

A New Paint Set

Josh likes to paint pictures and was saving money to buy a new paint set. He had already saved 50 cents. Josh's dad was planting a garden. He told Josh that if he would help him for an hour every day for a week, we would pay him \$1.25 a day. Josh's mom told him that if he helped her wash the breakfast dishes every day for a week she would pay him 25 cents a day. Josh figured out how much he would earn working for his dad and mom. It was exactly how much more he needed for his paint set. How much does the paint set cost? Show all your math thinking.

A New Paint Set

Suggested Grade Span

Grades 3–5

Grade(s) in Which Task Was Piloted

Grade 3

Task

Josh likes to paint pictures and was saving money to buy a new paint set. He had already saved fifty cents. Josh's dad was planting a garden. He told Josh that if he would help him for an hour every day for a week, we would pay him \$1.25 a day. Josh's mom told him that if he helped her wash the breakfast dishes every day for a week she would pay him 25 cents a day. Josh figured out how much he would earn working for his dad and mom. It was exactly how much more he needed for his paint set. How much does the paint set cost? Show all your math thinking.

Alternative Versions of Task

More Accessible Version:

Josh's dad was planting a garden. He told Josh that if he would help him for an hour every day for a week, he would pay him \$1.25 a day. How much money will Josh earn in 1 week?

More Challenging Version:

Josh likes to paint pictures. He was saving money to go to art camp. He already saved \$3.00. Josh's dad was planting a garden. He told Josh that he would pay him \$1.25 an hour to work in his garden. Josh's mom told Josh that if he helped her wash the breakfast dishes she would pay him 50 cents a day. Josh decided to take both parents up on their offers.

Josh planned to work in the garden 1 hour on Monday, 2 hours on Tuesday, 3 hours on Wednesday, and so on. He decided to wash the breakfast dishes every-other day starting on Monday.

Josh figured out how much he would earn working for his dad and mom. It was exactly how much more he needed for art camp. How much does art camp cost? Show all your math thinking.

NCTM Content Standards and Evidence

Number and Operation Standard for Grades 3–5

Instructional programs from pre-kindergarten through grade 12 should enable all students to...

- Compute fluently and make reasonable estimates.
 - *NCTM Evidence:* Develop fluency in adding, subtracting, multiplying, and dividing whole numbers.
 - *Exemplars Task Specific Evidence:* This task requires students to add and multiply to determine the cost of the paint set.

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

This is a short to medium length task.

Links

This task would link to investigations about hobbies, or studies about allowances and earning money.

Common Strategies Used to Solve This Task

Most students will create a chart of amounts earned with supporting computation.

Possible Solutions

Original Version:

$$7 \text{ days} \times \$1.25 = \$8.75$$

$$7 \text{ days} \times \$0.25 = \$1.75$$

$$\$8.75 + \$1.75 = \$10.50 + \$0.50 = \$11.00$$

More Accessible Version:

$$7 \text{ days} \times \$1.25 = \$8.75$$

More Challenging Version:

Garden Job

	<u>Daily Amount</u>	<u>Total</u>
Monday	\$1.25	\$1.25
Tuesday	\$2.50	\$3.75
Wednesday	\$3.75	\$7.50
Thursday	\$5.00	\$12.50
Friday	\$6.25	\$18.75
Saturday	\$7.50	\$26.25
Sunday	\$8.75	\$35.00

Breakfast Dishes: Mon, Wed, Fri, Sun, 4 days x 50 cents = \$2.00

$\$35.00 + \$2.00 = \$37.00 + \$3.00 = \$40.00$ for art camp

Task Specific Assessment Notes

General Notes

This is a multi-part task. It will be easy for students to forget to take into consideration that Josh already saved 50 cents. This needs to be correctly considered in order to achieve the level of a Practitioner.

Novice

The Novice may address some parts of the task correctly, but much of the solution will be incorrect. There may be no mathematical basis to arguments made and no awareness of audience will be communicated. The Novice will make no connections.

Apprentice

The Apprentice will present many correct parts of the task, but the final solution will be incorrect. Some awareness of audience will be present and some correct reasoning will be present, but omissions may be made.

