MATHLETICS

D Teacher Book
SERIES

Chance and Data

Series D – Chance and Data

Contents

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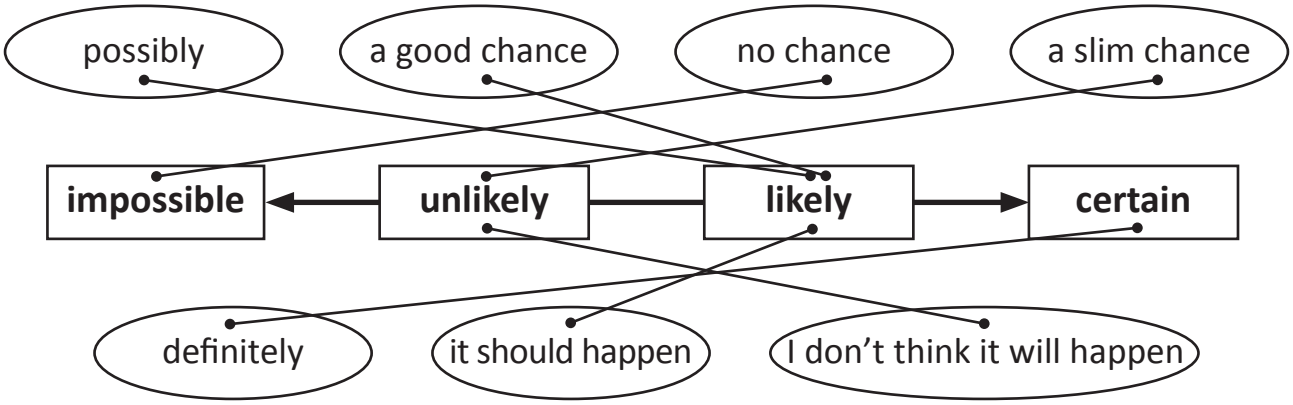
Chance – likelihood

Chance is the likelihood that something will happen.
If something will definitely happen, we say it is **certain**.
If something might happen, we say it is **likely**.
If something might not happen, we say it is **unlikely**.
If something will definitely not happen, we say it is **impossible**. We can show these chance words on a chance arrow like this, where certain and impossible are opposites.

1 **Often you will hear people using chance words in everyday conversation.**
For example, on the news you might hear that there is a **good chance** of rain tomorrow. Or a friend might say to you there is a **slim chance** that they will make it to your party.
What do these chance words actually mean? Where do they fit on the chance arrow? Look at the words in the ovals below and connect them to where you think they should go on the chance arrow. The first one has been done for you.

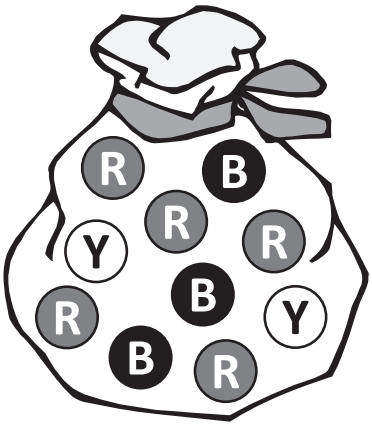


2 **Read each statement and circle the chance of it happening:**

Event	Chance
It will rain sometime this month.	impossible / unlikely / (likely) / certain
Thursday will come after Wednesday.	impossible / unlikely / likely / (certain)
A tiger will be serving at the canteen.	(impossible) / unlikely / likely / certain
Every student in our class likes broccoli.	impossible / (unlikely) / likely / certain

Chance – likelihood

3 **Look at this bag of different coloured counters.**
R stands for red, B is for blue, and Y is for yellow.



a If you reached in and grabbed a counter without looking, which colour do you think you would most likely grab?

Red

b Which colour do you think would be the most surprising to get?

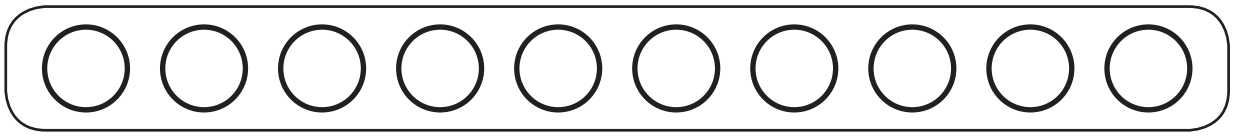
Yellow

4 **What's in the bag?**

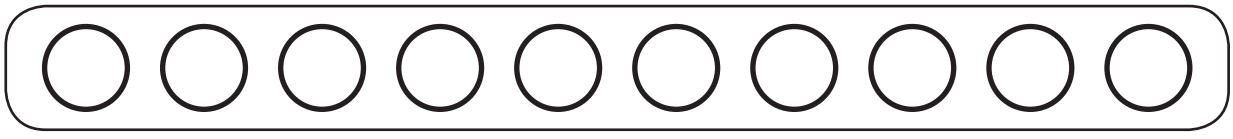
This is an investigation for two students where you are going to use chance and likelihood to guess what is in the bag. You will need a paper bag as well as 4 red, 4 blue and 4 yellow counters.
First, you need to decide who is Player 1 and who is Player 2. Player 1 guesses first so Player 2 puts 10 of the 12 counters in the paper bag in any combination they like. Player 1's job is to guess the combination of colours that are in the bag. They do this by taking one counter out, recording it and then replacing it. Record the colour by writing R, B, or Y in the space below. Do this 20 times until you think you can guess which 10 counters are in the bag.

a What I think is in the bag:

Answers will vary.



b What was actually in the bag:

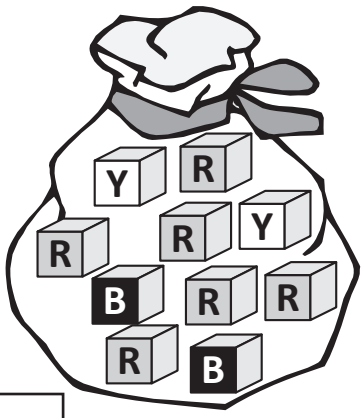


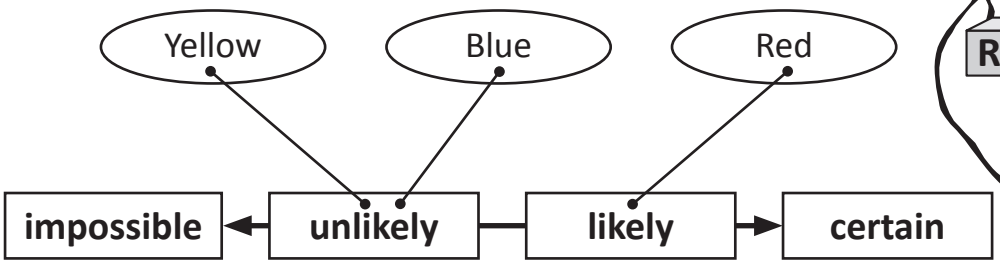
c How close was your guess?

d Swap turns so now Player 1 puts the counters in the bag and Player 2 guesses.

Chance – likelihood

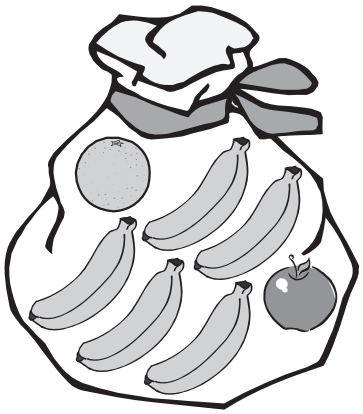
5 **Look at this bag of counters. Connect each colour to the chance arrow that you think best describes the chance of pulling out each colour:**





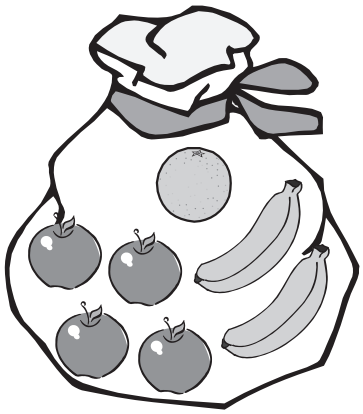
6 **Look at these shopping bags of fruit. Select the best chance word for each shopping bag:**

a The fruit I pick will be a banana.



impossible / unlikely / (likely)

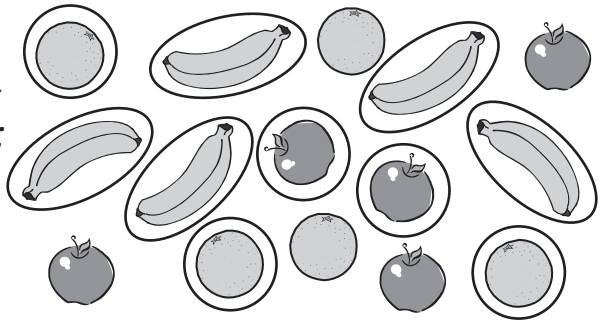
b The fruit I pick will be a strawberry.

