

Mathematics Level 3

Chapter 5 — Space

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Making, comparing and classifying three-dimensional objects

Code: VC2M3SP01 (.E01, .E02, .E03, .E04, .E05, .E06)

make, compare and classify objects, identifying key features and explaining why these features make them suited to their uses — VC2M3SP01

In Foundation, Year 1 and Year 2 you sorted, named and made shapes. Now you will work with **solid objects** — shapes you can pick up and hold. You will make solid objects, look at their **features**, sort them into groups, and say why their features make them good for their uses.

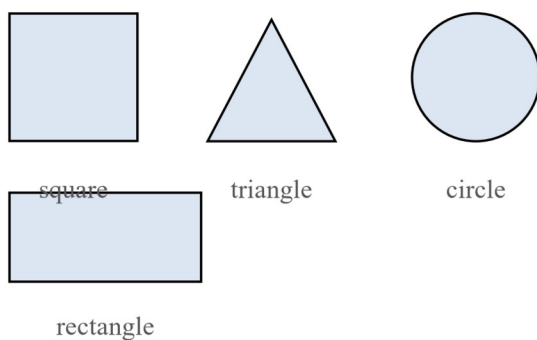
You will need: connecting cubes or blocks, straws, small balls of clay, and some everyday things such as a tin can, a ball and a box.

Learn about solid objects and their features

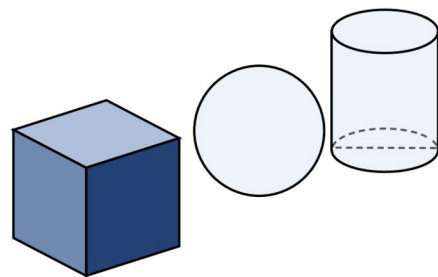
1. Flat shapes and solid objects

You already know flat shapes. A square, a triangle, a circle and a rectangle are flat shapes. They stay on the page. You can draw them.

Solid objects are different. A solid object takes up space. You can hold it in your hand.



Flat shapes stay on the page.



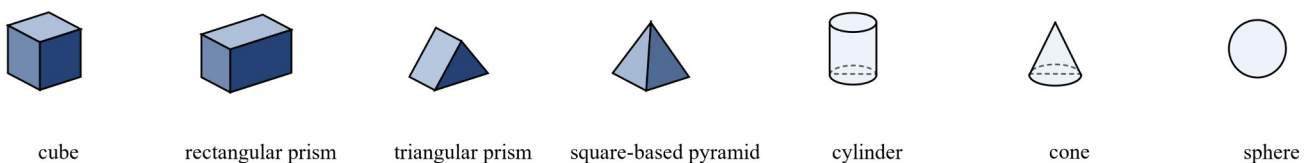
Solids take up space.

Left: four flat shapes, a square, a triangle, a circle and a rectangle. Right: three solid objects, a cube, a sphere and a cylinder.

The square, the triangle, the circle and the rectangle are flat shapes. The cube, the sphere and the cylinder are solid objects.

2. Names for solid objects

Here are seven solid objects to know.



Seven solid objects in a row with their names: cube, rectangular prism, triangular prism, square-based pyramid, cylinder, cone and sphere.

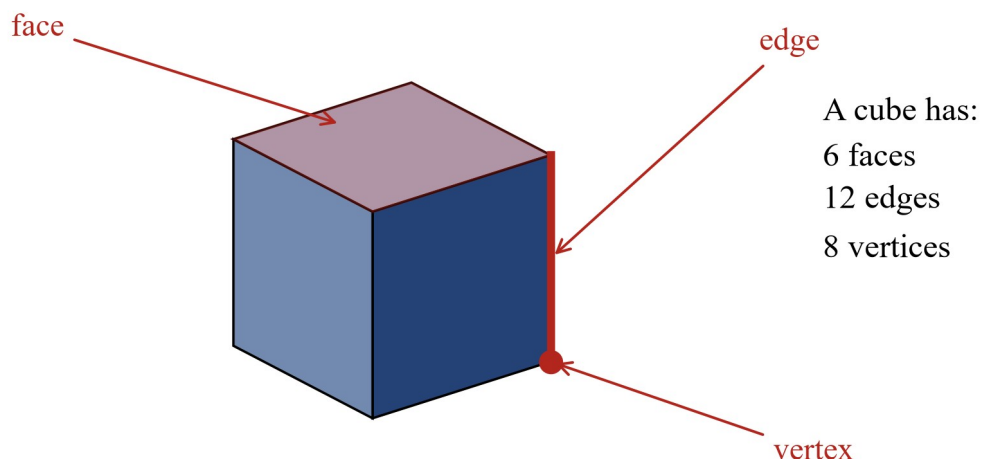
- A **cube** is like a dice. All of its faces are squares.
- A **rectangular prism** is like a box or a brick. All of its faces are flat.
- A **triangular prism** has a triangle at each end.

