

MeTEOR Performance Task

Fourth Grade

Mathematics
Challenge Accepted



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MeTEOR
CONNECTING THE DOTS

Performance Task Item: Challenge Accepted

Grade Level: Fourth Grade

Focus Area: Number and Operations – Fractions

Essential Question: How can you use fractions in real life?

Core Ideas:

- Understands how to use strategies to solve multi-step problems.
- Understands the relationship between fractions and whole numbers.

Learning Targets:

- Students will solve word problems involving multiplication of a fraction by a whole number.
- Students will compare numbers.
- Students will solve multistep word problems posed with whole numbers and having whole number answers using the four operations.
- Students will create a graph with data provided.

STANDARDS

Domain: Numbers and Operations - Fractions

Content Standards:

- Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.
- Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
- Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express $3 \times \frac{2}{5}$ as $6 \times \frac{1}{5}$, recognizing this product as $\frac{6}{5}$. (In general, $n \times \frac{a}{b} = \frac{n \times a}{b}$.)*
- Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.
- Solve multistep word problems posed with whole numbers and having whole number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Supporting Standards:

Speaking and listening:

- Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.

- Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
- Follow agreed-upon rules for discussions and carry out assigned roles.

Math Practice Standards:

MP 1: Make sense of problems and persevere in solving them.

MP 2: Reason abstractly and quantitatively.

MP 4: Model with mathematics.

MP 5: Use appropriate tools strategically.

MP 8: Look for and express regularity in repeated reasoning.

Materials:

- Performance Task
- Pencil
- Paper

Scenario: Your Physical Education teacher challenged 3rd, 4th and 5th grade students to a Fitness Frenzy! He wants to see which class can walk the greatest distance in one month. Is the 4th grade class up for the challenge?

Task/Question 1:

DOK Levels 1 to 2: Recall & Reproduction; Basic Application of Skills and Concepts

Math Practice Standards:

- MP 1: Make sense of problems and persevere in solving them.
- MP 2: Reason abstractly and quantitatively.
- MP 4: Model with mathematics.
- MP 5: Use appropriate tools strategically.
- MP 8: Look for and express regularity in repeated reasoning.

- A.** Each lap around the school building (on the sidewalk) is $\frac{3}{4}$ mile. You walked 5 laps around the school. How many miles did you walk?
- B.** 9 other students in your class also walked 5 laps around the school. How many miles total did the 9 students walk all together?
- C.** 7 of your classmates walked $11\frac{1}{4}$ miles each, how many miles did they walk?
- D.** Jeff walked one lap every day for 15 days, how miles did Jeff walk?
- E.** What is the grand total of miles walked for your 4th grade class (Use data from Parts A – D)?
- F.** With your math partner discuss your mathematical thinking. What patterns did you see? What strategies did you use to solve the problems?

Task/Question 2:

DOK Levels 1 to 2: Recall & Reproduction; Basic Application of Skills and Concepts

Math Practice Standards:

- MP 1: Make sense of problems and persevere in solving them.
- MP 2: Reason abstractly and quantitatively.
- MP 5: Use appropriate tools strategically.

A. The third grade class really wants to win the challenge so they walked one lap everyday as a class during their afternoon recess for 13 days. If there are 17 students in the class how many miles did they walk all together?

B. Did the third grade class walk more or less miles than 4th grade (Based on Data from Task 1)? Record the results of comparisons with symbols $<$, $>$, $=$

Task/Question 3:

DOK Level 2: Basic Application of Skills and Concepts

Math Practice Standards:

- MP 1: Make sense of problems and persevere in solving them.

The fifth graders were determined to win. They even made a poster for the hallway graphing the number of miles they walked. It included the following information:

- Week one the class walked 32 miles
- Week two the class walked $29 \frac{1}{2}$ miles
- Week three the class did not report any data for miles walked
- Week four the class walked $44 \frac{3}{4}$ miles

- A.** Based on the information above, create a poster, similar to the one you think the 5th graders posted in the hallway, that graphs the miles walked:

Task/Question 4:

DOK Levels 1 to 2: Recall & Reproduction; Basic Application of Skills and Concepts

Math Practice Standards:

- MP 4: Model with mathematics.
- MP 5: Use appropriate tools strategically.

Your PE teacher has asked for help calculating the totals to find out what grade is the most fit!

A. Create a graph showing the total number of miles walked for 3rd grade, 4th grade, and 5th grade:

B. Which grade walked the greatest number of miles?

C. Which grade walked the least number of miles?

Task/Question 5: Science Connection

DOK Level 3: Strategic Thinking and Reasoning

Math Practice Standards:

- MP 1: Make sense of problems and persevere in solving them.
- MP 2: Reason abstractly and quantitatively.

Typically, a person must take 26,471 steps to burn 1,000 calories. On average, a total of 2,250 steps is equivalent to 1 mile.

- A.** Form a hypothesis regarding walking and burning calories:
- B.** Based on the information from previous tasks, how **many steps** did your grade level take?
- C.** Using the information from Part B, how many calories did your grade burn?
- D.** Research a physical fitness activity that can help you burn more calories (e.g., tennis, track, basketball, football, golf, etc.). Then, write an essay explaining how you can be more physically fit and burn more calories.

Complete Performance Task Scoring Rubric *Challenge Accepted*

45-56 Proficient 32-44 Good 20-32 Satisfactory 11-20 Poor 0-10 Unsatisfactory

	Depth of Knowledge Level	Points	Total Possible Points for Task	Total Points Earned by Student
Task 1: A. 3 $\frac{3}{4}$ miles B. 33 $\frac{3}{4}$ miles C. 78 $\frac{3}{4}$ miles D. 11 $\frac{1}{4}$ miles E. 127 $\frac{1}{2}$ miles F. Student participation in discussion with math partner.	1 1 1 1 1 2	2 2 2 2 2 2	12	
Task 2: A. 165 $\frac{3}{4}$ mile B. More, $127 \frac{1}{2} < 165 \frac{3}{4}$	1 2	2 4	6	
Task 3: A. Graphs will vary. (5 points for correct information)	2	5	5	
Task 4: A. Creation of a graph showing 127 for 4 th grade, 165 $\frac{3}{4}$ for 3 rd grade and 106 $\frac{1}{4}$ for 5 th B. 3 rd grade walked the greatest distance C. 5 th grade walked the least distance	2 1 1	5 2 2	9	

Task 5: Student responses will vary for task 5:			24	
A. Form a hypothesis regarding walking and burning calories	2	5		
B. Answers will vary – based on data.	1	2		
C. Answers will vary – based on data.	1	2		
D. Completion of research citing two sources and written essay explaining how he/she can be more physically fit and burn more calories.	2/3	15		

TOTAL POINTS:



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