

Position



Name _____

Series G – Position

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Topic 1 – Spatial orientation (pp. 1–5)

Date completed

- point of view _____
- directions _____
- treasure trail – *create* _____

Topic 2 – Coordinates (pp. 6–12)

- plotting coordinates _____
- street directories _____
- take me to the movies – *solve* _____
- connections – *apply* _____

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- scale drawings _____
- map it out – *create* _____
- border or bust – *apply* _____

Series Authors:

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Nicola Herringer

Spatial orientation – point of view

Where we are in relation to an object impacts on how we see the object and describe its position.

1 Work in a small group for this activity:

- a Make a simple 3D model using blocks, books or perhaps 3 to 4 friends.
- b Photograph the model from different points of view. Make a note of where you were standing for each shot. Then print out the shots, upload them onto a computer or keep them on the camera for others to view. If a camera isn't available, sketch each view of the model.
- c Now ask another group to look at each picture, then stand where they think it was made.
- d Give them feedback on their choices.
- e Swap roles. How easy was it to work out the different perspectives?

2 Choose 2 of the photos or drawings from the first activity. Write a description of the perspectives. How does each description differ?

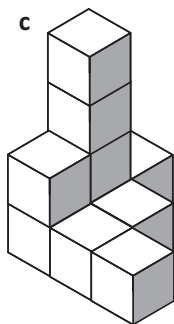
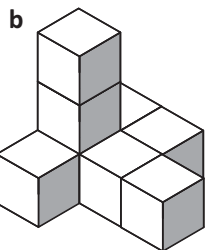
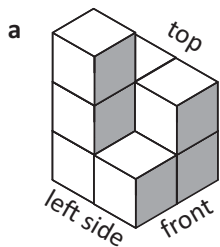
Perspective 1

Perspective 2

3 Go to Google Earth and locate a famous landmark such as Uluru or the Eiffel Tower. How does the bird's-eye view differ from the front or side-on views we normally see? Draw one of the views here:

Spatial orientation – point of view

4 Build these models using cubes. Now draw the top, front and the left side view of each:



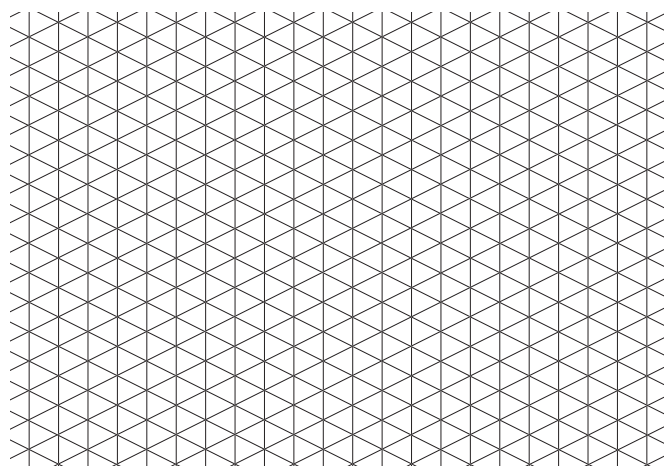
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5 This time, work with a partner. Create a simple cube model without showing your partner. Draw the top, front and left side views. Now, ask your partner to reconstruct the model. Show them your version. Are they right?

Swap roles.

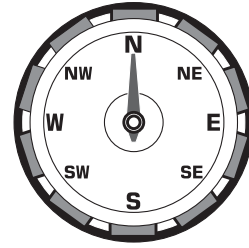
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6 Draw your model on the isometric graph paper:

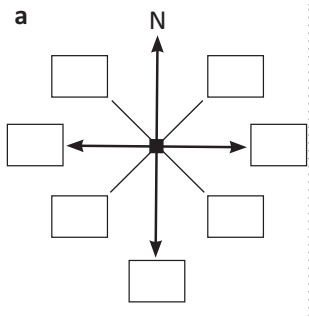


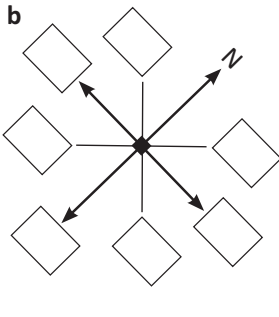
Spatial orientation – directions

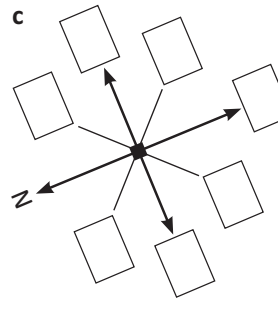
Compass directions can help us orient ourselves. There are 4 main points on a compass: north, south, east and west. Halfway between each of these is north-west, north-east, south-east and south-west.

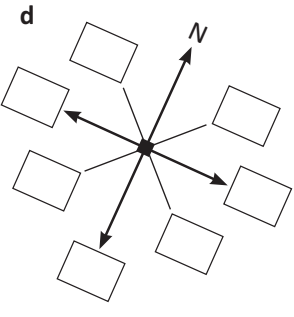


1 Add the missing directions to the compasses:

a 

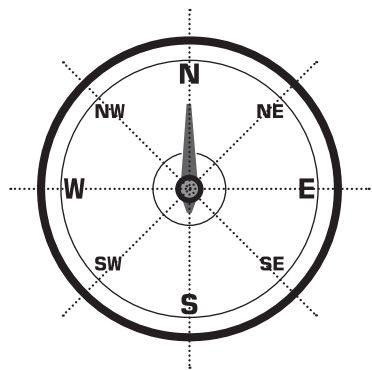
b 

c 

d 

When we turn from north back to north, we make a full turn. When we turn from north to south, we make a half turn. When we turn from north to east we make a quarter turn. What kind of turn is it from north to north-east?

