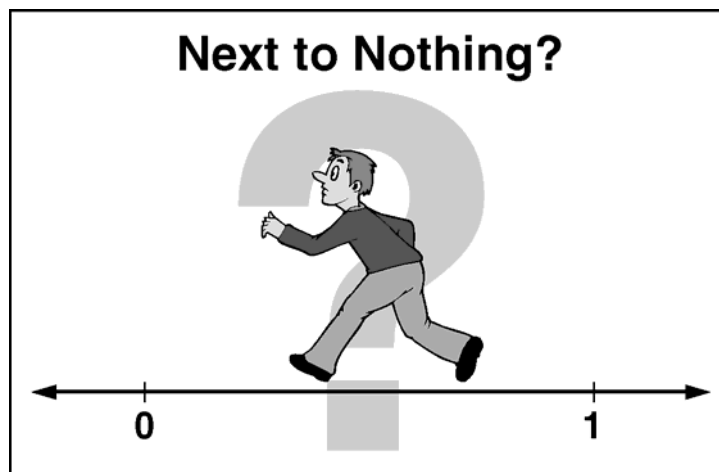


SITES-M Mathematics Challenge



Level: Grade Four

Standard: Number and Operations

Learning Target: Focus on System of Tens

Grade Level Expectations

GLE 0406.2.1 Understand place value of numbers from hundredths to the hundred-thousands place.

Checks for Understanding

0406.2.2 Understand decimal notation as an extension of the base-ten number system.

0406.2.11 Use models, benchmarks, and equivalent forms to compare fractions/decimals and locate them on the number line.

0406.2.12 Understand and use the decimal numbers up to hundredths.

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens
Next to Nothing?

The purpose of the Mathematics Challenges is to provide opportunities for students to develop and demonstrate understanding of important mathematical concepts and standards. Each Challenge includes a set of tasks that require higher-order thinking skills. Because these types of tasks may be new for students and they will have varying levels of understanding, the student responses will vary. The Challenges and guiding questions were designed to help teachers plan their implementation and elicit, analyze, and act on evidence of student understanding.

You will be able to choose which Mathematics Challenge Packet to implement each month, according to the learning needs of your students and your teaching context. Each packet contains all the materials necessary to implement the Mathematics Challenge including a grade-appropriate Challenge, the Mathematics Challenge Meeting Protocol, and the Guiding Questions for Analyzing Student Responses to Mathematics Challenges.

For each Challenge, you will complete a six step process of planning, implementation, and analysis and reflection.

The Mathematics Challenge Process

Stage	Step	Task
Planning	Step 1.	Review the Mathematics Challenge Meeting Protocol
	Step 2.	Review and solve the Mathematics Challenge prior to your Professional Learning Community (PLC) meeting. Think about your responses to the guiding questions on the Meeting Protocol
	Step 3.	Hold your PLC meeting and discuss your responses to the Guiding Questions on the Meeting Protocol
Implementation	Step 4.	Implement the Mathematics Challenge with your class
Analysis and Reflection	Step 5.	For your own planning and documentation, respond to the Guiding Questions on the Analyzing Student Responses Protocol
	Step 6.	To help us improve the Challenges and to provide recommendations for teachers implementing them in future years, complete the Mathematics Challenge Feedback Log and provide copies of all student work to the Assessment Coordinator

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens
Next to Nothing?

Mathematics Challenge Meeting Protocol

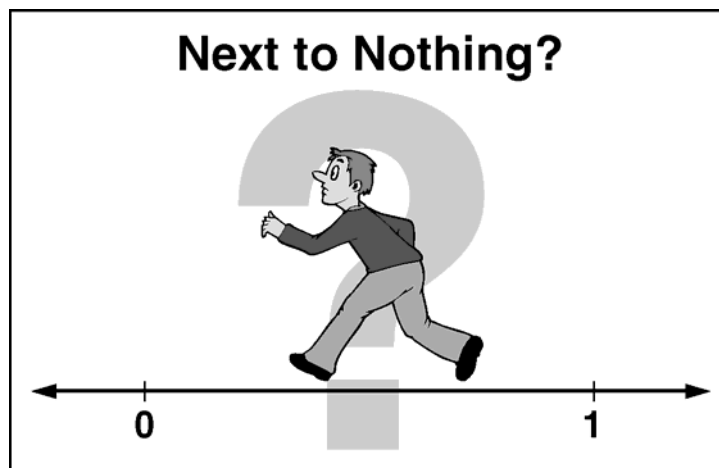
Each month, your Professional Learning Community will meet to discuss the implementation of one Mathematics Challenge. In preparation for your monthly meeting, please print and review this month's Mathematics Challenge, solve all tasks within the Challenge, and think about the guiding questions below. These questions will be used to facilitate a group discussion regarding the implementation of the upcoming Mathematics Challenge.

