

## Snack Shopping

David was in charge of buying fruit for the club meeting. He asked the members what fruit they would like to have for a snack.

Three club members said they would like an orange. Three club members said they would like an apple, and three club members said they would like a pear. David knew he would like an orange.

David went to the fruit stand and looked at the prices. This is what he discovered:

Oranges sell for \$0.30 each, or a bag of 4 for \$1.00

Apples sell for \$0.25 each, or a bag of 3 for \$0.60

Pears sell for \$0.30 each, or a bag of 3 for \$1.00

David only had \$3.00 to spend, so he wants to spend as little as possible for the fruit. How should David spend his money?

## Snack Shopping

### Suggested Grade Span

Grades 3–5

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

Grade 3

### Task

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### Alternative Versions of Task

#### *More Accessible Version:*

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How many pieces of fruit does David need to buy?

**More Challenging Version:**

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David went to the fruit stand and looked at the prices. This is what he discovered:

	<u>Fruits R Us</u>	<u>Fruit-Mart</u>
Oranges	4 for \$1.00,	1 dozen for \$3.60.
Apples	3 for \$0.60	1 dozen for \$3.00.
Pears	4 for \$1.00	1 dozen for \$2.10.

David only had \$3.00 to spend, so he wants to spend as little as possible for the fruit. How should David spend his money?

**NCTM Content Standards and Evidence**

**Number and Operation Standard for Grades 3–5**

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

- Compute fluently and make reasonable estimates.
  - *NCTM Evidence:* Develop fluency in adding, subtracting, multiplying, and dividing whole numbers;

Develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience.

- *Exemplars Task Specific Evidence:* This task requires students to determine the better buy through application of concepts of division. The task also requires students to arrive at a total cost by adding money most frequently represented in decimal form.

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

This task is considered a short task in that it took my students less than one class period in which to complete it.

**Links**

This task would be good to do before or after snack time. It could also accompany units on consumerism and unit pricing.

### Common Strategies Used to Solve This Task

Many students will create diagrams to represent fruits and their costs. Computation is then used to achieve a final solution.

### Possible Solutions

*Original Version:*

4 oranges, 3 apples, and 3 pears are needed.

Oranges sell for \$0.30 each, or 4 for 25¢ each ( $\$1.00 \div 4$ ). Buying the oranges by the bag is least expensive.

Apples sell for \$0.25 each, or 3 for 20¢ each ( $60¢ \div 3$ ). Buying apples by the bag is least expensive.

Pears sell for \$0.30 each, or 3 for approximately 33¢ each ( $\$1.00 \div 3$ ). Buying pears individually is least expensive:  $30¢ \times 3 = 90¢$

$$\text{Total} = \$1.00 + \$0.60 + \$0.90 = \$2.50$$

*More Accessible Version:*

$$4 + 3 + 3 = 10 \text{ pieces of fruit.}$$

*More Challenging Version:*

Cost Per Fruit

	<u>Fruits R Us</u>	<u>Fruit-Mart</u>
Oranges	25¢	30¢
Apples	20¢	25¢
Pears	25¢	17.5¢

At Fruits R Us buy Oranges ( $4 \times 25¢ = \$1.00$ ) and Apples ( $3 \times 20¢ = 60¢$ )

At Fruit-Mart buy pears ( $17.5¢ \times 3 = 52.5¢$  or 53¢)

$$\text{Total} = \$1.00 + \$0.60 + \$0.53 = \$2.13$$

### Task Specific Assessment Notes

**General Notes:** This task requires students to rely on their knowledge of money and computation to solve a problem. The primary math representation students will use is diagrams. This will assist students in finding the cost per piece of fruit. In practitioner solutions, look for diagrams to be clearly labeled in an effort to communicate with the audience.

**Novice:** The novice will not choose a strategy that will lead to a solution. Little or no engagement in the task will be evident. No awareness of audience will be demonstrated, and no attempt will be made to construct math representations as tools for problem solving.

**Apprentice:** The apprentice will have a strategy that will work for addressing only part of the task. The apprentice may neglect the part of the task asking to use the least amount of money possible, or they may only find for 9 students verses 10. Computation errors could also lead to an incorrect solution.

**Practitioner:** The practitioner will achieve a correct solution that is communicated with the audience, and supported with an adequate mathematical argument. The student may not explicitly state which prices are the “better deal”, but will use the better deals in the solution.


**Expert:** The expert will have a correct solution that is justified and supported by concrete mathematical reasoning. The expert will most likely analyze all costs, and may even provide suggestions and options for how to better spend the money.

### 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.

I have to find out  
 what David will buy  
 for \$3.00

$3 + 3 + 3 + 3 = 12$   
 $\$1.00 \quad \$1.00$   
 $\$2.00$

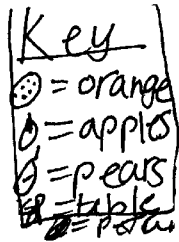

 - my fav'nit  
 fruit

David has the money

The student does restate the task but then demonstrates little or no understanding of how to find a correct solution. No evidence of 10 fruits needed is demonstrated.

It is unclear why the student adds 4 sets of 3 or how \$2.00 is achieved.

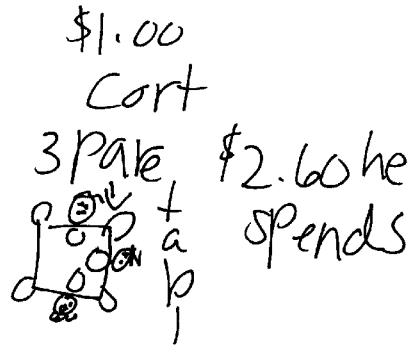
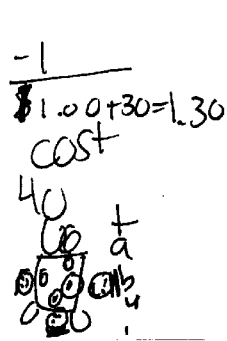
Apprentice



Diagrams are drawn but do not assist mathematically in finding a solution.

I need to find out how much money Pevid will spend. I will make a diagram.

hehe onle had 3<sup>00</sup>



The student has a partially correct solution but neglects to find the least expensive choice.

An attempt is made to communicate with the audience.

Practitioner

I need to find out how much money David will spend. I will make a chart.  
fruit for the club

people	fruit	money	total
4	orange	1.00	2.50
3	Apples	60¢	
3	pear	90¢	

yes David did have  
enough money

A correct answer is achieved. All work is shown. Math language and representations are used to explain and communicate the solution

# Exemplars

## Expert

to find out how much money I need. I will spend. I will make a chart

fruit	number	cost	too much
oranges	4	\$1.00	<del>1.20</del>
apples	3	\$.60¢	but has enough
Pears	3	.90¢	<del>1.20</del> \$2.95
		total	
		\$2.50	.50 left for 2 apples
		1.00 +.66 .90 ----- 2.50	

A correct answer is achieved. All work is clearly shown. The solution is displayed in a chart.

The student compares the 2 different fruit costs and determines which is "the best". The student makes a relevant comment about the amount left and how it could be spent.