2 Use the compass below to identify different turns. How many can you find?



half turns

quarter turns

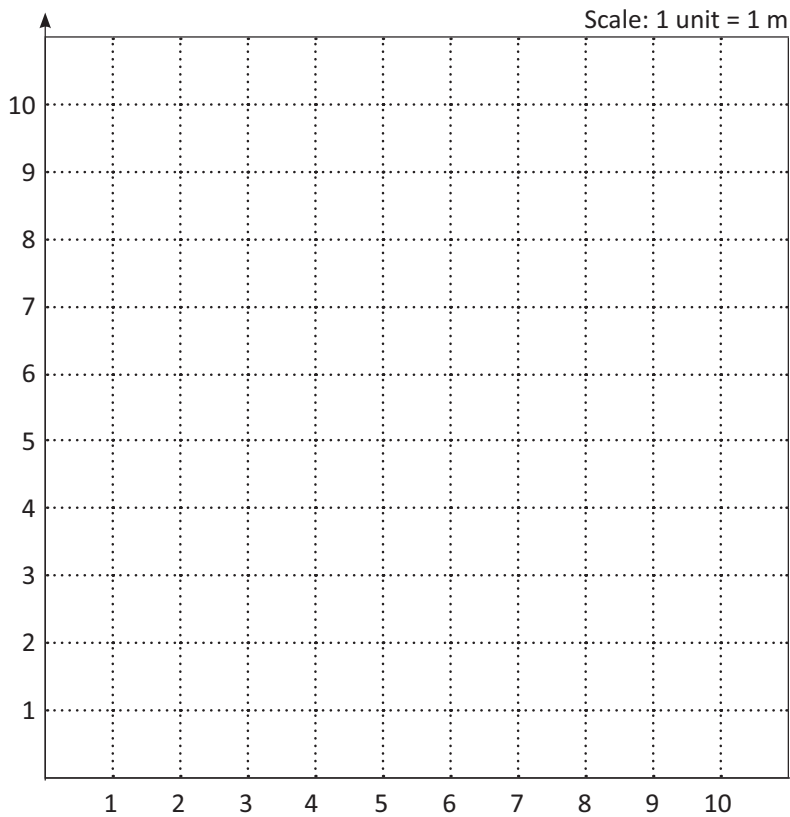
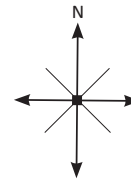
three-quarter turns

eighth turns

3 Play this game with a couple of friends. Draw a simple compass on paper and place it at your feet, making sure your north faces true north. One of you is the caller, the others are the doers. The caller gives an instruction such as, "Make a $\frac{3}{4}$ turn." What new direction will you face? Make the move, then check. How did you go? Can you make pictures in your head of where you are? Do you get better with practice?

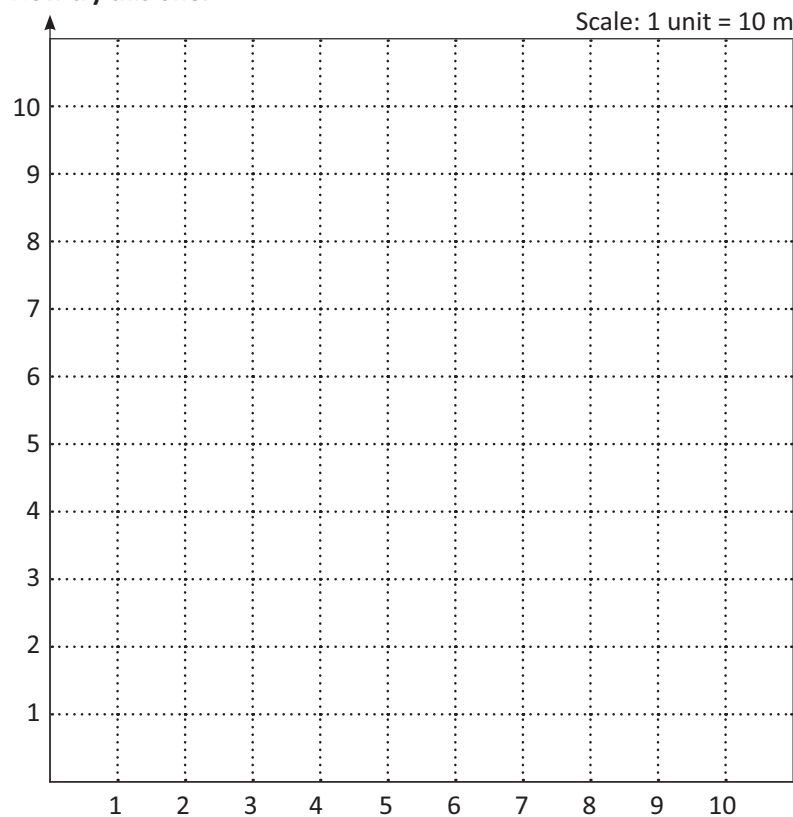
Spatial orientation – directions

- 4 Show the following path on the grid below. For the first number, look at the horizontal axis. For the second number, look at the vertical axis.



- a Start at Point A (6, 1) and head 2 m north to Point B.
- b Head 4 m east to Point C.
- c Move north-west through 2 squares to Point D.
- d Move 2 m east to Point E.
- e Turn north-west and travel through 2 squares to Point F.
- f Travel 2 m east to Point G.
- g From Point G, move through 4 squares north-west to Point H.
- h You are now halfway through a symmetrical picture. Complete it and decorate if you wish.

- 5 Now try this one:



- a Start at Point A (5, 2) and head 30 m north to Point B.
- b Face east and head 30 m to Point C.
- c Turn to face north and head 40 m to Point D.
- d Turn west and travel 70 m to Point E.
- e Turn south and head 40 m to Point F.
- f Face east and head 30 m to Point G.
- g Face south and head 30 m to Point H.
- h Join Point H and Point A. What have you created? Advertise something on it.



Getting ready

For this activity, you'll work in a small group to invent a treasure hunt. You'll think of a place in the school to hide your treasure and you will also think of a route to get there. At different points, you'll leave clues for your hunters. You'll need around 10 cards or pieces of paper and tape or Blu Tack. You will also want a 'treasure'.