Guiding Questions for Implementing the Mathematics Challenges

1. What is the title of the Challenge that you will use this month?
2. What skills or standards is this Challenge measuring?
3. Where does this Challenge fit within your curriculum? Within which unit?
4. At what point during the unit will you administer this Challenge (e.g., At the beginning of a unit to determine what students do or do not know, at the end of a unit to assess what students have or have not learned, in the middle of a unit to determine where to go next instructionally)?
5. How will your students complete this Challenge (e.g., individually, one-on-one, in small groups, as a class)? Why?
6. Are there any prerequisite skills, common misunderstandings, or vocabulary needs that you will have to address? What are they?
7. What difficulties do you anticipate your students will have with the Challenge? How will you address them?
8. Are these skills and difficulties different for special needs students, ELL students, etc.? How? Will you do anything different for these students? What?
9. How will you evaluate student responses (e.g., grade responses with the provided rubric, scan responses to identify common mistakes/misconceptions, have students evaluate one another's responses, have students evaluate their own response)?
10. What will student responses to this Challenge tell you about student understanding?
11. How might you use this evidence of student understanding to adapt your teaching and learning?
12. What other materials, resources, or support might you need? Where can you get them?
13. How can your colleagues assist you in the analysis of student understanding?
14. What other questions or concerns do you have about this Mathematics Challenge?

After you have implemented the challenge with your class, be sure to respond to the Guiding Questions on the Analyzing Student Responses Protocol.

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens



Standard: Number and Operations

Learning Target: Focus on System of Tens

Claims:

Students should understand and be able to explain or demonstrate how to:

- ✓ Understand place value of numbers from hundredths to the hundred-thousands place;
- ✓ Use models, benchmarks, and equivalent forms to compare fractions/decimals and locate them on the number line;
- ✓ Understand decimal notation as an extension of the base-ten number system;
- ✓ Understand and use the decimal numbers up to hundredths.

Task Preparation:

Each student will need a copy of the Student Response Sheet.

Stimulus Cards (Drawing or Word Description):

None

Manipulatives/Supplies:

Pencils

SITES-M Mathematics Challenge
Grade 4—Focus on System of Tens

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

Cues/Directions:

Distribute student response sheets. Students should be directed to look carefully at each figure. Allow students time to answer.

- 1. Instruct students to follow along as you read aloud and say: Each large square below has been divided into 100 smaller squares of equal size. Each large square represents 1 unit. Shade in 0.48 of the large square below. (TEACHER NOTE: Have students correctly shade in 0.48 of the square.) Shade in 0.7 of the large square below. (TEACHER NOTE: Have students correctly shade in 0.7 of the square.) Which number, 0.48 or 0.7, is bigger? (TEACHER NOTE: Have students check the correct box.) How do you know? (TEACHER NOTE: Students should write their explanation in the box.) Shade in the squares below to represent the sum below. (TEACHER NOTE: Have students correctly shade in $0.7 + 0.48$ of the square.) What is the sum? (TEACHER NOTE: Students should write their correct answer on the line.)**
- 2. Complete the table below by checking which number the decimal is closest to. The first one is done for you. (TEACHER NOTE: Have students correctly fill in the table.) Which decimal number in the table is closest to 0 ? (TEACHER NOTE: Students should write their correct answer on the line.) How do you know? (TEACHER NOTE: Students should write their explanation in the box.)**
- 3. Four regions on the number line below are labeled. (TEACHER NOTE: Give students time to examine the number line.) Complete the table below by finding the region of the number line that has that number. The first one is done for you. (TEACHER NOTE: Have students correctly fill in the table.) Which number in the table is closest to 1? (TEACHER NOTE: Students should write their correct answer on the line.) How do you know? (TEACHER NOTE: Students should write their explanation in the box.)**
- 4. Use the four numbers in the box above to write an addition problem with decimals so that the answer is as close to 0 as possible. (TEACHER NOTE: Students should write their answer in the box, this might be a stretch for some students.) How do you know that your answer is as close to 0 as possible? (TEACHER NOTE: Students should write their explanation in the box.)**

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

- 5. Use the four numbers in the box above to write an addition problem with decimals so that the answer is as close to 1 as possible, but less than 1. (TEACHER NOTE: Students should write their answer in the box, this might be a stretch for some students.) Use the same numbers to write an addition problem with decimals so that the answer is as close to 1 as possible, but more than 1. (TEACHER NOTE: Students should write their answer in the box, this might be a stretch for some students.) Which of your answers is closer to 1 ? (TEACHER NOTE: Students should write their correct answer on the line.) How do you know? (TEACHER NOTE: Students should write their explanation in the box.)**

SITES-M Mathematics Challenge
Grade 4—Focus on System of Tens

SITES-M Mathematics Challenge
Grade 4—Focus on System of Tens

Student Response Sheet
Next to Nothing?

