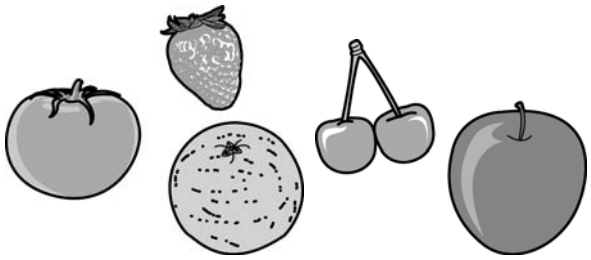
SITES-M Mathematics Challenge

School Garden in Order



Level: Grade Four

Standard: Number and Operations

Learning Target: Focus on Compare & Order

Checks for Understanding

0406.2.9 Compare equivalent forms of whole numbers, fractions, and decimals to each other and to benchmark numbers.

State Performance Indicators

SPI 0406.2.6 Use the symbols =, <, and > to compare common fractions and decimals in both increasing and decreasing order.

SPI 0406.2.7 Convert improper fractions into mixed numbers and/or decimals.

SITES-M Mathematics Challenge Packet
Focus on Comparing and Ordering Grade 4
School Garden in Order

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 Packet
Focus on Comparing and Ordering Grade 4
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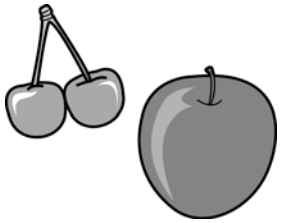
Mathematics Challenge Meeting Protocol

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.

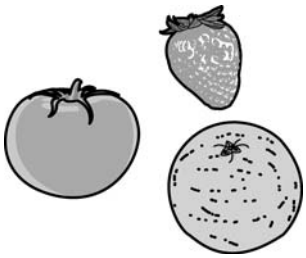
Guiding Questions for Implementing the Mathematics Challenges

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
Focus on Comparing and Ordering Grade 4



School Garden in Order

Standard: Number and Operations

Learning Target: Focus on comparing and ordering

Claims:
Students should understand and be able to explain or demonstrate how to:
- ✓ Use the symbols =, <, and > to compare common fractions and decimals;
- ✓ Compare equivalent forms of whole numbers, fractions, and decimals to each other and to benchmark numbers;
- ✓ Convert improper fractions into mixed numbers and/or decimals;

Task Preparation:
Each student will need a copy of the student response sheet and a pencil.

Stimulus Cards (Drawing or Word Description):
None

Manipulatives/Supplies:
A copy of the student response sheet for each student
Pencils

SITES-M Mathematics Challenge
Focus on Comparing and Ordering Grade 4

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

Instruct students to follow along as you read aloud and say: **Ms. Belen's, Ms. Harper's, and Mr. Liu's classes went to the local farmers' market to sell the fruits and vegetables they grew in the school garden.**

1. Say: **Ms. Belen's class sold $\frac{4}{8}$ pound of strawberries. Mr. Liu's class sold $\frac{5}{10}$ pound of strawberries. Was the number of pounds sold by Ms. Belen's class less than, greater than, or equal to the number sold by Mr. Liu's class? Circle one of the answers. (TEACHER NOTE:** Students should circle the correct choice.**) How do you know? (TEACHER NOTE:** Students should write their answers in the box.**) Write in the correct symbol (<, >, or =) that makes the comparison true. (TEACHER NOTE:** Students should fill in the blank with the correct symbol.**)**

2. **Mr. Liu's class sold $1\frac{1}{4}$ pounds of blueberries. Ms. Harper's class sold $\frac{6}{4}$ pounds of blueberries. Was the number of pounds sold by Mr. Liu's class less than, greater than, or equal to the number sold by Ms. Harper's class? Circle one of the answers. (TEACHER NOTE:** Students should circle the correct choice.**) How do you know? (TEACHER NOTE:** Students should write their answers in the box.**) Write in the correct symbol (<, >, or =) that makes the comparison true. (TEACHER NOTE:** Students should fill in the blank with the correct symbol.**)**

