

## A Share of the Spoils

### Purpose:

The purpose of this activity is to engage the students to use their knowledge of fractions and additive strategies to complete a whole.

### Achievement Objectives:

NA2-5: Know simple fractions in everyday use.

NA2-6: Communicate and interpret simple additive strategies, using words, diagrams (pictures), and symbols.

### Description of mathematics:

In readiness for this problem, the students should have familiarity with each of the following components of mathematics. The problem may be solved with different combinations of these components.

- Recognise simple fractions
- Use a fraction to represent a proportion
- Partition whole numbers
- Express a whole number as a sum of simple fractions
- Find fractions of a quantity - by shading a diagram
- Find fractions of a quantity - using number

This activity may be carried out with 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 pirate shares some of his treasure.

He gives  $\frac{1}{4}$  to the cabin boy,  $\frac{1}{4}$  to his first mate and  $\frac{1}{3}$  to the girl who feeds his parrot.

How much of his treasure does the pirate have left?



## The arithmetic approach

The student is able to use whole numbers to model a situation in order to solve a problem involving fractions.

Prompts from the teacher could be:

1. Has the pirate given away all of his treasure?
2. Try a number that could represent how much treasure is to be shared.
3. What value would represent  $\frac{1}{4}$  of the treasure?
4. What value would represent  $\frac{1}{3}$  of the treasure?
5. If your number doesn't give a tidy answer for  $\frac{1}{4}$  or  $\frac{1}{3}$ , then try another number that can.
6. How much of that number has the pirate given away?
7. How much is left over?
8. What fraction of the treasure has the pirate kept?

Say \$100  $\frac{1}{4} = \text{half of } 50 = 25$   
 $\frac{1}{3} = ?$

Say \$300  $\frac{1}{3} = 100$   $\frac{1}{4} = 25 + 25 + 25 = 50 + 25 = 75$

He Shares out  $100 + 75 + 75 = 100 + 150$   
 $= 250$

He gets \$50

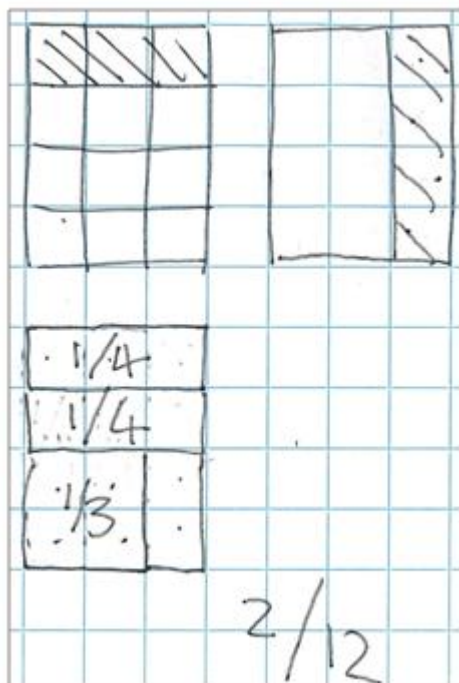
50 is half of  $\frac{1}{3}$  of \$300  
So the Pirate gets  $\frac{1}{6}$

## The procedural approach

The student is able to use shading to add fractions and to find the remainder of a whole.

Prompts from the teacher could be:

1. This problem could be solved by shading fractions on a diagram. How many squares should you draw if you need to neatly shade in  $\frac{1}{4}$ ?
2. How many squares should you draw if you need to neatly shade in  $\frac{1}{3}$ ?
3. How many squares should you draw if you need to shade in  $\frac{1}{4}$  and also  $\frac{1}{3}$ ? Draw a grid with this many squares.
4. Shade in the squares that represent the fractions of the treasure that the pirate gives away.
5. How many squares are left unshaded?
6. What fraction of the treasure does the pirate have left after sharing?



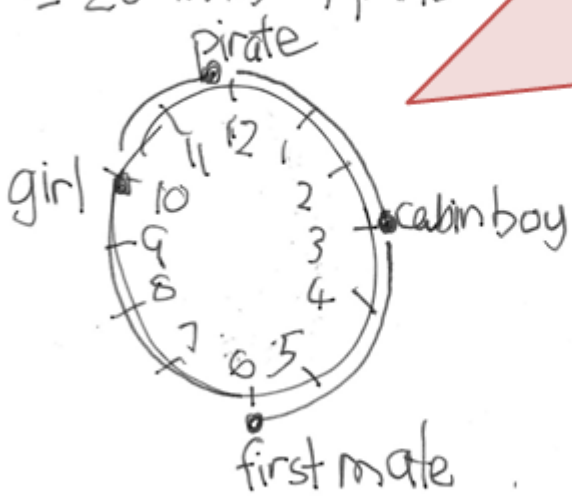
## The conceptual approach

The student is able to find and use a method to solve a problem involving fractions.

Prompts from the teacher could be:

1. How can you find how much of his treasure the pirate gives away?
2. How might you add these fractions,  $\frac{1}{3}$ ,  $\frac{1}{4}$  and another  $\frac{1}{4}$ ?
3. How much of the pirate's treasure does he have left after sharing?

$\frac{1}{4} = 15 \text{ mins} = 3 \text{ parts}$   
 $\frac{1}{3} = 20 \text{ mins} = 4 \text{ parts}$



T: I see you have used a clock face to solve this problem.  
S: Yeah 'cos we usually do pizza which I can cut up in thirds of quarters but to count wat was left over it was better to have the clock numbers.  
T: How did you use those 12 numbers?  
S: Well I know that quarter of an hour goes to the 3 o'clock so it's 3 parts. Like that.

Pirate gets  $2 / 12 \text{ parts} = 1/6$