Statistics

Series C – Statistics

Contents

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Statistics – collecting and representing data

Data is information. We collect data to help us find out about the world. We organise and display the data so that we can look at it easily and learn more.

1 Look at this group of people.
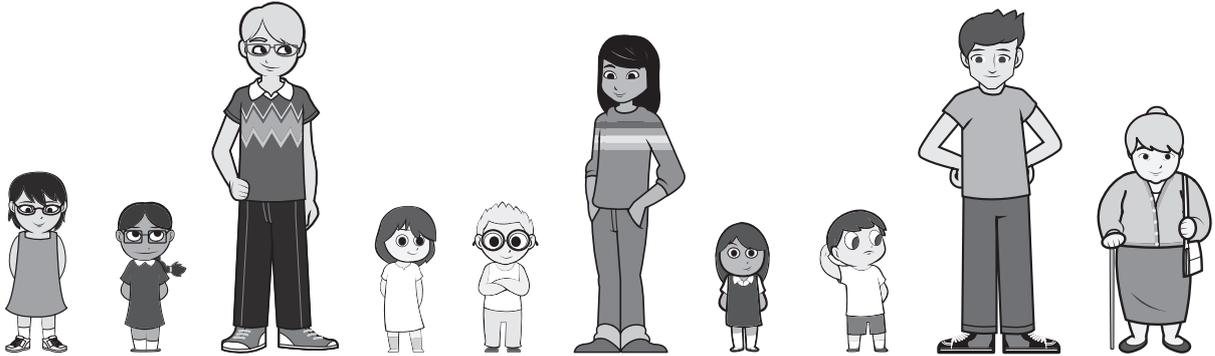
a What data can we collect about this group of people from the picture?

- there are 4 males and 6 females

b What data could we find out about these people if we ask them questions?

- who likes to eat chocolate
- what languages they speak at home

Statistics – collecting and representing data

> We can sort data in different ways. How we sort it depends on what information we are looking for.

1 Cut out the animals below. Sort them into 2 different groups or categories. Record your group headings here.

2 Now sort them into 3 different groups or categories. Record your headings here.

3 By sorting the data differently, did you find out different information?
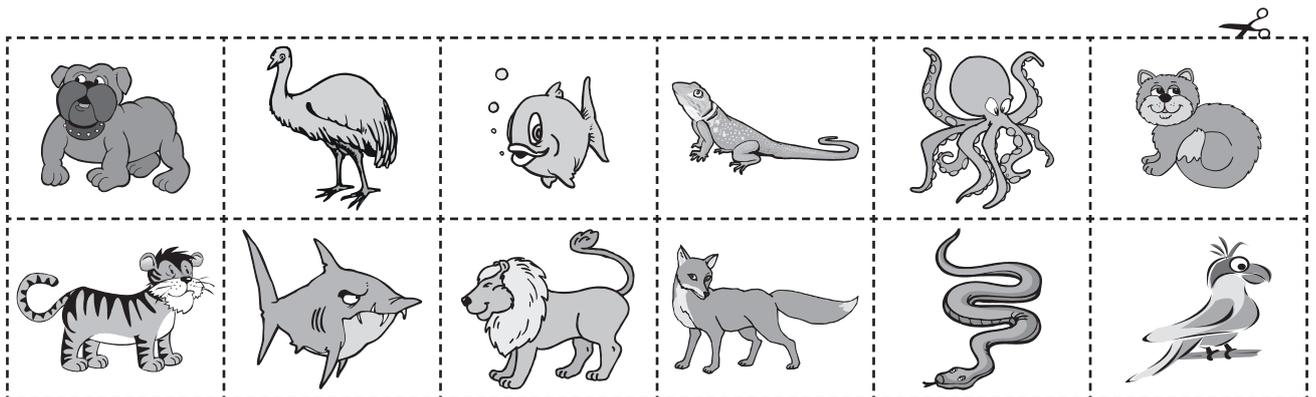
Statistics

Statistics – collecting and representing data

We often find out data by asking questions. We call this conducting a **survey**. We have to design the questions carefully to get the information we need.

1 William's coach has said the team can go either to the beach, to the movies or bowling for their end of season party. It is William's job to find out which is the most popular choice.

a William has thought of 2 possible questions. Are they the right questions to ask? Give him some feedback.

Question 1

'Would you prefer to go to the movies or go bowling for our party?'

Question 2

'What would you like to do for our end of season party?'

b Design a question that will give William the data he needs.

Statistics – collecting and representing data

One way to collect data is to use beads, blocks or counters to record the answers people give us.

You will need: your classmates   beads and two strings OR blocks

What we want to find out:

Let's imagine we want to find out who has brothers and who hasn't. What question would we ask? Write it here.

....

What to do:

Collect the answers. Hold a string in each hand and decide which side will be brothers and which will be no brothers. Give a bead to each person and ask them the question. Ask them to put a bead on the right string.