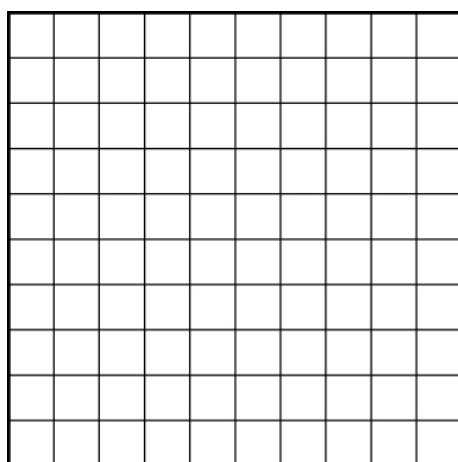


Name: _____

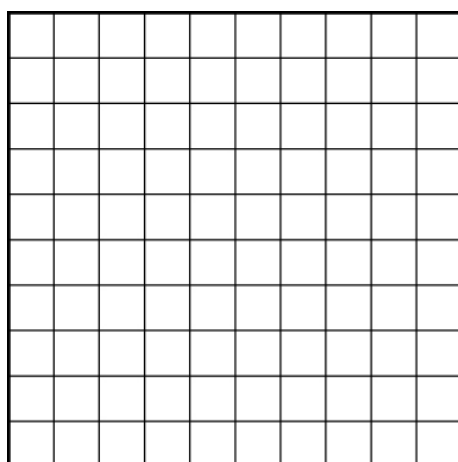
Date: _____

1. Each large square below has been divided into 100 smaller squares of equal size. Each large square represents 1 unit.

a. Shade in 0.48 of the large square below.



b. Shade in 0.7 of the large square below.



SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

c. Which number, 0.48 or 0.7, is bigger?

Check one:

0.48

0.7

How do you know?

--

d. Shade in the squares below to represent the sum below.

$$0.48 + 0.7$$

A blank 10x10 grid for graphing, consisting of 10 columns and 10 rows of squares.A blank 10x10 grid for graphing, consisting of 10 columns and 10 rows of squares.

What is the sum? _____

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

2. Complete the table below by checking which number the decimal is closest to. The first one is done for you.

Decimal Number	The decimal is closest to which number?		
	0	$\frac{1}{2}$	1
1.16			✓
0.22			
0.05			
0.9			
1.02			
0.78			
0.6			
0.48			
0.033			
0.15			

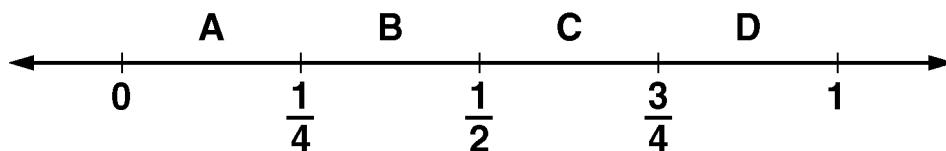
- a. Which decimal number in the table is closest to 0 ?

How do you know?

--

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

3. Four regions on the number line below are labeled.



Complete the table below by finding the region of the number line that has that number. The first one is done for you.

Decimal Number	The decimal is in which region?
0.62	C
0.26	
0.004	
0.1	
0.79	
0.9	
0.49	
0.3	
0.51	
0.706	

a. Which number in the table is closest to 1? _____

How do you know?

--

SITES-M Mathematics Challenge
Grade 4—Focus on System of Tens

4.

3

- a. Use the four numbers in the box above to write an addition problem with decimals so that the answer is as close to 0 as possible.

[illegible]

- b. How do you know that your answer is as close to 0 as possible?**

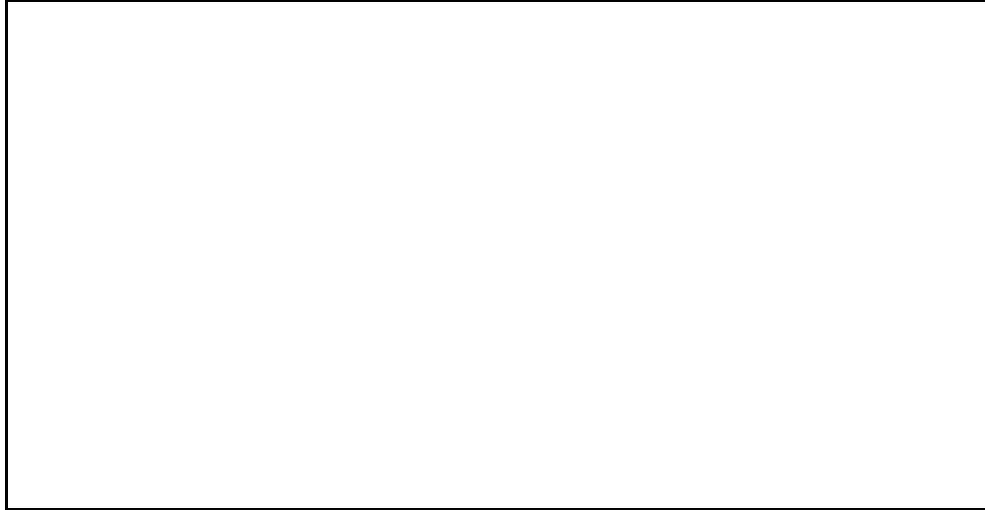
[illegible]

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

5.

