Superbeans

You need
- 30 multilink cubes, counters, or beans (10 each of yellow, blue, and red)
- a paper bag
- classmates

Activity One

1. When you toss two coins together, what are the *possible* outcomes?

   a. Copy and complete the table below and use it to answer the rest of question **1**:

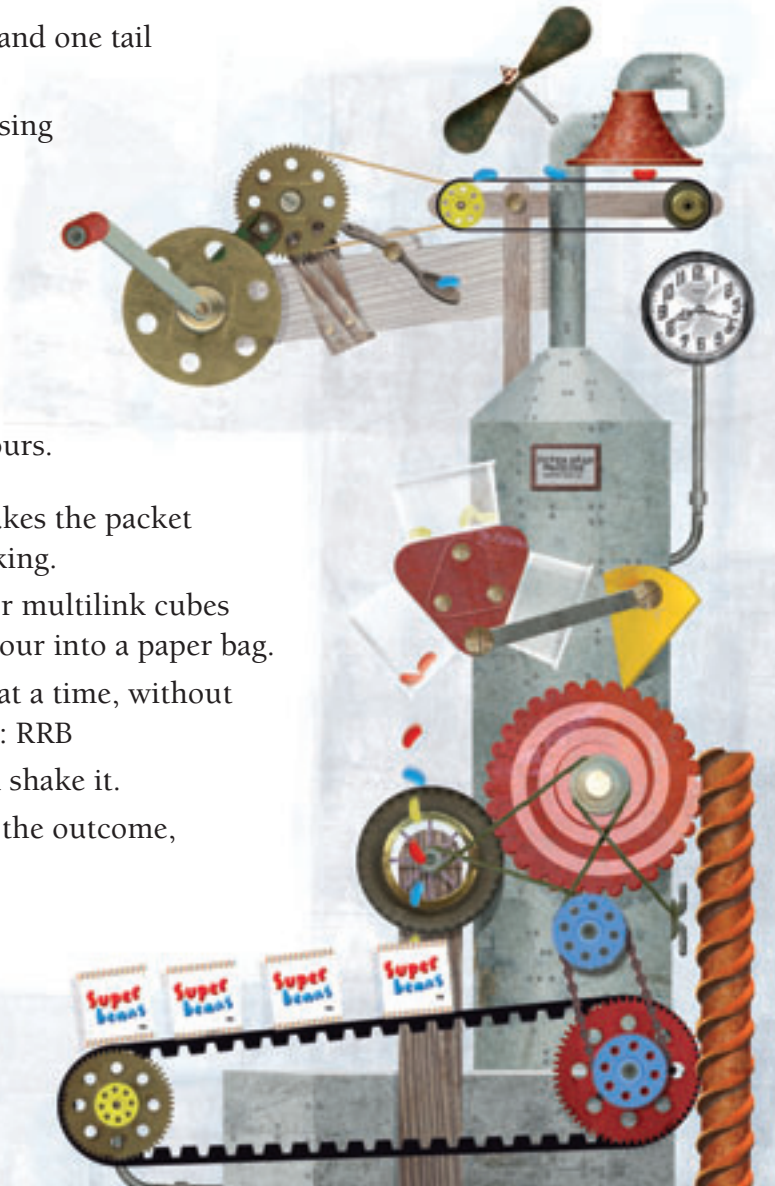
		Coin A	
		H	T
Coin B	H	HH	
	T		

   b. If you toss the two coins only once, how many different results (outcomes) are possible?

   c. Use your table to work out the chance of getting two heads.

   d. What is the chance of getting one head and one tail (*in any order*)?

   Use what you have learnt from this coin-tossing activity to help you with **Activity Two**.



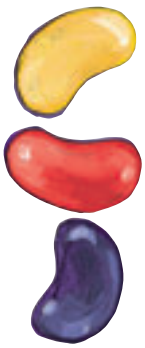
Activity Two

Ngaio has invented a Superbean machine. Her machine makes Superbeans coloured yellow, blue, and red and puts them into packets. Each packet contains the same number of all three colours.

1. Investigate what Ngaio can expect if she shakes the packet and takes 3 Superbeans from it without looking.

   Use yellow, blue, and red counters, beans, or multilink cubes to represent Superbeans. Put 10 of each colour into a paper bag.

   - Take 3 Superbeans out of the bag (one at a time, without looking). Record the outcome like this: RRB
   - Put the Superbeans back in the bag and shake it.
   - Take out another 3 Superbeans, record the outcome, and return them to the bag as before.
   - Do this 20 times.



2. a. For how many of the 20 trials were all 3 Superbeans a different colour? Write a statement about this.

b. How often were all 3 Superbeans the same colour? Write a statement about this.

c. How often were just 2 of the Superbeans the same colour?

3. a. In groups of up to four classmates, combine all your results to get a bigger data set. Put these results in a table.