....

What to do next:

Count the beads on each string and record the results below.

Now we know that:

☐ people have brothers

☐ people do not have brothers

Statistics

Statistics – collecting and representing data

We can use tally marks to record data as we collect it. We make a mark like this **|** as we count or receive answers.

We show 5 like this **||||**. This makes it faster to count because we can count in 5s.

How many marks are here? ~~||||~~ ~~||||~~ | | 12
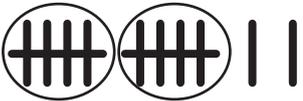
5,   10,   11, 12

1 How many cats are here? Each time you count a cat, make a tally mark.
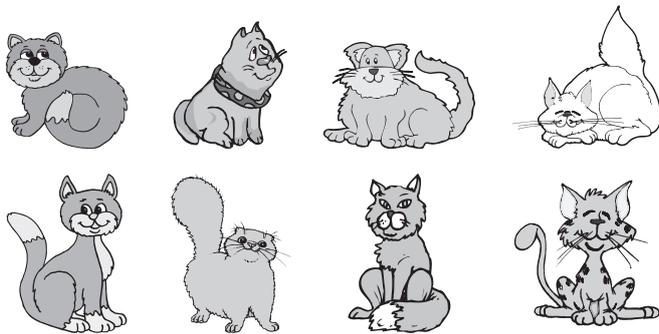
2 How many dogs are here? Each time you count a dog, make a tally mark.
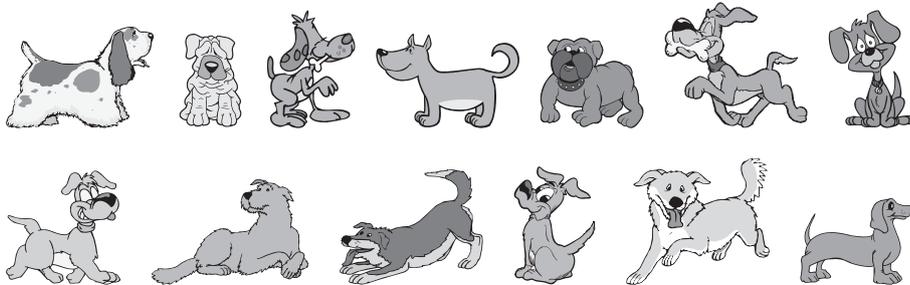
3 The tally marks show how many fish are in the pond. Draw the fish to match.
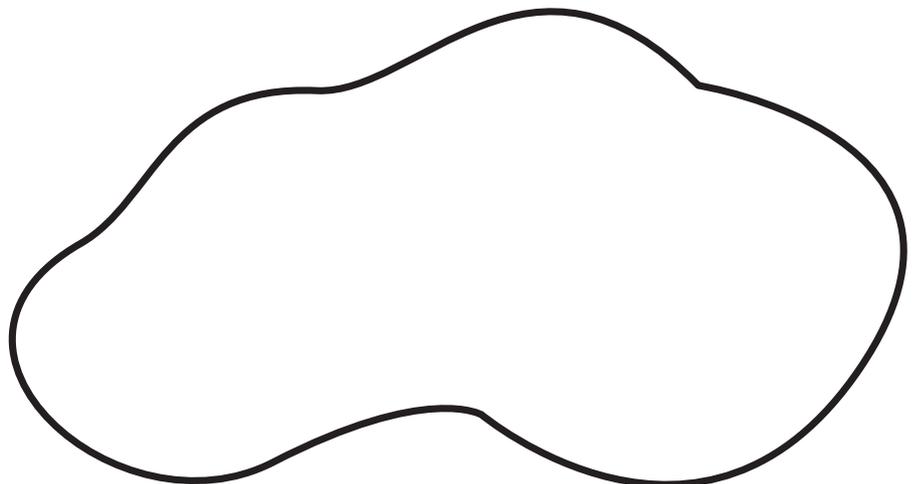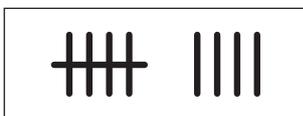
~~||||~~ ||||

Statistics – collecting and representing data

What to do:

Work with your partner to design a question to ask people about what they prefer to eat, do or play. Give people **3 choices**.

Plan your question here.

Write each choice at the top of a column.

Ask 10 people your question and record each answer with a tally mark in the correct column.

....

What to do next:

Write 2 pieces of information you learned from this survey.

Statistics – collecting and representing data

We can represent data in many different ways. We often use graphs as they make it easy to see and understand information. One kind of graph is a bar chart.

