

# Broken Sparkles

## Purpose:

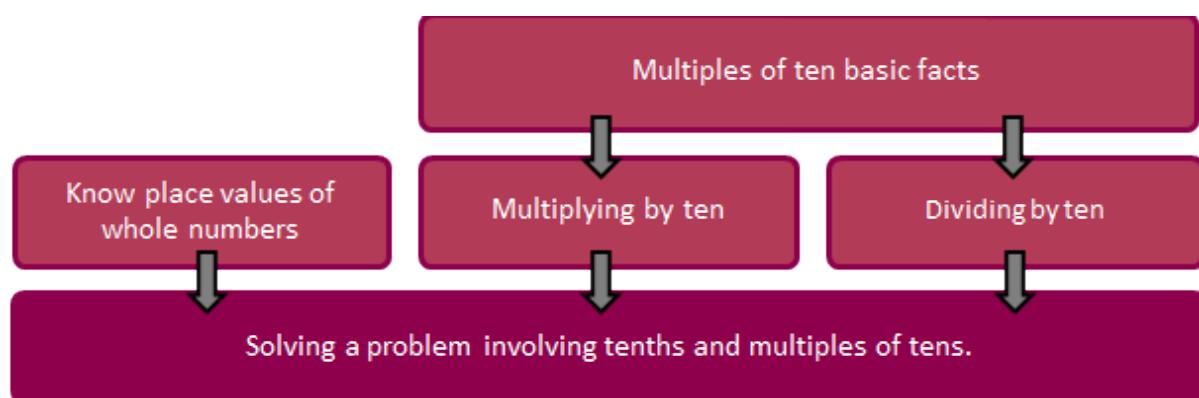
The purpose of this activity is to engage students in recognising place value and using knowledge of multiplying and dividing by multiples of ten to solve a problem.

## Achievement Objectives:

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

## Description of mathematics:

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



### Know place values of whole numbers

What is the value of the 4 in the number 5 490?

### Multiples of ten basic facts

Give the next three numbers and the name of this sequence: 10, 20, 30, 40, ....

### Multiplying by ten

What is ten lots of 563?

### Dividing by ten

Find one tenth of 563.

### Solving a problem involving tenths and multiples of tens

A newspaper reported a crowd of 2 600 attended a concert. The concert organisers actually printed 3 000 tickets and had 425 remaining unsold.

- How many people actually attended the concert.
- Did the reporter round the crowd size to the nearest ten, hundred or thousand?

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:**

Sparkles were a very popular form of boiled lolly, last century, that came in packs of ten.

To celebrate days gone by, a museum is giving out a packet of 'sparkles' to one in every ten of its next five hundred visitors.

If one tenth of all of the sparkles are broken, how many broken sparkles are given out altogether?



## The procedural approach

The student is able to use appropriate calculations, with guidance, to solve a problem based on place value.

Prompts from the teacher could be:

1. How many visitors will get a pack of sparkles?
2. How many sparkles are broken in each pack?
3. How many sparkles are broken altogether?

500 Visitors

One in ten is 50

50 get ten sparkles with one in ten broken = 1 each

Answer 50

T: I see you've listed each step in your thinking. Did you have to do any calculations to get these values ... like "one in ten is 50"?

S: Yeah, but it's just timesing or dividing by ten ... just moving the columns the numbers are in ... so I did that in my head.

## The conceptual approach

The student is able to use appropriate calculations, with guidance, to solve a problem based on place value.

Prompts from the teacher could be:

1. List the key facts given in the problem.
2. How many sparkles are given out?
3. If one tenth are broken, how will you calculate this?

T: Tell me about why you've divided by ten here.

S: I wanted to find out one tenth of 500, so I divided by ten, that's the same as taking one tenth of it.

T: And you've set this out like an algorithm.

S: That's just how I wrote it, but really I just know that dividing by 10 just means knocking everything down one place.

T: So the place value of the 5 was...?

S: Hundreds and then it went down to tens.

NA3-4,

$10 = \text{Pack}$

$1:10 \text{ gets pack}$

$\frac{1}{10} \text{ are broken}$

$$\begin{array}{r} 500 \\ \div 10 \\ \hline 50 \end{array} \text{ ppl get a pack}$$

500 sparkles given out

$\div 10 = 50 \text{ broken all together}$

Three different notations,  
 $\div 10$ ,  $1:10$ , and  $1/10$   
all used interchangeably