

Notes for parents (1).

The purpose of the activity is to help your child to:

- Work within a budget
- Multiply and add decimals

Here is what to do:

It will be wise to have a calculator handy for tricky calculations. However, expect your child to estimate the cost of a piece of cheese before using the calculator.

Read the problem statement together and discuss what is required.

How much do you have to spend on the cheeses?

Your child should notice that $\$30.00 - \$5.00 = \$25.00$ is available.

How much weight of cheese in total will you be able to buy?

The prices of the cheeses vary but $\$20.00$ is a reasonable average. Expect your child to estimate that they can buy a bit over 1 kilogram, unless they opt for cheaper or dearer cheeses than the average.

How many grams are in 1 kilogram?

They should know that 1000 grams equals 1 kilogram ('kilo' means one thousand).

About how many grams can you buy?

1200 grams is a good amount. Expect your child to allocate this weight among different cheeses. For example, they may decide that 200 grams of each cheese will work. You might ask how much cheese that is and visit the refrigerator to check. 200 grams is a good-sized piece for people to cut from.

However, encourage them to go for different weights to make the problem more challenging. After all Blue Vein is not everyone's cheese of choice.

How will you work the cost of each piece of cheese?

How will you keep track of the total cost?

Calculating the cost of each piece requires multiplication of the weight, as a decimal of 1 kilogram, and the cost per kilogram. For example, a 250 gram slice of Gouda costs $0.25 \times \$25.6$. Ask your child to estimate the cost before using a calculator. For example, 250 grams is one quarter of a kilogram, so the cost should be about one quarter of $\$26.00$ which is $\$4.50$. Establish some benchmarks to estimates, such as 200 grams is one fifth of a kilogram, 500 grams is one half, etc. Even after using the calculator ask if the cost looks reasonable. It is easy to make entry errors on a calculator and not notice.



Notes for parents (2). Activity next page.

It is unlikely that the total cost of the cheese will be exactly \$25.00. If the total is too high then your child will need to adjust what they are buying.

What can you do to be within the budget?

They could reduce the weight of one or more cheeses or swap an expensive cheese for a cheaper one. Before totalling the cost of the various cheeses ask your child if they think they are within the budget. Look for:

Do they 'give and take' among the costs to see if the balance is below the average?

Do they round amounts up and down appropriately to estimate the total cost?

Points to note:

Children often find operations on decimals difficult because they inappropriately apply rules they learn for whole numbers. Contexts, such as the cheese story, are very helpful for children to learn what is reasonable. For example, 0.1 kilograms at \$21.95 cannot be $0.1 \times 21.95 = \$210.95$ as the price is unreasonable.

It is important for children to link decimals to fractions when estimating. The development of benchmarks is very useful. 500 out of 1000 is equivalent to one half and can be written as 0.5, so 250 out of 1000 equals one quarter and can be written as 0.25. 100 grams is one tenth of 1000 grams so can be written as 0.1, so 200 grams must be 0.2 of a kilogram, 300 grams must be 0.3 kilograms, etc.

Questioning children using these benchmarks helps to develop their decimal number sense. Suppose a child wants to buy 300 grams at \$23.15.

What fraction of 1 kilogram is 300 grams?

How is that fraction written as a decimal?

What would 0.1 kilograms cost?

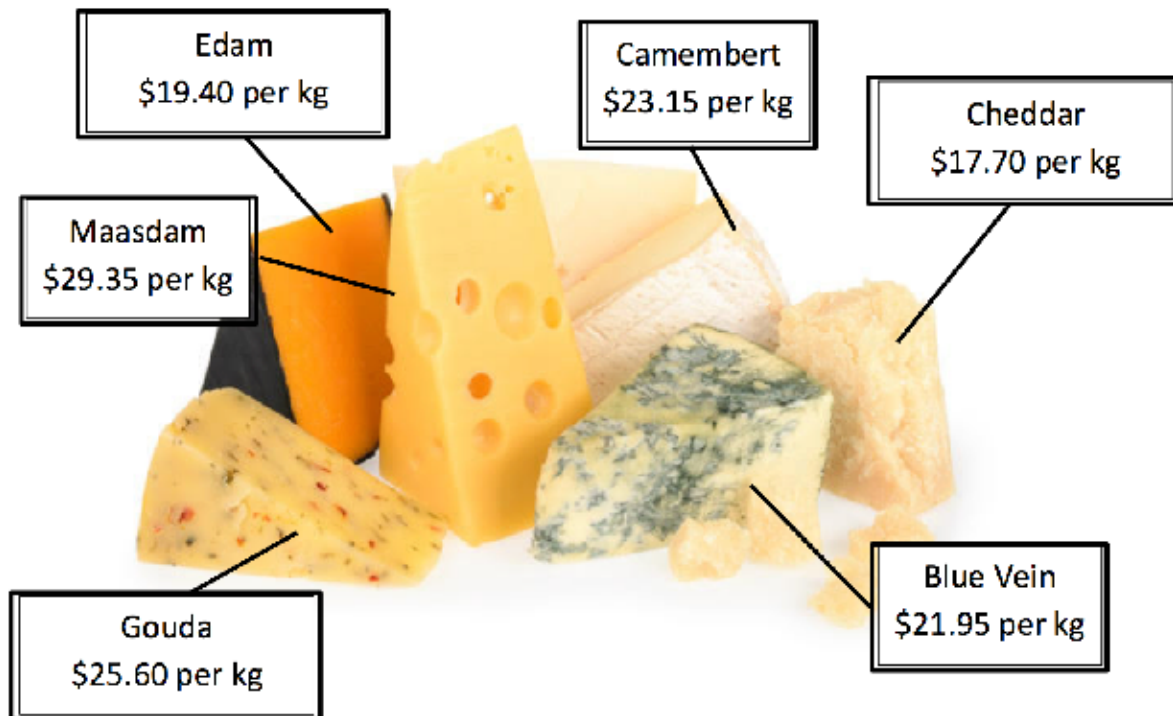
Therefore, what would 0.3 kilograms cost?

Rounding is also an important skill for estimation. Children need to decide on the degree of rounding. Rounding each price to the nearest dollar makes calculation easier but increases the error in the calculation. This will be especially true if more amounts are rounded down rather than up, or vice versa. It might be better to round prices like \$19.40 and \$25.60 to the nearest half a dollar. One way to reduce the error is to balance the rounding, for every amount rounded down find a matching amount to round up, e.g. \$29.35 with \$17.70.



New Zealand makes some of the best cheese in the world.

Here are some of the cheeses you can buy.



You are having friends and relatives around for dinner.

The budget for a cheeseboard is \$30.00. The crackers will cost \$5.00.

How many grams of each cheese will you buy?