3. **The table below shows how many pounds of vegetables Mr. Liu's and Ms. Harper's classes sold. Write in the correct symbol (<, >, or =) on the line between the fractions to make each comparison true. (TEACHER NOTE:** Students may do scratch work next to each fraction, elsewhere on the page, or on a separate piece of paper. Students should fill in each blank with the correct symbol.**) Ms. Belen's class sold 1.75 pounds of carrots. Was this less than, greater than, or equal to the number of pounds of carrots sold by Mr. Liu's class? Circle one of the answers. (TEACHER NOTE:** Students should circle the correct choice.**) How do you know? (TEACHER NOTE:** Students should write their answers in the box.**)**

4. **Mr. Liu's class earned $\frac{5}{10}$ of their money from selling fruits and 0.25 of their money from selling vegetables. Did the class make more money from selling fruits or selling vegetables? Check the correct box. (TEACHER NOTE:** Students should check the correct box.**) How do you know? (TEACHER NOTE:** Students should write their answers in the box.**)**

5. **Draw a line from each number in Column A to its equivalent fraction in Column B. (TEACHER NOTE:** Each item in each column will be used once in the matching exercise. An overlay transparency key would be helpful in checking this item.**)**

6. **Is the number $\frac{3}{5}$ closer to 0 or closer to 1? Check the correct box. (TEACHER NOTE:** Students should check the correct box.**) How do you know? (TEACHER NOTE:** Students should write their answers in the box.**) Is the number 0.35 closer to 0 or closer to 1? Check the correct box. (TEACHER NOTE:** Students should check the correct box.**) How do you know? (TEACHER NOTE:** Students should write their answers in the box.**)**

SITES-M Mathematics Challenge
Focus on Comparing and Ordering Grade 4

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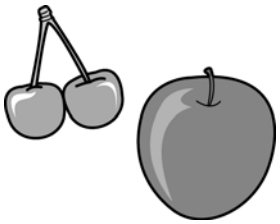
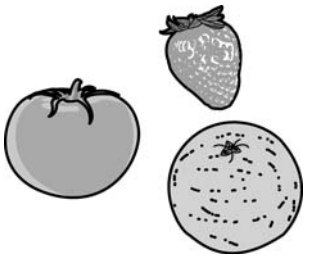


SITES-M Mathematics Challenge
Focus on Comparing and Ordering Grade 4

Student Response Sheet
School Garden in Order



Name: _____ **Date:** _____

Ms. Belen's, Ms. Harper's, and Mr. Liu's classes went to the local farmers' market to sell the fruits and vegetables they grew in the school garden.

1. Ms. Belen's class sold $\frac{4}{8}$ pound of strawberries. Mr. Liu's class sold $\frac{5}{10}$ pound of strawberries. Was the number of pounds sold by Ms. Belen's class less than, greater than, or equal to the number sold by Mr. Liu's class?

Circle one: Less than Greater than Equal to

How do you know?

Write in the correct symbol (<, >, or =) that makes the comparison true.

$$\frac{4}{8} \quad \_\_\_\_\_ \quad \frac{5}{10}$$

2. Mr. Liu's class sold $1\frac{1}{4}$ pounds of blueberries. Ms. Harper's class sold $\frac{6}{4}$ pounds of blueberries. Was the number of pounds sold by Mr. Liu's class less than, greater than, or equal to the number sold by Ms. Harper's class?

Circle one: Less than Greater than Equal to

How do you know?

Write in the correct symbol (<, >, or =) that makes the comparison true.

$$1\frac{1}{4} \quad \_\_\_\_\_ \quad \frac{6}{4}$$

3. The table below shows how many pounds of vegetables Mr. Liu's and Ms. Harper's classes sold. Write in the correct symbol (<, >, or =) on the line between the fractions to make each comparison true.

	Pounds sold by Mr. Liu's class		Pounds sold by Ms. Harper's class
Tomatoes	$2\frac{1}{2}$	_____	$2\frac{1}{4}$
Beans	$\frac{3}{4}$	_____	$\frac{6}{8}$
Peas	$\frac{1}{3}$	_____	$\frac{2}{3}$
Peppers	$\frac{2}{5}$	_____	$\frac{3}{10}$
Carrots	$\frac{7}{4}$	_____	$1\frac{3}{4}$

Ms. Belen's class sold 1.75 pounds of carrots. Was this less than, greater than, or equal to the number of pounds of carrots sold by Mr. Liu's class?

Circle one: Less than Greater than Equal to

How do you know?

4. Mr. Liu's class earned $\frac{5}{10}$ of their money from selling fruits and 0.25 of their money from selling vegetables. Did the class make more money from selling fruits or selling vegetables?

