorrect. Which brother is right? Justify your answer on the line provided below.

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Compare the following decimals. Use the symbols  $>$ ,  $=$ , or  $<$  to record your answers.

0.5 \_\_\_\_\_ 0.32

0.73 \_\_\_\_\_ 0.7

0.69 \_\_\_\_\_ 0.06

0.1 \_\_\_\_\_ 0.01

0.2 \_\_\_\_\_ 0.20

0.51 \_\_\_\_\_ 0.15

## Handout 4.1: And the Winner Is... KEY

During the 2012 Summer Olympics, Mitchell Watt jumped 8.16 meters and Greg Rutherford jumped 8.31 meters on the men's long jump. Who won the gold?

RUTHERFORD



During the 2012 Summer Olympics, Brittney Reese jumped 7.12 meters and Elena Sokolova jumped 7.07 meters on the women's long jump. Who won the gold?

REESE



Team France reached 5.97 meters on the men's pole vault during the 2012 London Olympics. Team Germany reached 5.91 meters. Who won the gold?

TEAM FRANCE



Team USA reached 4.75 meters on the women's pole vault during the 2012 London Olympic Games. Team Russia scored 4.7. Who won the gold?

TEAM USA





**Handout 4.2: Comparing Decimals - Key**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Kayla explained to her math group that 0.13 is greater than 0.5 because 13 is greater than 5. Tony disagreed with Kayla. He stated that 0.5 is greater than 0.13 because 5 is greater than 3. Write your response to these statements on the lines provided.

Kayla is incorrect. She is really comparing 13 hundredths to 50 hundredths. Tony is correct when he says 0.5 is greater but his reason is incorrect. He should be comparing the 5 tenths and the 1 tenth.

2. Roman completed his homework and set it on the kitchen table. His twin brother, Rico, walked by and noticed that Roman wrote  $0.4 > 0.48$ . Rico told Roman he was incorrect. Which brother is right? Justify your answer on the line provided below.

Rico is right. 0.4 is not greater than .048 because 0.4 is the same as 40 hundredths and 0.48 is the same as 48 hundredths. 40 is less than 48 so 0.4 is less than 0.48.

Compare the following decimals. Use the symbols  $>$ ,  $=$ , or  $<$  to record your answers.

$0.5 \underline{>} 0.32$

$0.73 \underline{>} 0.7$

$0.69 \underline{>} 0.06$

$0.1 \underline{>} 0.01$

$0.2 \underline{=} 0.20$

$0.51 \underline{>} 0.15$

## Lesson 5: Hurdling Through Centers

**Focus Standards:** 4.NF.6, 4.NF.7

**Additional Standard:** 4.MD.2

**Standards for Mathematical Practice:** SMP.1, SMP.2, SMP.4, SMP.6

**Estimated Time:** 90 minutes (2 days)

**Resources and Materials:**

- Base-Ten Blocks
- Copies of Country Flags
- Hundredths Grid on Legal Paper
- Money (dollars, dimes, pennies)
- Number Lines
- Handout 5.1: In the News
- Handout 5.2: Go for the Gold
- Scooter Quest Place Value: <http://www.sheppardsoftware.com/mathgames/decimals/scooterQuestDecimal.htm>
- Order Decimals: <https://www.ixl.com/math/grade-3/order-decimals>
- Number Line Mine: [https://www-k6.thinkcentral.com/content/hsp/math/hspmath/ca/common/mega\\_math\\_9780153663963\\_/megamathcd6/cm/launch.html?strActivityName=g36\\_3\\_2\\_N&strAssignID=1](https://www-k6.thinkcentral.com/content/hsp/math/hspmath/ca/common/mega_math_9780153663963_/megamathcd6/cm/launch.html?strActivityName=g36_3_2_N&strAssignID=1)

**Lesson Targets:**

- Students will use number grids to display decimal fractions and fractions.
- Students will utilize tools and manipulatives to answer questions about the Summer Olympics.
- Students will convert fractions to decimal fractions.
- Students will justify comparisons of two decimals to the tenths or hundredths place.

**Guiding Questions:**

- How can you use your understanding of place value to compare decimals?
- How can you use your understanding of fractions to compare decimals?
- How does your understanding of decimal fractions expand your understanding of numbers?