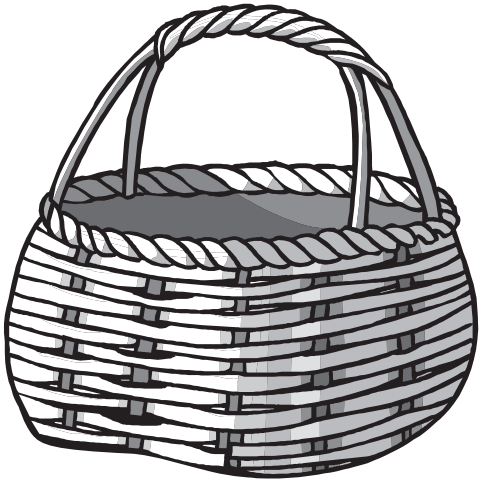


(impossible) / unlikely / likely

7 **Ten pieces of fruit are placed into this basket. Inside the basket is a mixture of bananas, oranges and apples. Circle the fruit that is inside the basket if a banana is most likely to be chosen without looking.**

Sample answer:





Chance – spinner investigation

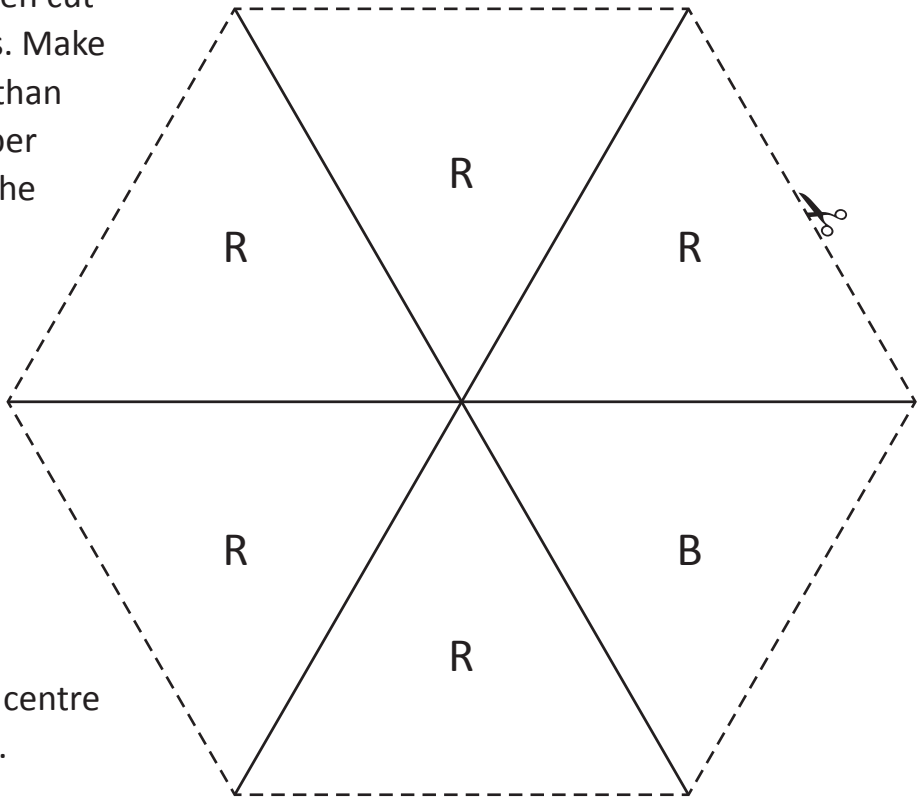
1 **Spin it! This is an investigation where you are going to make a spinner and look at the chance of it landing on certain colours.**

a For this activity you will need to copy this page and then cut out both the spinners. Make your spinners firmer than a regular piece of paper by pasting a copy of the spinner onto several sheets of scrap paper so it is firm.

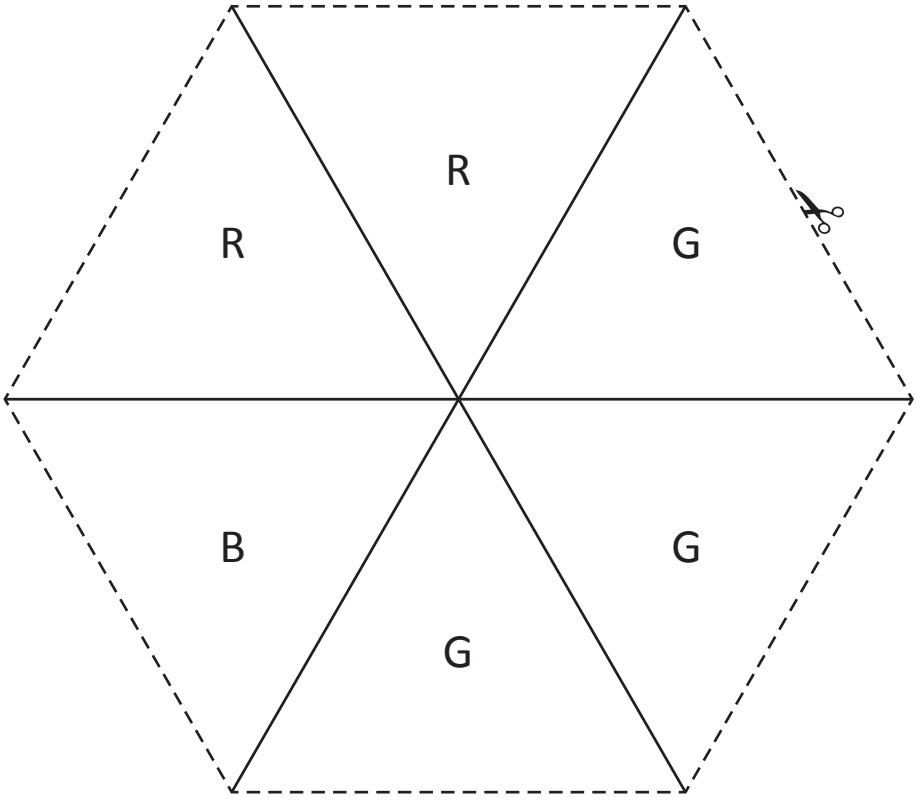
Now you need to colour in each section: R for red, B for blue and G for green.

Next, push a pencil carefully through the centre and practise spinning.

Spinner 1



Spinner 2



Continued on page 5.

Chance – spinner investigation

Continued from page 4.

b Now you can begin the investigation. First, write your prediction at the top of the table. Spin each spinner 20 times and tick where it lands each time.

My prediction:

I think that the spinner will be most likely to land on _____.

I think that the spinner will be least likely to land on _____.

Spinner 1: Number of times the spinner lands on each colour.	
Red	**Blue**
Answers will vary.	

My prediction:

I think that the spinner will be most likely to land on _____.

I think that the spinner will be least likely to land on _____.

Spinner 2: Number of times the spinner lands on each colour.		
Red	**Blue**	**Green**
	Answers will vary.	

c Were your results as you would expect? Why or why not?

Answers will vary.

Chance – coin investigation

When you toss a coin, you call out heads or tails. There are two sides and two different possible results. That means there is an equal chance of landing on heads as there is on tails.

Tails


Heads

1 **For this experiment, you will toss a coin 20 times and record your results. First, predict your results:**

a How many times do you think the coin will land on heads? *Answers will vary.*

b How many times do you think the coin will land on tails? _____

c Now toss a coin 20 times and record your results below. Write H for heads and T for tails.

○ ○ ○ ○ ○ ○ ○ ○ ○ ○

○ ○ ○ ○ ○ ○ ○ ○ ○ ○

2 **Repeat the above experiment.**

a Toss a coin 20 times and record your results: *Answers will vary.*

○ ○ ○ ○ ○ ○ ○ ○ ○ ○

○ ○ ○ ○ ○ ○ ○ ○ ○ ○

b What happened? Fill in this table to show the results.

Number of times the coin landed on heads and tails		
	H	**T**
Experiment 1		
Experiment 2		

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

Chance – die investigation

We usually roll a die when we are playing a board game. Do you have a lucky number? Often 6 is the luckiest number in board games, but does it come up any more or less often than the other numbers? Let's investigate.

1 **Complete this sentence:**

If there are 6 different ways that a die could land and 6 different numbers, that means there is an (even) / uneven (circle one) chance of rolling each number.

2 **Roll a die 18 times. Write down the number you roll each time:**

Answers will vary.

Roll	Number on die
1	
2	
3	
4	
5	
6	
7	
8	
9	

Roll	Number on die
10	
11	
12	
13	
14	
15	
16	
17	
18	

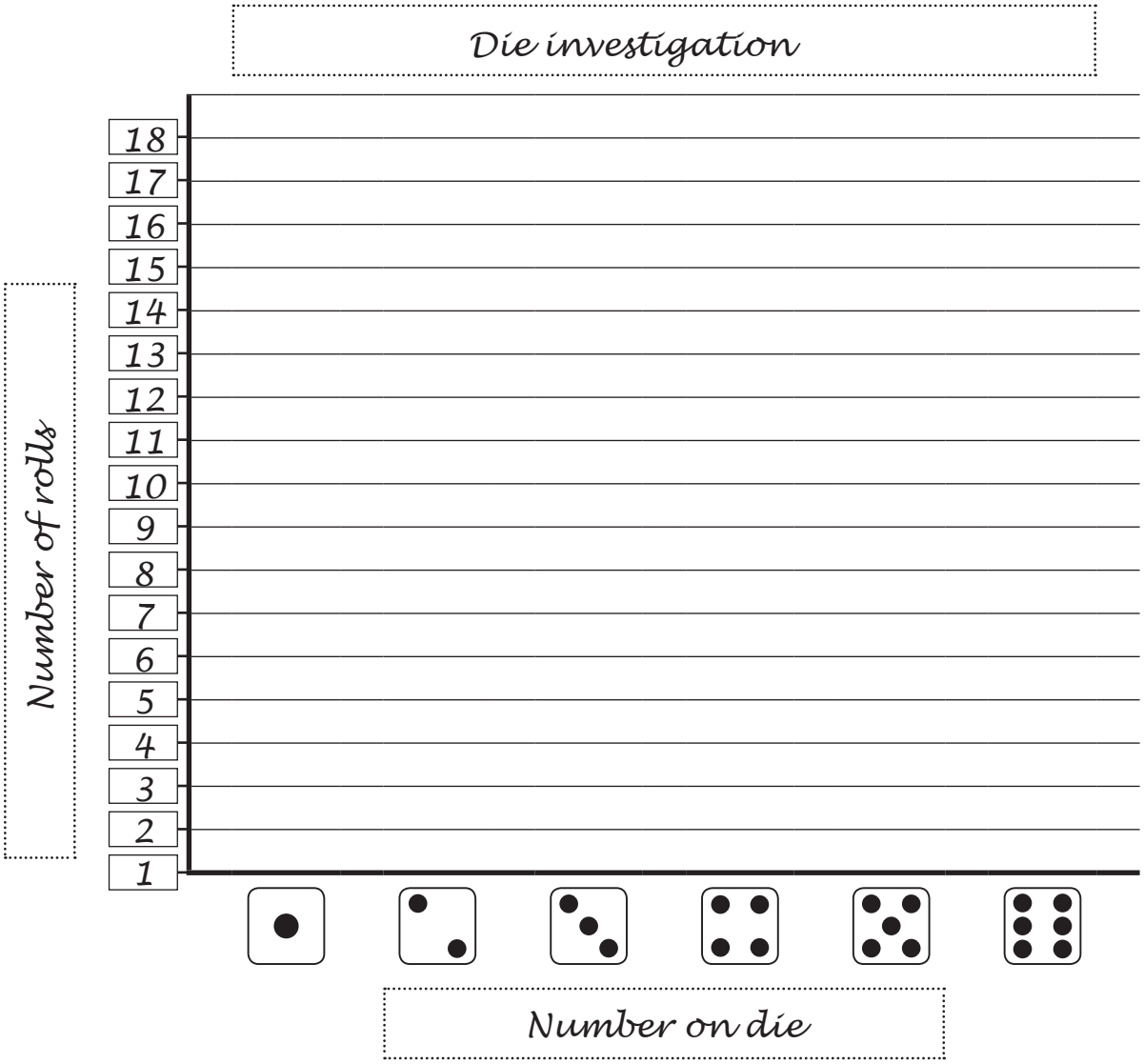
3 **Complete this tally table for the number you rolled:**

