# oranges for Snacks

**Ted really likes to eat oranges for his morning snack. The 1st day Ted ate 2 oranges for snack. The 2nd day Ted ate 1 orange for snack. The 3rd day Ted ate 2 oranges for snack. On the 4th day Ted ate 1 orange for snack. The pattern continued. Oranges were on sale for 10 cents each. How much money did Ted's mom spend on the oranges after 8 days of snacking?**

# Oranges for Snacks

## Suggested Grade Span
Grades Pre–K–2

## Grade(s) in Which the Task Was Piloted
Grade 2

## Task
Ted really likes to eat oranges for his morning snack. The 1st day Ted ate 2 oranges for snack. The 2nd day Ted ate 1 orange for snack. The 3rd day Ted ate 2 oranges for snack. On the 4th day Ted ate 1 orange for snack. The pattern continued. Oranges were on sale for 10 cents each. How much money did Ted's mom spend on the oranges after 8 days of snacking?

## Alternative Versions of the Task

*More Accessible Version:*
Ted really likes to eat oranges for his morning snack. The 1st day Ted ate 2 oranges for snack. The 2nd day Ted ate 1 orange for snack. The 3rd day Ted ate 2 oranges for snack. On the 4th day Ted ate 1 orange for snack. The pattern continued. How many oranges will Ted eat on the 8th day for snack?

*More Challenging Version:*
Ted really likes to eat oranges for his morning snack. The 1st day Ted ate 2 oranges for snack. The 2nd day Ted ate 1 orange for snack. The 3rd day Ted ate 2 oranges for snack. On the 4th day Ted ate 1 orange for snack. The pattern continued. How many oranges did Ted eat on the 8th day?

Oranges were on sale for 10 cents each, or a dozen for $1.18. What is the least expensive way for Ted's mom to buy his oranges?

## NCTM Content Standards and Evidence

**Algebra Standard for Grades Pre–K–2**

Instructional programs from Pre–Kindergarten though 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 pattern of 2–1–2, and to continue that pattern.

## NCTM Content Standards and Evidence

**Number and Operation Standard for Grades Pre–K–2**

Instructional programs from Pre–Kindergarten though grade 12 should enable students to...

- Compute fluently and make reasonable estimates.
  - ***NCTM Evidence:*** Use a variety of methods and tools to compute, including objects, mental computation, estimation, paper and pencil and calculators
  - ***Exemplars Tasks Specific Evidence:*** This task requires students to calculate the total number and the total cost of the oranges.

**Time/Context/Qualifiers/Tip(s) from Piloting Teacher**

This task is considered a medium length task in that it took my students one class period in which to complete it.

**Links**

This task may complement activities that focus on nutrition. Children's literature that would complement this task includes *Each Orange Had 8 Slices: A Counting Book* by Paul Giganti. Children can count or multiply with this book of sets and numbers.

**Common Strategies Used to Solve This Task**

Most students will create a chart in which to record and extend the pattern. Repeated addition is used to achieve a total sum of money.

## Possible Solutions

***Original Version:***

| Day | # of Oranges |
|---|---|
| 1 | 2 |
| 2 | 1 |
| 3 | 2 |
| 4 | 1 |
| 5 | 2 |
| 6 | 1 |
| 7 | 2 |
| 8 | 1 |

Total 12 oranges

12 oranges x 10 cents each = $1.20

***More Accessible Version:***

| Day | # of Oranges |
|---|---|
| 1 | 2 |
| 2 | 1 |
| 3 | 2 |
| 4 | 1 |
| 5 | 2 |
| 6 | 1 |
| 7 | 2 |
| 8 | 1 |

He ate 1 orange on day 8.

***More Challenging Version:***

| Day | # of Oranges |
|---|---|
| 1 | 2 |
| 2 | 1 |
| 3 | 2 |
| 4 | 1 |
| 5 | 2 |
| 6 | 1 |
| 7 | 2 |
| 8 | 1 |

Total 12 oranges

It is cheaper to buy a dozen at $1.18 than to pay 10 cents each (10¢ each = $1.20).

## Task Specific Assessment Notes

**General Notes**: This task encourages the use of a chart or diagram to solve the task. It may not, however, elicit much mathematical language or notation.

**Novice:** The Novice will not be able to address the eight days of snack, nor the pattern of oranges eaten. No math language will be used, and diagrams created will not lead toward a solution.

**Apprentice:** The Apprentice will have a partially correct solution. The Apprentice may demonstrate understanding the eight days and the pattern, but will not be able to successfully address the monetary aspect of the task. Some math language will be used to communicate.

