

WiFi units

Purpose:

The purpose of this activity is to engage students in using strategies for sharing and for rates to solve a measurement problem in context.

Achievement Objectives:

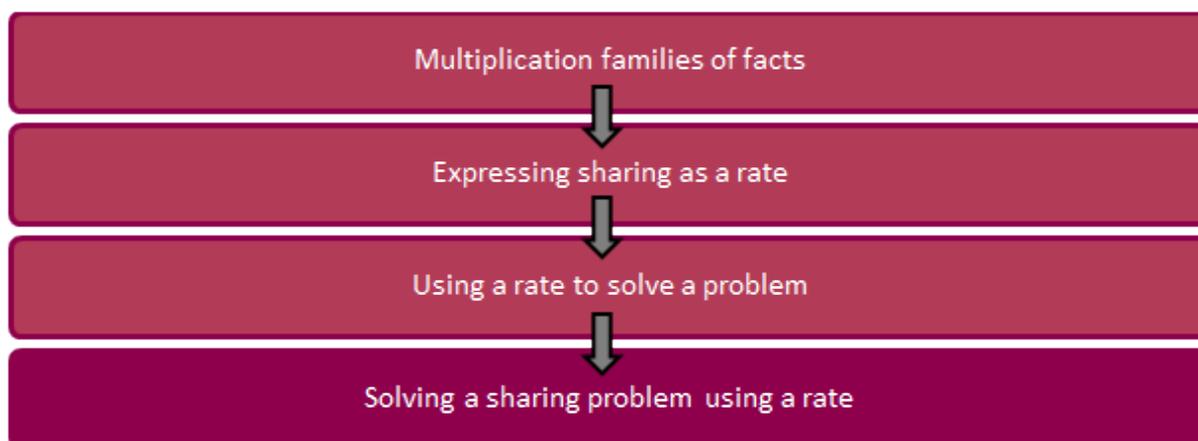
NA3-1: Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages.

NA3-2: Know basic multiplication and division facts.

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

Description of mathematics:

The background knowledge and skills that should be established before and/or during this activity are outlined in the diagram below:



Multiplication families of facts

How many sixes are in 42?

Expressing sharing as a rate

If eight children share 56 marbles, how many marbles per child will there be?

Using a rate to solve a problem

A pack of marbles are shared out so that there are 12 marbles per child. How many marbles are needed for 5 children?

Solving a sharing problem using a rate

There are 6 apples per bag. If Sharon buys 3 bags of apples to give one each to the 14 teachers at her school, how many apples will she have left over?

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 school is setting up a WiFi system for a block of three classes.

The units they are installing are advertised as allowing four people to each use two devices at once.

Each of the three classes have 23 students and a teacher.

If everyone is limited to just using one device at a time, how many units are needed to service the three classes?



The arithmetic approach

The student is able to calculate using a rate to solve a sharing problem.

Prompts from the teacher could be:

1. A single WiFi unit supports four people using two devices each. How many devices does a unit support?
2. How many devices will need to be supported?
3. How many WiFi units will be needed?

8 devices per unit

3 classes - 23 students + 1 teacher

$$\begin{array}{r} 3 \\ \times 24 \\ \hline 72 \\ 0 \\ \hline 72 \end{array}$$

9 units

The student's work is on a grid background. The calculation shows 3 multiplied by 24, resulting in 72. The word 'units' is written in a large, cursive font and circled in blue.

T: You've written two facts to start with.

S: Yes, that's the question written my way. Four people with two devices is the same number of devices as eight people with one. Then I needed to think about how many people in the classes.

T: That's what you've calculated?

S: Yep, 72 people.

The conceptual approach

The student is able to use imaging to solve a sharing problem.

Prompts from the teacher could be:

1. How many devices will need to be supported? Show this on a diagram.
2. A single WiFi unit supports four people using two devices each. How many devices does a unit support? Show this on your diagram.
3. How many WiFi units will be needed?