Answers will vary.

Number	Tally	Total
		
		
		
		
		
		

Chance – die investigation

4 **Graph the data that you collected. Make sure you include a heading and the labels.**



a Which number was rolled the most? ☐

b Which number was rolled the least? ☐

c How many times was the number 6 rolled? ☐

d List each number in order of the most to least times it was rolled:

_____

e If you repeated this investigation, would you have the same results?

Answers will vary.

Race to 6 apply

Getting ready

This is a game for two players. You will need a copy of this page to share and two dice. Each player will need their own coloured pencil. Make sure they are different colours.

What to do

The aim of this game is to be the first player to colour 6 spaces in a column.

Player 1 rolls both dice, adds the numbers and then shades a space in that column. Player 2 repeats these steps. The players take turns rolling and recording the totals in their own colour. The winner is the player who has 6 spaces coloured. The colours do not have to be in a row.

2	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**

Total of dice

What to do next

Which column got filled in the fastest? Why do you think this is?

Answers will vary.

Data – collecting data

Data is information. Data can be numbers or words.

Many different people use data in some way.
Teachers use data about their students, such as test scores, to help them improve. Your dentist keeps data about you, such as when you last had a checkup and which tooth might need filling. If you are planning your birthday party, you might collect data about your friends such as what they like to eat and drink.

1 **Meet Harley. Here is some data about him:**

- Harley's birthday is on the 9th of June.
- His lucky number is 3.
- His favourite colour is blue.

What questions was Harley asked to get this data?

When is your birthday?

What is your lucky number?

What is your favourite colour?

2 **Sometimes collecting data is to do with finding out peoples' preferences. For example, an ice cream shop might want data on which ice cream flavour their customers like the best so they can sell more ice cream. They might ask their customers some questions to find out about flavours. This is called a survey.**

a Put a ring around the question that will give the ice cream shop data that can help them sell more:

'Do you prefer chocolate or caramel flavoured ice cream?' **or** 'Do you like ice cream?'

b Explain why:

The first question would get more useful answers. The other question is too broad, there would be too many different answers.

3 **3H are talking about getting a classroom pet. Their teacher asked them 'Which pet would you like to have in the classroom?' This is the list they came up with:**

turtle	~~cat~~	~~elephant~~	~~spider~~
guinea pig	~~chimpanzee~~	~~dog~~	~~snake~~

They discussed that they need to consider the suitability of these animals. For instance, the pet must be easy to care for and happy to live in the classroom during the week. Someone would have to care for it during the school holidays. Also, the pet must be harmless.

a Can you see which animals suggested in the list above may not be suitable? Cross them out.

b Write a new question for the class to decide on which pet they should have:

Question: *Which classroom pet do you prefer, a turtle or a guinea pig?*

c How should this data on 3H's classroom pet be collected? Pretend it is your class getting a pet. Survey 6 people in your class with the question you thought of in part **b**. Use this table to collect data:

	Turtle	*Guinea pig*
1		
2		
3		
4		
5		
6		

Data – collecting data

The tally method is where we count in 5s. We put a stroke for each number and the fifth stroke is a line that goes diagonally through the set of 4.

However, we don't write down the numbers, we just use strokes like this:

4 **Count these tallies and write the total in the box at the end:**

a  25

b  28

5 **Josie collected some data on favourite colours in her class.**

a Show Josie how to represent this data using tallies:

Favourite colours in 4B	
Red	
Blue	
Green	
Yellow	

Favourite colours in 4B	
Red	
Blue	
Green	
Yellow	

b How many children are in 4B? 30

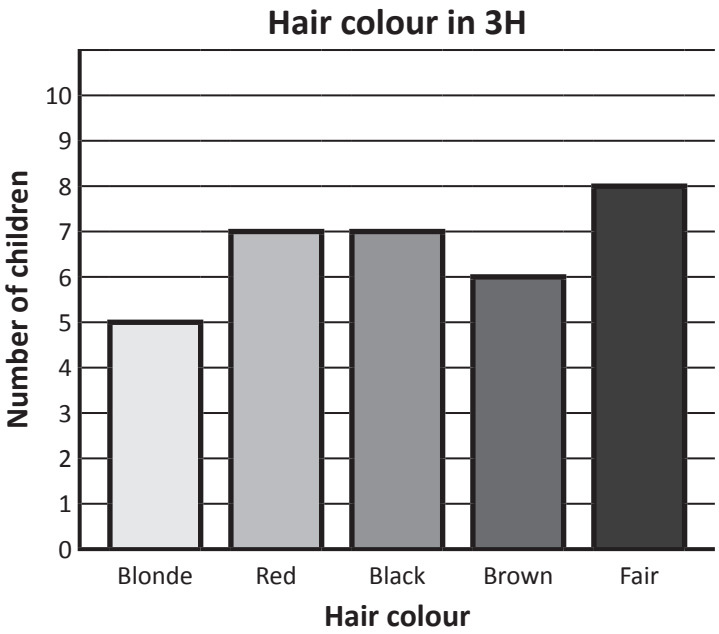
c Why do you think tallies are a good way of collecting data?

It makes it easy to count because they are in groups of 5.

Data – column graphs

Column graphs are a clear way of showing data. There is a vertical line that has numbers, and is called the scale. The horizontal line has the different categories that are being counted. There should always be a heading at the top so it's easy to see what the data is about.

1 **Answer the questions about the data shown on this column graph.**



a How many children have brown hair? 6

b Which colour hair do the smallest group of children have?

Blonde

c Which colour hair do most children have?

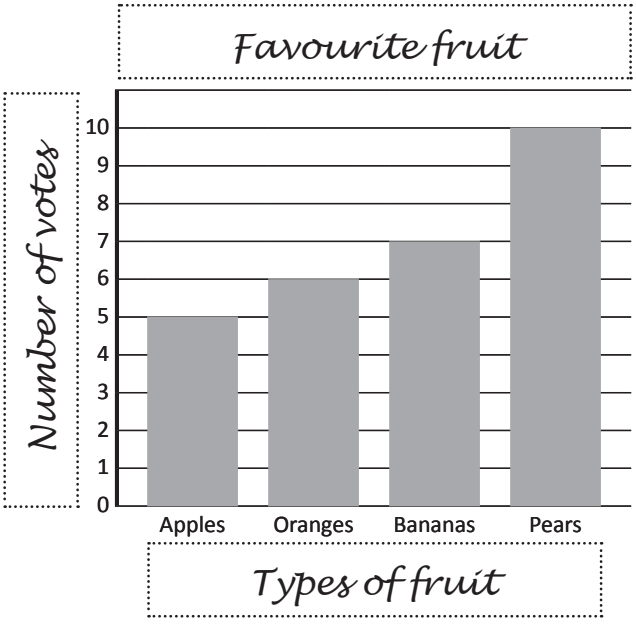
Fair

d What do you notice about the number of children who have either red or black hair?

The same number of children have red and black hair.