Check one : ☐ **fruits** ☐ **vegetables**

How do you know?

5. Draw a line from each number in Column A to its equivalent fraction in Column B.

Column A	Column B
0.75	$\frac{1}{4}$
1.25	$\frac{2}{4}$
0.50	$\frac{3}{4}$
0.25	$\frac{4}{4}$
1.50	$\frac{5}{4}$
1.00	$\frac{6}{4}$

6. Is the number $\frac{3}{5}$ closer to 0 or closer to 1?

Check one : ☐ **closer to 0** ☐ **closer to 1**

How do you know?

Is the number 0.35 closer to 0 or closer to 1?

Check one : ☐ **closer to 0** ☐ **closer to 1**

How do you know?

SITES-M Mathematics Challenge
Focus on Comparing and Ordering Grade 4

School Garden in Order Grade 4

Mathematics Challenge
Learning and Teaching Considerations

Task 1:

A) Be sure that students understand that the bottom number (denominator) of a fraction tells how many equal portions a whole or group has been divided into, and the top number (numerator) tells how many portions are being considered.

B) Some students may have the misconception that each fractional part of a whole or a group does not have to be equal in size or in number, e.g., 1/8 of a pound of strawberries could weigh more than another eighth, as long as the strawberries have been divided into eight parts.

C) Be sure that students understand that fractions are equal, or equivalent, as long as they represent the same portion of a whole or group. Working with fraction manipulatives may help.

D) Some students may have the misconception that adding/subtracting the same number to/from the numerator and denominator results in an equivalent fraction, e.g., 4/8 + 2/2 = 6/10 or 5/10 – 2/2 = 3/8. Working with fraction manipulatives may help.

E) Students may answer in words, symbols (digits, dots, dashes, base-10 block representations, etc.), or by using manipulatives (blocks, cubes). They may also use number lines or recall number sense and fraction facts. Be sure they understand that they can get the correct answer using any of these strategies, though some are more efficient.

F) Be sure that students understand the difference between the greater than (>) symbol and the less than (<) symbol. Some students may confuse them, so it is important to determine if the explanation of their choices of words and a symbol provides evidence that they understand the mathematical concept. Working with manipulatives or providing a mnemonic ["the symbol opens wide to the number of greater (bigger) value" or "the 'alligator mouth' eats the larger number"] may help.

G) 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." (This applies to the other tasks, as well.)

H) 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 getting them to vocalize or write about that knowledge is all they need. (This applies to the other tasks, as well.)

Task 2:

A) Be sure that students understand that the whole number portion of a mixed number represents any fraction you want it to, as long as it can be reduced to the whole number, e.g., 1 = 4/4 or 8/8.

B) Some students may have the misconception that improper fractions are impossible, e.g., 6/4. Working with fraction manipulatives may help.

C) Some students may convert the mixed number to an improper fraction in order to compare values, while others may do the opposite. Be sure they understand that they can get the correct answer using either of these strategies.

D) Some students may have the misconception that you convert a mixed number to an improper fraction by appending the whole number to the numerator in the fraction, e.g., 1¼ = 11/4.

E) Students may answer in words, symbols, or by using manipulatives. They may also use number lines or recall number sense and addition facts.

F) Be sure that students understand the difference between the greater than (>) symbol and the less than (<) symbol. Some students may confuse them, so it is important to determine if the explanation of their choices of words and a symbol provides evidence that they understand the mathematical concept.

Task 3:

A) Be sure that students understand that the whole number portion of a mixed number represents any fraction you want it to, as long as it can be reduced to the whole number, e.g., 2 = 4/2 or 8/4.

C) Some students may have the misconception that you convert a mixed number to an improper fraction by appending the whole number to the numerator in the fraction, e.g., 2½ = 21/2.

D) Some students may convert the decimal number to an improper fraction in order to compare values, while others may do the opposite. Be sure they understand that they can get the correct answer using either of these strategies.

E) Students may answer in words, symbols, or by using manipulatives. They may also use number lines or recall number sense and fraction/decimal facts.

F) Be sure that students understand the difference between the greater than (>) symbol and the less than (<) symbol. Some students may confuse them, so it is important to determine if the explanation of their choice of words provides evidence that they understand the mathematical concept.