**Practitioner:** The Practitioner will have a correct solution. The Practitioner will demonstrate understanding the eight days and the pattern, and will be able to successfully address the monetary aspect of the task. All work will be shown and labeled. A sense of audience will be demonstrated. Mathematically relevant observations will be made, but they will not further the solution.

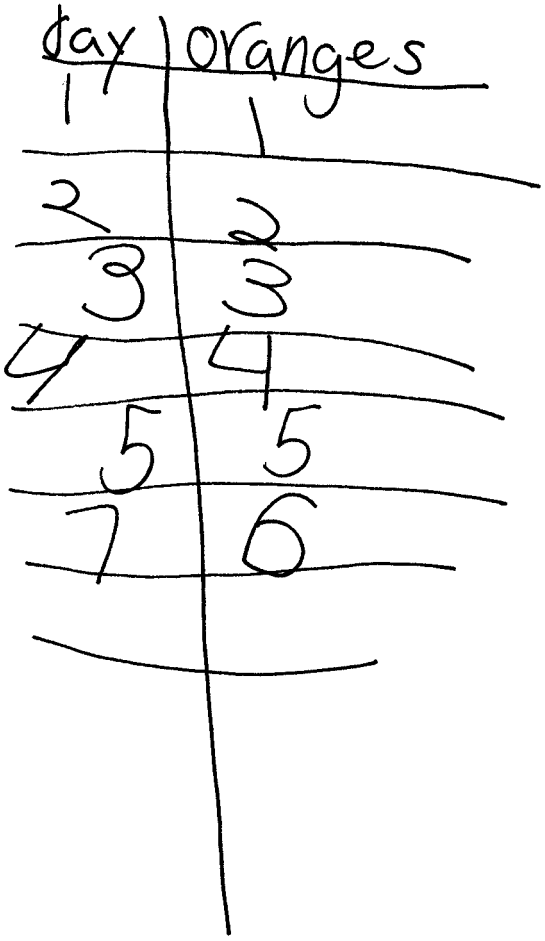
**Expert:** The Expert will have an efficient approach. Accurate and appropriate math language will be used. Mathematically relevant observations will help further the solution.

## Author

**Deb Armitage**, Pre–K–8 Mathematics Assessment Consultant at the Vermont Department of Education, wrote this task. Teachers and students in Vermont piloted the task.

# Novice

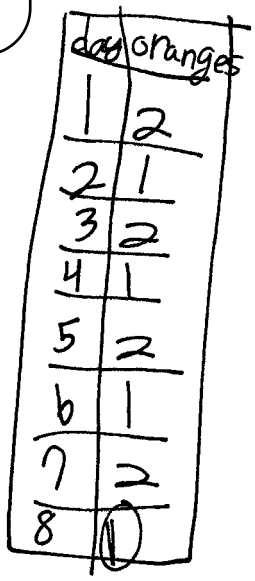
The student shows little or no understanding of the task. There is no recognition that there are eight days, nor that a 2–1–2–1 pattern exists.




No attempt is made to address the money aspect of the task.

# Apprentice

The student is able to solve part of the task correctly.

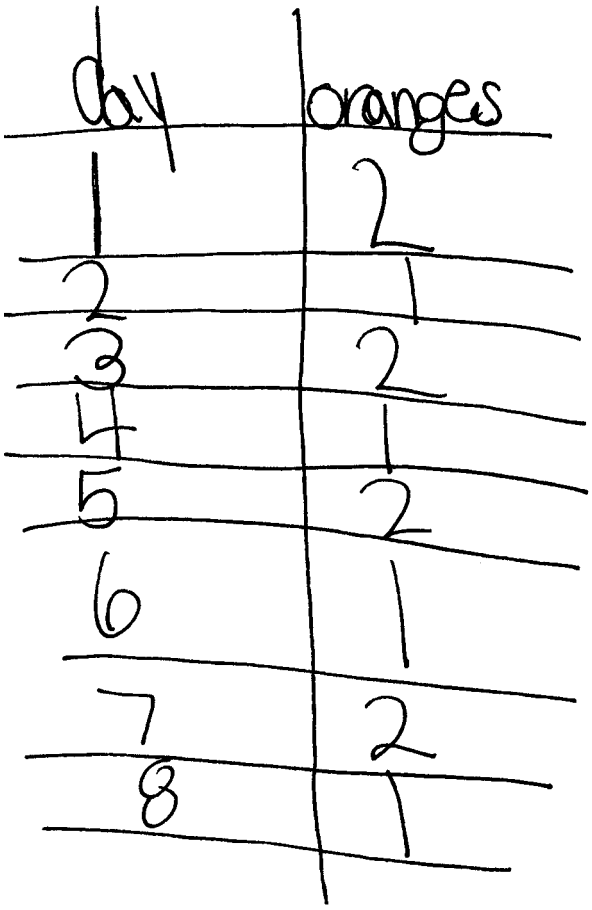



No attempt is made to address the money aspect of the task.