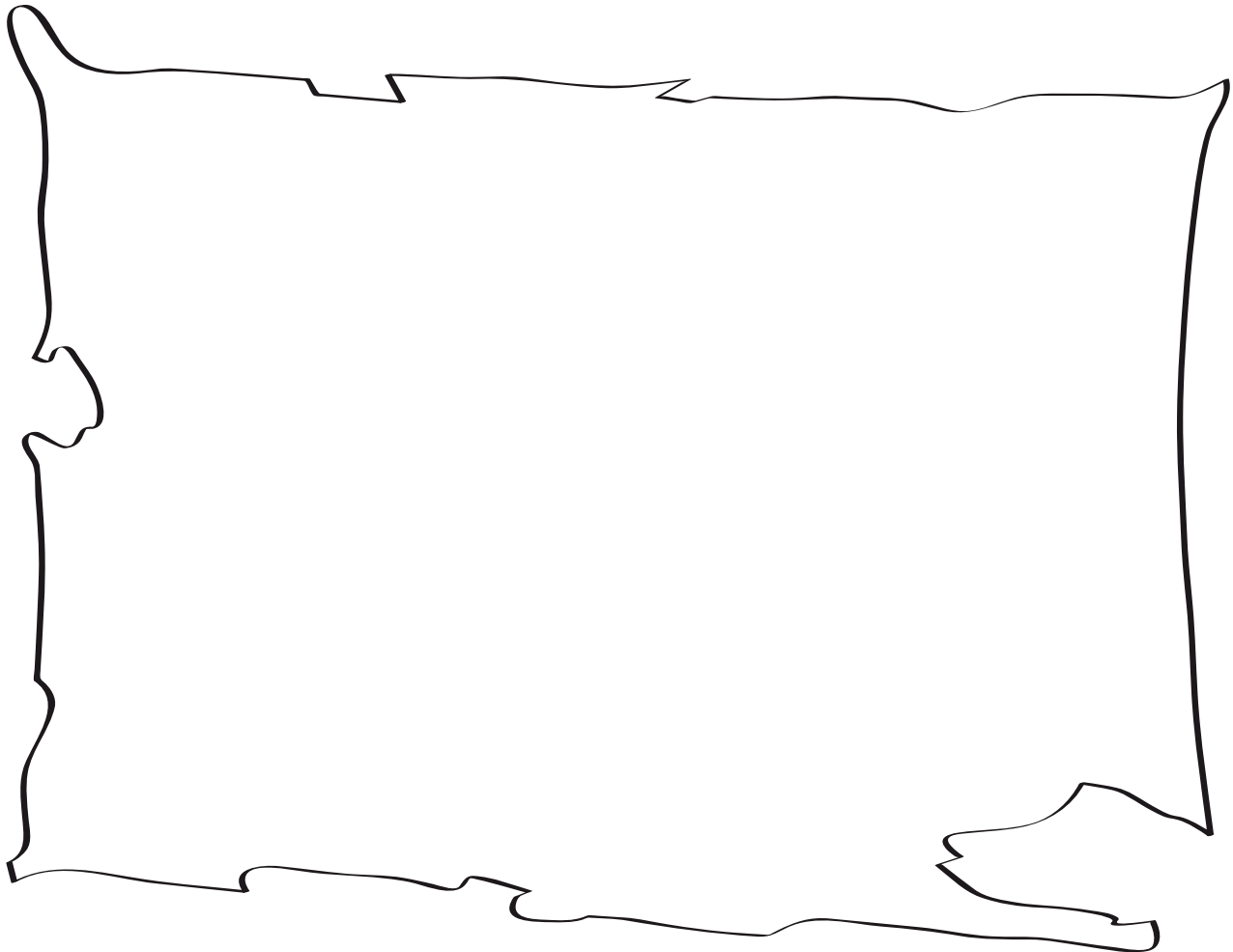
What to do

- 1 Plan a route that you can describe easily to someone using directions such as, "Start at the library door. Your next clue is 25 paces to the north".
- 2 Write out the clues on a card or piece of paper and display them along the route. (If the whole class is doing this activity, you may want to name your cards!)
- 3 You'll need to think about how people will know which direction to head from the different points. If you have access to compasses, it makes it easier. Or you could place a hand-drawn direction at each point to help your hunters.
- 4 Hide your treasure at the final point.
- 5 Find another group to follow your treasure trail.



What to do next

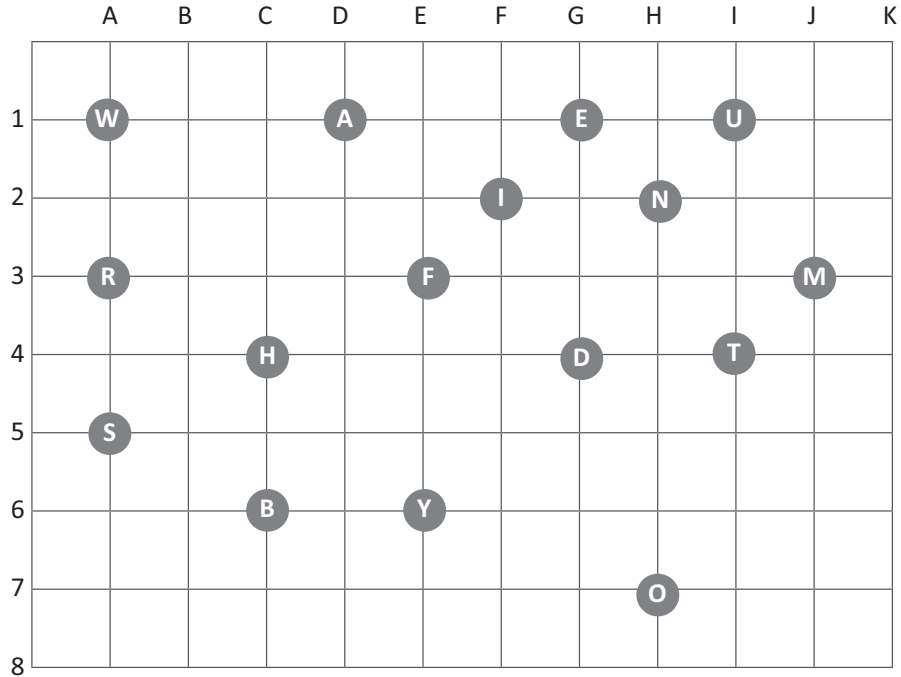
Make a treasure map of your route.



Coordinates – plotting coordinates

Maps and street directories use coordinates to help us follow routes and find places.
We read coordinates horizontally and then vertically, so the letter comes before the number.

1 Write the letter for each coordinate to work out the riddle and the answer:

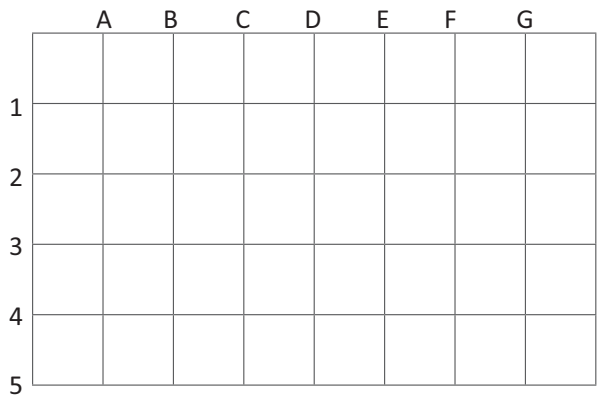


Questions			
A1, C4, D1, I4, A5		F2, I4	
E6, H7, I1, A3, A5		J3, H7, A3, G1	
C6, I1, I4		I4, C4, D1, H2	
E6, H7, I1, A3		E6, H7, I1	
E3, A3, F2, G1, H2, G4, A5		G4, H7?	
I1, A5, G1			

Riddle answer	
E6, H7, I1, A3	
H2, D1, J3, G1!	

