

## Peg's Purple Pebbles

Peg likes the color purple. She decided to look for purple pebbles in the stream by her house. On the 1st day Peg found 2 purple pebbles. On the 2nd day Peg found 4 purple pebbles. On the 3rd day Peg found 6 purple pebbles. If this pattern continues, how many pebbles will Peg find on the 7th day?

## Peg's Purple Pebbles

### Suggested Grade Span

Grades Pre–K–2

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

Grade 1

### Task

Peg likes the color purple. She decided to look for purple pebbles in the stream by her house. On the 1st day Peg found 2 purple pebbles. On the 2nd day Peg found 4 purple pebbles. On the 3rd day Peg found 6 purple pebbles. If this pattern continues, how many pebbles will Peg find on the 7th day?

### Alternative Versions of the Task

#### *More Accessible Version:*

Peg likes the color purple. She decided to look for purple pebbles in the stream by her house. On the 1st day Peg found 2 purple pebbles. On the 2nd day Peg found 4 purple pebbles. On the 3rd day Peg found 6 purple pebbles. Show all of the pebbles she found.

#### *More Challenging Version:*

Peg likes the color purple. She decided to look for purple pebbles in the stream by her house. On the 1st day Peg found 2 purple pebbles. On the 2nd day Peg found 4 purple pebbles. On the 3rd day Peg found 6 purple pebbles. If this pattern continues, how many pebbles will Peg find on the 7th day? At the end of day 7, how many pebbles in all did she find for her collection?

## 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 pattern of counting by twos, and to continue that pattern.

## 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 collections or on studies of rivers or rocks.

## Common Strategies Used to Solve This Task

Most students will create a chart in which to record and extend the pattern.

## Possible Solutions

### *Original Version:*

<u>Day</u>	<u># of Pebbles Found</u>
1	2
2	4
3	6
4	8
5	10
6	12
7	14

### *More Accessible Version:*

$2 + 4 + 6 = 12$  pebbles should be shown

### *More Challenging Version:*

The original version, and...

$2 + 4 + 6 + 8 + 10 + 12 + 14 = 56$  pebbles

## Task Specific Assessment Notes

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

**Novice:** The Novice will not be able to address the seven days, nor the pattern of pebbles found. 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 seven days, but will not be able to identify or extend the pattern correctly or completely. Some math language will be used to communicate.

**Practitioner:** The Practitioner will have a correct solution. The Practitioner will demonstrate understanding of the seven days, and will be able to successfully identify and extend the pattern. 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.

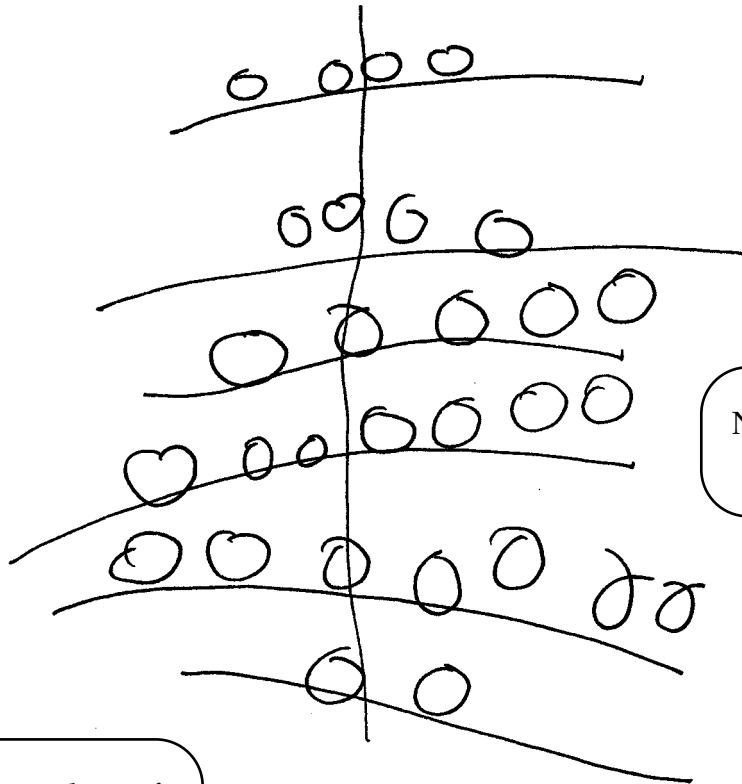
**Expert:** The Expert will have an efficient approach. Accurate and appropriate math language will be used. Mathematically relevant observations will help further the solution.

### 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

"Here are all of Peg's Pebbles."  
-Scribed by Teacher



No progress is made toward a solution.

No understanding of seven days nor of two, four and six pebbles is demonstrated.

Apprentice

Day	Pebbles
	2
2	4
3	6
4	8
5	
6	

The student is able to extend the pattern correctly to day four.

The student has an approach that would work, but is unable to execute it completely nor accurately.

Practitioner

day	pebbles
1	2
2	4
3	6
4	8
5	10
6	12
7	14

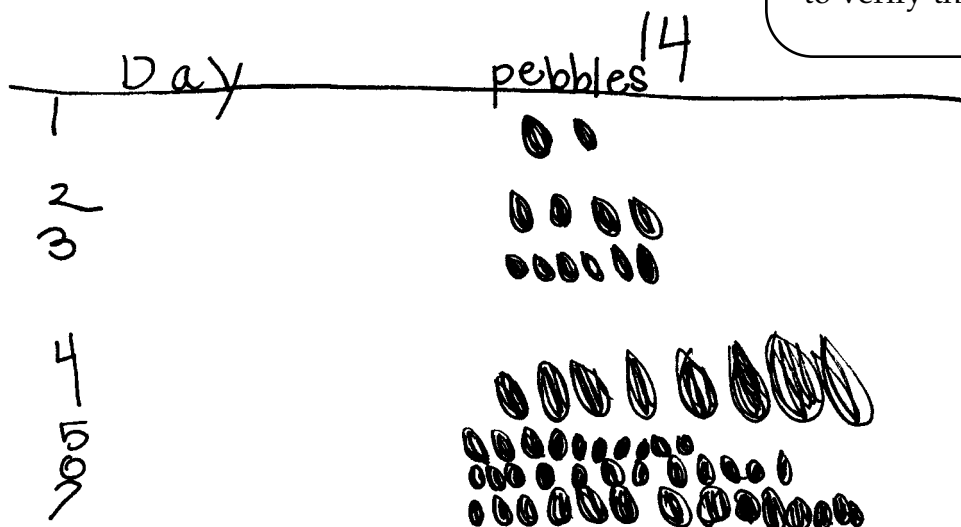
A table is created and correctly executed. The student correctly identifies the pattern.

"I made a table. I counted by two's."  
-Scribed by Teacher

A correct answer is achieved. Work is shown.

Expert

A correct answer is achieved. The student solves the task two ways to verify the solution.



The Pattern is +2

Or

Day	1	2	3	4	5	6	7	8
pebbles	2	4	6	8	10	12	14	16

9	10
18	20

"Seven days is a week. I did two tables, one with pebbles, one with numbers. I got the same answer both ways, so I know I am right."  
-Scribed by Teacher

The student extends the pattern to eight, nine and 10 days after identifying the pattern as +two.