2 **A group of people were surveyed about their favourite fruit. Make a column graph from the data collected in the table. First write the number of tallies in the table:**

Favourite fruit		
Apples	𝍸	5
Oranges	𝍸 |	6
Bananas	𝍸 ||	7
Pears	𝍸 𝍸	10



Data – column graphs

3 **3L were planning a healthy breakfast morning. They conducted a survey to find out the most popular option. The data they collected is shown in the table below:**

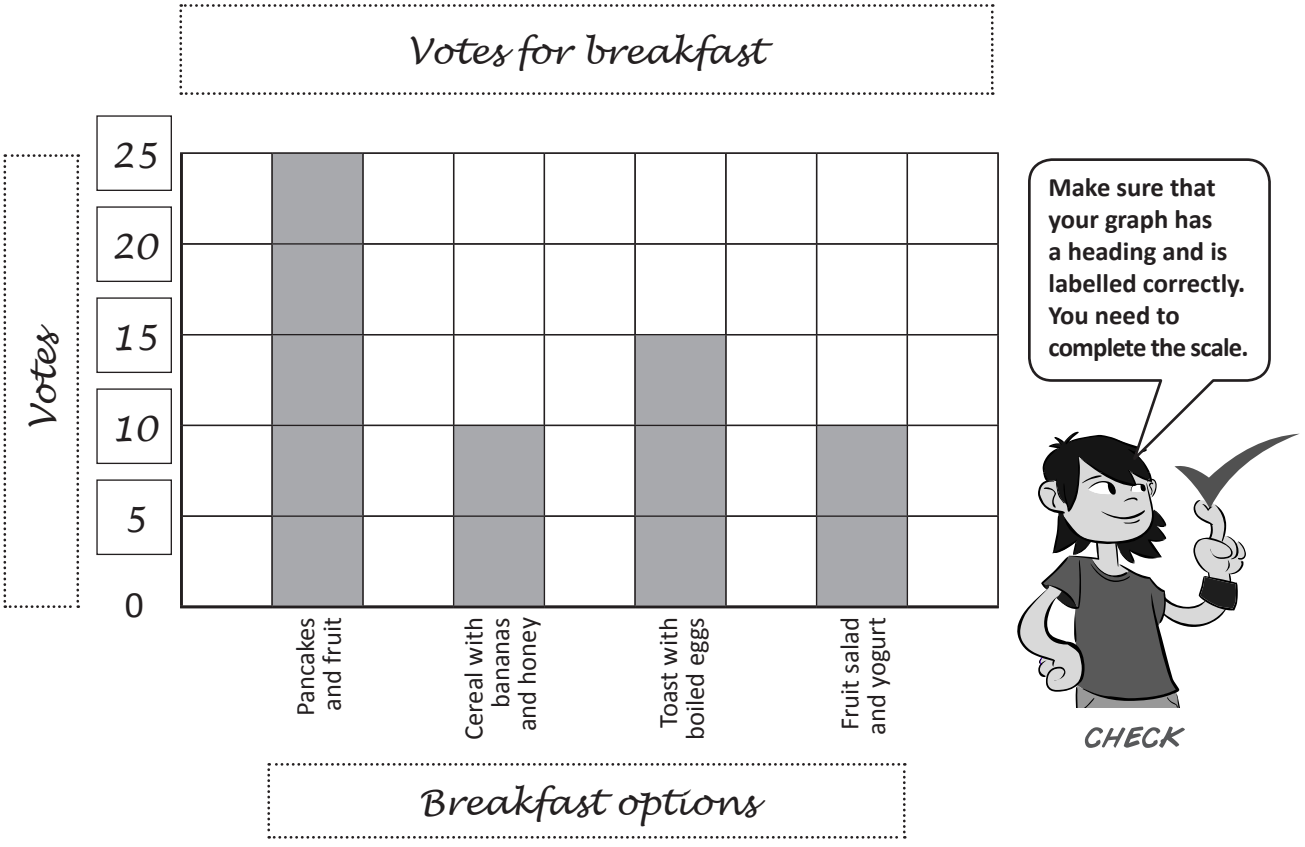
Breakfast options	Votes	Number of votes
Pancakes and fruit	𝍸 𝍸 𝍸 𝍸 𝍸	25
Cereal with bananas and honey	𝍸 𝍸	10
Toast with boiled eggs	𝍸 𝍸 𝍸	15
Fruit salad and yogurt	𝍸 𝍸	10

a What question did they ask?

Which of these four options would you like for the healthy breakfast morning?

b Work out the number of students from the tallies. Write this number in the last column in the table above.

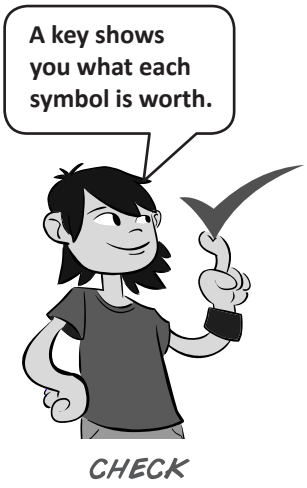
c Show this data on the column graph below:



Data – picture graphs

Picture graphs use pictures to show how many items are in each category.

1 **This picture graph shows what a group of children saw on a mini-beast hunt.**



Mini-beasts that we saw

Worms	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●
Dragonflies	● ● ● ● ● ●
Snails	● ● ● ● ● ● ● ● ● ● ● ● ● ●
Butterflies	● ● ● ● ● ● ● ●

Key: ● = 1

a Give this picture graph a heading.

b How many butterflies did they see? *8*

c How many more snails than dragonflies did they see? *8*

d How many mini-beasts did they find in total? *46*

2 **This picture graph shows the same data as the one above, but this time it has a different key.**

Mini-beasts that we saw

Worms	● ● ● ● ● ● ● ● ●
Dragonflies	● ● ●
Snails	● ● ● ● ● ● ●
Butterflies	● ● ● ●

Key: ● = 2

a Give this picture graph the same heading as the first graph.

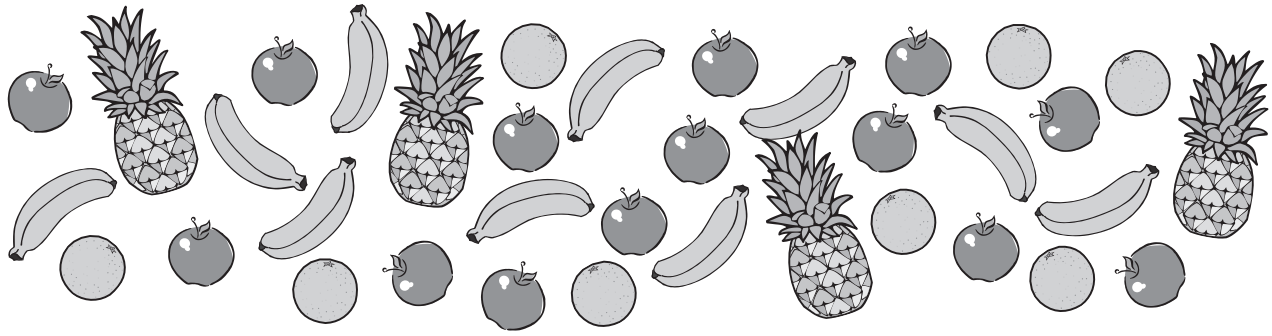
b Add the symbols for the number of snails. Look at the key.

c Why is the second version of the graph better?

It's easier to count the amount in each category.

Data – picture graphs

3 **Josie runs a juice bar and has just received a fruit delivery. Help Josie create a picture graph of what she has for her records.**



Heading:	*Fruit in stock (or similar)*
Bananas	✓ ✓ ✓ ✓ ✓
Apples	✓ ✓ ✓ ✓ ✓ ✓ ✓
Oranges	✓ ✓ ✓ ✓
Pineapples	✓ ✓

Key: ✓ = 2

4 **This picture graph shows the birthdays in grade 3 for the first 4 months of the year. Complete the graph using all the clues below. What is the key?**

Heading:	*Birthdays in grade 3*
January	
February	
March	
April	

Clues:

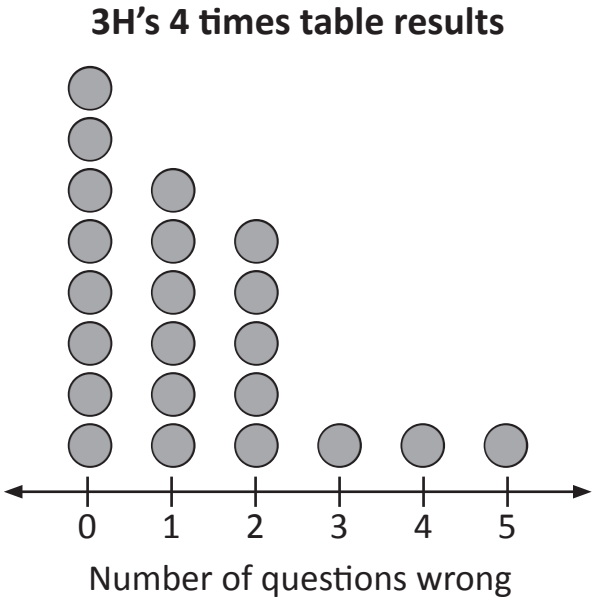
- 16 birthdays in January
- 8 birthdays in February
- 12 birthdays in March
- 20 birthdays in April

Key: = 4

Data – dot plots

A dot plot uses a number line where the numbers are the categories.
The dots show the amount in each category.

1 **Answer the questions about this dot plot:**



a How many students got two questions wrong? *5*

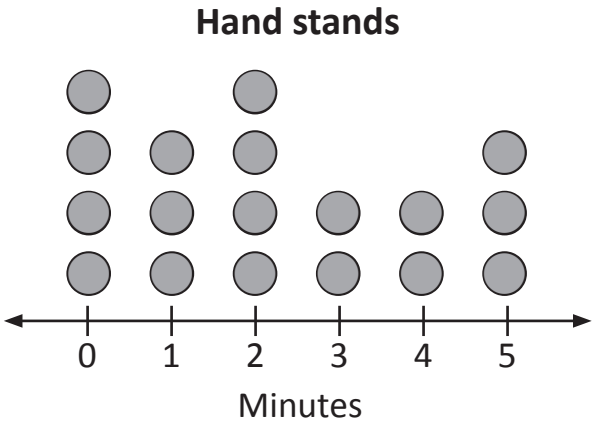
b How many students got only one question wrong? *6*

c How many students got all the questions correct? *8*

d What could you say about how well 3H know the 4 times table?

Most kids know the 4 times table.