2 Plot these points and then connect them to make a 3D shape. Use a ruler.

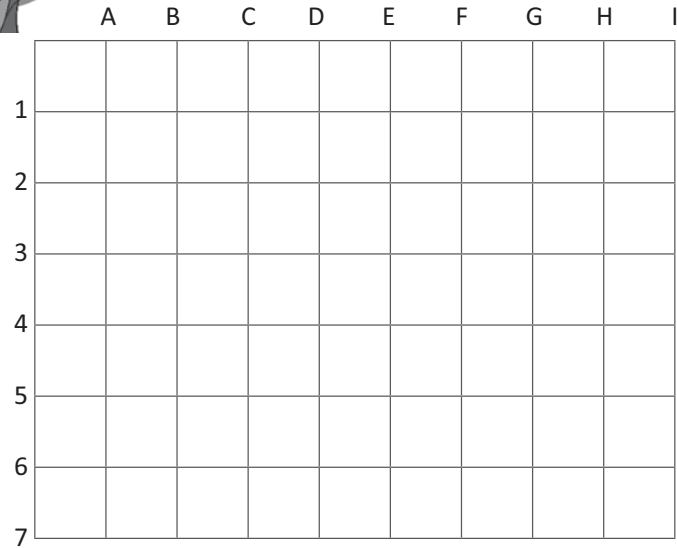
- | | |
|----------|----------|
| F1 to C1 | F1 to D3 |
| C1 to A3 | D3 to D5 |
| A3 to A5 | C1 to C3 |
| A5 to D5 | A3 to F3 |
| D5 to F3 | C3 to A5 |
| F3 to F1 | |



Coordinates – plotting coordinates

3 Plot and connect these coordinates to find the path taken by the cowboy to find his boots.

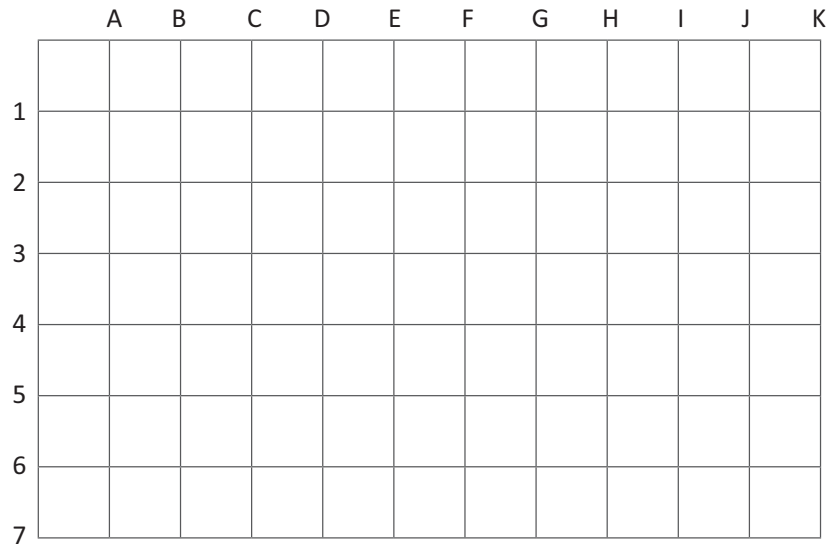
Plot these points: A1, A2, C2, C3, E3, E4, G4, G5, I5, I7



4 Connect each set of dots using a ruler:

E2 to D1, D1 to D3, D3 to B3, B3 to C4, C4 to B5, B5 to D5, D5 to D7, D7 to E6

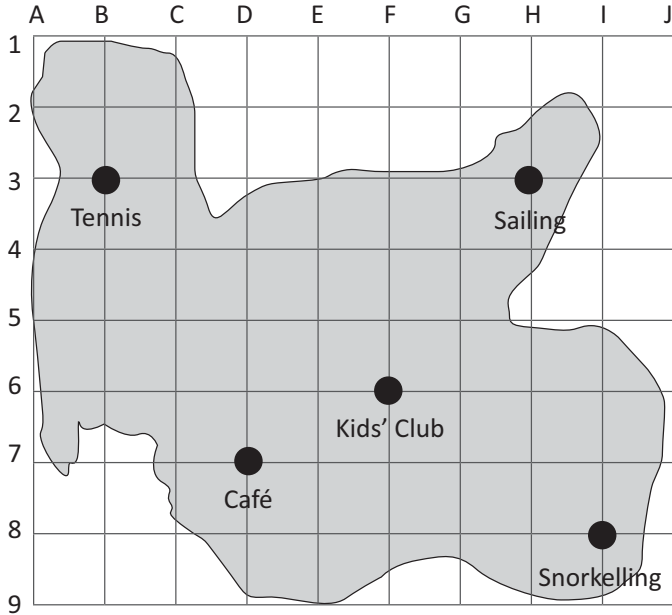
Draw the other half of your shape and decorate.



Coordinates – street directories

Maps and street directories use coordinates to help us follow routes and find places.

