

GRADE FIVE - CONTENT STANDARD #4, 8, 9 ASSESSMENT A

MILLIE'S BUSINESS

Short Task

Task Description

In this task students are asked to figure out which of two kinds of supplies would be used up first, given the amount of each supply on hand and the amount of each supply used each day. Students are asked to explain or show how they figured out their answers.

Assumed Mathematical Background

Students should have prior experience using problem solving strategies, such as breaking a problem down into smaller parts and sketching or acting out part of the situation. They should also have experience with using everyday fractional amounts such as $\frac{1}{2}$ and $\frac{3}{4}$ to answer mathematical questions and solve problems.

Core Elements of Performance

- ◆ note the important comparative features of the situation
- ◆ use rate (for example, gallons per day and pints per day) to compare number and quantity accurately
- ◆ verify one's own mathematical reasoning

Circumstances

Grouping: Students work to complete an individual written response.

Materials: No special materials are needed for this task.

Estimated time: 15 minutes

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Overview

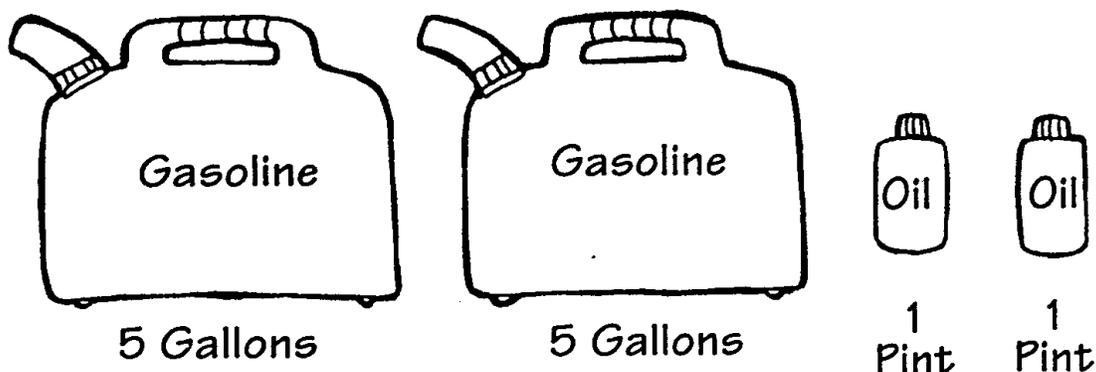
Use the concept of rate to solve a problem. Calculate and compare number and quantity accurately. Verify mathematical reasoning.

MILLIE'S BUSINESS

This problem gives you the chance to

- ◆ *use measures of gallons, pints, and days to solve a mathematical problem*
- ◆ *work accurately with numbers (including fractions)*
- ◆ *explain the math in your answer*

Millie has a lawn-mowing business. She uses $\frac{1}{4}$ pint of oil each day and 1 $\frac{1}{2}$ gallons of gasoline each day. She has these supplies on her shelf:



Which will she run out of first, gasoline or oil? Show or explain how you know your answer is right. _____

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A SAMPLE SOLUTION

"One fourth" means "one out of four", so it takes four days to use up $\frac{4}{4}$, or one pint of oil. It takes four more days to use up the second pint, for a total of eight complete days.

Every two days 3 gallons of gasoline are used ($1\text{ } \frac{1}{2} + 1\text{ } \frac{1}{2} = 3$), so at the end of six days 9 gallons of gasoline will have been used. Millie will run out of gasoline partway through the seventh day, more than a day before she runs out of oil.

OR

Look at the table that shows how much of each kind of supply is used up at the end of each day:

Number of days	Gallons used: Gasoline	Pints used: Oil
1	1 $\frac{1}{2}$	$\frac{1}{4}$
2	3	$\frac{2}{4}$
3	4 $\frac{1}{2}$	$\frac{3}{4}$
4	6	1
5	7 $\frac{1}{2}$	1 $\frac{1}{4}$
6	9	1 $\frac{2}{4}$
7	run out	1 $\frac{3}{4}$
8		2

During the seventh day, the gasoline runs out. The oil lasts until the end of the eighth day.

OR

Since half of the oil on hand (1 pint) lasts four full days, find the answer by figuring out whether or not at least half of the gasoline (5 gallons) will be used up at the end of four days. Whichever supply is first to be half used up will be first to be entirely used up. Three gallons of gasoline is used up in two days, so 6 gallons (more than half of the 10 gallons on hand) will be used up at the end of four days. The gasoline will therefore be used up first.

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