2 **This dot plot shows the length of time a group of gymnasts can hold a hand stand. Answer these questions:**



a How many gymnasts can hold a hand stand for 1–3 minutes? *9*

b How many gymnasts can't do a hand stand yet? *4*

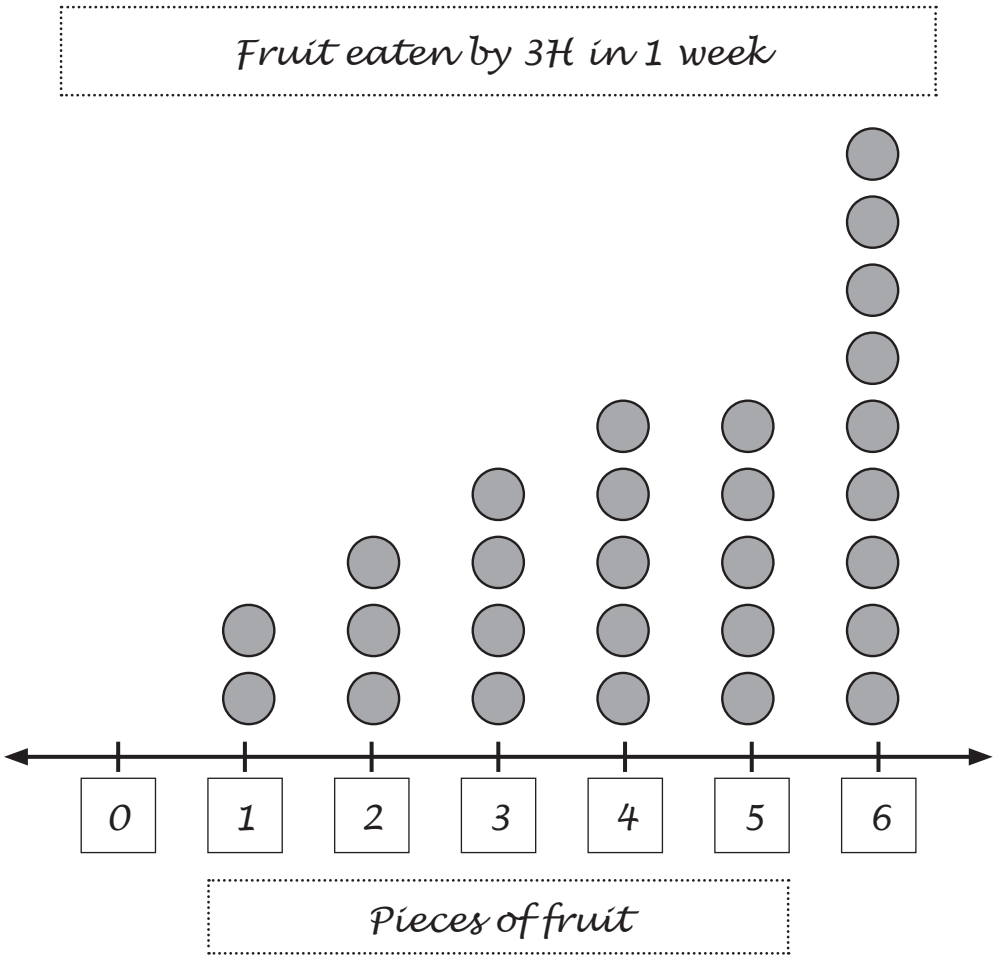
c How many gymnasts can hold a hand stand for more than 4 minutes? *3*

Data – dot plots

3 **3H is looking at healthy eating habits. Each student kept a record of how many pieces of fruit they ate over 1 week. Here are the results:**

Fruit eaten by 3H in 1 week	
Pieces of fruit	**Number of students**
1	2
2	3
3	4
4	5
5	5
6	9

Show these results in a dot plot below. You will need to draw the dots, label the number line and provide a heading.



Data – two-way tables

A two-way table can show a lot of information in a small space. Look at this two-way table about pets:

	Has a cat	**Doesn't have a cat**
Has a dog	Cam Ellie	Zoe
Doesn't have a dog	Tim	Sara Nick

1 **Answer questions about the two-way table above.**

a How many kids have a cat? *3*

b Name 2 kids who have neither a cat or a dog. *Sara and Nick*

c What pet does Tim have? *A cat*

2 **Lee had a fancy dress party where her guests had to wear a hat, glasses or both. Sort this data by writing the names into the two-way table below:**

- Yvette found a hat in her dressing-up box.
- Simon wore his brother's hat and glasses.
- Ben bought a pair of fake glasses.
- Lee wore her beach hat and sunglasses.
- Arki just wore a large floppy hat.
- Mel lost her cowboy hat and sunglasses on the way to the party so ended up with neither.

Yvette Simon Ben Mel Arki Lee

	Glasses	**No glasses**
Hat	*Lee* *Simon*	*Arki* *Yvette*
No hat	*Ben*	*Mel*

Data – two-way tables

3 **Put these numbers into the two-way table:**

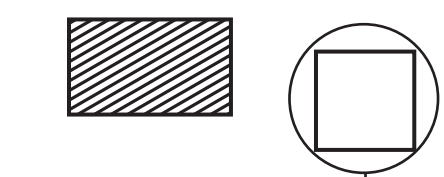
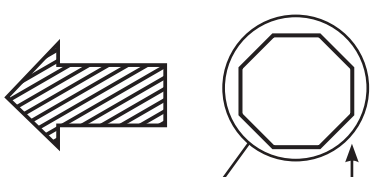
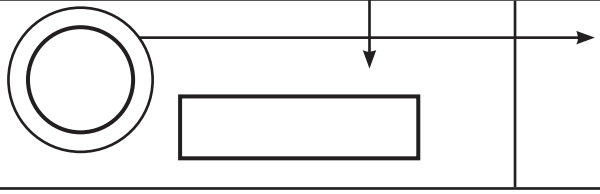
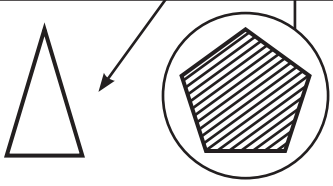
a 21 6 9 16 19 20

	Even	Not even
Less than 10	*6*	*9*
Not less than 10	*16 20*	*21 19*

b 12 20 32 15 40 18 35 34 25 45 28

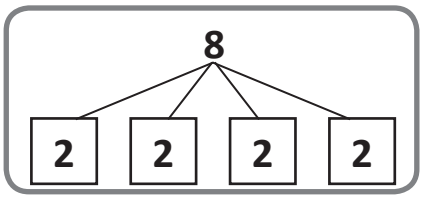
	Divisible by 5	Not divisible by 5
Greater than 30	*40 45 35*	*32 34*
Not greater than 30	*15 25 20*	*12 18 28*

4 **Mel sorted some shapes into a two-way table but made some mistakes. Where did she go wrong? Ring the shapes that are in the wrong space and draw an arrow to the correct space it should be:**

	Quadrilateral	Not quadrilateral
Striped		
Not striped		

Data – surveys

1 **Mathletics is testing out an idea for an activity and they need your help. They want to find out which operation most people think of when they see the picture in the box, × or + or ÷.**



Multiplication 4 × 2 = 8

Addition 2 + 2 + 2 + 2 = 8

Division 8 ÷ 4 = 2

a You need to survey 10 kids. What question will you ask them?

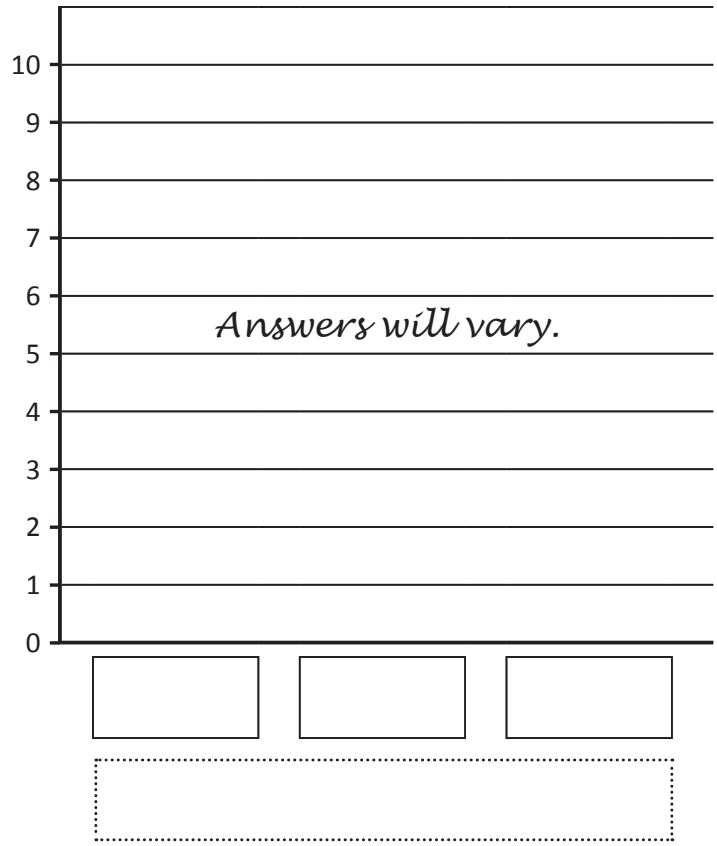
Question: *Which operation matches this picture?*

b Collect your data in this table:

Answers will vary.

Operation	Tally	Total
×		
+		
÷		

c Present the data as a column graph:



Conclusion:

Answers will vary.