1 Write the coordinates for these places on the island:



Sailing _____

Tennis _____

Café _____

Kids' Club _____

Snorkelling _____

Now label these on the map:

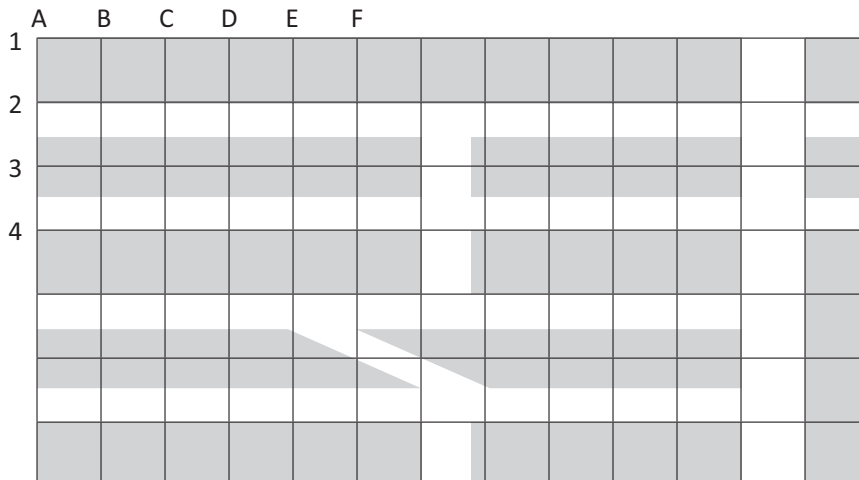
Marina – G3

Jet skiing – C8

Camping site – D4

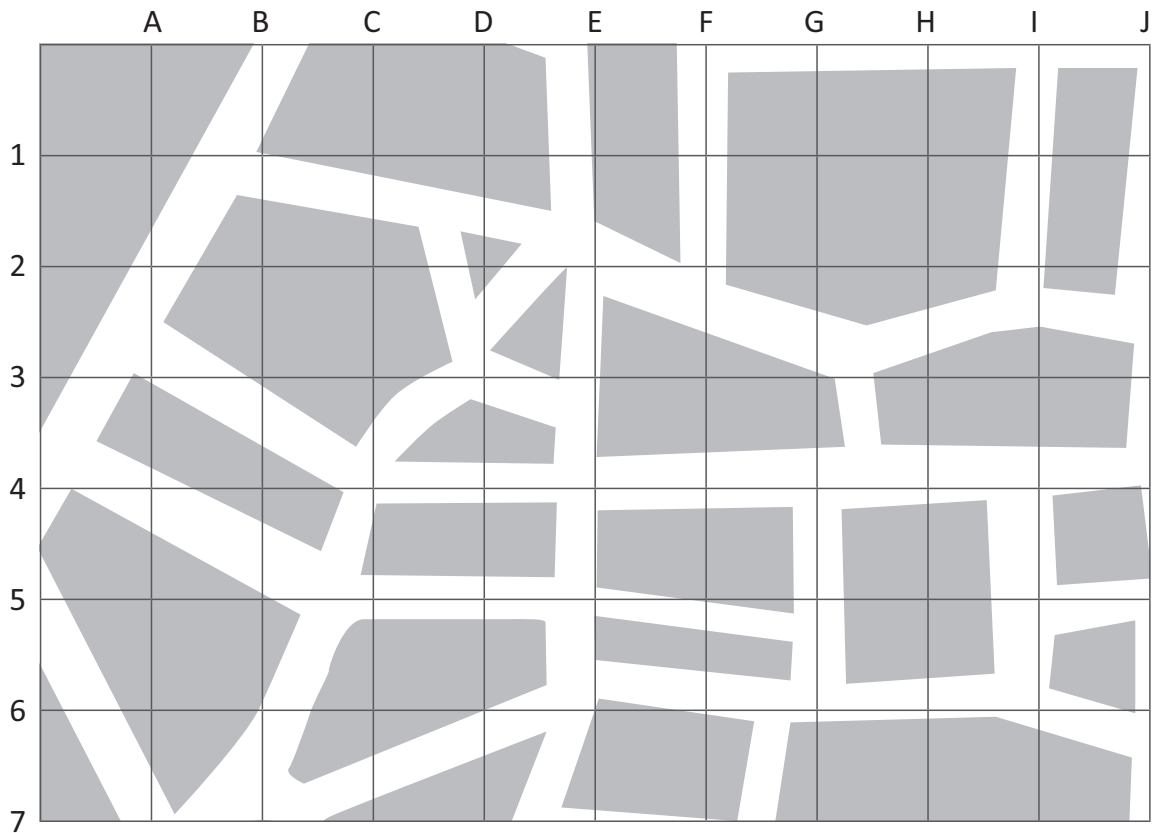
2 You will need to use a street directory for this question. Look at what it uses as symbols and how the streets are labelled. Do you think their choices are useful? Now ...

- a Finish the coordinates on the grid below.
- b Name each street.
- c Make your own key using symbols.
- d Label your map with the following:
 - swimming pool
 - church
 - police station
 - library
 - hospital
 - post office
 - bridge
 - railway line



Coordinates – street directories

3 Complete this map by labelling it with the streets in the table below:

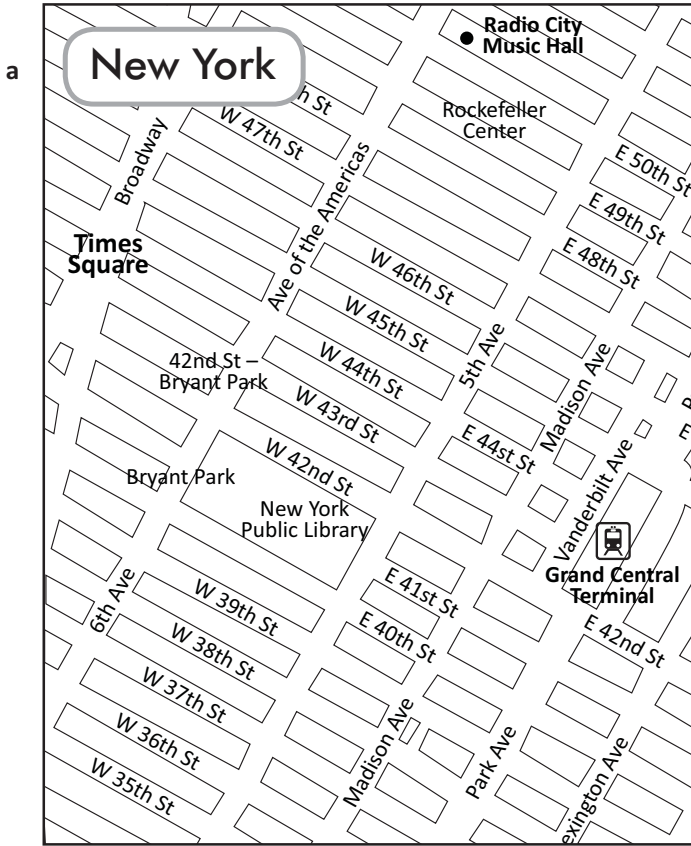


Label	Clue 1	Clue 2
Webb Street	B6	C4
Cuba Street	G4	G6
Noble Parade	A4	B5
Brent Street	A3	C4
Wilcox Street	E5	E3
Corona Street	I6	I4
Orion Street	E2	G3
Thorpe Road	F4	H4
Shirley Street	E6	G6
Fox Road	F2	F1

You live on the corner of Cuba and Shirley Streets. Your friend lives on the corner of Fox Road and Orion Street. Draw your houses and then write a set of directions for your friend to visit you.