1 Students in 2G conducted a class survey to find out what class pet they should get.

ⅢⅢ	ⅢⅢ II	II	III

They decided to show this information on a bar chart and present the chart to their class teacher.

a What should the title of the chart be? Write it in the box at the top of the chart.
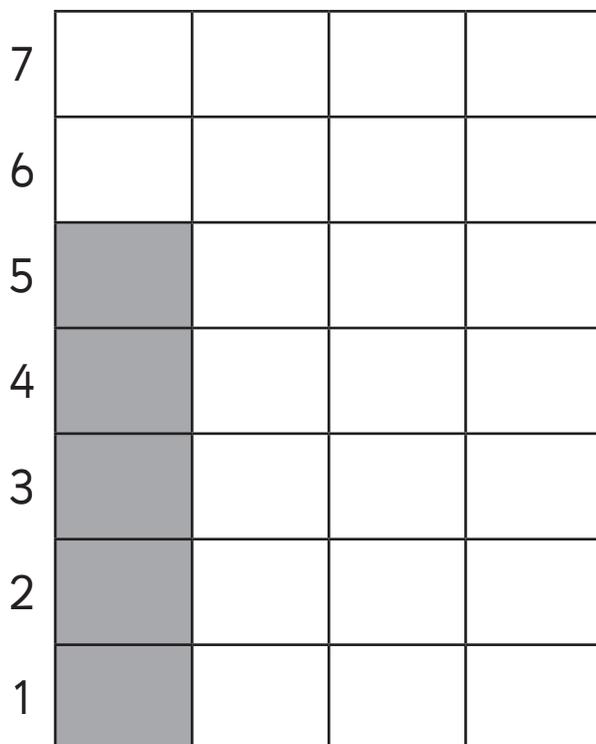
Type of pets

b Colour a square to match each vote. The fish votes have been done for you.

c Which is the **most popular** choice?

d Which is the **least popular** choice?

e Does the bar chart make it easy to find out this information? Why or why not?

Statistics – collecting and representing data

Bar charts can be vertical   or horizontal.
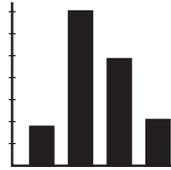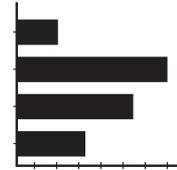
1 2F conducted this survey to find out how many parents could come on their class camp.

Yes	No	Maybe
ЖЖ I	ЖЖ ЖЖ II	IIII

a Colour the squares to represent this information on the horizontal bar chart.

Parents who can help on our camp

Parents who can come

	1	2	3	4	5	6	7	8	9	10	11	12
maybe												
no												
yes												
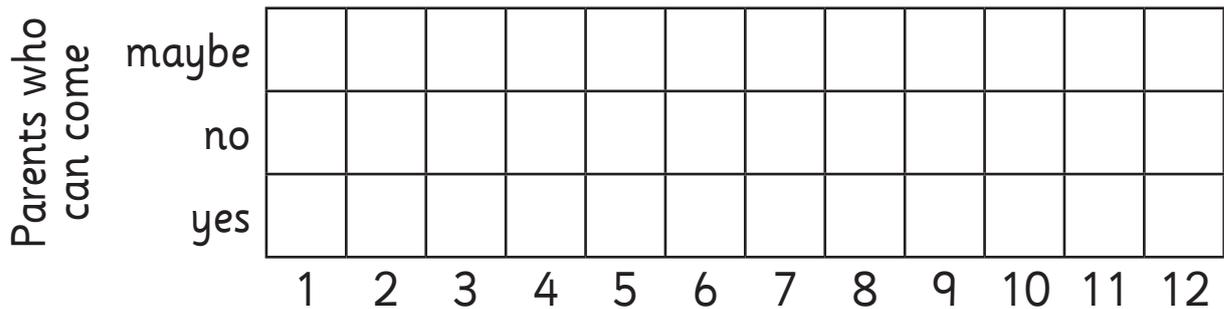
b Write 3 things this chart tells you.

c If all the maybes turn into yeses, how many parents will come along? Show how you know.

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Statistics – collecting and representing data

Continued from page 8.

2 a Use the same information on page 8 and represent it on this vertical bar chart.

b Compare the 2 charts. Do they represent the same data?

c This chart is missing its title. Add it to the bar chart.

d Why do charts need titles?

