Eating Apples

Kate loves apples and likes to eat them at lunch. On the first day Kate ate 1 apple. On the second day, Kate ate 2 apples. On the third day she ate 1 apple. On the fourth day she ate 2 apples. If this pattern continues how many apples will Kate eat on the tenth day?

Kate's mom buys apples in bags that hold a dozen apples. If she buys a bag of apples in the morning of the first day, will she have enough for Kate to eat all 10 days?

Eating Apples

Suggested Grade Span
Grades Pre K–2

Grade(s) in Which Task Was Piloted
Grade 1

Task
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Kate's mom buys apples in bags that hold a dozen apples. If she buys a bag of apples in the morning of the first day, will she have enough for Kate to eat all 10 days?

Alternative Versions of Task

More Accessible Version:
Kate loves apples and likes to eat them at lunch. On the first day Kate ate 1 apple. On the second day, Kate ate 2 apples. On the third day she ate 1 apple. On the fourth day she ate 2 apples. If this pattern continues how many apples will Kate eat on the tenth day?

More Challenging Version:
Kate loves apples and likes to eat them at lunch. On the first day Kate ate 1 apple. On the second day, Kate ate 2 apples. On the third day she ate 1 apple. On the fourth day she ate 2 apples. If this pattern continues how many apples will Kate eat on the fifth day? The tenth day?
Apples cost 25¢ each, or $3.29 for a dozen. How much money does Kate's mom pay for the apples Kate will eat in the 10 days?

NCTM Content Standards and Evidence

Algebra Standard for Grades Pre K–2

Instructional programs from Pre-Kindergarten through grade 12 should enable students to...

- Understand patterns, relations, and functions.
  - ***NCTM Evidence:*** Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.
  - ***Exemplars Tasks Specific Evidence:*** This task requires students to identify the 1-2-1-2 pattern, and to continue that pattern.

Number and Operation Standard for Grades Pre K–2

Instructional programs from Pre-Kindergarten through grade 12 should enable students to...

- Compute fluently and make reasonable estimates.
  - ***NCTM Evidence:*** Develop and use strategies for whole-number computations, with a focus on addition and subtraction.
  - ***Exemplars Task Specific Evidence:*** This task requires students to find the total number of apples.

Time/Context/Qualifiers/Tip(s) From Piloting Teacher

This is a short to medium length task. Students will be motivated to solve the task if actual apples are brought in for snack. The apples can also be used for scientific investigations, lessons on fractions, etc. Since this task also has a money component, students should have experience with money before being given this task.

Links

Many students study apples in the fall, so this task would work well during this unit. It could also accompany a unit on nutrition.

Common Strategies Used to Solve This Task

Most students will create a chart in which to record information presented in the task and to extend it. Students then find a sum to which they compare one dozen. A conclusion is then made.

Possible Solutions
Original Version:

Days	Number of Apples Eaten
1	1
2	2
3	1
4	2
5	1
6	2
7	1
8	2
9	1
10	2
	15 in all

15 apples are eaten in all, so Kate's mom will need to buy more than one dozen apples.

More Accessible Version:
See above: 2 apples are eaten on the tenth day.

More Challenging Version:
15 apples are needed in all. 1 dozen cost $3.29. The extra 3 apples cost 75¢ in all, for a total of $4.04.

Task Specific Assessment Notes

General Notes: This is a multipart task. In order to score beyond an apprentice, students need to accurately address both parts of the task. Some teachers may choose to score both parts of the task separately, while others will want to assess students' ability to solve a multipart problem.

Novice: The novice will demonstrate little or no understanding of the task. The student will not be able to correctly extend the pattern, and will not have a strategy for accurately keeping track of the days. The student will not, or will incorrectly, attempt the second part of the task.

Apprentice: The apprentice will have a partially correct solution with a strategy that will work for solving part of the task. The apprentice may be able to correctly extend the pattern, but will not be able to do so correctly to 10 days. Or the student may not understand the concept of a dozen, and therefore cannot accurately find an answer to that part of the problem.