Task 4:

A) Be sure that students understand that the word "more" signifies "comparing amounts to find out which is greater." For this task, students have to compare a decimal amount of money to a fractional amount to determine which is greater.

B) Some students may convert the fraction to a decimal in order to compare values, while others may do the opposite. Be sure they understand that they can get the correct answer using either of these strategies.

C) Some students may have the misconception that you only need to compare numerators of two fractions to determine which has a greater value, e.g., 25/100 > 5/10 because 25 > 5.

D) Students may answer in words, symbols, or by using manipulatives. They may also use number lines or recall number sense and fraction/decimal facts.

Task 5:

A) Be sure that students understand that the words "equivalent fractions" signify "two fractions of equal value or a fraction that is equal in value to a decimal number, mixed number, etc."

B) Students may compare the numbers in Column A with the fractions in Column B either by converting the decimals to fractions or by converting the fractions to decimals. Be sure they understand that they can determine the equivalent amounts by using either strategy.

C) Some students may have the misconception that you only need to compare numerators of two fractions to determine which has a greater value, e.g., 75/100 > 3/4 because 75 > 3.

D) Be sure that students understand that the whole number portion of a decimal number represents any fraction you want it to, as long as it can be reduced to the whole number, e.g., 1 = 4/4 or 8/8.

Task 6:

A) Be sure that students understand that the word "closer" signifies "being nearer in value or location to one number than the other." For this task, students should compare the difference in value or location on a number line between a fraction (decimal) and the numbers 0 and 1.

B) Be sure that students understand that a whole number represents any fraction you want it to, as long as it can be reduced to the whole number, e.g., 1 = 5/5 or 100/100.

C) Be sure that students understand that a whole number is really a decimal number, e.g., 1 = 1.0 or 1.00.

D) Students may answer in words, symbols, or by using manipulatives. They may also use number lines or recall number sense and fraction/decimal facts. Be sure they understand that they can get the correct answer using any of these strategies, though some are more efficient.

Name: ANSWER KEY Date: _____

Ms. Belen's, Ms. Harper's, and Mr. Liu's classes went to the local farmers' market to sell the fruits and vegetables they grew in the school garden.

1. Ms. Belen's class sold $\frac{4}{8}$ pound of strawberries. Mr. Liu's class sold $\frac{5}{10}$ pound of strawberries. Was the number of pounds sold by Ms. Belen's class less than, greater than, or equal to the number sold by Mr. Liu's class?

Circle one: Less than Greater than **Equal to**

How do you know?

$\frac{4}{8}$ IS $\frac{1}{2}$ AND $\frac{5}{10}$ IS $\frac{1}{2}$
BOTH CLASSES SOLD $\frac{1}{2}$ POUND OF STRAWBERRIES, SO THEY ARE EQUAL

(ANSWERS MAY VARY)

Write in the correct symbol (<, >, or =) that makes the comparison true.

$$\frac{4}{8} = \frac{5}{10}$$

2. Mr. Liu's class sold $1\frac{1}{4}$ pounds of blueberries. Ms. Harper's class sold $\frac{6}{4}$ pounds of blueberries. Was the number of pounds sold by Mr. Liu's class less than, greater than, or equal to the number sold by Ms. Harper's class?

Circle one: (Less than) Greater than Equal to

How do you know?

$\frac{6}{4} = 1\frac{2}{4} = 1\frac{1}{2}$

$1\frac{1}{4} < 1\frac{1}{2}$

SO MR LIU'S CLASS SOLD LESS THAN MS HARPER'S CLASS

(ANSWERS MAY VARY)

Write in the correct symbol (<, >, or =) that makes the comparison true.

$1\frac{1}{4}$ ___<___ $\frac{6}{4}$

3. The table below shows how many pounds of vegetables Mr. Liu's and Ms. Harper's classes sold. Write in the correct symbol (<, >, or =) on the line between the fractions to make each comparison true.

	Pounds sold by Mr. Liu's class		Pounds sold by Ms. Harper's class
Tomatoes	$2\frac{1}{2}$	>	$2\frac{1}{4}$
Beans	$\frac{3}{4}$	=	$\frac{6}{8}$
Peas	$\frac{1}{3}$	<	$\frac{2}{3}$
Peppers	$\frac{2}{5}$	>	$\frac{3}{10}$
Carrots	$\frac{7}{4}$	=	$1\frac{3}{4}$

Ms. Belen's class sold 1.75 pounds of carrots. Was this less than, greater than, or equal to the number of pounds of carrots sold by Mr. Liu's class?