The math representation (chart) is organized and labeled.

All parts of the task are accurately addressed. Math language and a representation (chart) are used to communicate the approach and reasoning used.

# Practitioner

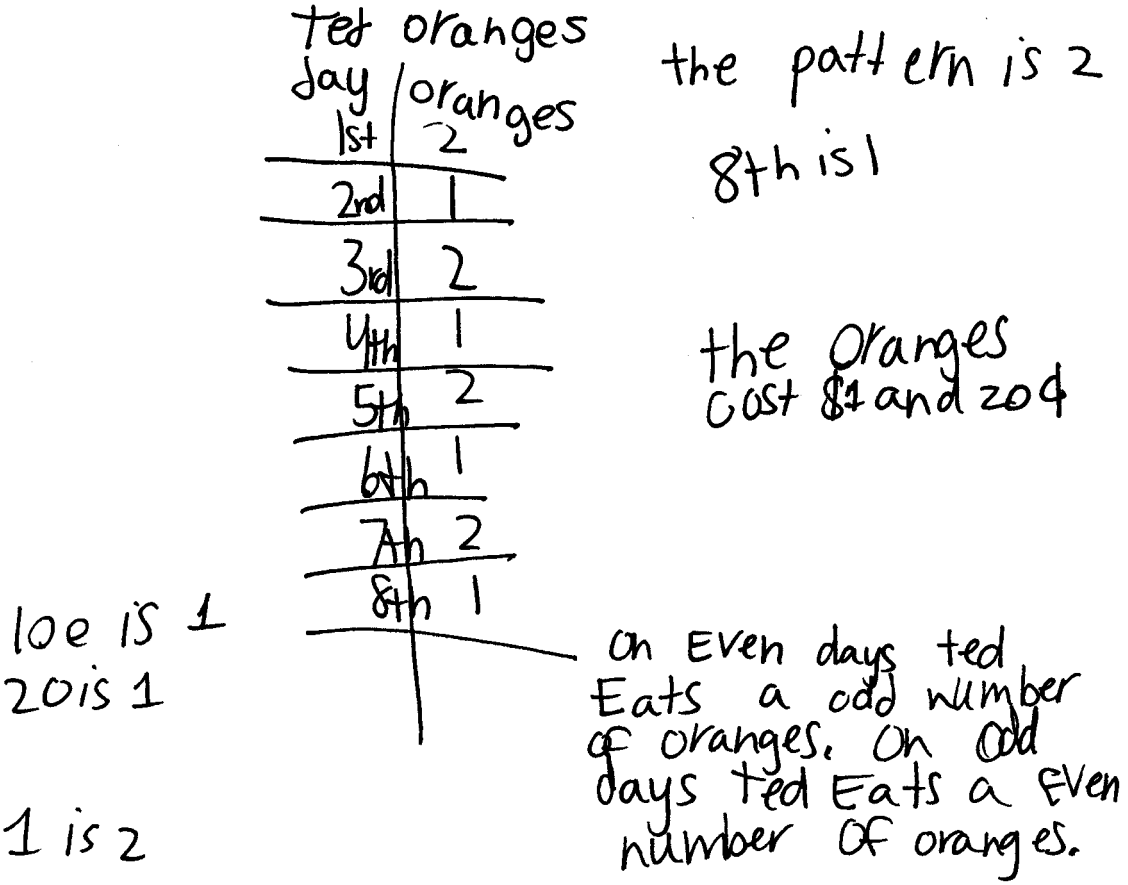



Ted ate 12 in all.
$1.20
The pattern is 12121212
Day 8 Tedd ate 1 orange.
Day 9 Tedd ate 2 oranges

The student identifies the pattern and makes a rudimentary observation about the number of oranges eaten on day nine.

# Expert

Precise math language and a math representation is used to communicate.




A correct answer is achieved for both parts of the task. The student makes mathematically relevant observations that allow the student to generalize the solution.

The student can now tell how many oranges are eaten depending on whether the day is even or odd numbered.