

Ensuring Instructional Task Quality in Mathematics

Leadership II - Grades K-12 - Day 3

K–5 Tasks

2.OA.1

Solve and show your strategy.

- 39 books were on the top bookshelf. Marcy added 48 more books to the top shelf. How many books are on the top shelf now?

<https://www.engageny.org/file/93041/download/math-g2-m4-topic-a-lesson-5.docx?token=6vGvsvHQ>

2.MD.10

- A woman ran a lot. She drank water while she ran. She wrote down how much she drank over the last 3 hours.

1st Hour: 8 ounces

2nd Hour: 16 ounces

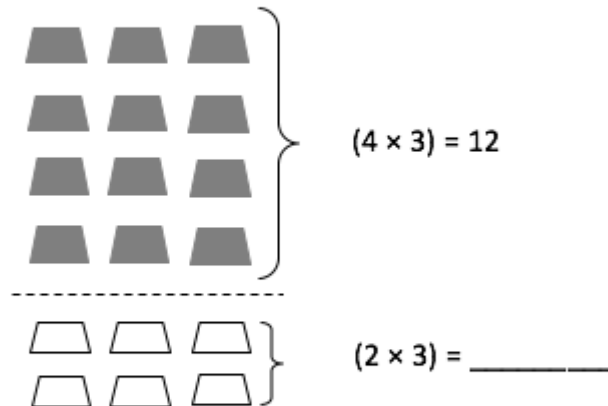
3rd Hour: 24 ounces

Create a pictogram to show the data.

Created by Doug Sovde for purposes of this session.

3.OA.5

- $6 \times 3 =$ _____



$$12 + \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$$

$$6 \times 3 = \underline{\hspace{1cm}}$$

<https://www.engageny.org/file/40821/download/math-g3-m1-topic-c-lesson-10.docx?token=0MnV4rpi>

4.OA.3

Karl's rectangular vegetable garden is 20 feet by 45 feet, and Makenna's is 25 feet by 40 feet. Whose garden is larger in area? Show your reasoning.

Adapted from: Illustrative Mathematics: <https://www.illustrativemathematics.org/content-standards/4/OA/A/3/tasks/876>

5.NBT.7

Task

- a. Jessa has 23 one-dollar bills that she wants to divide equally between her 5 children.
 - i. How much money will each receive? How much money will Jessa have left over?
 - ii. Jessa exchanged the remaining one-dollar bills for dimes. If she divides the money equally between her 5 children, how much money will each child get?
- b. A website has games available to purchase for \$5 each. If Lita has \$23, how many games can she purchase? Explain.
- c. A jug holds 5 gallons of water. How many jugs can Mark fill with 23 gallons of water? Explain.
- d. A class of 23 children will take a field trip. Each car can take 5 children. How many cars are needed to take all the children on the field trip? Explain.
- e. Write a division problem for $31 \div 4$ where the answer is a mixed number. Show how to solve your problem.

From Illustrative Mathematics: <https://www.illustrativemathematics.org/content-standards/5/NBT/B/7/tasks/292>

6–8 Tasks

6.RP.2

- c. A publishing company is looking for new employees to type novels that will soon be published. The publishing company wants to find someone who can type at least 45 words per minute. Dominique discovered she can type at a constant rate of 704 words in 16 minutes. Does Dominique type at a fast enough rate to qualify for the job? Explain why or why not.

From Engage NY: https://www.engageny.org/file/39886/download/math-g6-m1-topic-c-lesson-16-student.pdf?token=ZOR_z4Zs

7.RP.3

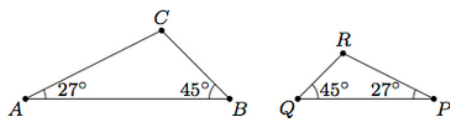
2. DeMarkus says that a store overcharged him on the price of the video game he bought. He thought that the price was marked $\frac{1}{4}$ of the original price, but it was really $\frac{1}{4}$ off the original price. He misread the advertisement. If the original price of the game was \$48, what is the difference between the price that DeMarkus thought he should pay and the price that the store charged him?