Circle one: Less than Greater than (Equal to)

How do you know?

$1.75 = 1\frac{3}{4} = \frac{7}{4}$

SO 1.75 IS THE SAME AS MR. LIU'S CLASS. (ANSWERS MAY VARY)

4. Mr. Liu's class earned $\frac{5}{10}$ of their money from selling fruits and 0.25 of their money from selling vegetables. Did the class make more money from selling fruits or selling vegetables?

Check one : ☒ fruits ☐ vegetables

How do you know?

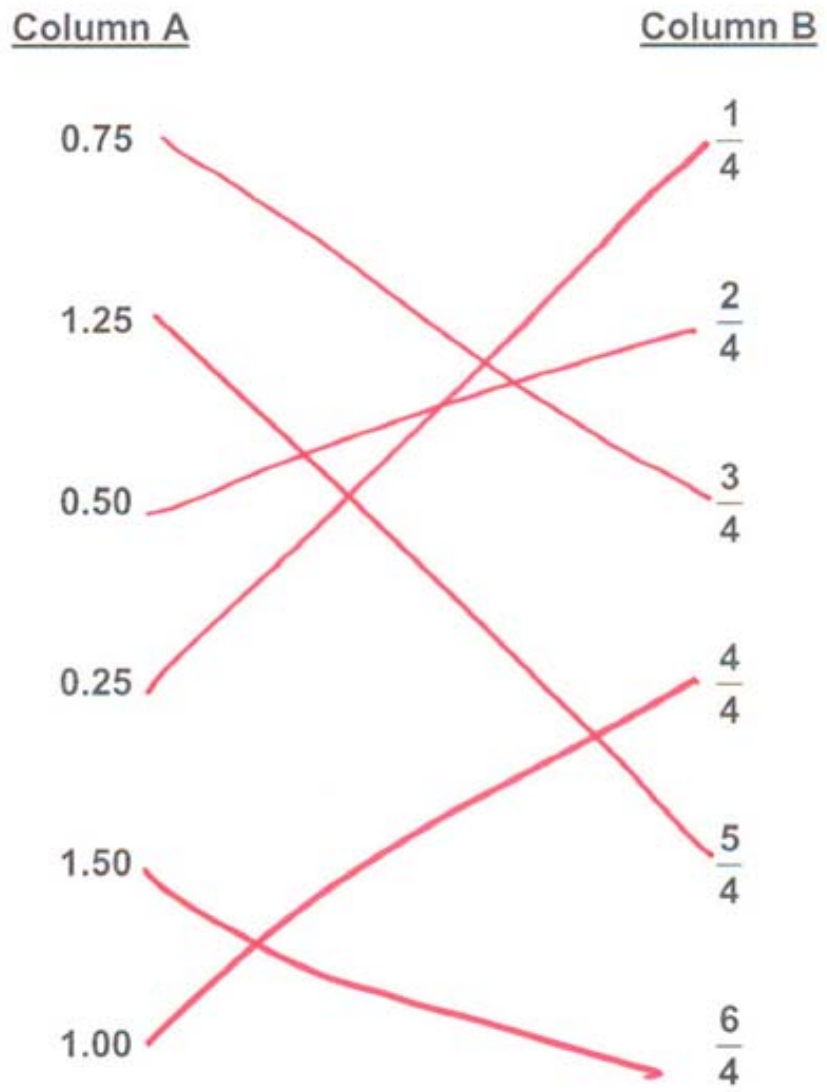
$\frac{5}{10} = \frac{1}{2} = .50$

AND $.50 > .25$

SO MORE MONEY CAME FROM FRUITS

(ANSWERS MAY VARY.)

5. Draw a line from each number in Column A to its equivalent fraction in Column B.



6. Is the number $\frac{3}{5}$ closer to 0 or closer to 1?

Check one : ☐ closer to 0 ☒ closer to 1

How do you know?

NOTE: THERE ARE MANY REASONS THAT ARE CORRECT

$\frac{3}{5} = \frac{6}{10}$ AND $\frac{6}{10} > \frac{1}{2}$

OR

OR HALF OF 5 IS $2\frac{1}{2}$ AND 3 IS MORE THAN $2\frac{1}{2}$

Is the number 0.35 closer to 0 or closer to 1?

