

## Lots of Reading

Jane likes dinosaurs and decided to read library books about dinosaurs for four weeks. The first week she read 2 books. The second week she read 3 books. The third week she read 4 books. The fourth week she read 5 books.

Jane's dad said he would buy her a dinosaur book if she read at least 10 books in 30 days or less. Will Jane's dad need to buy Jane a dinosaur book?

Jane's mom said she would give Jane ten cents for every book she read because she knew Jane wanted to earn one dollar to buy a dinosaur pin. How much money did Jane earn?

## Lots of Reading

### Suggested Grade Span

Grades Pre K–2

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

Grade 1

### Task

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### Alternative Versions of Task

#### *More Accessible Version:*

Jane likes dinosaurs and decided to read library books about dinosaurs for four weeks. The first week she read 2 books. The second week she read 3 books. The third week she read 4 books. The fourth week she read 5 books.

Jane’s dad said he would buy her a dinosaur book if she read at least 10 books in 30 days or less. Will Jane’s dad need to buy Jane a dinosaur book?

#### *More Challenging Version:*

Jane likes dinosaurs and has decided to read library books about dinosaurs and archeology for the whole month of July. The first day she plans to read 1 book. The second day she plans to read 2 books. The third day she plans to read 3 books. The fourth day she plans to read no books. The fifth day she plans to read 1 books. The sixth day she plans to read 2 books. The seventh day she plans to read 3 books , and on the eighth day no books. If this pattern continues, how many books in all will Jane read by the end of July?

Jane’s mom said she would give Jane ten cents for every book she read because she knew Jane wanted to earn\$4.50 to buy a dinosaur pin. How much money did Jane earn?

## NCTM Content Standards and Evidence

### 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 books read.

### Measurement Standard for Grades Pre K–2

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

- Understand measurable attributes of objects and the units, systems, and processes of measurement.
  - *NCTM Evidence:* Recognize the attributes of length, volume, weight, area, and time.
  - *Exemplars Task Specific Evidence:* This task requires students to know that there are 4 weeks in a month.

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

This is a medium length task. Students given this task should have experience with identifying and extending patterns, along with calendar familiarity.

### Links

This task could link to a unit on dinosaurs, or it could be given to students who are making a summer reading plan. Many schools celebrate February as I Love To Read and Write month. This would also be a timely month in which to present this task to students.

### Common Strategies Used to Solve This Task

Most students create a chart to organize information presented in the task about the number of books that are read during each weeks. In determining the amount of money earned, many students list 14 groups of 10 cents to count, or they draw diagrams and then count the coins mentally.

### Possible Solutions

*Original Version:*

Week #	# of Books	Total
1	2	2
2	3	5
3	4	9
4	5	14

14- yes she'll read more than 10 books in 30 days.

$14 \text{ books} \times \$0.10 = \$1.40$  earned from Mom

*More Accessible Version:*

Same as above.

*More Challenging Version:*

Day	# of Books Read	Total	Day	# of Books Read	Total
1	1	1	17	1	25
2	2	3	18	2	27
3	3	6	19	3	30
4	0	6	20	0	30
5	1	7	21	1	31
6	2	9	22	2	33
7	3	12	23	3	36
8	0	12	24	0	36
9	1	13	25	1	37
10	2	15	26	2	39
11	3	18	27	3	42
12	0	18	28	0	42
13	1	19	29	1	43
14	2	21	30	2	45
15	3	24	31	3	48
16	0	24			

$48 \text{ books} \times 10\text{¢ each} = \$4.80$ , so enough money will be earned to buy the pin.

### Task Specific Assessment Notes

**General Notes:** This task assesses addition skills, as well as an understanding that there are 4 weeks in a month. Students must employ a problem solving strategy for finding a solution.

**Novice:** The novice will demonstrate little or no understanding of the task. No correct reference to 14 books will be made, and no strategy will be present for correctly determining the amount earned from reading the books.

**Apprentice:** The apprentice will have a partially correct solution or a strategy that will work for solving part of the task. The apprentice may be able to determine the total number of books read, but may not be able to correctly find a solution for the second part of the task. The apprentice may also have approaches that work for both parts of the task, but computation errors lead to an incorrect solution.