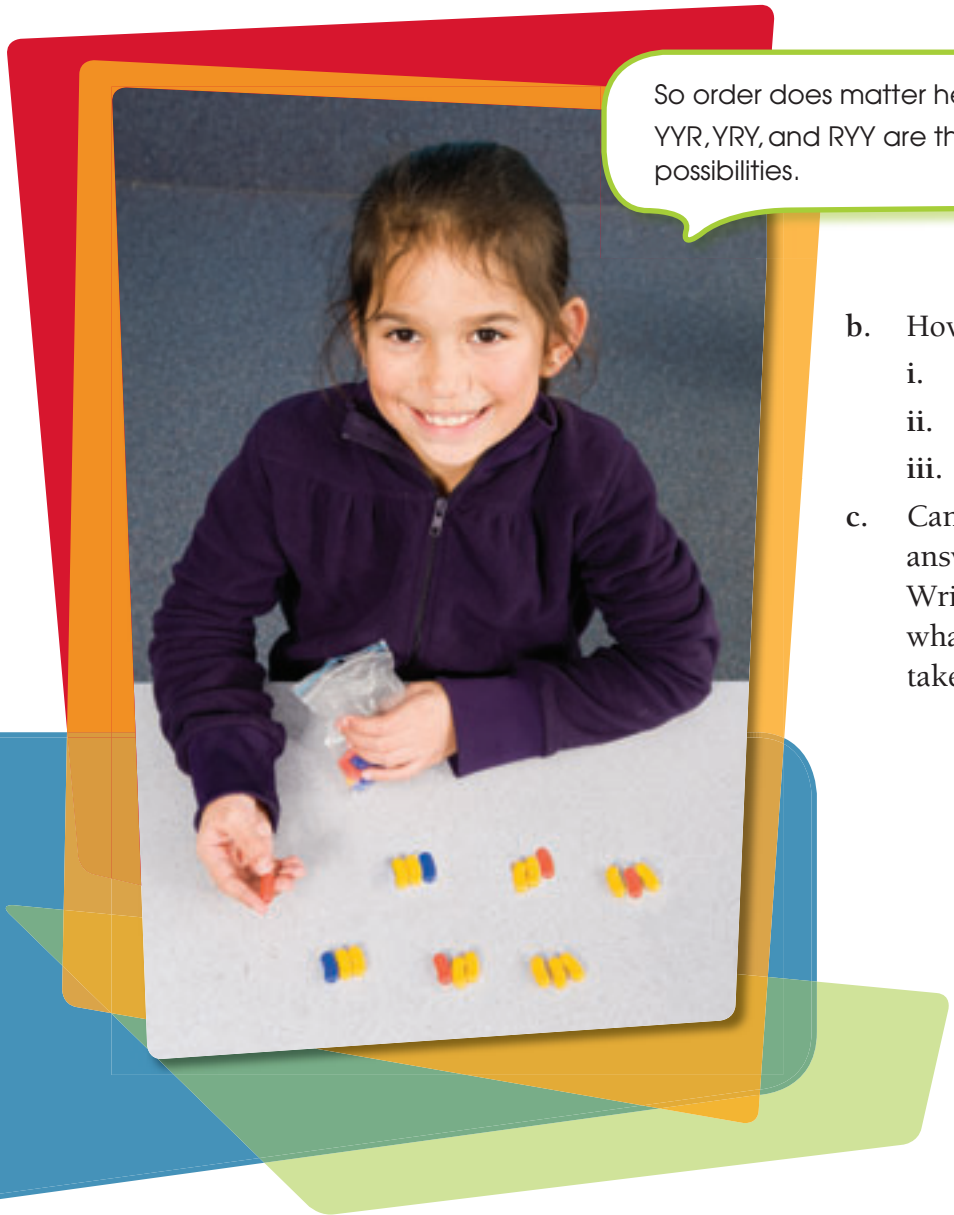
i. For how many of the outcomes were all 3 Superbeans a different colour?

ii. How often were all 3 Superbeans the same colour?

iii. What comments can you make now?

b. Which of the outcomes from your group's table would you describe as "most likely" and "least likely"? Write one or two sentences to describe what Ngaio might expect when she takes 3 Superbeans from her packet.

4. a. List every possible arrangement of Superbean colours. For example: YYY, YYR, YYB, YRY, RYY, BYY, …



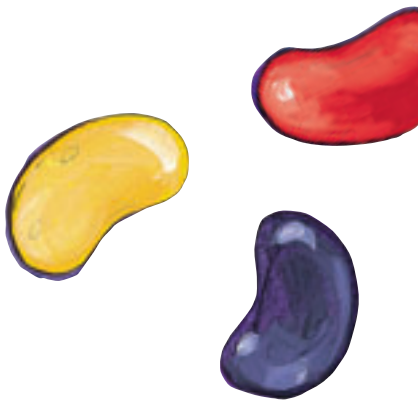
b. How many of these arrangements are:

i. all the same colour?

ii. all different colours?

iii. just 2 different colours?

c. Can you now use this information to answer question **3b** more precisely? Write some new sentences to describe what Ngaio might expect when she takes 3 Superbeans from her packet.



Focus Exploring probability experimentally and by listing outcomes