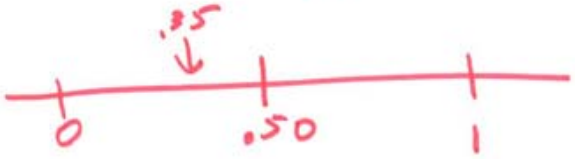
Check one : ☒ closer to 0 ☐ closer to 1

AND

How do you know?

$.35 = \frac{35}{100}$ AND $\frac{35}{100} < \frac{1}{2}$

OR



OR $.35 < .50$

SITES-M Mathematics Challenge Rubric
Focus on Comparing and Ordering Grade 4

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 parts of tasks. **Task 1**. Student circles "Equal to" and writes in = sign. **Task 2**. Student circles "Less than" and writes in < sign. **Task 3**. Student writes in = sign and explains that 1.75 is the same as $\frac{7}{4}$. **Task 4**. Student checks fruits and explains that $\frac{5}{10}$ is greater than 0.25. **Task 5**. All matches are correct. **Task 6**. Student indicates that $\frac{3}{5}$ is closer to 1 and uses a valid argument. **Task 6**. Student indicates that 0.35 is closer to 0 and uses a valid argument.	Response shows evidence in only 5 or 6 of the tasks described in category 4.	Response shows evidence in only 3 or 4 of the tasks described in category 4.	Response shows evidence in only 2 or fewer of the tasks described in category 4.

SITES-M Mathematics Challenge Rubric
Focus on Comparing and Ordering Grade 4

CATEGORY	4	3	2	1
Strategy/ 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 problem(s), but not consistently.**	**Student rarely uses an effective strategy to solve problem(s).**
	Response shows evidence in ALL of the following tasks. **Task 1**. Student provides evidence of converting both $\frac{4}{8}$ and $\frac{5}{10}$ to $\frac{1}{2}$. **Task 2**. Student provides evidence of converting improper fraction to mixed number or mixed number to improper fraction. **Task 3**. Student provides evidence of converting fraction to decimal or decimal to fraction. **Task 4**. Student provides evidence of converting $\frac{5}{10}$ to a decimal or 0.25 to a fraction. **Task 6**. Student provides evidence of comparing $\frac{3}{5}$ to $\frac{1}{2}$, OR evidence of finding distance from $\frac{3}{5}$ to 0 and from $\frac{3}{5}$ to 1. **Task 6**. Student provides evidence of comparing 0.35 to $\frac{1}{2}$, OR evidence of finding distance from 0.35 to 0 and 0.35 to 1.	Response shows evidence in only 4 or 5 of the tasks described in category 4.	Response shows evidence in only 2 or 3 of the tasks described in category 4.	Response shows evidence in only 1 of the tasks described in category 4 or the response shows no evidence of strategy..

SITES-M Mathematics Challenge Rubric
Focus on Comparing and Ordering Grade 4

CATEGORY	4	3	2	1
Explanation/ 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; little use of appropriate terminology and/or notation.**	**Explanation is difficult to understand, is missing several components, does not use or include appropriate terminology and/or notation.**
	Response shows evidence in ALL of the following tasks. **Task 1**. Student explains that because both fractions equal one-half, they must equal each other. **Task 2**. Student explains that $\frac{6}{4}$ is the same as $1\frac{1}{2}$ (or $1\frac{2}{4}$) and this number is greater than $1\frac{1}{4}$; or provides an equivalent explanation using improper fractions. **Task 3**. Student explains that 1.75 is the same as $1\frac{3}{4}$ or $\frac{7}{4}$ and that this is equal to the pounds of carrots in Mr. Liu's class. **Task 4**. Student explains that $\frac{5}{10} = \frac{1}{2}$ and that $0.25 = \frac{1}{4}$, and concludes that one-half of something is more than one-quarter of something. **Task 6**. Student explains that the distance from 0 to $\frac{3}{5}$ is greater than the distance from $\frac{3}{5}$ to 1, OR explains that $\frac{3}{5}$ is greater than $\frac{1}{2}$, and concludes that $\frac{3}{5}$ is closer to 1. **Task 6**. Student explains that the distance from 0 to 0.35 is less than the distance from 0.35 to 1 OR that 0.35 is less than 0.5, and concludes that 0.35 is closer to 0.	Response shows evidence in Tasks 1, 2, 3, and 4 as described in category 4 and only partial explanations in Task 6.	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 Rubric
Focus on Comparing and Ordering Grade 4