Practitioner: The practitioner will achieve a correct solution to both parts of the task with supporting work, math language, and representations.

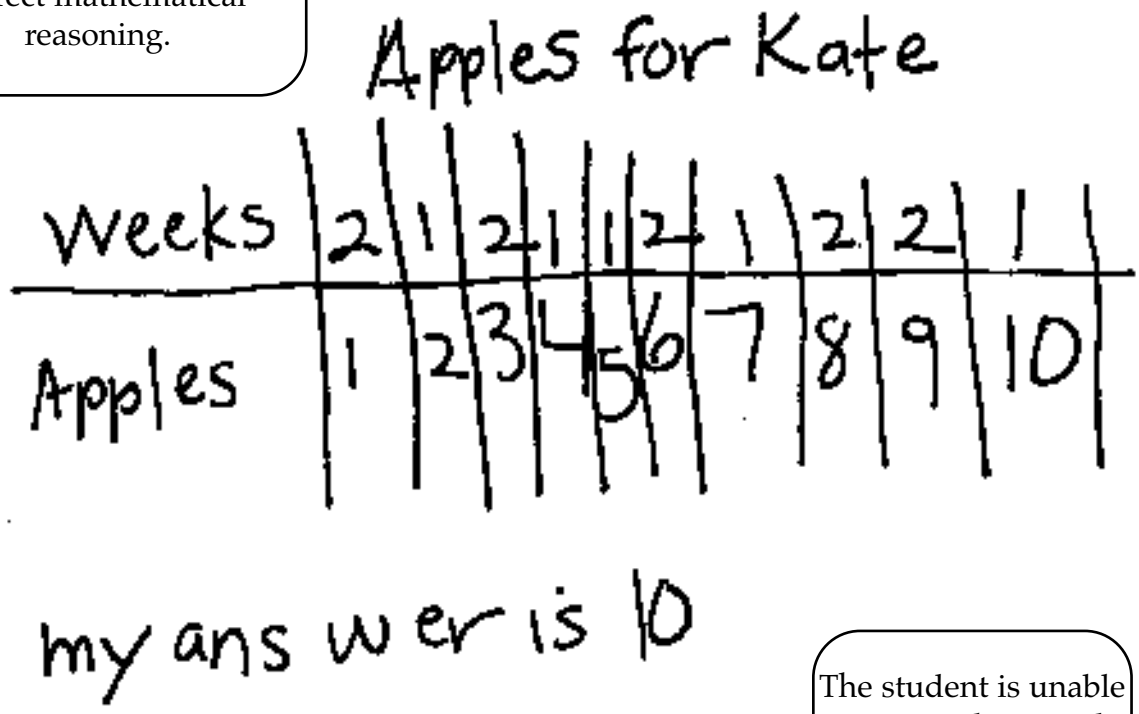
Expert: The expert will not only achieve a correct solution, but will also utilize other good problem solving strategies such as creating a rule to solve the task, verifying the solution, or going above and beyond the task requirements such as finding for more days, or commenting on the number of extra apples Kate's mom will need to buy.

Author

This task was written by **Deb Armitage**, Pre K–8 Mathematics Assessment Consultant at the Vermont Department of Education. The task was piloted by teachers and students in Vermont.