From EngageNY: <https://www.engageny.org/file/58916/download/math-g7-m1-topic-c-lesson-14-student.pdf?token=W29RYYvz>

8.G.5

Task

Triangles ABC and PQR below share two pairs of congruent angles as marked:



- a. Explain, using dilations, translations, reflections, and/or rotations, why $\triangle PQR$ is similar to $\triangle ABC$.
- b. Are angles C and R congruent?
- c. Can you show the similarity in part **a** *without* using a reflection? What about *without* using a dilation? Explain.
- d. Suppose DEF and KLM are two triangles with $m(\angle D) = m(\angle K)$ and $m(\angle E) = m(\angle L)$. Are triangles DEF and KLM similar?

From Illustrative Mathematics: <https://www.illustrativemathematics.org/content-standards/8/G/A/5/tasks/2042>

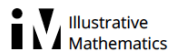
9–12 Tasks

N-Q.A.1

You are considering driving an ice cream van during the summer vacation. Your friend, who “knows everything” tells you that “It’s easy money.” You make a few inquiries and find that the van costs \$600 per week to rent. Each ice cream cone costs 50 cents to make and sells for \$1.50.

For each of the questions below, show all work and include an explanation of your method of solution.

- a. How many ice cream cones would you have to sell each week just to cover the cost of renting the van?
- b. In order to sell the ice cream cones, you have a choice of driving the van through neighborhoods or parking the van in a public area. Typical selling data is that one can sell an average of 35 ice cream cones per hour at each of your planned stops if driving through neighborhoods, while you can sell an average of 30 ice cream cones per hour if one parks the van in a public area.
 - i. If you choose to drive the van, you will have to consider the time spent driving the van, which will depend on the average speed from stop to stop on your route, as well as the cost of gasoline, which will depend on the number of miles per gallon the van gets. Make reasonable estimates for these and any other costs you feel would be relevant. If you drive an average of 180 miles per week, how many ice cream cones would you have to sell just to cover the cost of driving the van for a week (not including rental costs)?
 - ii. If you choose to park the van, you will have to pay a one-time seasonal permit fee and weekly space rental. If the seasonal permit costs \$90.00 and space rental ranges from \$140 to \$150 per week, how many ice cream cones would you have



to sell just to cover the cost of parking the van for a week (again, not including rental costs)? Identify any assumptions you make.

- c. How many hours a week will you have to work in order to make this “easy money”? After how many hours would the amounts you earned under each of the two options be the same? How much money might you be able to make if you were willing to work really hard? Identify and take into account any additional expenses for the additional hours. Explain your reasoning clearly.

From Illustrative Mathematics: <https://www.illustrativemathematics.org/content-standards/HSN/Q/A/1/tasks/85>

A-SSE.2

3. Simplify the expression: $4(x+3) + 5 =$

From Doug Sovde, for purposes of this session only.

Key:

Grade 2: Good task; meets all criteria.

Grade 2: Good task, but does not require explanation of reasoning; add the expectation.

Grade 3: Good task; meets all criteria.

Grade 4: Good task, but too much processing; could split it up some and delete unnecessary information to fix.

Grade 5: Not aligned, as load-bearing wall of task is to use the information. Find a new one or add questions that require use of information.

Grade 6: Good task; meets all criteria.

Grade 7: Does not require communication/reasoning.

Grade 8: Good task; meets all criteria.

Algebra 1: Too much processing. Cut it up or delete unnecessary information.

Algebra 2: Not aligned: “simplify” is nowhere in the standards...on purpose. Idea is to notice ways to rewrite for a purpose – so we can factor more easily (to find roots) or we can isolate a variable of interest. This is just dumb. Find a different one.