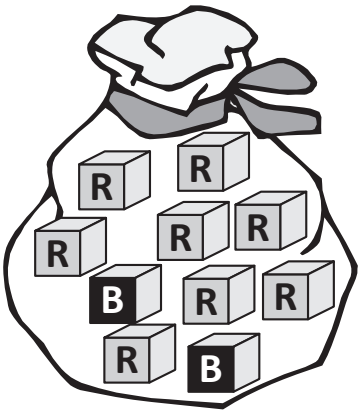
Chance

Name _____

1 **Read each statement and circle the chance of it happening:**

	Event	Chance
a	You will find an elephant hiding under your bed.	impossible / unlikely / likely / certain
b	Sunday will come after Saturday.	impossible / unlikely / likely / certain
c	Every student in your class will choose red as their favourite colour.	impossible / unlikely / likely / certain
d	It will be sunny every day this week.	impossible / unlikely / likely / certain

2 **Look at this bag of counters. Connect each colour to the chance arrow that you think best describes the chance of pulling out each colour:**



Yellow

Blue

Red

impossible ← **unlikely** — **likely** → **certain**

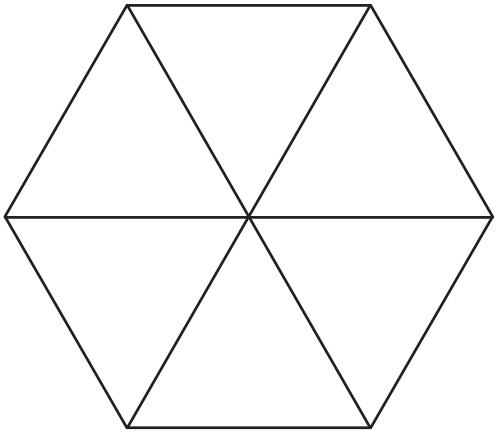
Skills	Not yet	Kind of	Got it
• Labels events as being impossible, unlikely, likely or certain			
• Identifies potential outcomes in a simple chance situation			

Chance

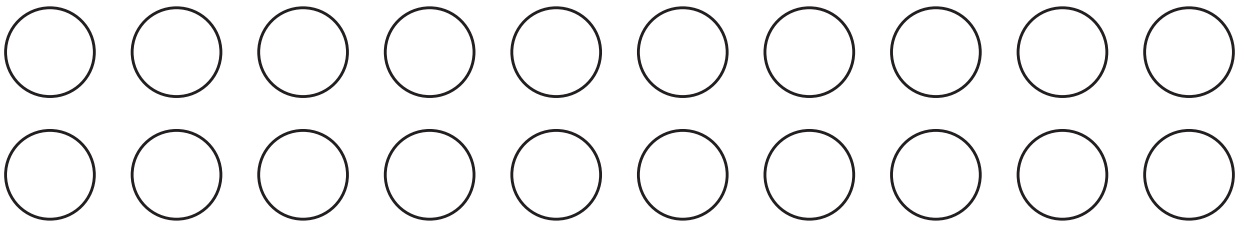
Name _____

3 **The results of a spinner are shown in this table. Colour the spinner to show what the spinner is likely to look like:**

Spinner experiment		
Red	**Blue**	**Green**
5	12	3



4 **Jo tossed a counter 20 times. One side was blue and the other side was red. Show what her results could have looked like. Use B for blue and R for red.**



5 **Is 6 the luckiest number in board games? Why or why not?**

Skills	Not yet	Kind of	Got it
• Connects results of simple chance experiments with the object used			
• Explains likelihood of a die number			

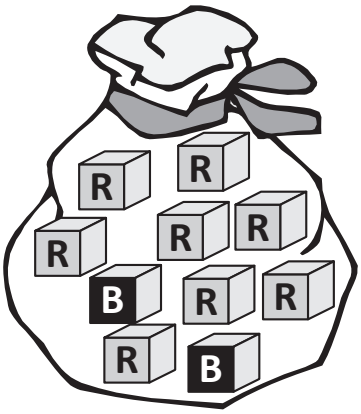
Chance

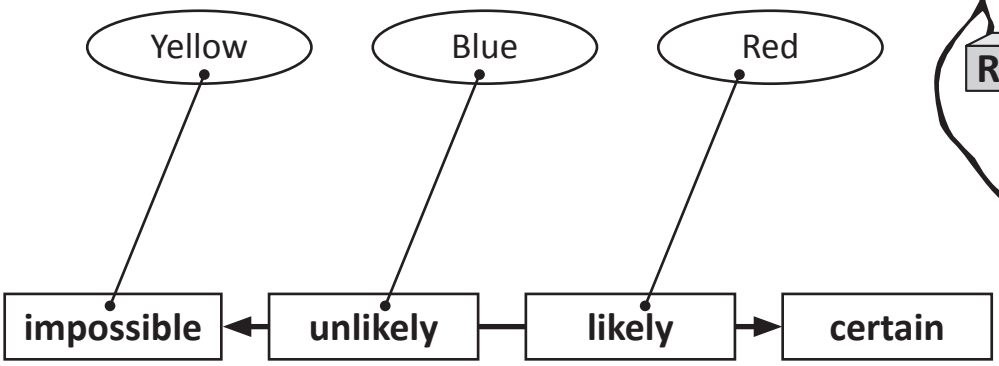
Name _____

1 **Read each statement and circle the chance of it happening:**

	Event	Chance
a	You will find an elephant hiding under your bed.	(impossible) / unlikely / likely / certain
b	Sunday will come after Saturday.	impossible / unlikely / likely / (certain)
c	Every student in your class will choose red as their favourite colour.	impossible / (unlikely) / likely / certain
d	It will be sunny every day this week.	impossible / (unlikely) / *or* / (likely) / certain

2 **Look at this bag of counters. Connect each colour to the chance arrow that you think best describes the chance of pulling out each colour:**



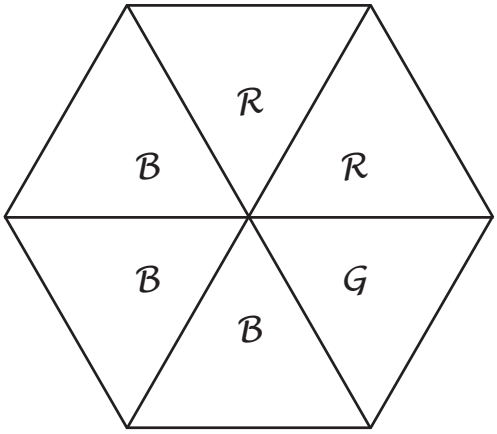


Skills	Not yet	Kind of	Got it
• Labels events as being impossible, unlikely, likely or certain			
• Identifies potential outcomes in a simple chance situation			

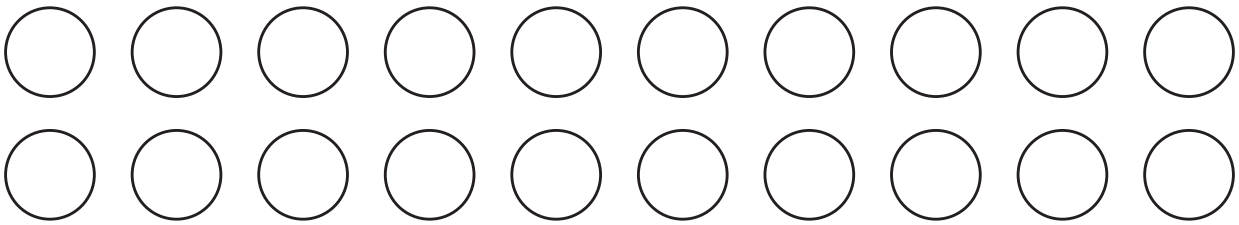
Name _____

3 **The results of a spinner are shown in this table. Colour the spinner to show what the spinner is likely to look like:**

Spinner experiment		
Red	**Blue**	**Green**
5	12	3



4 **Jo tossed a counter 20 times. One side was blue and the other side was red. Show what her results could have looked like. Use B for blue and R for red.**



Answers will vary but should show it to be half blue, half red or close to half.

5 **Is 6 the luckiest number in board games? Why or why not?**

Sample answer:

No because there are 6 different ways that a die could land and 6 different numbers which means there is an even chance for each number 1 to 6.

Skills	Not yet	Kind of	Got it
• Connects results of simple chance experiments with the object used			
• Explains likelihood of a die number			

Data – representing data

Name _____

1 **3F conducted a survey to find out the favourite breakfast cereal. The data they collected is shown in the table below:**

Cereal	Tallied votes	Number of votes
Wheat pops	𝍸 𝍸	
Honey oats	𝍸 |	
Rice flakes	𝍸	

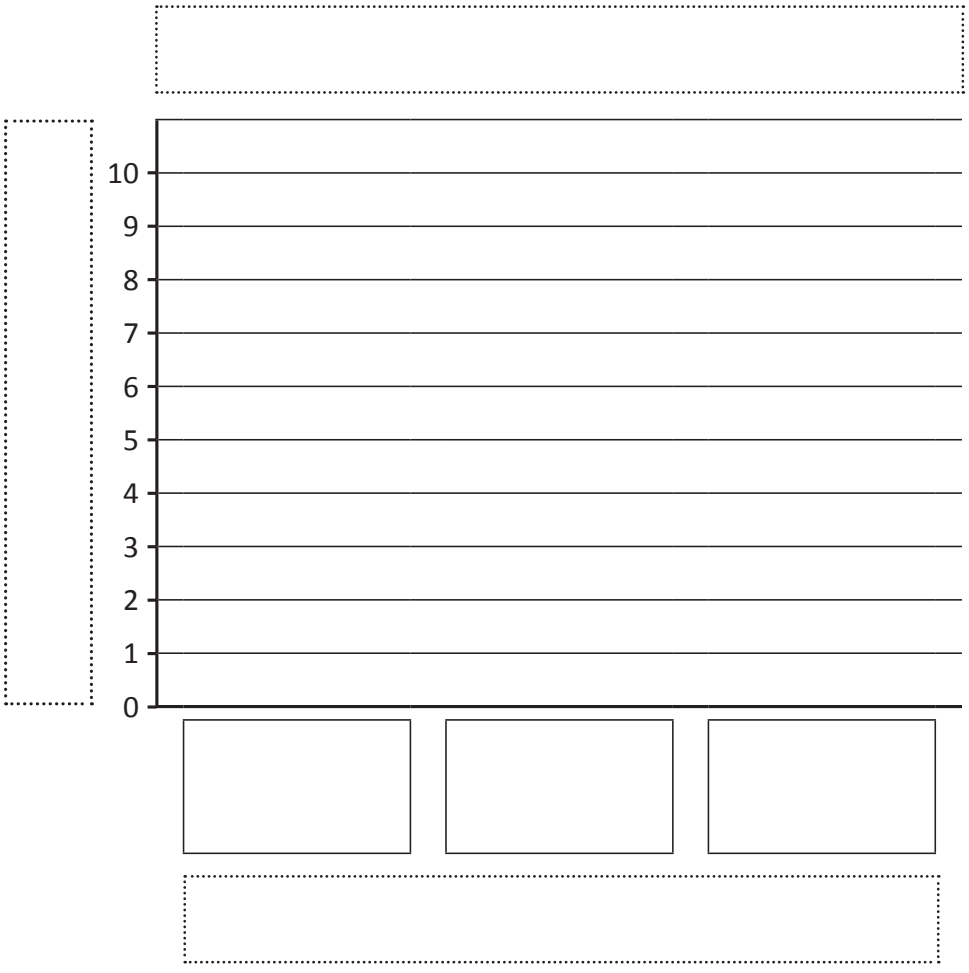
a Work out the number of votes from the tallies. Write this number in the last column (in the table above).