	yes	no	maybe
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2			
1			

Parents who can come
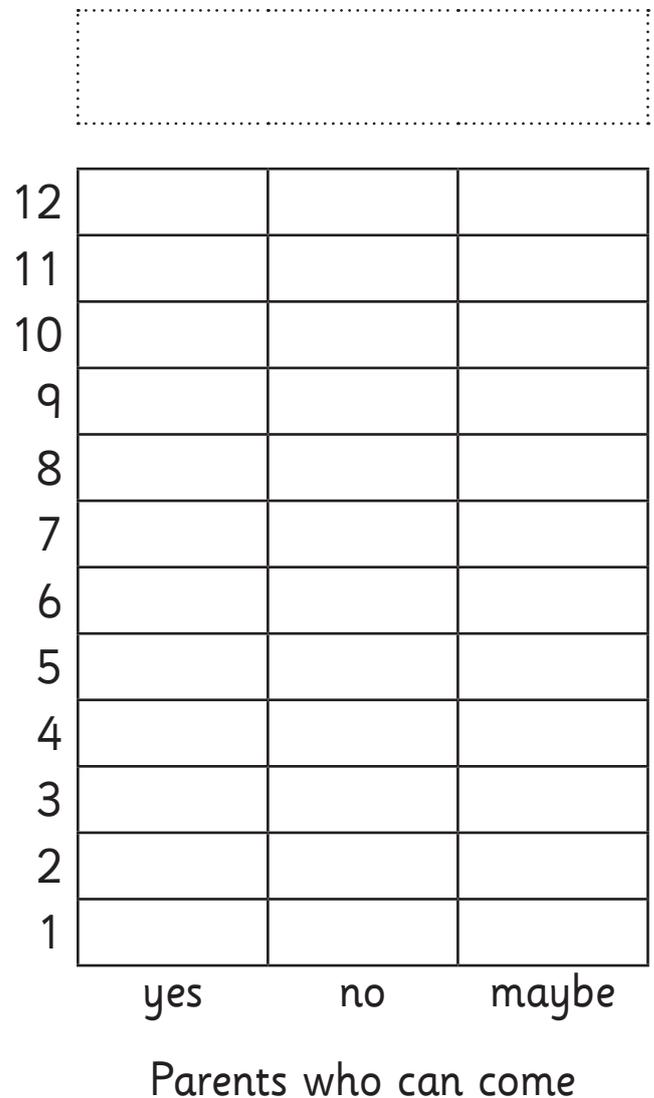
3 Find a third way to represent this information. Perhaps you could use blocks or counters and sticky notes for the labels.

Statistics – collecting and representing data

Pictograms are another type of graph. Pictures are used to represent the data.

You will need: a partner   pencils   10 people to ask

What to do:

Survey 10 people and find out how many children are in their family. Draw a ☺ in the correct column to represent **each person you ask**.

Children in family

8					
7					
6					
5					
4					
3					
2					
1					
	1	2	3	4	5+

Number of children in family

Statistics

Statistics – collecting and representing data

What to do next:

Use your pictogram to answer the following questions:

a How many people have **only 1** child in their family?

b How many people have **more than 4** children in their family?

c What is the **most common** number of children in the families in your survey?

d Sometimes we get data that we might not have planned for. For example, did any children have older step brothers and sisters who don't live with them? Did you decide to include or not to include them?

e What are 2 other pieces of information your pictogram tells you?

Statistics – analysing data

Once we have collected and represented our data, we can look at it more closely and learn from it.

1 Imagine you have been asked by the owner of the local ice cream shop to study this data for them. Use the graph to answer their questions.

Dear _____,

Which flavour is our best seller?

How many tubs of ⬚ ice cream do we sell each week?

How many tubs of ice cream do we sell each week altogether?

If we could only sell 3 flavours, which flavour should we stop selling? Why?

We need someone to be our new flavour taster. Would you like the job?

Thanking you,
The Ice Cream family

Tubs of ice cream sold in 1 week

Flavours

SERIES C TOPIC 1

Statistics
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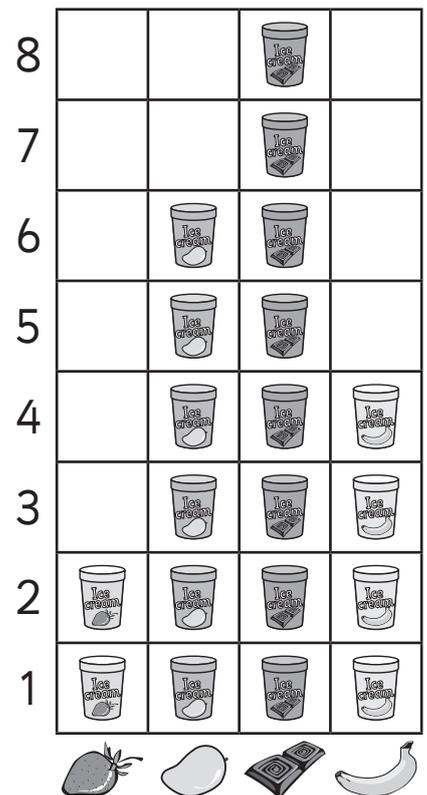
Statistics – analysing data

When we look at data we have to think carefully about what information it actually tells us.

1 Look at this graph. Does it tell us that…

a the 2 favourite subjects in 2Y are Writing and Art?

b the least favourite subject in 2Y is Spelling?

c everybody in 2Y loves Art?