Novice

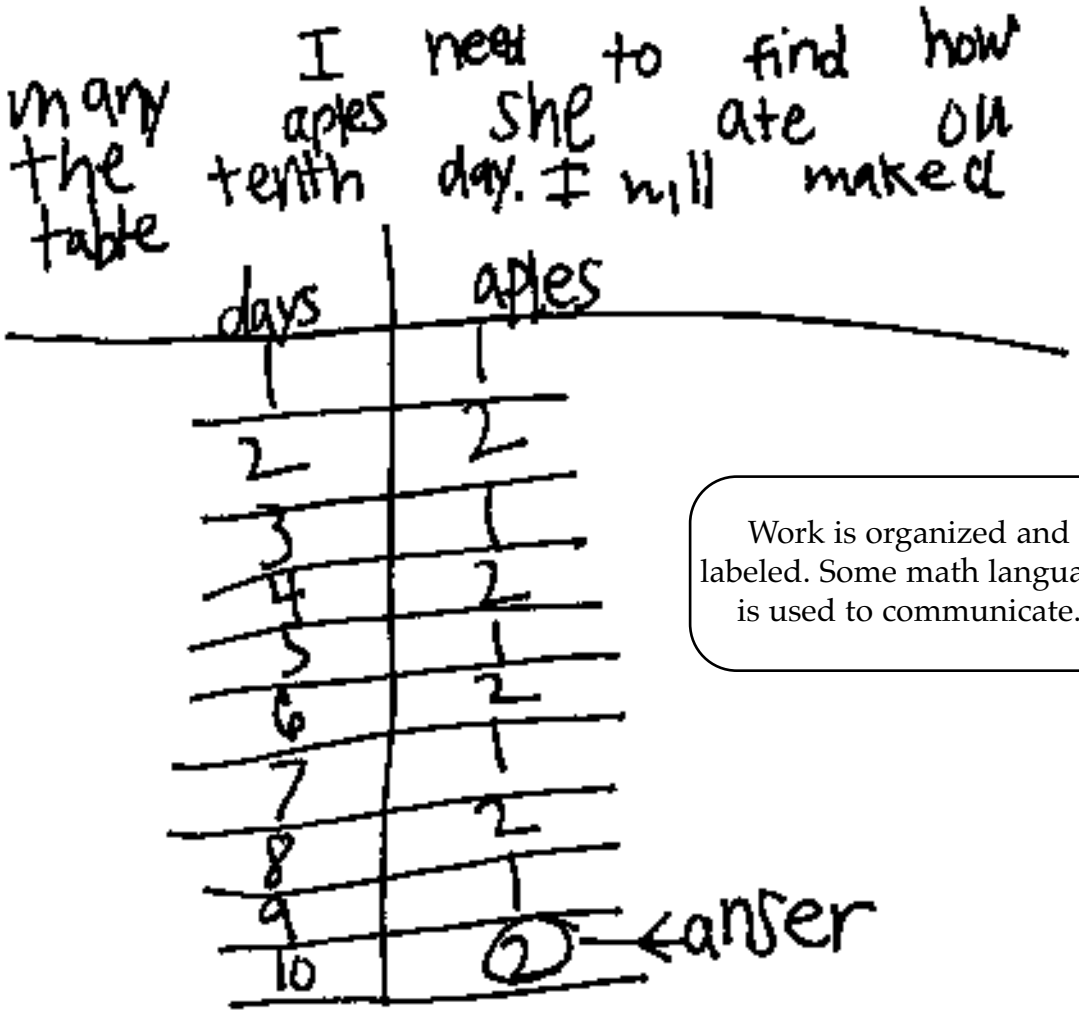
Only 1 part of the task is addressed. The student demonstrates little or no correct mathematical reasoning.



The student is unable to correctly extend the pattern.

The student confuses days with weeks and also confuses apples eaten with "weeks" eaten.