b Write the question that they asked:

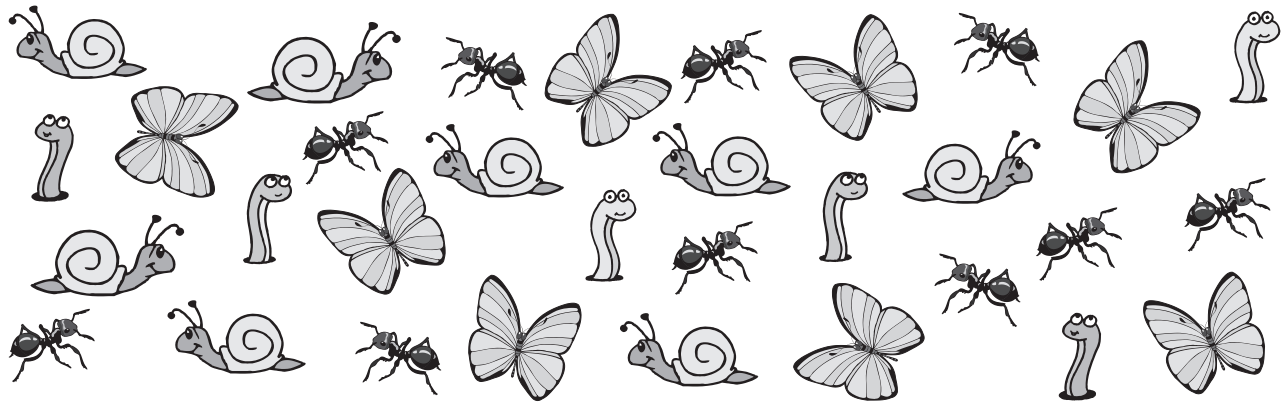
_____

_____

c Show this data on the column graph below:



2 **A group of children went on a mini-beast hunt and this is what they saw:**



Represent this data in a picture graph below:

Butterflies	
Worms	
Snails	
Ants	

Key: ✓ = 2

Skills	Not yet	Kind of	Got it
• Formulates questions that can be answered with data			
• Calculates tallies			
• Constructs a column graph showing one-to-one correspondence			
• Constructs a picture graph and includes a key			

Name _____

1 **3F conducted a survey to find out the favourite breakfast cereal. The data they collected is shown in the table below:**

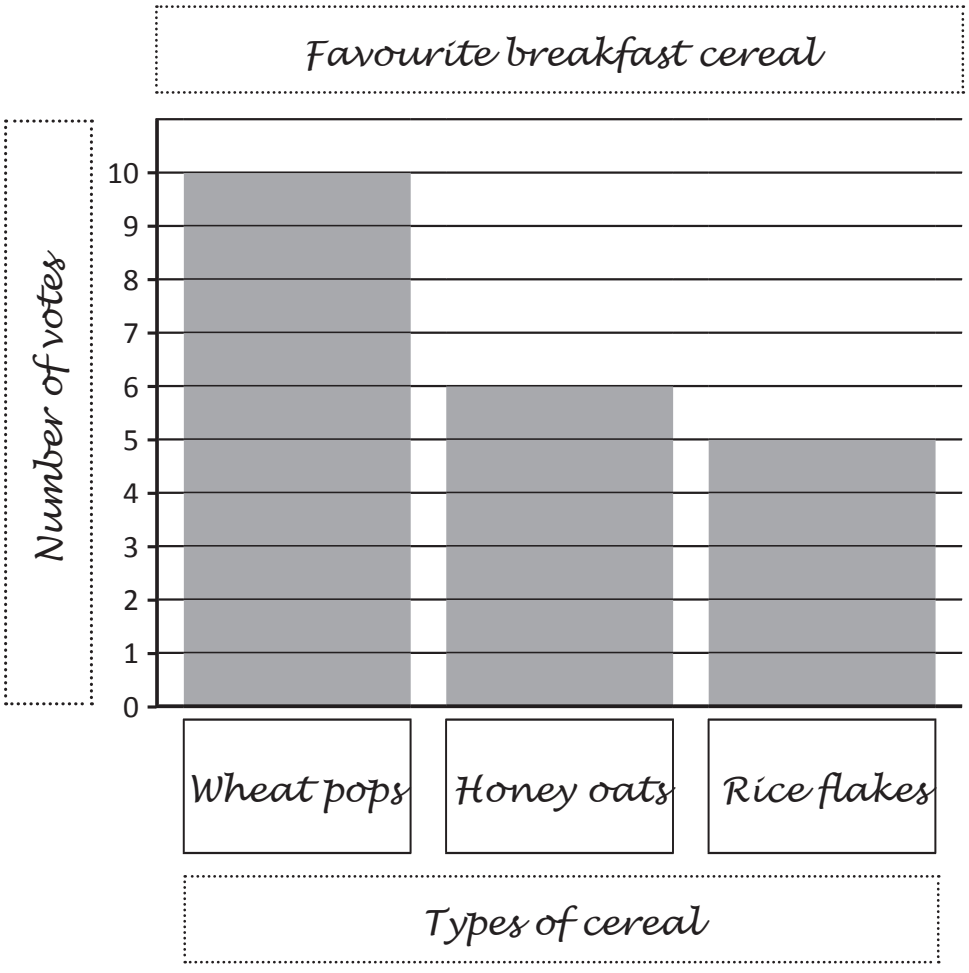
Cereal	Tallied votes	Number of votes
Wheat pops	𝍸 𝍸	10
Honey oats	𝍸 |	6
Rice flakes	𝍸	5

b Work out the number of votes from the tallies. Write this number in the last column (in the table above).

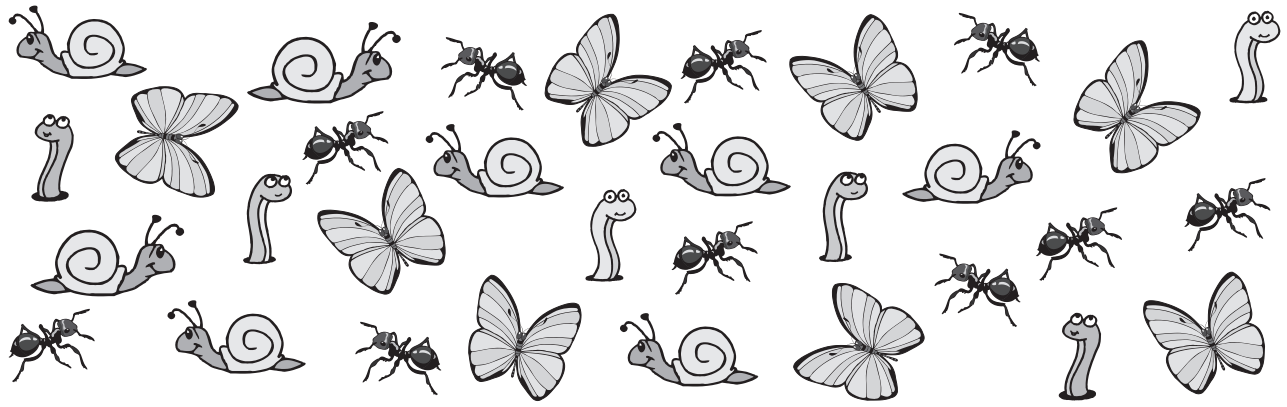
a Write the question that they asked:

Which of these 3 cereals do you like the best?

c Show this data on the column graph below:



2 **A group of children went on a mini-beast hunt and this is what they saw:**



Represent this data in a picture graph below:

Mini-beasts that we saw

Butterflies	✓ ✓ ✓ ✓
Worms	✓ ✓ ✓
Snails	✓ ✓ ✓ ✓
Ants	✓ ✓ ✓ ✓ ✓

Key: ✓ = 2

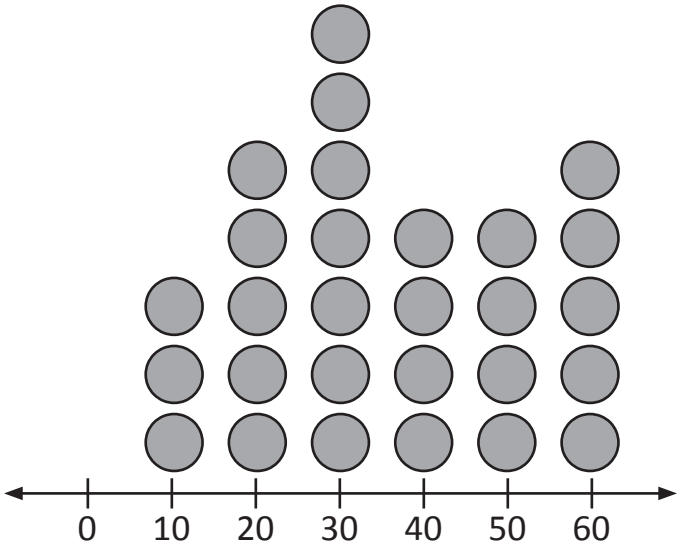
Skills	Not yet	Kind of	Got it
• Formulates questions that can be answered with data			
• Calculates tallies			
• Constructs a column graph showing one-to-one correspondence			
• Constructs a picture graph and includes a key			