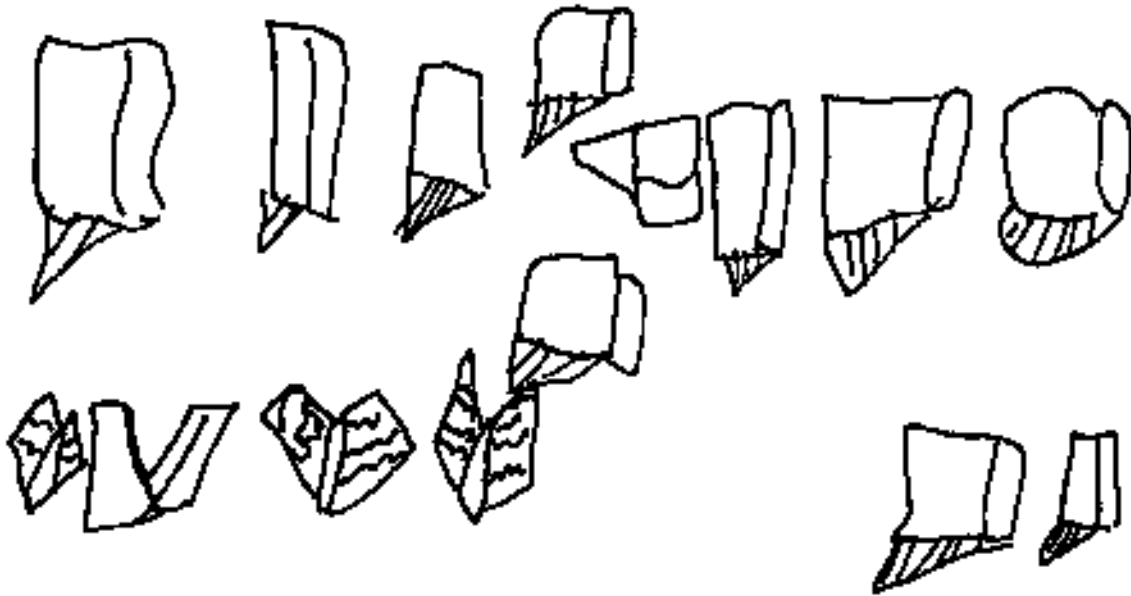
**Practitioner:** The practitioner will achieve a correct solution to the task with supporting work. A correct total of books will be achieved, and the student will be able to accurately compute to find a total of \$1.40 earned.

**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 explaining how much beyond the \$1.00 she was able to earn. The expert may also be able to rely strictly on a computational approach to solve the second part of the task.

### 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



This student makes little or no progress towards a solution.

Books are drawn, but they seem to total 15 instead of 14.

No math language is used to communicate, Mathematical reasoning is lacking.

Apprentice

It is unclear how the student gets \$1.04 instead of \$1.40. It is more than a transcription error as it is written 3 times as 4¢.

This student shows a lot of potential. The student is very aware of the audience, showing and labeling all work.

Lots of Reading

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 Jane's mom said she would give Jane ten cents for every book she read because she knew Jane wanted to save one dollar to buy a dinosaur pin. How much money did Jane earn? \$1.04

Lots of Reading

I need to find out if dad ~~is~~ <sup>to</sup> buys a book and if dad ~~is~~ <sup>how much</sup> money Mom gives her how much I will make a list.

week	books	total books
1	2	2
2	3	5
3	4	9
4	5	14
total for weeks		14
10¢ 10¢		1/7
10¢ 10¢		2/14
10¢ 10¢		3/21
10¢ 10¢		4/28
10¢ 10¢		5/35
10¢ 10¢		6/42
10¢ 10¢		7/49
10¢ 10¢		8/56
10¢ 10¢		9/63
10¢ 10¢		10/70
10¢ 10¢		11/77
10¢ 10¢		12/84
10¢ 10¢		13/91
10¢ 10¢		14/98

1. Her dad will give her a dinosaur book. Her dad will need to give her a dinosaur book.

2. She got \$1.00 off so she will be able to get the pin.

remember there is 7 days in a week. remember she needs 10 books to get the pin

A correct answer is achieved for only part of the task so the student may not score beyond an apprentice.

Practitioner

Work is organized and labeled. An attempt is made to communicate with the audience through commentary.

Lots of Reading

Jane likes dinosaurs and decided to read library books about dinosaurs for four weeks. The first week she read 2 books. The second week she read 3 books and the third week she read 4 books. The fourth week she read 5 books. Jane's dad said he would buy her a dinosaur book if she read at least 10 books in less than 30 days. Will Jane's dad need to buy Jane a dinosaur book? How much money did Jane need to find out if Dad buys her a dinosaur book and how many much money mom gives her

I will use an organized list to find out

Books	Days	Weeks	Total Days	Money
2	7	1	7	
3	14	2	14	
4	21	3	21	
5	28	4	28	
14				\$1.40

$$\begin{array}{r}
 1000000 \\
 1000000 \\
 1000000 \\
 1000000 \\
 1000000 \\
 \hline
 1.40
 \end{array}$$

The student achieves a correct solution with supporting work for both parts of the task.

