Deliveries

Purpose:

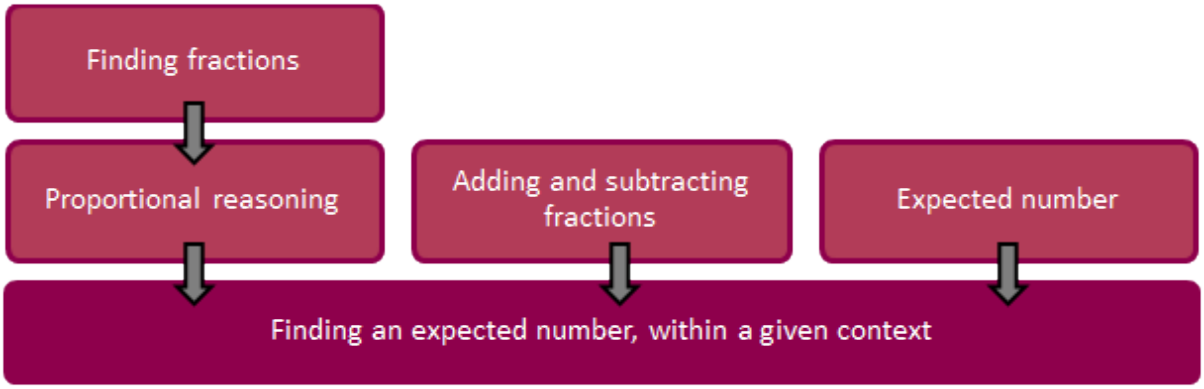
The purpose of this activity is to engage students in solving a problem involving probability, proportional reasoning and expected number, within context.

Achievement Objectives:

S4-4: Use simple fractions and percentages to describe probabilities.

Description of mathematics:

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



Finding Fractions

Seventeen out of 68 people prefer to read the news online. Express this proportion as a fraction.

Proportional Reasoning

It takes three men two hours to prepare the soil in a garden for planting. How long would it take three men to do the same job?

Adding and Subtracting Fractions

If 1/4 and 1/3 of a pizza is eaten, how much remains?

Expected Number

The probability of winning a particular game of chance is 1/6. How many games would you expect to win if you played 30 games in a row?

Finding an expected number, within a given context.

Harry and his sister Sally always flip a coin for who has to do the dishes each night. If Harry always chooses heads, how many times can he expect to wash the dishes each week? (In this context, the expected number must be a whole number, so the student will need to choose how they will treat their calculated value.)

In approaching this activity, the students will need to make assumptions. Making different assumptions will mean that their final solutions are not likely to be exactly the same. The students might need to be reassured that this does not mean any solution is wrong, rather that it fits a different interpretation of the context. When discussing the assumptions the students will need to

make, there is an opportunity to discuss the practicalities of the context and how mathematical calculations can be used to guide rather than dictate our actions.

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:

Janet has an after school job delivering flyers and the local advertiser (free newspaper).

She has a total of 126 letterboxes to deliver to with different combinations of no circulars, advertiser only and ones happy to take anything.

So that she doesn't have to carry extra weight, Janet has recorded how many of each type of letterbox on her delivery route.

Takes flyers and advertiser	63
Advertiser only	42
No Flyers, no advertiser	21

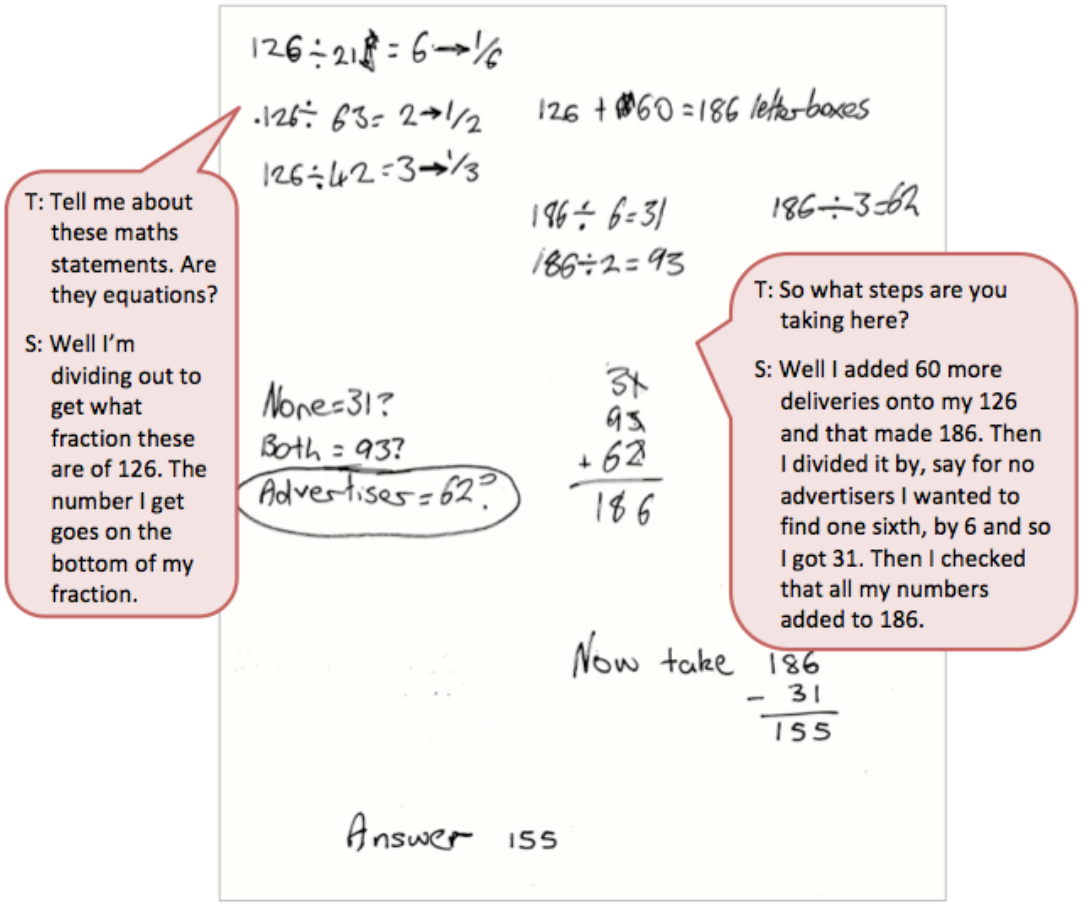
If her delivery route is extended to include a further 60 letterboxes, how many advertisers should she expect to deliver?

The arithmetic approach

The student is able to calculate proportions and to use these to solve and expected number problem, with guidance.

Prompts from the teacher could be:

1. What proportion of the 126 letterboxes require advertisers?
2. What proportion of the new 60 letterboxes would you expect to require advertisers?
3. How many advertisers should Janet carry?



The conceptual approach

The student is able to calculate proportions and to use these to solve and expected number problem.

Prompts from the teacher could be:

1. What do the numbers in the table tell you about Janet's deliveries?
2. How can you use the breakdown of the 126 current letterboxes, to predict what the new 60 will want?
3. How many advertisers in total should Janet carry?
4. Is your answer practical for Janet?