Practitioner

The Practitioner will achieve a correct answer with supporting work and all work will be shown and labeled. Representations will be created to organize the work and display the solution and math connections will be recognized.

Expert

The Expert will achieve a correct answer and all work will be shown, labeled, and justified. Evidence will be used to support decisions and connections will be used to extend the solution.

Exemplars

Novice

No connections are made.
No sense of audience is demonstrated.

Many parts are unclear. Much of the computation makes no sense.

A New Paint Set

Days	Dad money	mom money	Total
1	\$1.25	\$0.25	\$1.50
2	\$1.25	\$0.25	\$3.00
3	\$1.25	\$0.25	\$4.50
4	\$1.25	\$0.25	\$1.00
5	\$1.25	\$0.25	18.00
6	\$1.25	\$0.25	37.00
7	\$1.35	\$0.25	113.00

~~\$1.50~~
~~\$3.00~~
~~\$4.50~~
~~\$9.00~~
~~\$18.00~~
~~\$37.00~~
~~\$113.00~~

 39.00

A representation is attempted, but it does not further the solution.

It appears that the student had a good start to the task, but by day four, significant errors are made. It is then unclear why the student totals the totals.

Apprentice

I have to see how
much the paint cost.
I have to make a table.

Although a final correct answer is achieved, it is not supported with documented work.

Exemplars

Apprentice cont.

Many computation errors are present.

Days	Money from Dad	Money from Mom	Total money
1	\$1.25	\$0.25	\$1.50
2	\$1.25	\$0.25	\$3.00
3	\$1.25	\$0.25	\$4.50
4	\$1.25	\$0.25	\$5.50
5	\$1.25	\$0.	\$6.50
6	\$1.25	\$0.25	\$7.50
7	\$1.25	\$0.25	\$8.50
8			

The total money that I got is \$11.00

Some omissions are made (such as money earned from Mom on day five, and the 50 cents Josh had already saved).

Exemplars

Practitioner

All work is shown and labeled.

An awareness of audience is communicated through annotation of the student's work.

*His dad gave him a \$1.00 more per day.

*The Paint Set Cost \$11.00

*The Patterns + \$1.50
* 7 days is 1 week

*He needed to add 5¢ to \$10.50.

Math connections are recognized.

A math representation is used to portray the solution.

A New Paint Set

I have to find out how much money the paint set cost.

I will make a table to get my answer.

Days	Money from Dad	Money from Mom	Total
1	\$1.25	\$0.25	\$1.50
2	\$1.25	\$0.25	\$3.00
3	\$1.25	\$0.25	\$4.50
4	\$1.25	\$0.25	\$6.00
5	\$1.25	\$0.25	\$7.50
6	\$1.25	\$0.25	\$9.00
7	\$1.25	\$0.25	\$10.50
			\$10.50 + \$1.50 = \$12.00

A correct answer is achieved.

Exemplars

Expert

The student achieved a correct solution with supporting work.

An efficient strategy is chosen.

I will figure out how much the paint set cost. Each day Josh gets $\$1.25 + 25¢ = \1.50
 $\$1.50 \times 7 \text{ days} = \10.50 is what he got.

He had 50¢ $\$10.50 + 50¢ = \11.00
to prove it I made a table.

	money for Dad	money for mom	total
1	\$1.25	25¢	\$1.50
2	\$1.25	25¢	\$3.00
3	\$1.25	25¢	\$4.50
4	\$1.25	25¢	\$6.00
5	\$1.25	25¢	\$7.50
6	\$1.25	25¢	\$9.00
7	\$1.25	25¢	\$10.50

Exemplars

Expert cont.

A sense of audience is communicated.

$$\begin{array}{r} \$0.50 \\ + \cancel{m}50\cancel{c} \\ \hline \$1.00 \end{array}$$

The solution is verified.

You can get the total both ways.

You can just times \$1.50 times the number of days to see what he got in all or go

$$\$1.50x = y$$

$y = \text{money in all}$ $x = \text{days}$

don't forget to add 50¢
 $\$1.50x + 50¢ = y$

Math connections extend the solution to any number of days.

The situation is evaluated in algebraic terms.