## Vocabulary

### Academic Vocabulary:

- Decimal fractions
- Decimal number
- Equivalent
- Hundredths
- Tenths
- Numerator
- Denominator

### Instructional Strategies for Academic Vocabulary:

- Model how to use the words in discussion
- Discuss the meaning of word in a mathematical context
- Create pictures/symbols to represent words
- Write/discuss using the words

**Note:** Vocabulary instruction should be embedded into the lesson each day using the strategies suggested above.

### Symbol



### Type of Text and Interpretation of Symbol

Instructional support and/or extension suggestions for students who are EL, have disabilities, or perform well below the grade level and/or for students who perform well above grade level

✓

Assessment (Pre-assessment, Formative, Self, or Summative)

## Instructional Plan

### Understanding Lesson Purpose and Student Outcomes:

Students will rotate through centers to practice modeling and writing decimal fractions and decimal numbers, compare decimals and fractions, and solve word problems involving the Summer Olympics.

### Anticipatory Set/Introduction to the Lesson:

Introduce students to each of the centers for the day and review the center rotation chart and center norms. Students will rotate through the centers with their county. Let them know that at times, some students will be called to meet with the teacher at the teacher table.

**Note:** Using the data from the unit’s formative assessments, provide individualized instruction to students who share the same misconceptions. This may be done as a 5-10 minute mini-lesson at the teacher table. Such misconceptions may include misunderstanding the importance of comparing numbers based on place value, misunderstanding the relationship between decimals and fractions, and the misunderstanding of placement on a number line.

**a. Center 1: Fraction Flags**

Provide students with a hundredths grid printed on legal sized paper and a photo of their country’s flag. (France, Germany, Italy, Denmark, Belgium, Austria, Ireland). Have students work together to color in their own flag on the grid and then create a table depicting the decimal fraction and decimal notation for each color (SMP.1 and SMP.6):

Color	Decimal Fraction	Decimal Number

**Extensions for students with high interest or working above grade level:**

- Have students add the decimal numbers and/or decimal fractions to check that they equal 1.

**b. Center 2: Technology**

Depending on the technology available in your classroom, choose one of the following options:

1. Create a folder on student desktop computers containing each of these games and allow students to practice and play individually or with a group partner.
2. Display one of these games on the classroom’s interactive whiteboard for the country to play together.

Choose one of the following:

[Ordering Decimals](#)

[Number Line Mine](#)

[Scooter Quest Place Value](#)

**c. Center 3: In the News**

Select a variety of texts for students to read from [Newsela: Olympics and Olympians](#). Instruct students to read the entire passage first. Then, have them count the words until they reach 100. Have them place a bracket after the hundredth word in the text.

Students should count the number of nouns, verbs, adjectives, and adverbs and complete **Handout 5.1: In the News**.

**Note:** Newsela has an option to adjust the reading level for each passage.

**For students who are EL, have disabilities, or perform well below grade level:**

- Provide student dictionaries or an online dictionary for students to check the part of speech.

**d. Center 4: Go for the Gold**

Provide students with one piece of chart paper per group, student created place value mats from the hundreds place to the hundredths place, money, base-ten blocks, and scratch paper for number lines. Copies of **Handout 5.2: Go for the Gold** will be needed for each group as well (SMP.2 and SMP.4). Students will work together to solve as many problems as they can in the allotted time. For each correct answer, the team will receive a gold medal. Have students write the problem numbers and answers on the chart paper. Once time is called, fold the chart paper in half, and tape it to the wall to check later. This will keep other teams from trying to see the work.

**e. Teacher Table:**

During each rotation, call students to the teacher table to reteach any misconceptions that have appeared on previous formative assessments.

**Reflection and Closing:**

✓ On the board, write the following: Do you feel this unit has helped you understand decimal fractions and fractions better?

1 ring - strongly disagree

2 rings - disagree

3 rings - neutral

4 rings - agree

5 rings - strongly agree

Provide students with a notecard. Ask them to draw the number of Olympic rings that correspond with how they feel about decimal fractions and fractions.

**Note:** This should be done at the end of Day 2 of this lesson.

## Homework

No homework assigned.

**Handout 5.1: In the News**

	Word Count	Decimal Form	Fraction Form	Word Form
Nouns				
Adjectives				
Verbs				
Adverbs				

Plot the decimal forms of the numbers on the number line to determine the order from least to greatest. Label the line appropriately.