4	7	1	6
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- a. Use the four numbers in the box above to write an addition problem with decimals so that the answer is as close to 1 as possible, but less than 1.



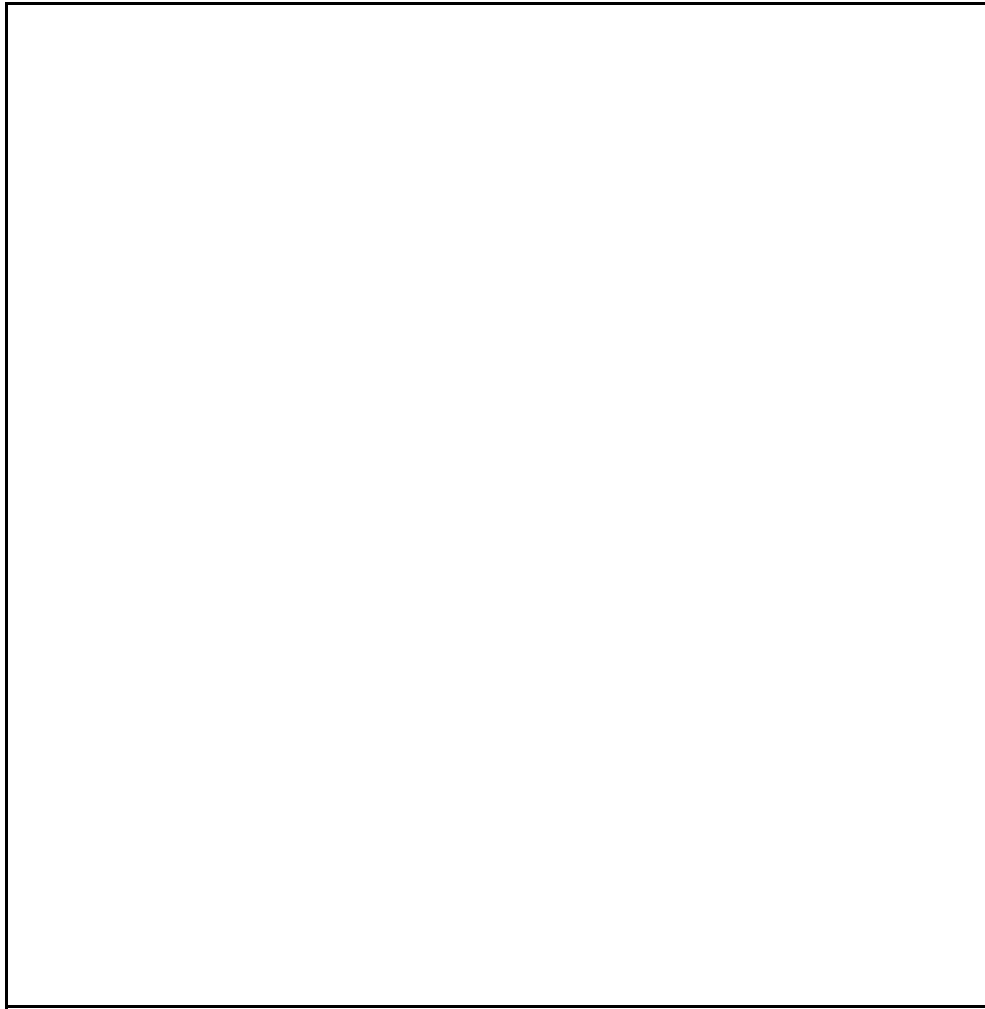
- b. Use the same numbers to write an addition problem with decimals so that the answer is as close to 1 as possible, but more than 1.



SITES-M Mathematics Challenge
Grade 4—Focus on System of Tens

c. Which of your answers is closer to 1 ? _____

How do you know?



SITES-M Mathematics Challenge
Grade 4—Focus on System of Tens

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

Learning and Teaching Considerations

Task 1:

- A)** Be sure that students understand that the positions of digits determine the value of such digits within the number. The base ten place-value system extends infinitely in two directions. Between any adjacent place values, the ratio of the left place to the right place is 10 to 1.
- B)** If a student says or writes, “I just know,” prompt him or her by saying something like “I’m glad you know, but it’s important in math to be able to explain your answers so other people can understand what you’re thinking.”
- C)** If a student says or writes, “I don’t know,” say something positive like “Let’s start with what you do know about this problem.” Students often know more than they think or say, and encouraging them to vocalize or write about that knowledge is all they need.
- D)** The teacher could encourage students to use manipulatives such as base ten blocks to explore decimals, by using the big cube (that is created with 100 units) to represent 1, rather than 1,000. The manipulatives can be used by students as a tool to reason and make sense of our base ten system.
- E)** Be sure that students understand that there are patterns to the way that numbers in our number system are formed. For example, in base ten, each decade has a symbolic pattern reflective of the 0-to-9 sequence. There are ten possible symbols that can be used as a digit in each place.
- F)** Student explanations may refer to the area model, to the placement of the digits, or to fractions.