Favourite subjects in 2Y

|	Maths	Reading	Spelling	Writing	Art
10					
9					
8				☺	☺
7	☺			☺	☺
6	☺			☺	☺
5	☺	☺		☺	☺
4	☺	☺	☺	☺	☺
3	☺	☺	☺	☺	☺
2	☺	☺	☺	☺	☺
1	☺	☺	☺	☺	☺
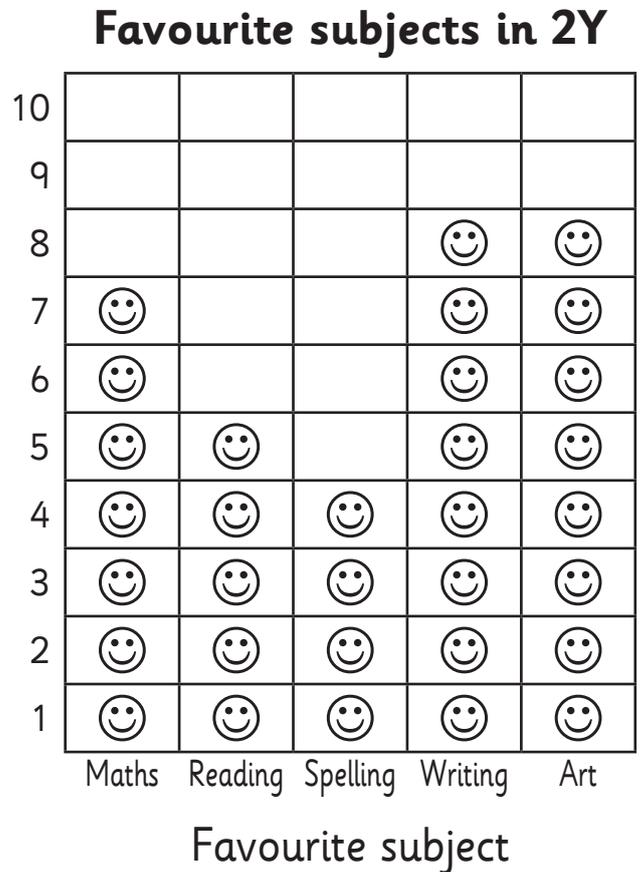
Favourite subject

2 a One student says that this graph shows that 2Y shouldn't learn spelling because only 4 students say it is their favourite subject. What do you think of their argument?

b Does this graph mean that no one likes PE or Science? Explain your thinking.

Statistics – analysing data

Sometimes we can play with data to make it say what we want.

1 Clem wants to convince her parents that most children in her class go to bed after 9 pm. She decides to survey the other students in her class to find out when they go to bed. When she creates the choices for students to select from, she gives them these:

9:00 pm	9:30 pm	10:00 pm	10:30 pm

a Will this survey give a balanced picture of when students in her class go to bed? Why or why not?

b Explain what you could do to make this survey fairer.

2 Jack is in charge of organising a survey to find out what movie should be played on the class bus trip. He asks 5 of his friends and the winning movie is 'Transformables'.

a Was the survey balanced? Why or why not?

b How could you make the survey fairer and provide more balanced data?

Statistics

Statistics – analysing data

> **You will need:** a partner   pencils

What to do:

Look at this graph. What could it be about? Work with your partner to create a title and labels that could make sense.

|		
8		
7	☺	
6	☺	
5	☺	☺
4	☺	☺
3	☺	☺
2	☺	☺
1	☺	☺
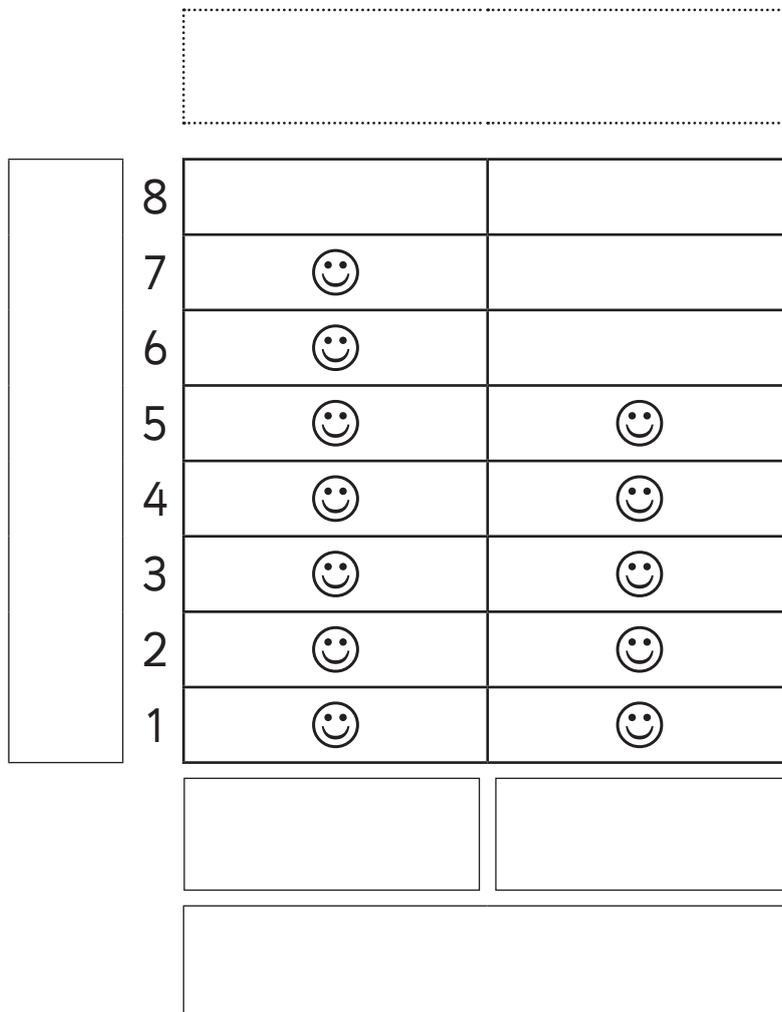
What to do next:

Write 3 questions about your graph for another pair to answer. Show your questions to your teacher then swap pages with another group and answer their questions.

Chance – language of chance

If something will definitely happen, we say it is **certain**.

If something might happen, we say it is **uncertain**.

If something definitely can't happen, we say it is **impossible**.

Certain and **impossible** are the opposites of each other.

There are lots of possibilities in between.

impossible		certain

1 At school today, what is something you …

are **certain** will happen?	are **uncertain** will happen?	think is **impossible** to happen?

2 Look at the jars below and answer the questions.

Is it possible to pull out a white counter? _____

Is it possible to pull out a black counter? _____

Is it possible to pull out a frog? _____

Zoe says it is impossible to pull out a black heart. Is she right? _____

Otis says it is impossible to pull out a red heart. Is he right? _____

Daz says it is certain he will pull out a white heart. Is he right? _____

Chance – language of chance

> We use lots of different words to describe the possibilities between impossible and certain.

1 You ask your mum or dad if you can sleep over at your friend's place tonight.

    a What are some possible answers they might give you?

    b Which is the most likely answer?

    c Which is the most unlikely answer?

2 Draw arrows to show where you think each of the terms below should fit on the chance line.

Maybe, maybe, maybe. Why can't they just say yes!

impossible

certain

| |
|---|
| never |
| probably |
| improbably |
| likely |
| unlikely |
| even |
| definitely |
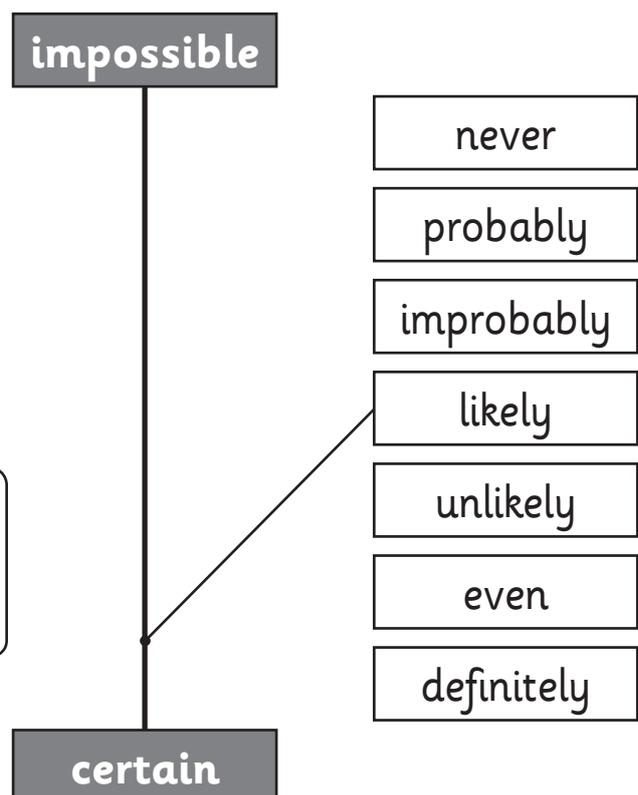
Chance – likelihood

1 Look at the bag.

a Colour 6 counters red, 1 counter green and 3 counters orange.

b What colour counter are you **most** likely to pull out? Why?
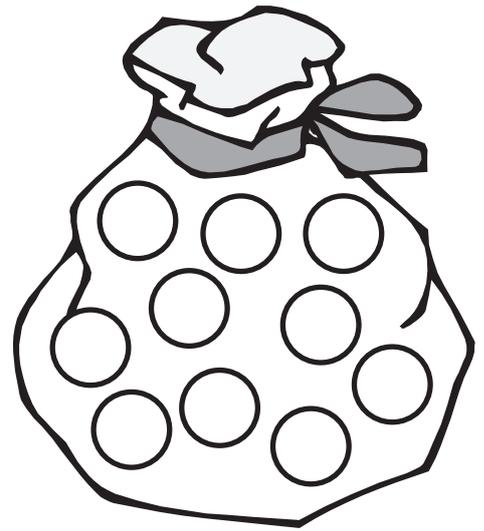
c What colour counter are you **least** likely to pull out? Why?

d How would you describe the chance of pulling out an orange counter?