A math representation is used to solve the task and to communicate the solution. Language of time and money are used.

# Exemplars

## Expert

### Lots of Reading

Math language and notation of money are used correctly to communicate the solution. The student makes a relevant observation about the extra money earned.

The student uses a sophisticated approach to solve the task using a chart that includes a running total.

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 Jane's mom said she would give Jane ten cents for every book she read because she knew Jane wanted to save one dollar to buy a dinosaur pen. How much money did Jane earn? **\$.40**

I need to find out if Dad buys a book and how many mom gives her. I will make a table

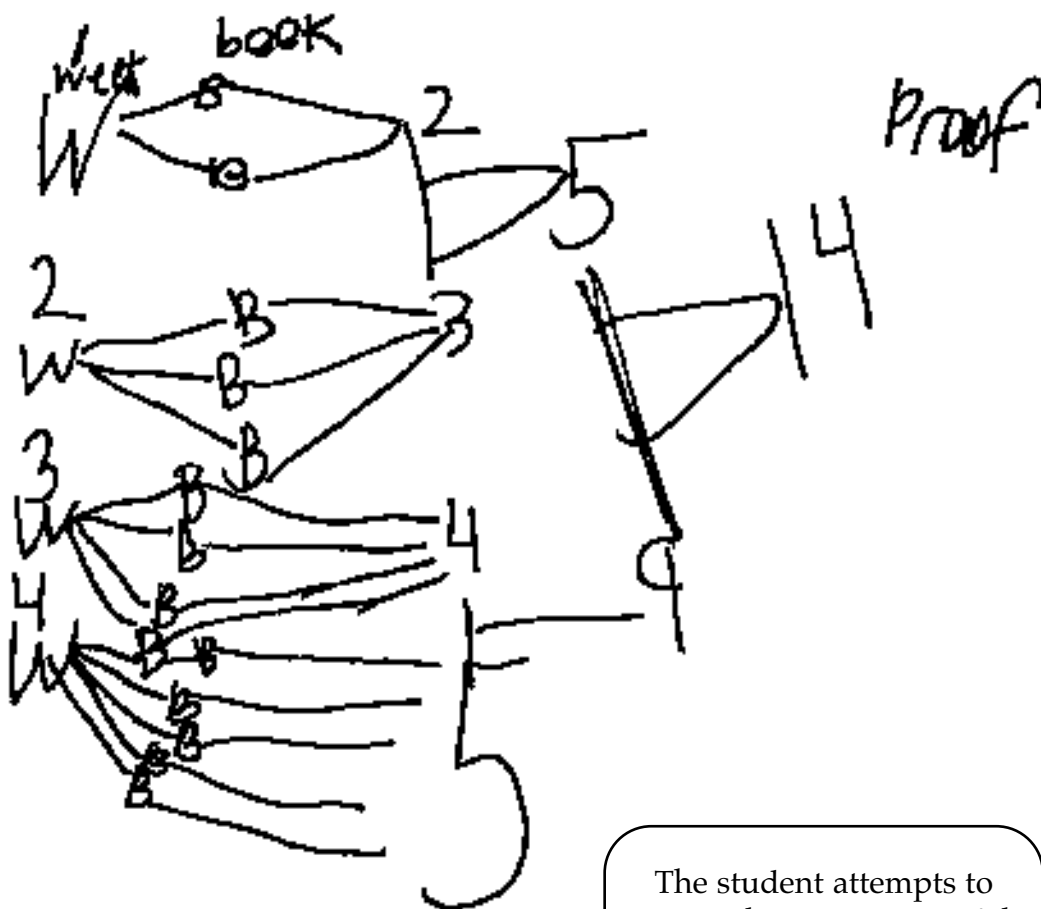
days	week	books	total
7	W1	2	2
14	W2	3	5
21	W3	4	9
28	W4	5	14

40¢ left

14 books  
 $\times 10¢$   
 \$1.40 total

The student also uses multiplication to find the money earned.

Expert cont.



The student attempts to “prove” the correctness of the solution. Work is labeled and organized. Communication with the audience is achieved through commentary.

$4 = 14$   
I am write