Task 2:

- A)** Be sure that students understand that decimal numbers are another way of writing fractions.
- B)** Be sure that students have opportunities to think of decimals in terms of familiar fraction equivalents and are able to make this connection in a conceptual manner.
- C)** Students may draw pictures or use manipulatives.
- D)** Students may convert fractions to decimals or decimals to fractions.
- E)** Students may have the misconception that 0.033 has more digits than some of the others and is therefore not closest to zero.

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

Task 3:

- A) Be sure that students are able to apply and discuss the related concepts of fractions, place value, and decimals in activities.
- B) Students may write the numbers on the number line and/or convert fractions to decimals or decimals to fractions.
- C) Students may have the misconception that the letters represent points on the number line rather than regions.
- D) Students may have the misconception that 0.9 has less digits than some of the others and is therefore not the closest to 1.
- E) Students may have the misconception that the number with more digits is the largest.

Task 4:

- A) Students may explain that the smallest numbers need to go into the biggest place values.
- B) Students may use trial and error by combining the 4 digits to achieve different sums.
- C) Students may use the least numbers (2 and 3) in the biggest place value, the tenths, and the greatest numbers (9 and 5) in the smallest place value, the hundredths, to achieve the least sum.

Task 5:

- A) Students may provide an explanation that discusses distance from 1, either by subtraction or by a comparison on the number line.
- B) Students may use trial and error by combining the 4 digits to achieve different sums.
- C) Students may subtract each sum from 1 or subtract 1 from each sum.

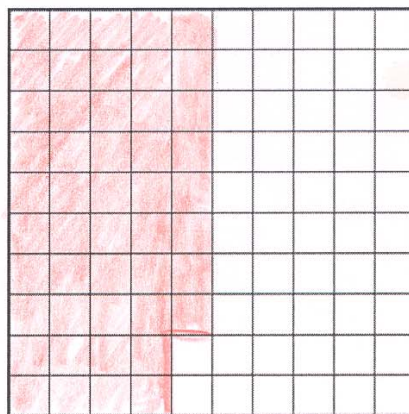
SITES-M Mathematics Challenge
Grade 4—Focus on System of Tens

Name: ANSWER KEY

Date: _____

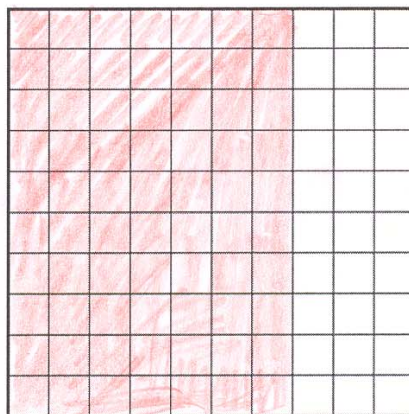
1. Each large square below has been divided into 100 smaller squares of equal size. Each large square represents 1 unit.

- a. Shade in 0.48 of the large square below.



NOTE:
ANY 48
SQUARES
CAN BE
SHADED

- b. Shade in 0.7 of the large square below.



ANY 70
SQUARES,
7 COLUMNS,
7 ROWS,
ETC.

SITES-M Mathematics Challenge
Grade 4—Focus on System of Tens

c. Which number, 0.48 or 0.7, is bigger?

Check one:

☐

0.48

☒

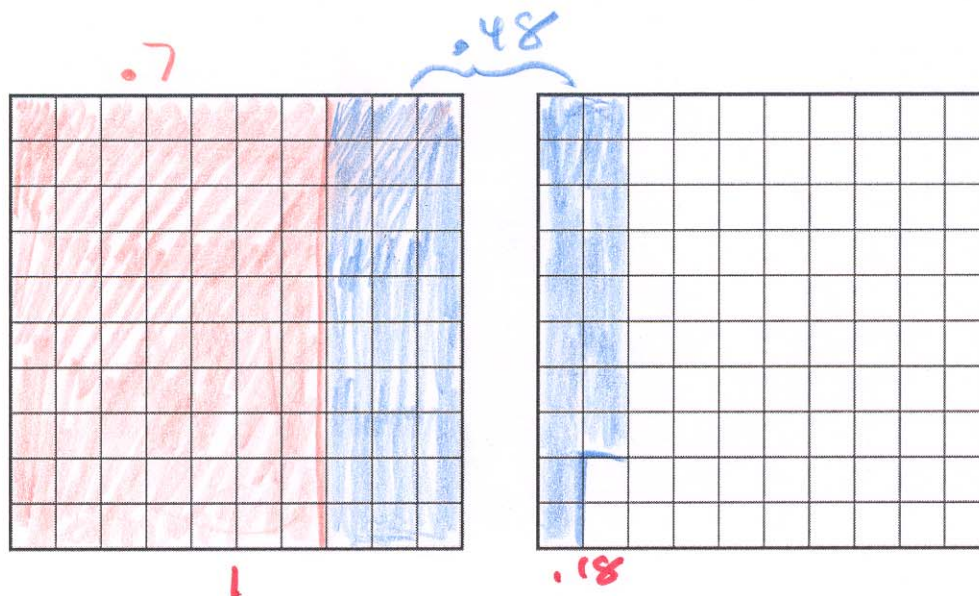
0.7

How do you know?

MORE OF THE SQUARE IN (b)
IS SHADED.
OR $.70 > .48$
OR $\frac{70}{100} > \frac{48}{100}$

d. Shade in the squares below to represent the sum below.

$$0.48 + 0.7$$



What is the sum?

1.18

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

2. Complete the table below by checking which number the decimal is closest to. The first one is done for you.

Decimal Number	The decimal is closest to which number?		
	0	$\frac{1}{2}$	1
1.16			✓
0.22	✓		
0.05	✓		
0.9			✓
1.02			✓
0.78			✓
0.6		✓	
0.48		✓	
0.033	✓		
0.15	✓		

- a. Which decimal number in the table is closest to 0 ?

0.033

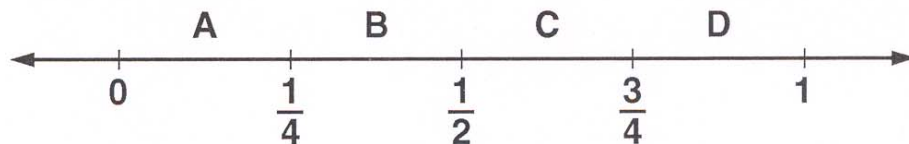
How do you know?

IF YOU LOOK AT ALL THE NUMBERS AS HUNDREDTHS, THIS IS JUST A LITTLE MORE THAN 3. THE NEXT SMALLEST IS 5 HUNDREDTHS OR 0.05. 0.033 IS 3.3 HUNDREDTHS.

NOTE: STUDENT MAY ALSO CONVERT TO THOUSANDTHS.

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

3. Four regions on the number line below are labeled.



Complete the table below by finding the region of the number line that has that number. The first one is done for you.

Decimal Number	The decimal is in which region?
0.62	C
0.26	B
0.004	A
0.1	A
0.79	D
0.9	D
0.49	B
0.3	B
0.51	C
0.706	C

a. Which number in the table is closest to 1? .9

How do you know?

IT HAS THE MOST TENTHS OF ALL THE NUMBERS IN THE TABLE.
 $.9 = \frac{9}{10}$ OR $\frac{90}{100}$ OR $\frac{900}{1000}$

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

4.

9	2	5	3
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- a. Use the four numbers in the box above to write an addition problem with decimals so that the answer is as close to 0 as possible.

$$\begin{array}{r} .259 \\ + .3 \\ \hline .559 \end{array} \quad \text{OR} \quad \begin{array}{r} .359 \\ + .2 \\ \hline .559 \end{array}$$

NOTE: $\begin{array}{r} .25 \\ + .39 \\ \hline .64 \end{array}$ IS NOT AS CLOSE TO 0 AS .559

- b. How do you know that your answer is as close to 0 as possible?

YOU WANT THE SMALLEST DIGITS IN THE BIGGEST PLACE VALUE. SO THE 2 & 3 SHOULD BE IN THE TENTHS PLACE.

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

5.

4	7	1	6
---	---	---	---

- a. Use the four numbers in the box above to write an addition problem with decimals so that the answer is as close to 1 as possible, but less than 1.

$$\begin{array}{r} .74 \\ + .16 \\ \hline .90 \end{array} \quad \text{OR} \quad \begin{array}{r} .76 \\ + .14 \\ \hline .90 \end{array}$$

- b. Use the same numbers to write an addition problem with decimals so that the answer is as close to 1 as possible, but more than 1.

$$\begin{array}{r} .417 \\ + .6 \\ \hline 1.017 \end{array} \quad \text{OR} \quad \begin{array}{r} .617 \\ + .4 \\ \hline 1.017 \end{array}$$

NOTE: $\begin{array}{r} .41 \\ + .67 \\ \hline 1.08 \end{array}$ IS NOT AS CLOSE AS 1.017

SITES-M Mathematics Challenge
Grade 4—Focus on System of Tens

c. Which of your answers is closer to 1 ? 1.017

How do you know?

