

# Expected or observed?

NAMES \_\_\_\_\_

CLASS \_\_\_\_\_

## YOUR BAG

Your bag holds 4 counters: 2 RED, 1 BLUE, 1 GREEN.

You will draw a counter 40 times, putting it back every single time.

## Part A · Before you draw anything

Fill in the probability and expected columns FIRST. Do not draw a counter yet.

| COLOUR | PROBABILITY | EXPECTED<br>out of 40 | OBSERVED | DIFFERENCE<br>observed – expected |
|--------|-------------|-----------------------|----------|-----------------------------------|
| RED    |             |                       |          |                                   |
| BLUE   |             |                       |          |                                   |
| GREEN  |             |                       |          |                                   |
| TOTAL  |             |                       |          |                                   |

## HOW TO FIND THE EXPECTED NUMBER

Method 1 — divide, then multiply.  $40 \div 4 = \underline{\hspace{2cm}}$ , then  $\times 2 = \underline{\hspace{2cm}}$  for red.

Method 2 — decimal first.  $2 \div 4 = \underline{\hspace{2cm}}$ , then  $\times 40 = \underline{\hspace{2cm}}$  for red.

Use a calculator for the dividing if you need one.

## Part B · Now draw

Tally every draw. Put the counter back each time.

RED

BLUE

GREEN

Now go back and fill in the OBSERVED and DIFFERENCE columns in Part A.

## WORKING SPACE

# Expected or observed?

## Part C · Show your thinking

SF

**1. A bag has 8 counters. 3 are red. You draw 40 times.**

How many reds do you expect? Show your working.

CF

**2. You expect 15 blues out of 60 draws.**

What is the probability of drawing a blue? Explain how you worked it out.

CF

**3. Look at the DIFFERENCE column in Part A. Add the three numbers together.**

What do you get? Why must that always happen?

### GOING FURTHER

- A different bag holds 7 counters: 1 red, 2 blue, 4 green. You draw 40 times.  
Work out the expected number for each colour. None of them is a whole number.
- What does an expected frequency of 5.71 mean, when you cannot draw 0.71 of a counter?
- Add your three expected numbers together. What do you get? Why must that happen?

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## Exit ticket

Hand this in at the end of the lesson.

### THE SPINNER

A spinner has 5 equal sections. 2 of them are shaded.  
You spin it 30 times.

#### 1. How many times do you expect it to land on shaded?

Show your working.

#### 2. Sam spun it 30 times and it landed on shaded 9 times.

Did Sam make a mistake? Explain.

#### 3. Sam says "the probability of shaded is 9 out of 30".

Is Sam right? Explain your answer.