Coordinates – street directories

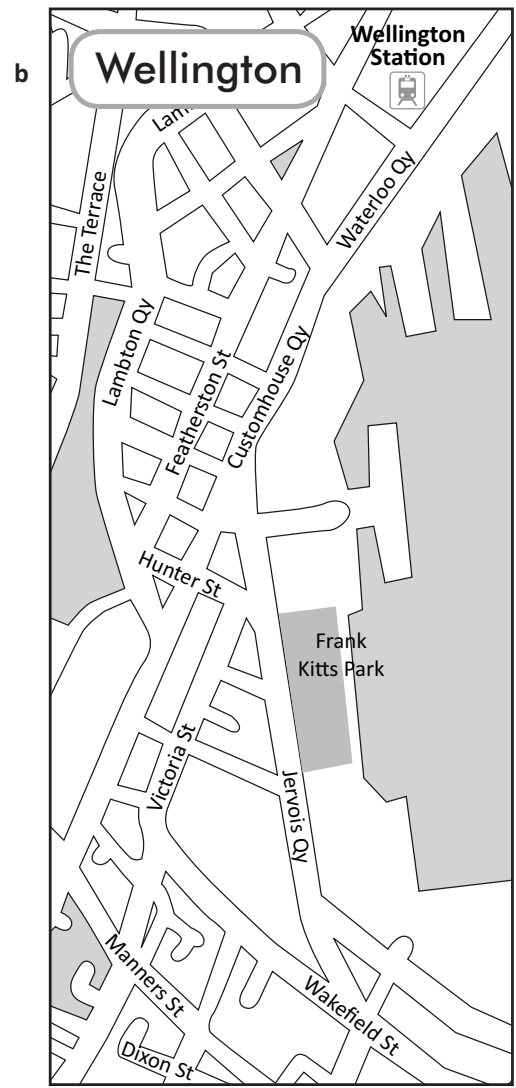
- 4 You will be travelling to 2 cities. In each city you will follow directions to locate a secret spot. Mark your travels on the map. Some of the clues are a little cryptic and might require some thought.



It's time to hit the streets of **New York** (USA)! You arrive at Grand Central Terminal and walk out onto Vanderbilt Avenue.

You want to get to Radio City Music Hall. Draw what you think would be the fastest route. From Radio City Music Hall, walk 8 blocks down Ave of the Americas/6th Ave and then turn left. What is on your right?

Turn right into 5th Ave and turn right onto E 40th St. Walk for 2 blocks and then turn right onto Broadway. What famous area is 3 blocks to the right?



You fly direct to **Wellington** (New Zealand). Do you know what island are you on?

You catch a train to Wellington Station and then head south on Featherston St. Turn left onto Hunter St and then right onto a street named after a queen.

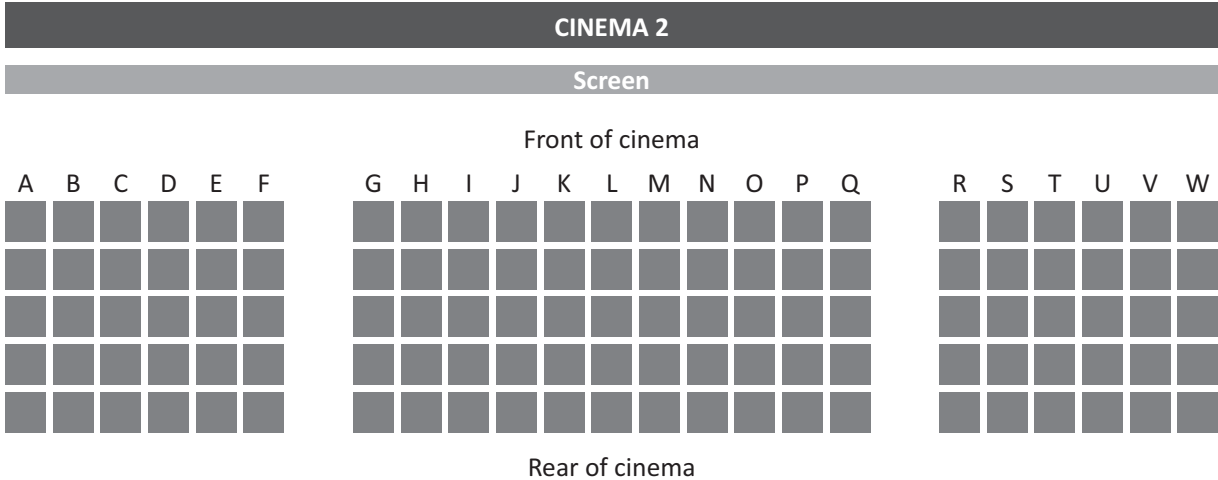
Turn into Wakefield St and then take your first left. Travel along this till you reach a park. What street does the park face onto?



What to do



Look at the cinema plan. Use the clues to find who is sitting where.



The following seats were booked by 6 different people. Read the clues then fill in the table.

- Clue 1** Jack is sitting in E4.
- Clue 2** Molly is 2 rows directly in front of Jack.
- Clue 3** Trent is 2 seats to the left of N3.
- Clue 4** Carly is 12 seats to the right of Molly.
- Clue 5** Brian is on Carly's left.
- Clue 6** Lim is directly behind Trent.
- Clue 7** Zac is 6 seats to the right of Molly.
- Clue 8** Ella is on Lim's left.
- Clue 9** Will is in an aisle seat in row 3 in the section on the far right.

Name	Seat
Molly	
Jack	
Trent	
Brian	
Carly	
Lim	
Zac	
Ella	
Will	





Create a design by connecting the coordinates below. Use a sharp pencil and a ruler.

