

Feeding the Goats

Sean loves to feed the goats at the petting zoo. His dad gave him one dollar in dimes and nickels to use at the feed machine. Every time he puts a dime and a nickel in the machine a little package of goat food comes out. Sean wants to buy as many packages as he can. How many packages can Sean buy from the machine to feed the goats?

Feeding the Goats

Suggested Grade Span

Grades Pre K–2

Grade(s) in Which Task Was Piloted

Grade 2

Task

Sean loves to feed the goats at the petting zoo. His dad gave him one dollar in dimes and nickels to use at the feed machine. Every time he puts a dime and a nickel in the machine a little package of goat food comes out. Sean wants to buy as many packages as he can. How many packages can Sean buy from the machine to feed the goats?

Alternative Versions of Task

More Accessible Version:

Sean loves to feed the goats at the petting zoo. His dad gave him the money below to use at the feed machine. Every time he puts a dime and a nickel in the machine a little package of goat food comes out. Sean wants to buy as many packages as he can. How many packages can Sean buy from the machine to feed the goats?



More Challenging Version:

Sean loves to feed the goats at the petting zoo. His dad gave him one dollar in dimes and nickels to use at the feed machine. Every time he puts 15 cents in the machine a little package of goat food comes out. Sean wants to buy as many packages as he can. How many packages can Sean buy from the machine to feed the goats?

Given the fact that dad has exactly one dollar in nickels and dimes, what different combinations of each could he have in his pocket?

NCTM Content Standards and Evidence

Number and Operations Standard for Grades Pre K–2

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

- Understand meanings of operations and how they relate to one another.
 - *NCTM Evidence:* Understand situations that entail multiplication and division, such as equal groupings of objects and sharing equally.
 - *Exemplar Task Specific Evidence:* Students must divide \$1.00 by 15 cents.

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

This is a medium length task. Students should have experience with money to be able to attempt this task. Providing students with change from which they can choose what they need in solving the task may help more students in being successful.

Links

This task could link to studies of animals and what they eat, or it can be given before a field trip to a zoo.

Common Strategies Used to Solve This Task

Most students draw the coins and then circle combinations. Others use a chart to organize information. Some may strictly use computation, but this will be rare.

Possible Solutions

Original Version:

$\$1.00 \div 15\text{¢} = 6.666$, so 6 packages of feed can be purchased.

More Accessible Version:

Same as above.

More Challenging Version:

Same as above, and in addition...

Nickels	Dimes
0	10
2	9
4	8
6	7
8	6
10	5
12	4
14	3
16	2
18	1
20	0

Task Specific Assessment Notes

General Notes: This task requires students to combine their knowledge of money, combinations, and repeated addition or division. Students need to find strategies for applying the above concepts in order to find a correct and complete solution.

Novice: The novice will demonstrate little or no understanding of the task. The student will not demonstrate understanding of \$1.00 in coins, nor of how to make 15 cents.

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 represent \$1.00 in coins and even combinations of 15 cents, but will achieve an incorrect solution either due to computation or reasoning errors. The apprentice solution may also be incomplete because the student neglects to reach a conclusion.

Practitioner: The practitioner will achieve a correct solution to the task with supporting work.

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 identifying the amount of money left over.

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

Some combinations listed do not equal 15¢.

I have to find how many feed bags.



It's ten

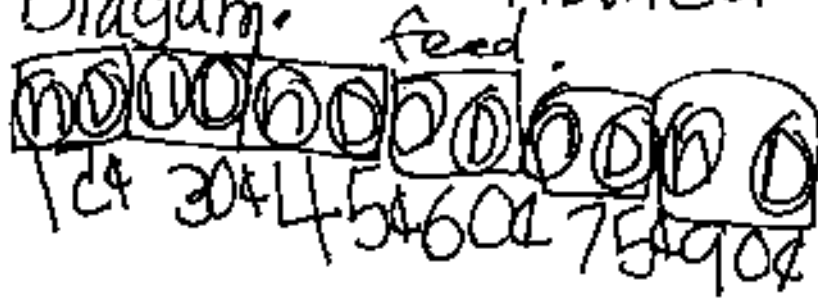
Little or no understanding of the task is demonstrated.

The student starts with more than one dollar in dimes and nickels so will be unable to achieve a solution.

Work lacks organization and correct reasoning.

Practitioner

I need to find how many packages of feed he can get. I will make a diagram.



key
 ○ nickel
 ○ dime

he has 10¢ extra

answer)

I Added 17¢ every

Work is organized and labeled. The student accounts for the extra 10¢.

A correct answer is achieved. All work is shown. Communication with the audience is intentional.

Exemplars

Expert

All work is shown and labeled. The student verifies the solution with a strict computational approach showing understanding of how to interpret remainders.

The student uses a chart to solve the task and to organize and communicate the solution.

$$\begin{array}{r} 1 \\ 30 \\ \hline 315 \\ 30 \\ \hline 345 \\ 90 \\ \hline 435 \\ 90 \\ \hline 525 \end{array}$$

turn	hickles and dimes	feeding the goats feed	money
1	(N) (D)	1	15¢
2	(N) (D)	1	30¢
3	(N) (D)	1	45¢
4	(N) (D)	1	60¢
5	(N) (D)	1	75¢
6	(N) (D)	1	90¢

He go to Bags
see 151.00 He has total