Data – dot plots

Name _____

1 **3F collected data on how much time students spent on Live Mathletics each day. They represented the data in this dot plot. Answer the questions below:**

Time 3F spends on Live Mathletics



a How many kids spent 60 minutes playing Live Mathletics? _____

b Most kids spent _____ minutes playing Live Mathletics.

c _____ kids spent 10 minutes playing Live Mathletics.

d How many kids spent more than 30 minutes playing Live Mathletics? _____

e How many kids spent less than 30 minutes playing Live Mathletics? _____

f How many kids are there in 3F? _____

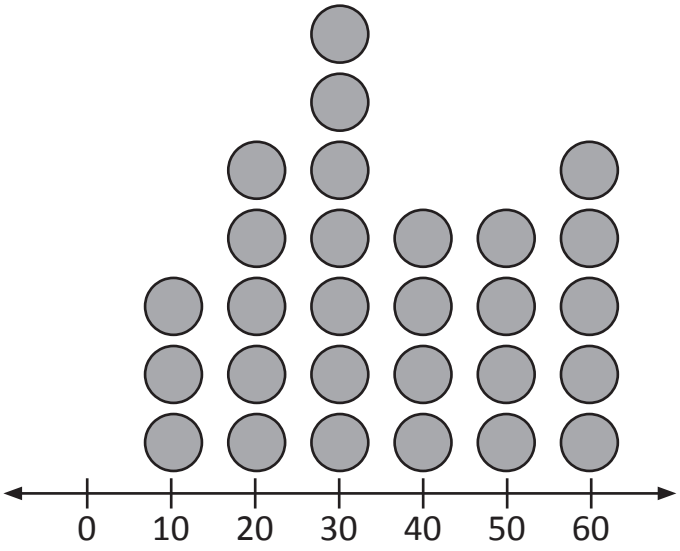
Skills	Not yet	Kind of	Got it
• Interprets data from a dot plot			

Data – dot plots

Name _____

1 **3F collected data on how much time students spent on Live Mathletics each day. They represented the data in this dot plot. Answer the questions below:**

Time 3F spends on Live Mathletics



a How many kids spent 60 minutes playing Live Mathletics? 5

b Most kids spent 30 minutes playing Live Mathletics.

c 3 kids spent 10 minutes playing Live Mathletics.

d How many kids spent more than 30 minutes playing Live Mathletics? 13

e How many kids spent less than 30 minutes playing Live Mathletics? 8

f How many kids are there in 3F? 28

Skills	Not yet	Kind of	Got it
• Interprets data from a dot plot			

Data – two-way tables

Name _____

1 **At a sports carnival, students were allowed to bring either pom-poms or a mascot or both in the colours of their team. This two-way table shows what a group of students brought.**

	Pom-poms	**No pom-poms**
Mascot	Molly Bianca Jo Lexie Brigit	Alex Nick Rachel
No mascot	Will Charlie Sam	Cam Max Wes Callum

a How many kids brought only pom-poms? _____

b How many kids brought only mascots? _____

c What did Charlie bring? _____

d Name one person who brought both a mascot and a pom-pom. _____

e How many kids brought neither a pom-pom or a mascot? _____

2 **Sort this data by writing the names into the two-way table below:**

- Marley and Tom both have a cat and a dog.
- Cassie just has a cat.
- Bri just has a dog.
- Tess and Sia don't have any pets.

Marley Cassie Bri Tess Sia Tom

	Cat	**No cat**
Dog		
No dog		

Skills	**Not yet**	**Kind of**	**Got it**
• Interprets and sorts data from a two-way table			

Data – two-way tables

Name _____

1 **At a sports carnival, students were allowed to bring either pom-poms or a mascot or both in the colours of their team. This two-way table shows what a group of students brought.**

	Pom-poms	No pom-poms
Mascot	Molly Bianca Jo Lexie Brigit	Alex Nick Rachel
No mascot	Will Charlie Sam	Cam Max Wes Callum

a How many kids brought only pom-poms? 3

b How many kids brought only mascots? 3

c What did Charlie bring? pom-poms

d Name one person who brought both a mascot and a pom-pom. Molly

e How many kids brought neither a pom-pom or a mascot? 4

2 **Sort this data by writing the names into the two-way table below:**

- Marley and Tom both have a cat and a dog.
- Cassie just has a cat.
- Bri just has a dog.
- Tess and Sia don't have any pets.

Marley Cassie Bri Tess Sia Tom

	Cat	No cat
Dog	Marley Tom	Bri
No dog	Cassie	Tess Sia

Skills	Not yet	Kind of	Got it
• Interprets and sorts data from a two-way table			

Series D – Chance and Data

Region	Outcomes
NSW	**NS2.5** Describes and compares chance events in social and experimental contexts **DS2.1** Gathers and organises data, displays data using tables and graphs, and interprets the results
VIC	**Measurement VELS – Level 3** At Level 3: They compare the likelihood of everyday events (for example, the chances of rain and snow). They describe the fairness of events in qualitative terms. They plan and conduct chance experiments (for example, using colours on a spinner) and display the results of these experiments. They recognise different types of data: non-numerical (categories), separate numbers (discrete), or points on an unbroken number line (continuous).They use a column or bar graph to display the results of an experiment (for example, the frequencies of possible categories).
QLD	**Topic – Chance** CD 3.1 Students identify all possible outcomes of familiar situations or actions and, for these sample spaces, order the likelihood of occurrence of the identified outcomes using experimental data. **Topic – Data** CD 3.2 Students design and trial a variety of data collection methods and use existing sources of data to investigate their own and others' questions, organise data and create suitable displays, identifying and interpreting.
SA	**2.1** Poses questions, explores patterns, and collects relevant data. They record and represent the data, and also use data presented by others. **2.2** Describes key features of data and draws conclusions from similar data from different groups. They make general predictions based on results. **2.3** Describes situations where chance plays a role; collects, organises and represents data to identify possible outcomes; and uses comparative language to describe the likelihood of each outcome.

Series D – Chance and Data

Region	Outcomes
WA	**Chance** • chance uses specific language (e.g. possible/impossible, probable/improbable, certain/uncertain, likely/unlikely, fair/biased) • the ambiguity in chance language needs to be supported by a measurement of probable outcomes (e.g. the probability of throwing a 6 on a die can be trialled) • some events will definitely happen or not happen but other events involve an element of chance as it is not known whether they will definitely happen or not happen • outcomes from using probability devices (e.g. spinners, dice) can be listed (e.g. rolling two dice can create many combinations) • familiar events can be described as having equal chances of happening or being more or less likely (e.g. making spinners with equal and unequal sections and considering which have an equal, more or less chance of occurring) • events are equally likely to happen when there is no reason to think one is more or less likely than the other (e.g. the spinner is equally likely to stop on red, blue, green or yellow because the circle has 4 equal sized sections and could stop anywhere) • prior experiences can be used to predict future events (e.g. when there are dark grey clouds it is more likely to rain than if there are no clouds) • events can be quantified informally with ratio, fractions and key percentages (e.g. an event has a 50% chance of occurring) • outcomes from a familiar event or experiment can be ordered from least likely to happen to those most likely to happen on the basis of numerical and other information about events • the chance of an event happening can change if other factors change (e.g. selecting a red counter after they have all been removed from the jar) **Collect and organise data** • how to pose and refine questions that can be answered by collecting data • methods to plan, collect, organise and record data in order to answer questions • data can be classified, sequenced and tabulated • events involving chance processes can be investigated and outcomes from chance events can be predicted and tested • organising and representing data allows events to be compared (e.g. playing basketball was more popular than cricket) • collecting or recording data requires accuracy • data can be clarified through discussion • lists and tables (e.g. one-way and two-way tables) can be used to organise information • frequency data can be recorded using formats based on tallies, organised lists or plots (e.g. tables, simple spreadsheets, dot plots) • when planning a survey the method of data collection is determined by the purpose of the investigation • how to devise survey questions
NT	**CD 2.1 Chance** • provide reasons as to why one familiar event may be more or less likely to occur than another • identify situations where all outcomes are equally likely **CD 2.2 Data** • collect and organise data in order to answer questions • interpret two-way tables and create column graphs • using a whole-number labelled axis • produce and read

Series D – Chance and Data

ACT	**17.LC.15** identify and describe possible outcomes for familiar events involving chance, make judgements about their likelihood and predict whether some are more likely than others **17.LC.16** collect data from experiments or observation to justify or adjust predictions involving chance and distinguish situations that involve equally likely events from those that do not **17.LC.17** select and use a range of ways to collect data, including surveys, observations and experiments, choose suitable tables or graphs to present the information (e.g. using ICT) and use these to support statements or predictions made about the data **17.LC.18** read data from tables and graphs, compare information from related data sets, look for and describe expected or unexpected variation within the sets of data and decide whether additional data should be collected to draw reasonable conclusions
TAS	**Stage 6** • read and interpret values from conventional tallies, simple two-way tables, bar graphs with intermediate gridlines, and pictographs with many-to-one correspondence **Stage 7** • compare chances qualitatively (equal/less/more) for simple events such as coins or spinners • make predictions based on data • notice relationships in bar and line graphs, and tables **Stage 8** • list equally likely outcomes and simple combinations e.g. ways of choosing 2 coins from 10c, 20c, 50c and $1 • make judgments about data obtained from experiments and observations using the language of chance e.g. say which totals are most likely when two dice are tossed • suggest data collection methods, such as a sample or improving simple survey questions • read and interpret Venn diagrams and two-way tables • talk about the shape of a graph and what it means

ACARA	**M3SP1** Investigate data-oriented questions about familiar situations, predict what the data might show, carry out the investigation and report the results **M3SP2** Construct, read and make connections between tables, diagrams and graphs including dot plots with prepared baselines **M3SP3** Conduct chance experiments and recognise that there will be variation in results as well as having expected outcomes