Apprentice



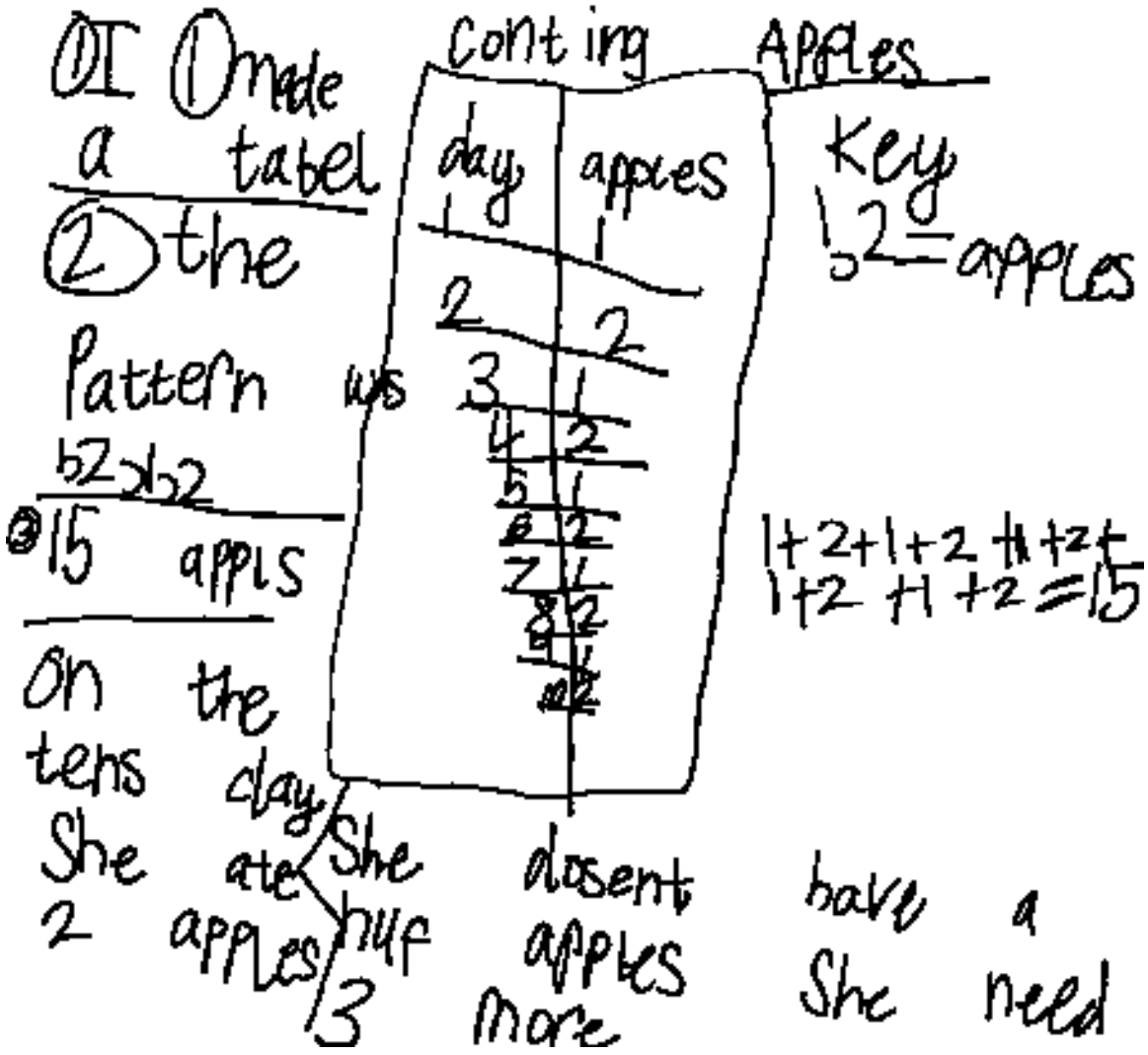
Work is organized and labeled. Some math language is used to communicate.

The student achieves a correct answer to one part of the task but makes no attempt at the second part.

The student's table is accurate and complete.

Practitioner

A correct answer is achieved for both parts of the task.