.9 IS 1 TENTH AWAY
FROM 1

1.017 IS LESS THAN 1
TENTH AWAY FROM 1.
SO 1.017 IS CLOSER.

$$\begin{array}{r} 1.0 \\ - .9 \\ \hline .1 \end{array}$$

$$\begin{array}{r} 1.017 \\ - 1. \\ \hline .017 \end{array}$$

$$.1 > .017$$

NOTE: STUDENTS CAN GIVE A
CORRECT REASON FOR
THEIR ANSWERS EVEN IF
THE ANSWERS ARE WRONG.

SITES-M Mathematics Challenge
Grade 4—Focus on System of Tens

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens
Rubric

CATEGORY	4	3	2	1
Mathematical concepts	Response shows complete understanding of the mathematical concepts used to solve the problem(s).	Response shows substantial understanding of the mathematical concepts used to solve the problem(s).	Response shows some understanding of the mathematical concepts needed to solve the problem(s).	Response shows very limited understanding of the underlying concepts needed to solve the problem(s), OR the response is not written.
	Response shows evidence in ALL of the following tasks. Task 1. Student shades any 48 squares in part (a) and any 70 squares in part (b). In part (c) student is able to identify 0.7 as the larger number and gives a valid reason why. In part (d) student shades all of 1 large square, 18 parts of the other large square, and answers 1.18. Task 2. Student completes table, as shown on answer sheet. Student answers 0.033 in part (a) and gives a valid reason. Task 3. Student completes table, as shown on answer sheet. Student answers 0.9 in part (a) and gives a valid reason. Task 4. Student is able to combine the numbers to add to 0.559. In part (b) student can explain that the smallest numbers need to go into the biggest place values even though he or she did not get the correct answer in part (a). Task 5. Student answers 0.90 in part (a) and 1.017 in part (b). Answer to part (c) is reasonable based on answers to (a) and (b), even if those answers are not correct.	Response shows evidence in only 4 of the tasks described in category 4.	Response shows evidence in only 3 of the tasks described in category 4.	Response shows evidence in 2 or fewer of the tasks described in category 4.

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens
Rubric

CATEGORY	4	3	2	1
Strategy and procedures	Student typically uses an efficient and effective strategy to solve the problem(s).	Student typically uses an effective strategy to solve the problem(s).	Student sometimes uses an effective strategy to solve the problem(s), but not consistently.	Student rarely uses an effective strategy to solve the problem(s).
	Response shows evidence in ALL of the following tasks. Task 1. Student shows a decimal or fraction comparison in part (c) and shows a correct shading in part (d). Task 2. Student shows somewhere on paper a fraction or decimal comparison of each number in table to 0, 0.5, and 1. Task 3. Student shows somewhere on paper a fraction or decimal conversion of numbers in table to numbers on number line. Task 4. Student shows evidence of combining the 4 digits to achieve different sums. Task 5. Student shows evidence of combining the 4 digits to achieve different sums. Student shows evidence of subtracting sum from 1 or subtracting 1 from sum.	Response shows evidence in only 4 of the tasks described in category 4.	Response shows evidence in only 3 of the tasks described in category 4	Response shows evidence in 2 or fewer of the tasks described in category 4.

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens
Rubric

CATEGORY	4	3	2	1
Explanation and communication	Explanation is detailed and clear; uses appropriate terminology and/or notation.	Explanation is clear; uses some appropriate terminology and/or notation.	Explanation is a little difficult to understand, but includes critical components; shows little use of appropriate terminology and/or notation.	Explanation is difficult to understand, is missing several components, and does not use or include appropriate terminology and/or notation.
	Response shows evidence in ALL of the following tasks. Task 1. Student explains in part (c) why 0.7 is greater than 0.48. Explanation can be area, or with decimals, or with fractions. Task 2. Student explains in part (a) why 0.033 is the smallest of all numbers in the table. Task 3. Student explains in part (a) why 0.9 is the greatest of all the numbers in the table. Task 4. Student gives an explanation in part (b) that compares the smallest digits to the biggest place value, that is, the tenths. Task 5. Student gives an explanation in part (c) that discusses distance from 1, either by subtraction or by a comparison on the number line. Explanation must refer to student answers in parts (a) and (b) even if the answers are not correct.	Response shows evidence in only 4 explanations as described in category 4.	Response shows evidence in only 3 explanations as described in category 4.	Response shows evidence in 2 or fewer explanations as described in category 4.