## Handout 5.2: Go for the Gold

1. German Sanchez and Aisen Chen were the top two divers on the 10 M platform dive in the 2016 Summer Olympics. Sanchez scored 532.70 on his 10 M platform dive and Chen scored 585.30. Which diver won gold?

Justify your answer.



2. In the men's pole vault, Team Brazil, Team USA, and Team France received the highest scores. Team Brazil jumped 6.03 meters, Team USA jumped 5.85 meters, and Team France scored 5.98. Who won each of the three medals?

Use a number line to justify your answer.



3. Team USA scored 14.71 in the women's triple jump. Team Kazakhstan scored 14.74, Team Venezuela scored 14.98, and Team Columbia scored 15.17. Did Team USA receive a medal?

Justify your answer.



4. During the women's long jump, Tianna jumped 7.17 meters. Her teammate, Brittney jumped 7.15 meters. Which teammate made the longest jump? Write both decimals as fractions.

Justify your answer.





5. In women's gymnastics, Simone Biles scored 15.97 on the vault. Maria Paseka scored 15.25. Which gymnast received the higher score?

Justify your answer.



6. In the men's individual all-around for gymnastics, Team Japan scored 92.37. Team Great Britain scored 90.64 and Team Ukraine scored 92.27. Rank these teams from highest to lowest scores.

Justify your answer.



7. Madison Kocian of Team USA scored 15.83 on the uneven bars. Sophie Schieder from Team Germany scored 15.57. Which gymnast scored higher? Which place value determines this?

Justify your answer.



8. Jeff Henderson won gold by jumping 8.38 meters in the 2016 Rio Olympics. During the 2012 London Olympics, Greg Rutherford scored 8.31 meters. Which Olympian jumped further?

Justify your answer.



## Handout 5.2: Go for the Gold - Key

1. German Sanchez and Aisen Chen were the top two divers on the 10 M platform dive in the 2016 Summer Olympics. Sanchez scored 532.70 on his 10 M platform dive and Chen scored 585.30.

Which diver won gold? **Chen won**

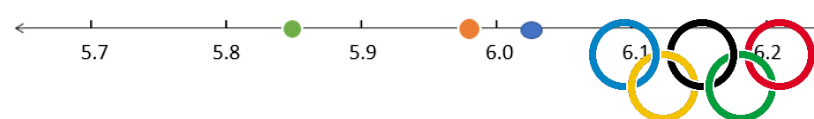
Justify your answer. **585.30 is greater than 532.70**

**because 85 wholes is greater than 32 wholes.**



2. In the men's pole vault, Team Brazil, Team USA, and Team France received the highest scores. Team Brazil jumped 6.03 meters, Team USA jumped 5.85 meters, and Team France scored 5.98. Who won each of the three medals? **Brazil – Gold, France – Silver, USA – Bronze.**

Use a number line to justify your answer.



3. Team USA scored 14.71 in the women's triple jump. Team Kazakhstan scored 14.74, Team Venezuela scored 14.98, and Team Columbia scored 15.17. Did Team USA receive a medal? **No.**

Justify your answer. **15.17 is more than 15 which is higher than all of the 14s. 14.98 is second because .98 is higher than .74 and 14.74 is third because .74 is higher than .71. Team USA came in fourth.**



4. During the women's long jump, Tianna jumped 7.17 meters. Her teammate, Brittney jumped 7.15 meters. Which teammate made the longest jump? Write both decimals as fractions. **Tianna had the longest jump.**

Justify your answer. **7.17 is  $\frac{17}{100}$  and 7.15 is  $\frac{15}{100}$ . The numbers both have 7 but  $\frac{17}{100}$  is more than  $\frac{15}{100}$ .**



5. In women's gymnastics, Simone Biles scored 15.97 on the vault. Maria Paseka scored 15.25. Which gymnast received the higher score? *Simone Biles did.*

Justify your answer.

*15.97 is more than 15.25 because 97 hundredths is more than 25 hundredths.*



6. In the men's individual all-around for gymnastics, Team Japan scored 92.37. Team Great Britain scored 90.64 and Team Ukraine scored 92.27. Rank these teams from highest to lowest scores.

*92.37, 92.27, 90.64* Justify your answer.

