

Loads of Sugar

Purpose:

The purpose of this activity is to engage students in using mathematical strategies to solve a measurement problem in context.

Achievement Objectives:

NA3-1: Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages.

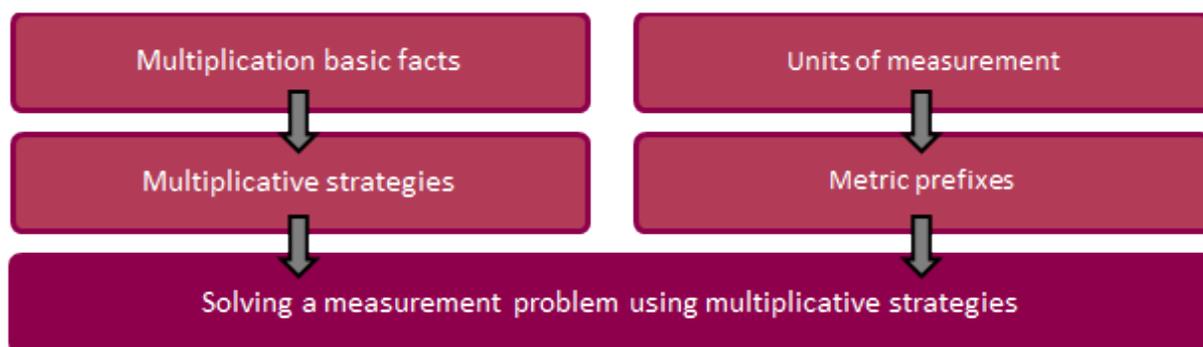
NA3-4: Know how many tenths, tens, hundreds, and thousands are in whole numbers.

NA3-6: Record and interpret additive and simple multiplicative strategies, using words, diagrams, and symbols, with an understanding of equality.

GM3-1: Use linear scales and whole numbers of metric units for length, area, volume and capacity, weight (mass), angle, temperature, and time.

Description of mathematics:

This activity could be included in a thematic study, for example, of nutrition, junk food, marketing and food labels. The background knowledge and skills that should be established before and/or during this activity are outlined in the diagram below:



Multiplication basic facts

What do five lots of seven make?

Multiplicative Strategies

If it takes eight people can lift a stack of four crates, how many people are needed to lift just one crate?

Units of measurement

Which of the following are used to measure volume?: kg, mL, km, m², m³, L

Metric prefixes

Convert 4.8 L into mL

Solving a measurement problem using multiplicative strategies

The volume of twelve scoops of icecream is 360 mL. What is the volume of five scoops?

This activity may be carried out with step by step guidance, or by allowing the student to follow their

own method of solution. The approach should be chosen in sympathy with students' skills and depth of understanding.

Activity:

A year 6 class is studying healthy foods and wants to show, at a school assembly, how bad sugary drinks are.

The class has found out that sugar makes up one tenth of the volume of a popular soft drink.

The class plans to ask each of the 600 students in the school to bring in their drink bottles filled with the same amount of water as a 500 mL (half a litre) soft drink bottle holds. This is so that the class can tell the school it is just as well they have water in the bottles because, if they had a soft drink...what a huge lot of sugar they would all be consuming.



They will have on stage, the volume of sugar that would be in all of the drink bottles if they contained the sugary soft drink rather than water. The sugar will be placed in 2 L icecream containers.

How many icecream containers will they need?

The procedural approach

The student is able to solve a context-based rates problem, measurement multiplicative strategies with guidance.

Prompts from the teacher could be:

1. How many mL of the 500 mL in each drink is sugar?
2. How much sugar is in all of the schools drinks (600 drinks)?
3. There are 1000 mL in one litre (L). How many litres of sugar would be in all of the school's drinks?
4. How many 2 L containers would it take to hold this much sugar?

T: Can you talk me through each step?

S: "x 600" is to times the sugar by the number of kids with drink bottles.

"÷ 1000" is to change 30 000 millilitres to 30 litres.

"÷ 2" is to work out how many 2 litre containers for 30 litres.

$\frac{1}{10}$ of 500 mL = 50 mL

$\times 600 = 30\,000$ mL

$\div 1000 = 30$ L

$\div 2 = 15$

$5 \times 6 = 30$
0 0
0

T: I'm interested in this working here.

S: I was timesing 50 by 300 and I knew 5 times 6, so I just collected up the zeros that came after that to get 30 000.

The conceptual approach

The student is able to solve a context-based measurement problem, using multiplicative strategies.

Prompts from the teacher could be:

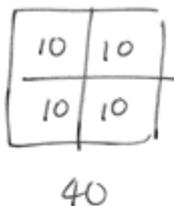
1. Think about how much sugar is in each drink. This might be measured in mL.
2. What if each of the 600 students had one of those drinks. How many mL of sugar would this be?
3. Think about how much sugar each container will hold, in L and in mL.
4. Use your responses to (2) and (3) to work out how many containers would be needed to hold all the sugar.

T: This is interesting; how you've set these diagrams up.

S: They are pictures of ice cream containers. I was working out how many times 0.5 litres fits into a container.



Sugar = $\frac{1}{6}$ so 10 0.5L bottles have 0.5L sugar.



T: And what is this diagram?

S: One tub fits four lots of the sugar in ten drinks.

T: Then you used this to work out how many containers...?

S: Yeah, I found out how many 40s in 600.

how many 40's in 600?

how many 4's in 60? 15

$$\begin{array}{r} / \\ 40 + 20 \\ / \quad | \\ 10 \text{ 4's} + 5 \text{ 4's} \end{array}$$

Answer:
15 icecream
containers of
sugar