0	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														



Connect these coordinates, work down each column and tick each one off as you go:

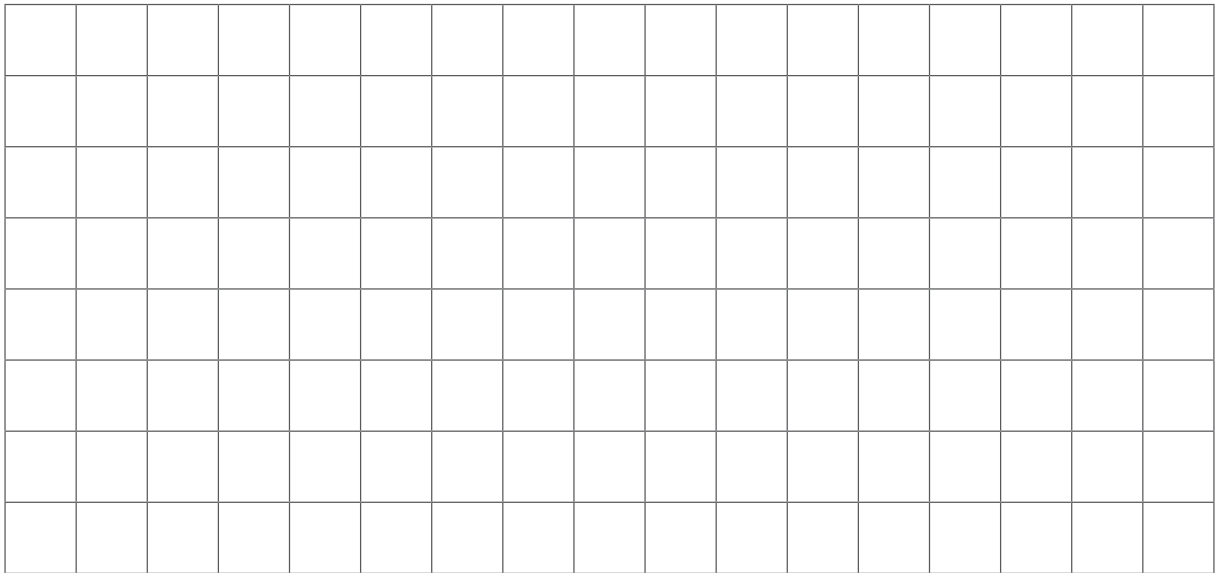
- | | | | | |
|----------|------------|-----------|-----------|-----------|
| G1 to I3 | K9 to K11 | C11 to C9 | E3 to G1 | E11 to G7 |
| I3 to K3 | K11 to I11 | C9 to A7 | I3 to G7 | C9 to G7 |
| K3 to K5 | I11 to G13 | A7 to C5 | K5 to G7 | C5 to G7 |
| K5 to M7 | G13 to E11 | C5 to C3 | K9 to G7 | E3 to G7 |
| M7 to K9 | E11 to C11 | C3 to E3 | I11 to G7 | |

Maps and scale – scale drawings

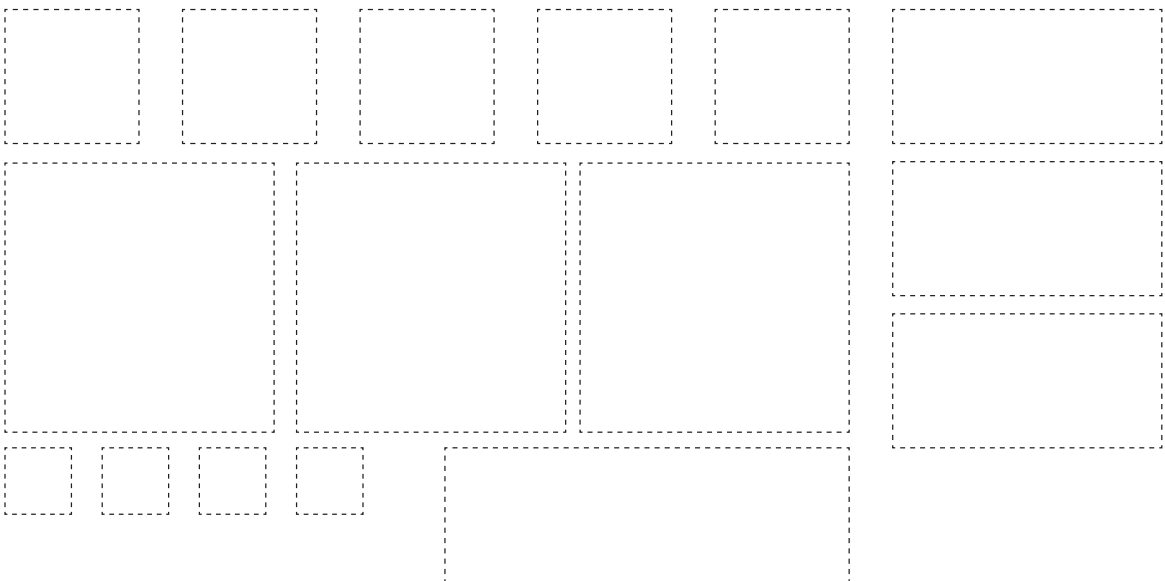
We use scale drawings to represent larger measurements or areas.
Maps and floor plans are good examples of scale being used in real life.
We use one measurement to represent another, like this: $1 \text{ cm} = 5 \text{ km}$



- 1 Choose an area that is easy to measure in your school such as the basketball court, your classroom or the school hall. Work with a partner to measure its length and width in metres. You'll need a tape measure, metre ruler or trundle wheel to do this. Now represent the space on the grid below using the scale $1 \text{ cm} = 1 \text{ m}$. If you choose a bigger region, you may need to adjust the scale.