*92.37 and 92.27 both have 92 wholes which is more than 90.64 because it has 90 wholes. 92.37 is more than 92.27 because 37 hundredths is more than 27 hundredths.*



7. Madison Kocian of Team USA scored 15.83 on the uneven bars. Sophie Schieder from Team Germany scored 15.57. Which gymnast scored higher? Which place value determines this?

*Madison Kocian. Tenths place.*

Justify your answer. *Eight tenths is more than five tenths.*



8. Jeff Henderson won gold by jumping 8.38 meters in the 2016 Rio Olympics. During the 2012 London Olympics, Greg Rutherford scored 8.31 meters. Which Olympian jumped further? *Jeff Henderson*

Justify your answer. *38 hundredths is more than 31 hundredths.*



## Lesson 6: Mathletes: Olympic Trials

**Focus Standards:** 4.NF.6, 4.NF.7

**Additional Standard:** W.4.2

**Standards for Mathematical Practice:** SMP.4, SMP.5, SMP.6

**Estimated Time:** 135 minutes (3 days)

**Resources and Materials:**

- Garbage Can
- Painter's Tape
- Paper
- Straws
- Handout 6.1: Olympic Trials
- Handout 6.2: Newspaper Article

**Lesson Targets:**

- Students will explore using decimal fractions through their performance task.
- Students will write an article detailing the Olympic Trials for their country.

**Guiding Questions:**

- How can understanding decimal fractions help in real-world situations?
- How can you use tools and manipulatives to better understand decimal fractions?

## Vocabulary

### Academic Vocabulary:

- Decimal fractions
- Decimal number
- Equivalent
- Hundredths
- Tenths
- Numerator
- Denominator

### Instructional Strategies for Academic Vocabulary:

- Write/discuss using the words

**Note:** Vocabulary instruction should be embedded into the lesson each day using the strategy suggested above.

### Symbol



### Type of Text and Interpretation of Symbol

Instructional support and/or extension suggestions for students who are EL, have disabilities, or perform well below the grade level and/or for students who perform well above grade level

✓

Assessment (Pre-assessment, Formative, Self, or Summative)

## Instructional Plan

### Understanding Lesson Purpose and Student Outcomes:

Students will compete in Olympic trials and then work with their country to represent and order decimal fractions using a variety of methods.

### Anticipatory Set/Introduction to the Lesson:

Divide the students into their country groups and give them their fraction flags created during centers on the previous day. Explain to them that they will all now be competing in their own Olympic Trials (SMP.4, SMP.5, SMP.6). Distribute **Handout 6.1: Olympic Trials** to each country/group to record their results.

### Activity 1: Javelin Throw

Lead students to the painter's tape number line. (This number line should already be sectioned into tenths and measured as meters). One-by-one, provide each student with a straw. Have them stand at the starting line and throw their straw as far as possible. Allow the student's teammates to help measure and record the throw on the table found in **Handout 6.1: Olympic Trials**.

**Note:** If you prefer to host the games outside, the number line can be created easily using sidewalk chalk.

**Activity 2: Basketball Toss**

For this activity, students will attempt 10 shots into the garbage can using balls of paper. Their teammates will assist in counting and recording the number of shots made onto the table found in **Handout 6.1: Olympic Trials**.

**Note:** If you have access to the gymnasium, students can use basketballs and basketball goals for this event.

**Activity 3: Tallest Tower**

For this activity, provide students with 100 unit blocks. Have them build the tallest tower possible. Have them record the final number of units used before the tower collapses on **Handout 6.1: Olympic Trials**.

**Note:** To save time, allow multiple students to do this around the room and appoint classroom judges to assist in counting and recording their total.

**Activity 4: Teamwork**

Have students work together to complete **Handout 6.2: Newspaper Article**. Provide students with support as needed through the use of tools and manipulatives.

**Note:** Collaboration with the ELA teacher is highly recommended to ensure that students can write informational articles.

**Reflection and Closing:**

- ✓ Review the performance task and allow students to share their results with the class.

## Homework

Instruct students to study and prepare for their final assessment.

## Handout 6.1: Olympic Trials

Javelin Throw      Basketball Toss      Tallest Tower			



## Handout 6.2: Newspaper Article

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# THE TITLE OF YOUR PAPER

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Volume 1

City

Date

---

## Headline Goes Here

### *Descriptive Subtitle Goes Here*

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*Insert picture of the team, country, or country's flag.*

Caption related to picture

Summarize the tallest tower event. Identify the team scores as decimal fractions and fractions. List the team's rankings from least to greatest.