CATEGORY	4	3	2	1
Mathematical Accuracy	**Response shows all or almost all of the steps and solutions have no mathematical errors.**	**Response shows most of the steps and solutions have no mathematical errors.**	**Response shows some of the steps and solutions have no mathematical errors.**	**Response shows few of the steps and solutions have no mathematical errors.**
	Student provides correct answers for ALL of the following tasks. **Task 2**. $\frac{6}{4} = 1\frac{1}{2}$ OR $1\frac{1}{4} = \frac{5}{4}$ **Task 3**. $1.75 = \frac{7}{4}$ **Task 4**. $0.25 = \frac{1}{4}$ OR $\frac{5}{10} = 0.5$ **Task 6**. $\frac{3}{5} = \frac{6}{10}$ OR $\frac{3}{5}$ is placed correctly on a number line. (There may be other correct procedures.) **Task 6**. $0.35 = \frac{35}{100}$ OR 0.35 is placed correctly on a number line. (There may be other correct procedures.)	Student provides correct answers for only 4 of the tasks described in category 4.	Student provides correct answers for only 2 or 3 of the tasks described in category 4.	Student provides a correct answer for only 1 task or none of the tasks described in category 4.

SITES-M Mathematics Challenge
Focus on Comparing and Ordering Grade 4

Compare Order Grade 4 **Scoring Notes Checklist**

Task	Check Yes	Category
Task 1		
Circles "equal to" and writes in the = sign.		Concept
Provides evidence of converting 4/8 to 1/2 and converting 5/10 to 1/2.		Strategy
Explains that both fractions equal 1/2 and that if both classes sold 1/2 pound, the number is the same.		Explanation
Task 2		
Circles "less than" and writes in < sign.		Concept
Provides evidence of converting 6/4 to mixed number OR converting 1 1/4 to an improper fraction.		Strategy
Explains that 6/4 is the same as 1 1/2 (or 1 2/4) and that this number is greater than 1 1/4.		Explanation
Converts the improper fraction to a mixed number (or the mixed number to an improper fraction) .		Accuracy
Task 3		
Uses = sign AND indicates that 1.75 is the same as 7/4.		Concept
Provides evidence of converting 1.75 to fraction form OR converting 7/4 to decimal form.		Strategy
Explains that the decimal 1.75 is the same as 1 3/4 or 7/4 and that this is the number of pounds of carrots sold by Mr. Liu's class.		Explanation
Fills in >, =, <, >, = as shown on answer sheet.		Accuracy
Task 4		
Checks fruits AND indicates that 5/10 is greater than 0.25.		Concept
Provides evidence of converting 5/10 to a decimal OR 0.25 to a fraction.		Strategy
Explains that 5/10 equals 1/2 and that 0.25 equals 1/4, and 1/2 of something is greater than 1/4 of something.		Explanation
Converts decimal to fraction or fraction to decimal.		Accuracy
Task 5		
All matches are correct (0.75 = 3/4, 1.25 = 5/4, 0.50 = 2/4, 0.25 = 1/4, 1.50 = 6/4, 1.00 = 4/4).		Concept

Task	Check Yes	Category
Task 6		
Checks "closer to 1" for first question and gives a valid explanation.		Concept
Checks "closer to 0" for second question and gives a valid explanation.		Concept
Provides evidence of comparing 3/5 to 1/2, or provides evidence of comparing distances to 0 and 1.		Strategy
Provides evidence of comparing 0.35 to 0.5, or provides evidence of comparing distance to 0 and 1.		Strategy
Explains that 3/5 is greater than 1/2, so it must be closer to 1 OR explains that the distance from 0 to 3/5 is greater than the distance from 3/5 to 1.		Explanation
Explains that 0.35 is less than 1/2, so it must be closer to 0 OR explains that the distance from 0 to 0.35 is less than the distance from 0.35 to 1.		Explanation
Converts 3/5 to 6/10 and compares it to 1/2 OR converts 3/5 to 0.6 and compares it to 0.5.		Accuracy
Compares 0.35 to 0.50, or converts 0.35 to 35/100 and compares it to 50/100.		Accuracy

SITES-M Mathematics Challenge
Focus on Comparing and Ordering Grade 4

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?

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.