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens
Rubric

CATEGORY	4	3	2	1
Mathematical accuracy	All or almost all of the steps and solutions have no mathematical errors.	Most of the steps and solutions have no mathematical errors.	Some of the steps and solutions have no mathematical errors.	Few of the steps and solutions have no mathematical errors.
	Student provides correct answers for ALL of the following tasks. Task 1. Student shades any 48 small squares in part (a) and any 70 small squares in part (b). Student answers 0.7 in part (c) and 1.18 in part (d). Task 2. Student completes table, as shown on answer sheet. Student answers 0.033. Task 3. Student completes table, as shown on answer sheet. Student answers 0.9. Task 4. Student finds least sum of 0.559. Task 5. Student finds sum of 0.9 in part (a) and sum of 1.017 in part (b).	Student provides correct answers for ALL of the tasks described in category 4, but may have, at most, 2 errors in tables in tasks 2 and 3. Student may also have a sum of 0.64 in task 4 and 1.08 in task 5.	Student provides correct answers for only 4 of the tasks described in category 4. Student has more than 2 errors in the tables in tasks 2 and 3. In task 4 student finds a sum that is not 0.559 or 0.64. In task 5 student finds a sum that is not 1.017 or 1.08.	Student provides correct answers for 3 or fewer of the tasks described in category 4.

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

Scoring notes checklist

Task	Check Yes	Category
Task 1		
Student shades any 48 squares in part (a) and any 70 squares in part (b). In part (c) student is able to identify 0.7 as the larger number and gives a valid reason why. In part (d) student shades all of 1 large square, 18 parts of the other large square, and answers 1.18.		Concept
Student shows a decimal or fraction comparison in part (c) and shows a correct shading in part (d).		Strategy
Student explains in part (c) why 0.7 is greater than 0.48. Explanation can be area, or with decimals, or with fractions.		Explanation
Student shades any 48 small squares in part (a) and any 70 small squares in part (b). Student answers 0.7 in part (c) and 1.18 in part (d).		Accuracy
Task 2		
Student completes table, as shown on answer sheet. Student answers 0.033 in part (a) and gives a valid reason.		Concept
Student shows somewhere on paper a fraction or decimal comparison of each number in table to 0, 0.5, and 1.		Strategy
Student explains in part (a) why 0.033 is the smallest of all numbers in the table.		Explanation
Student completes table, as shown on answer sheet. Student answers 0.033.		Accuracy
Task 3		
Student completes table, as shown on answer sheet. Student answers 0.9 in part (a) and gives a valid reason.		Concept
Student shows somewhere on paper a fraction or decimal conversion of numbers in table to numbers on number line.		Strategy
Student explains in part (a) why 0.9 is the greatest of all the numbers in the table.		Explanation
Student completes table, as shown on answer sheet. Student answers 0.9.		Accuracy
Task 4		
Student is able to combine the numbers to add to 0.559. In part (b) student can explain that the smallest numbers need to go into the biggest place values even though he or she did not get the correct answer in part (a).		Concept
Student shows evidence of combining the 4 digits to achieve different sums.		Strategy
Student gives an explanation in part (b) that compares the smallest digits to the biggest place value, that is, the tenths.		Explanation
Student finds least sum of 0.559.		Accuracy

SITES-M Mathematics Challenge
Grade 4–Focus on System of Tens

Task 5		
Student answers 0.90 in part (a) and 1.017 in part (b). Answer to part (c) is reasonable based on answers to (a) and (b), even if those answers are not correct.		Concept
Student shows evidence of combining the 4 digits to achieve different sums. Student shows evidence of subtracting sum from 1 or subtracting 1 from sum.		Strategy
Student gives an explanation in part (c) that discusses distance from 1, either by subtraction or by a comparison on the number line. Explanation must refer to student answers in parts (a) and (b) even if the answers are not correct.		Explanation
Student finds sum of 0.9 in part (a) and sum of 1.017 in part (b).		Accuracy

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Analyzing Student Responses Protocol

The purpose of the Mathematics Challenges is to provide opportunities for students to develop and demonstrate understanding of important mathematical concepts and standards. They include extended responses, open-ended tasks, and tasks that require higher-order thinking skills. Because these types of tasks may be novel for students and they will have varying levels of understanding, the student responses will vary.

The guiding questions below were designed to assist you in analyzing your class' response to the Challenge and determining appropriate next steps for your teaching and learning. Responses to these questions are for your reflection and documentation and will not be collected.

Guiding Questions for Analyzing Student Responses to the Mathematics Challenges

1. When completing the Challenge, what did your students do well? How do you know?

2. When completing the Challenge, what did your students struggle with? How do you know?

3. When your students completed the Challenge, did they implement multiple correct solutions strategies? What insightful approaches to problem solving did you observe?

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4. What, if any, patterns (e.g., common errors/misconceptions) did you observe across your student responses?
5. What questions or concerns did your students have when working through this Challenge or a particular task? Are these things you should address for the class as a whole?
6. What, if any, feedback did you provide to your class? How did you provide it?
7. What did you learn about your students' mathematical understanding based on their responses to this Challenge?

Reminders:

- 1) After you have completed the Challenge with your class and responded to these Guiding Questions for Analyzing Student Responses, please complete the Challenge Feedback Log. A link to this Log is e-mailed to you each month. Responses will be used to improve the Challenges and to provide recommendations for teachers implementing the Challenges in future years.
- 2) Please provide copies of all student work to the Assessment Coordinator.