### **Tallest Tower**

*Insert Picture of Teammate building the winning tower.*

Caption related to the picture below.

### **Basketball Throw**

*Insert table ranking scores from highest to lowest showing the fractions with a denominator 10 and denominator 100.*

Caption related to the winner of the event above.

Summarize the basketball throw event. Identify the team scores as fractions with denominators of 10 and 100. Then state both fractions as decimal fractions. Explain which place value determined the winner of this event.

Summarize the javelin throw event. Identify the team scores as decimal fractions Explain which place value determined the winner of this event.

### **Javelin Throw**

*Insert a number line, plotting a point for each team members' score. Label using decimal fractions.*

Caption related to the winner of the event below.



## Lesson 7: Closing Ceremony

**Focus Standards:** 4.NF.6, 4.NF.7

**Additional Standards:** 4.NF.5, 4.MD.2

**Standards for Mathematical Practice:** SMP.1, SMP.2, SMP.3, SMP.4, SMP.5, SMP.6, SMP.7

**Estimated Time:** 30 minutes

**Resources and Materials:**

- Base-Ten Blocks
- Number Lines
- Pencils
- Place Value Mats
- Handout 7.1: Final Assessment
- Closing Ceremony: <https://www.youtube.com/watch?v=ssc5eLjLoMQ>

**Lesson Target:**

- Students will demonstrate their understanding of decimal fractions by completing a final assessment.

**Guiding Question:**

- Why are decimal fractions important?

## Vocabulary


**Academic Vocabulary:**

- Decimal fractions
- Denominator
- Hundredths
- Numerator
- Tenths

**Instructional Strategies for Academic Vocabulary:**

- Discuss the meaning of word in a mathematical context
- Write/discuss using the words

**Note:** Vocabulary instruction should be embedded into the lesson each day using the strategies suggested above.

Symbol	Type of Text and Interpretation of Symbol
	Instructional support and/or extension suggestions for students who are EL, have disabilities, or perform well below the grade level and/or for students who perform well above grade level
✓	Assessment (Pre-assessment, Formative, Self, or Summative)
Instructional Plan	
<p><b>Understanding Lesson Purpose and Student Outcomes:</b> Students will complete a final assessment.</p> <p><b>Anticipatory Set/Introduction to the Lesson:</b> Explain to students that the Olympics has now come to an end for the classroom and that today they will be given their final assessment. Conduct a brief review of all they have learned.</p> <p><b>Activity 1: Final Assessment</b> ✓ Provide students with <b>Handout 7.1 Final Assessment</b></p> <div data-bbox="310 911 1780 1073" style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p><b>For students who are EL, have disabilities, or perform well below grade level:</b></p> <ul style="list-style-type: none"> <li>• Allow students to use any of the tools and manipulatives that were used during the unit.</li> <li>• Students can use notes or work completed throughout the unit for assistance.</li> </ul> </div> <p><b>Reflection and Closing:</b> Show a small clip of the <a href="#">Closing Ceremony for the 2016 Summer Olympics</a>.</p>	
Homework	
No Homework	

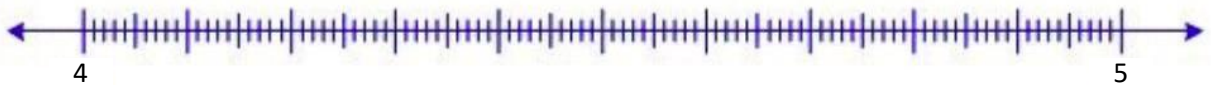
**Handout 7.1 Final Assessment**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**The 2016 Summer Olympics were held in Rio de Janeiro, Brazil. Answer the questions below about the games using what you learned about decimals and fractions during this unit.**

1. Sandi Morris from team USA won a silver medal in the women's pole vault by reaching 4.85 meters.

- Rewrite 4.85 as fraction. \_\_\_\_\_
- Locate 4.85 on the number line below.