....

2 You will need blue, yellow and pink pencils.
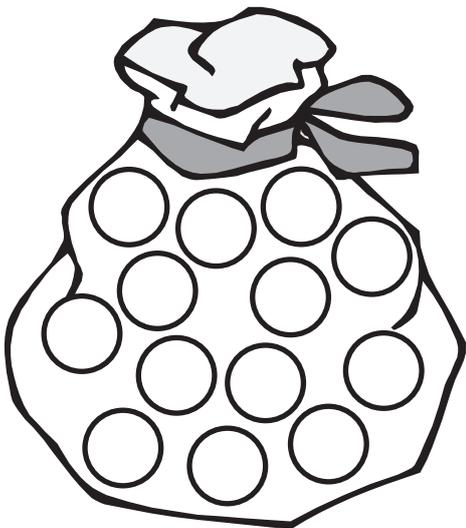
a Colour the counters so that:
- you are **most** likely to pull out a blue one.
- you are **least** likely to pull out a pink one.
- you **could** pull out a yellow one.

b Compare your bag with a friend's bag. Have they coloured the counters the same way as you? If they are different, can you both be right?

Statistics

Chance – possible outcomes

1 What could happen
next? Draw or write
some more possible
outcomes.
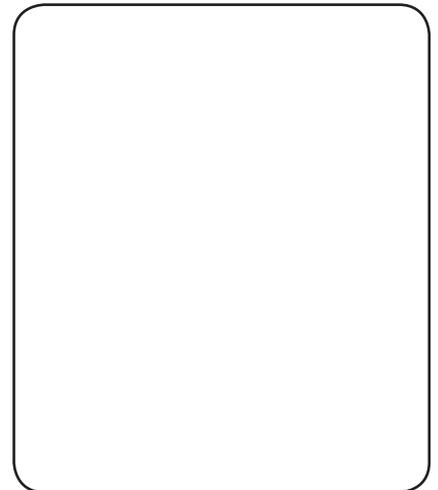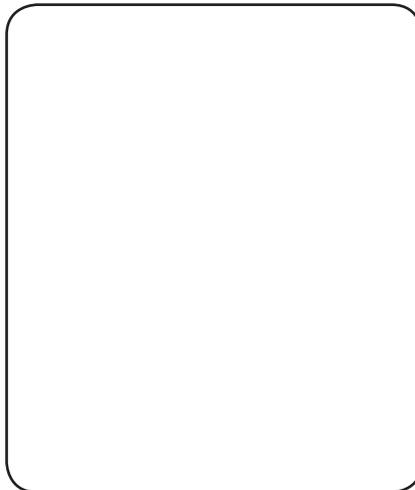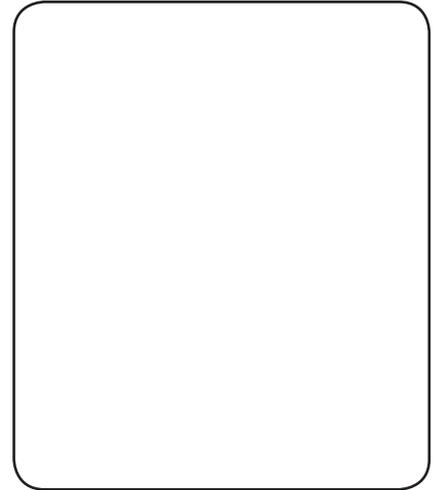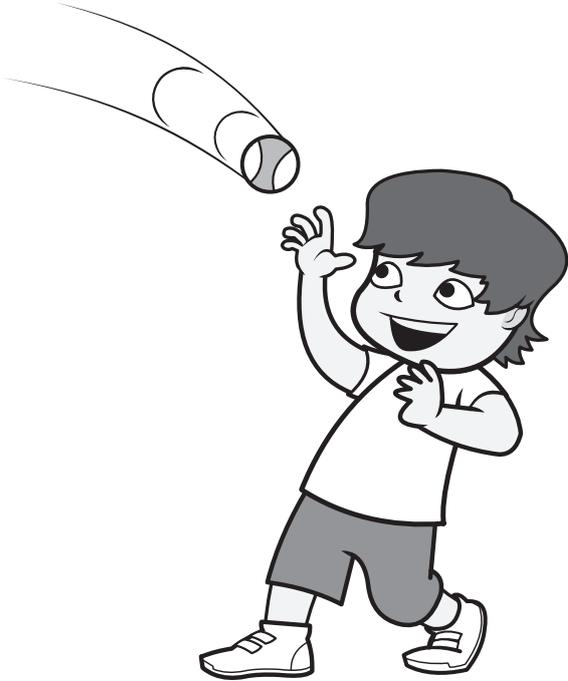
2 Draw or write an event that could have some different outcomes.
Ask 2 friends to record a different possible outcome for the event.
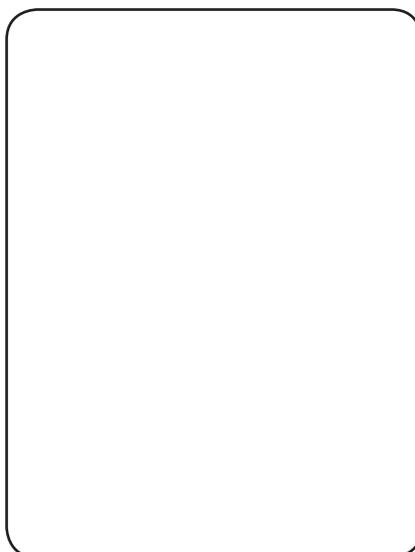
| My event | Friend 1 outcome | Friend 2 outcome |
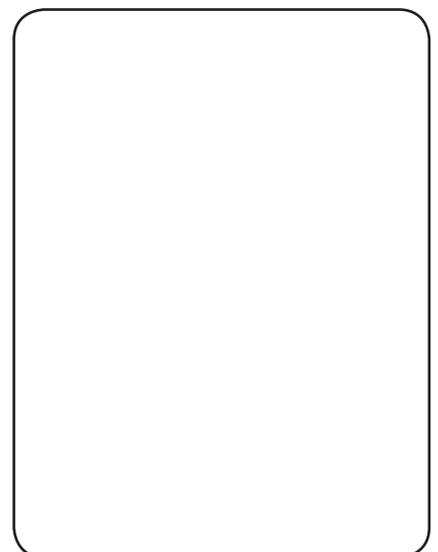
Chance – possible outcomes