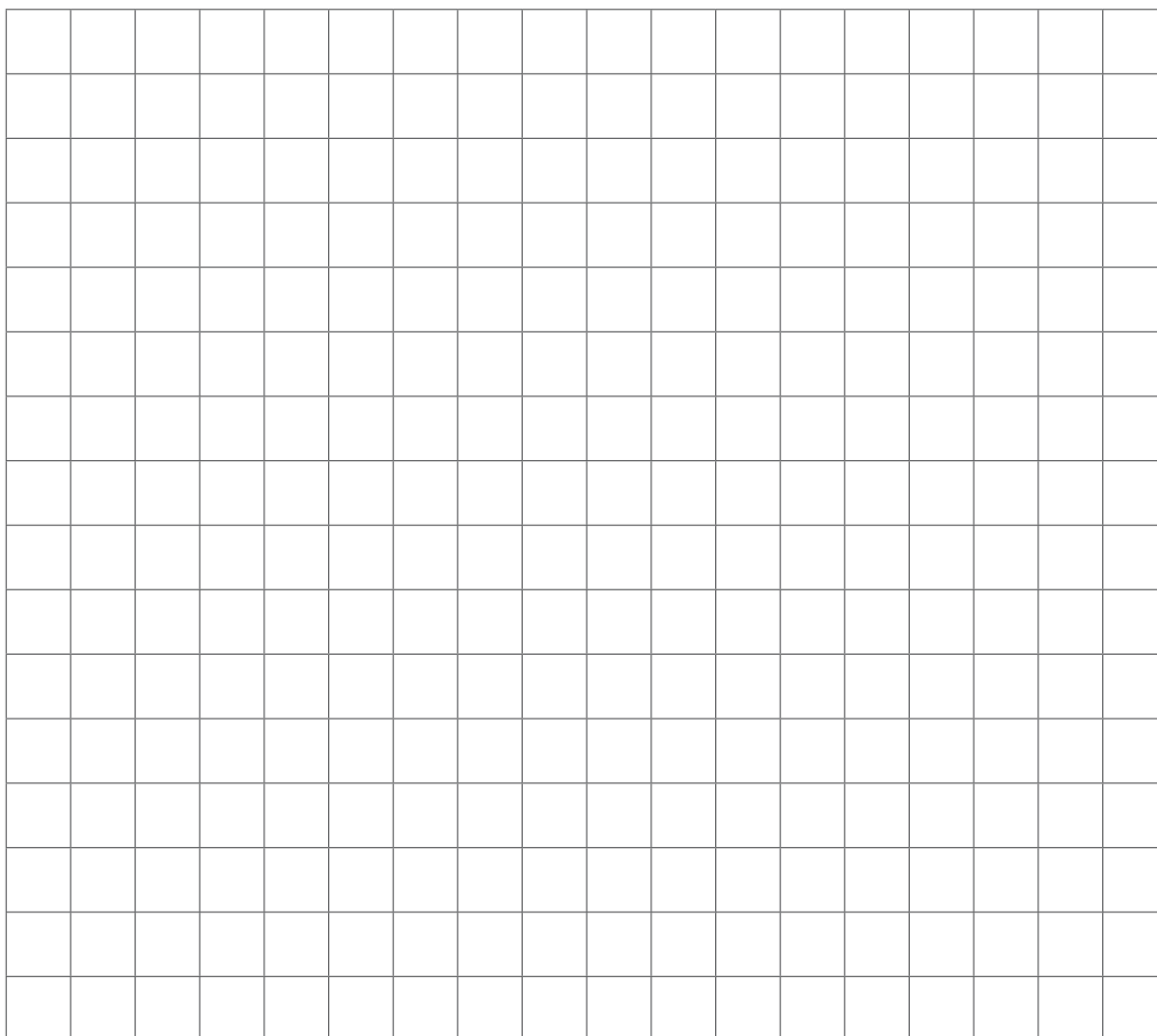


- 2 In this activity, you'll make a map of a school fair. What will you need? Stalls? Rides? Ticket booths? A Haunted House? Photocopy the shapes below, then draw or label the shapes with your selections. Once you are done, cut them out and place them on the grid on the next page.



Maps and scale – scale drawings

- 3 Design your fairground. Add paths and other features if you wish.



1 cm represents 1 m

- 4 Write 4 problems for your partner to solve such as, "How far is it from the Jumping Castle to the Trash and Treasure stall?"



Getting ready

You are going to make a scaled drawing or map of a familiar location. This could be your school, room, home, or local neighbourhood. Choose somewhere that matches your interests; shopaholics might choose a section of a mall, sports nuts might map the local oval, bookworms might choose the library. You can work by yourself or in a small group.

You'll need a tool for measuring the distances. If you are measuring a compact area such as your house or the school, you could use a trundle wheel or tape measure. If you choose a larger area, you may need to enlist an adult to use the car's odometer to record distances between landmarks. You could also use maps as a research tool.



What to do

- 1 Walk around your chosen region and make a rough sketch of what your map will look like. How detailed will you be? Will you include all landmarks or just the major ones? It may help to take photos to assist you later.
- 2 Measure and record the size of landmarks and the distances between them. How precise will you be? Make a decision as to how you will round measurements and apply this to all your sizes and distances.
- 3 Your next step is to decide the scale. What size paper will you present your map on? This will impact on your decision.
- 4 Once you have all this organised, create your map. You can create it freehand or place it on a grid. Label each landmark.



What to do next

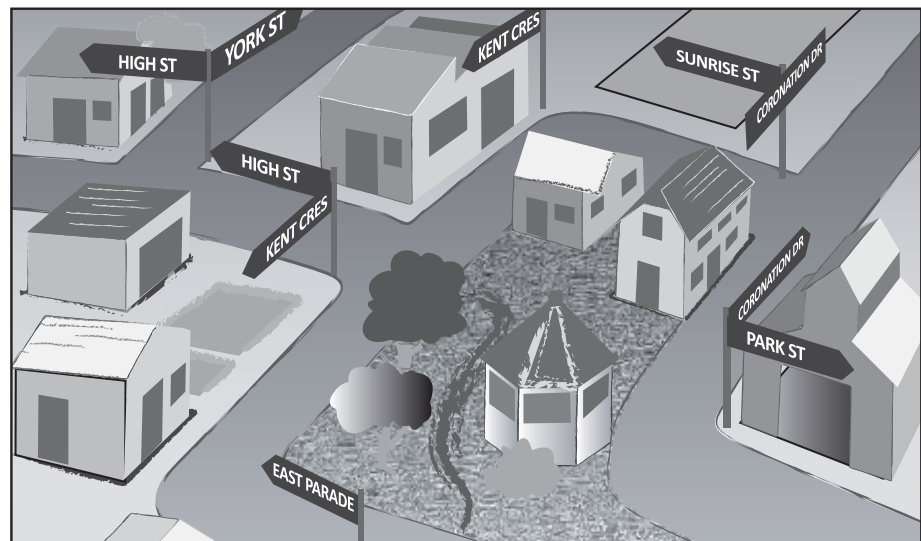
Work out where north is for your map and add a compass.

Write some directions for a partner about your map.

"What landmark is 10 m north-west of the chip shop?"

"Find the shortest route from the office to the sports shed."

I'm going to map my neighbourhood. It'll need to be a bird's-eye view.





Play this game with a partner. You'll need 2 counters, a die, 8 slips of paper labelled N, S, E, W, NE, NW, SE and SW and a container for the direction slips.



Take turns rolling the die, pulling a direction from the container and moving your counter to the appropriate square. The first to the border wins the round. Make it best of 3 rounds.