2. Team Germany outscored Team USA by 0.26 on the men's horizontal bars. Write 0.26 as a fraction.

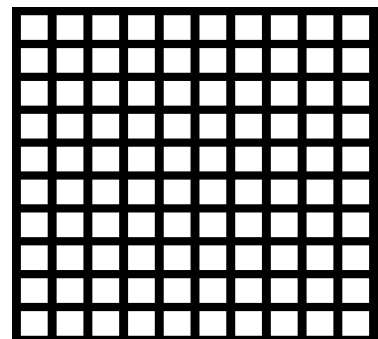
\_\_\_\_\_

3. Louis from Team Greece won gold when he jumped 8.27 meters during the 2008 Beijing Olympics. Greg from Team Great Britain jumped 8.31 meters during the 2012 London Olympics.

- Which Olympian jumped the farthest? Write an inequality to compare the distances.
- \_\_\_\_\_

- The difference between the two jumps was 0.04. Shade the hundredths grid to represent this distance. Express 0.04 as a fraction on the line below.

\_\_\_\_\_



4. Alexandra from Team USA scored 15.07 on the women's balance beam. Linlin from Team China received a score of 15.6 and Lu, also from Team China, scored a 15.5. All three women received medals. Use the chart below to show their scores as fractions and word form. Then, plot their points on the number line below to determine who won gold, silver, and bronze.

	Decimal Form	Fraction Form	Word Form
Alexandra	15.07		
Linlin	15.6		
Lu	15.5		



5. While practicing his free throws, Kevin Durant of Team USA made 40 out of 100 shots.

- Write the number of shots he made as a fraction with the denominator as 100.  
\_\_\_\_\_ . Write it as a decimal fraction \_\_\_\_\_ .
- Write the number of shots he made as a fraction with the denominator as 10.  
\_\_\_\_\_ . Write it as a decimal fraction \_\_\_\_\_ .
- Explain the relationship between your answer for A and your answer for B.

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**Handout 7.1 Final Assessment - Key**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

The 2016 Summer Olympics were held in Rio de Janeiro, Brazil. Answer the questions below about the games using what you learned about decimals and fractions during this unit.

1. Sandi Morris from team USA won a silver medal in the women's pole vault by reaching 4.85 meters.

- a. Rewrite 4.85 as fraction.  $4 \frac{85}{100}$   
 b. Locate 4.85 on the number line below.



2. Team Germany outscored Team USA by 0.26 on the men's horizontal bar. Write 0.26 as a fraction.

$$\frac{26}{100}$$

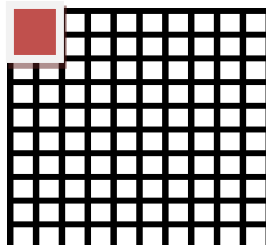
3. Louis from Team Greece won gold when he jumped 8.27 meters during the 2008 Beijing Olympics. Greg from Team Great Britain jumped 8.31 meters during the 2012 London Olympics.

- a. Which Olympian jumped the furthest? Write a comparison sentence.

Greg jumped the farthest. 8.27 is less than 8.31 because 27 hundredths is less than 31 hundredths

- b. The difference between the two jumps was 0.04. Shade the hundredths grid to represent this distance. Express 0.04 as a fraction on the line below.

$$\frac{4}{100}$$



4. Alexandra from Team USA scored 15.07 on the women's balance beam. Linlin from Team China received a score of 15.6 and Lu, also from Team China, scored 15.5. All three women received medals. Use the chart below to show their scores as fractions and word form. Then, plot their points on the number line below to determine who won gold, silver, and bronze.

	Decimal Form	Fraction Form	Word Form
Alexandra	15.07	$15\frac{7}{100}$	Fifteen and seven hundredths
Linlin	15.6	$15\frac{6}{10}$	Fifteen and six tenths
Lu	15.5	$15\frac{5}{10}$	Fifteen and five tenths



5. While practicing his free throws, Kevin Durant of Team USA made 40 out of 100 shots.

a. Write the number of shots he made as a fraction with the denominator as 100.

$\frac{40}{100}$ . Write it as a decimal fraction  $\frac{40}{100}$ .

b. Write the number of shots he made as a fraction with the denominator as 10.

$\frac{4}{10}$ . Write it as a decimal fraction  $\frac{4}{10}$ .

c. Explain the relationship between your answer for A and your answer for B.

Four tenths is the same as forty hundredths. Four out of ten is the same as forty out of one hundred.

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For training or questions regarding this unit,  
please contact:

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