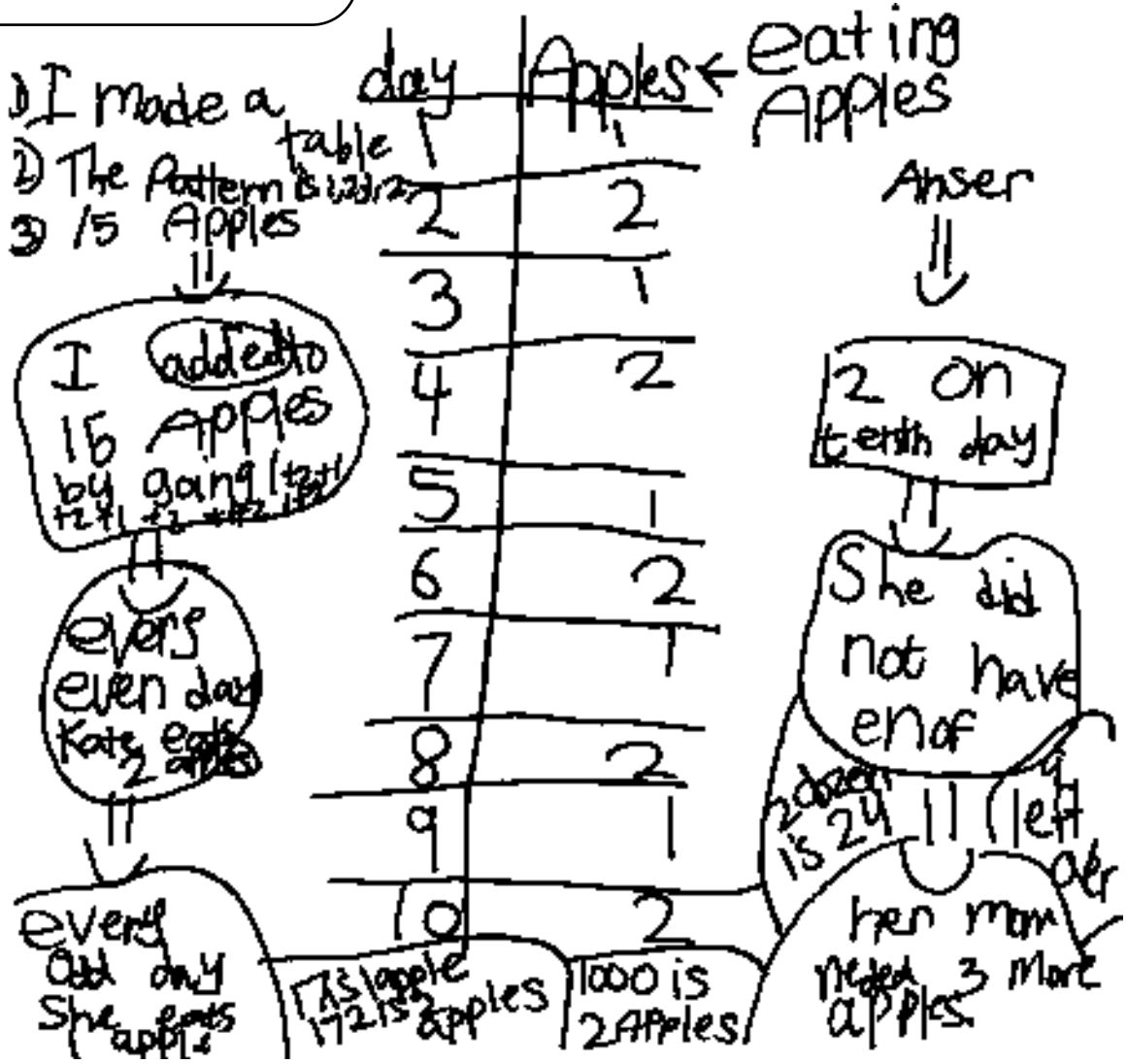
The student communicates the approach and reasoning used by using labels, math language and math representations.

An awareness of audience is present.

Expert

A correct answer is achieved to both parts of the task.

Math language and representations are used throughout to the solution.



Work is labeled, organized, and communicated to the audience.

The student identifies the pattern, applies knowledge of even and odd numbers, and then generalizes the solution by showing the # of apples eaten on a few example days.