What to do:

A family has 4 kids. One possibility is that there are 2 girls and 2 boys.

What are the other possibilities? Draw or write them.
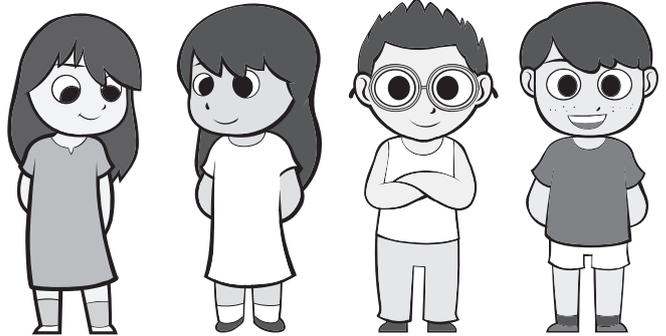
What to do next:

How many possibilities did you find? Share your work with a friend. Did they find the same possibilities?

Statistics

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Chance – chance experiments

You will need: a partner   a coin

What to do:

What are the possible outcomes of tossing a coin? ( ) or ( )
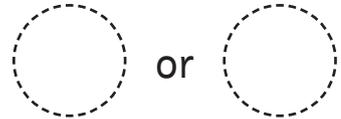
Is one outcome more likely than the other?

....

What to do next:

Toss a coin 20 times and record the results using tally marks (|||||) in the Game 1 section. (For an explanation of how tally marks work, see page 13.)

	Heads	Tails
Game 1		
	Total	Total
Game 2		
	Total	Total

Are the results what you thought they might be?

Toss the coin 20 times for Game 2. Are your results the same as before?

If your results changed, why do you think this is?

Chance – chance experiments

You will need: a partner   a die

What to do:

We often roll a 6 to start a game.
Do you think it is harder to roll a 6
than the other numbers? Explain.

|	
•	• • / • •
• / •	• • / • / • •
• / • / •	• • • / • • •

Let's find out. Roll a die 20 times, recording the results in the table
above using tally marks. Was 6 the hardest to roll?

What to do next:

Roll the die again another 20 times and record the results in the
table below.

Was 6 the hardest to roll this time?

•	• • / • •
• / •	• • / • / • •
• / • / •	• • / • •

Compare your results with 2 other
pairs of students. What did they find?

What would you now say about how hard it is to roll 6?

SERIES TOPIC

Statistics

Chance – chance experiments

What to do:

When you roll 2 dice, what are the different outcomes you could get when you add the 2 numbers? Work with your dice and a partner to find out and add them to the table.
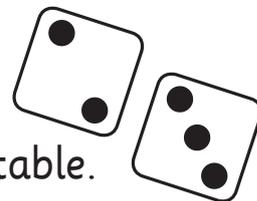
We can roll …										
2	3	4								12

What to do next:

Roll the dice at least 20 times and record a tally mark for each outcome.

Which outcomes do you find are **more likely**?

Which outcomes do you find are **less likely**?