- A **square-based pyramid** has a square base. Its four triangle faces meet at a point on top.
- A **cylinder** is like a tin can. It has two flat, round faces and a curved surface.
- A **cone** is like a party hat. It has one flat face underneath and a point at the top.
- A **sphere** is like a ball. It is curved all over, with no flat faces.

3. Features: faces, edges and vertices

Every solid object has features. Three important features are faces, edges and vertices.

- A **face** is a flat side of a solid object.
- An **edge** is the line where two faces meet.
- The **vertices** are the corner points where edges meet. One corner point is one of the vertices.

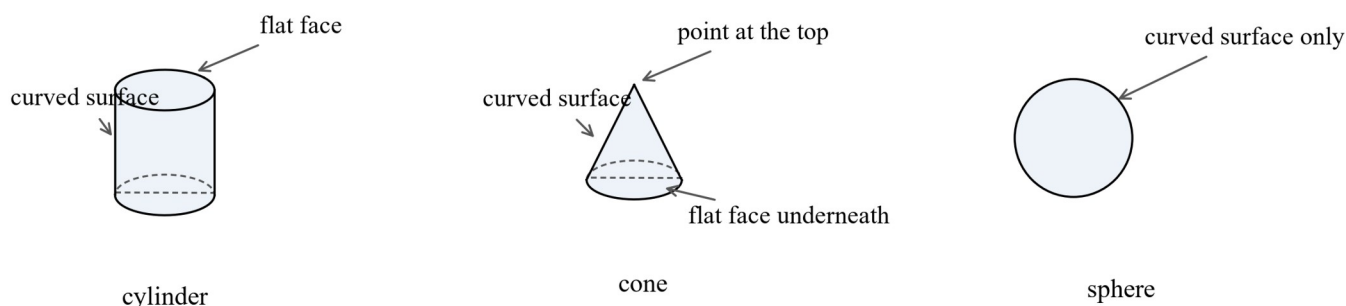


A cube with its top face marked red, one edge marked red and one corner point marked red. The words say: a cube has 6 faces, 12 edges and 8 vertices.

A cube has 6 faces, 12 edges and 8 vertices.

4. Curved surfaces

Some solid objects do not have only flat faces. They have a **curved surface**.



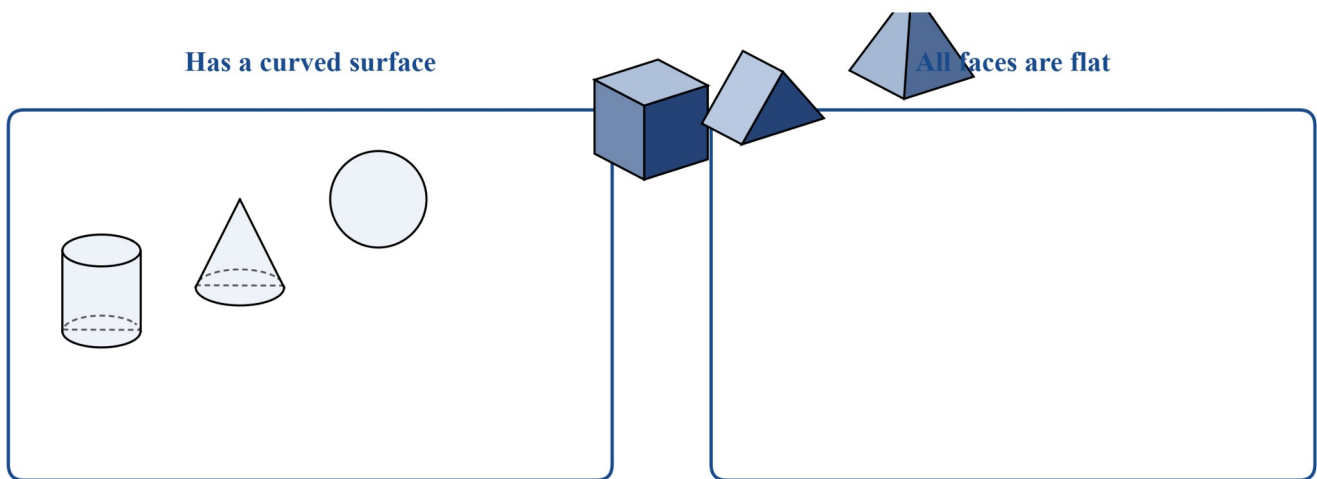
Three solids with their parts labelled. A cylinder has two flat faces and a curved surface. A cone has one flat face underneath, a point at the top and a curved surface. A sphere has a curved surface only.

- A cylinder has two flat faces and one curved surface.
- A cone has one flat face, one point and one curved surface.
- A sphere has no flat faces, no edges and no vertices. It is curved all over.

5. Sort solid objects by their features

To **classify** means to sort things into groups by a rule. You can classify solid objects by their features.

One rule you could use: *does it have a curved surface?*



Two groups of solid objects. The first group, has a curved surface: a cylinder, a cone and a sphere. The second group, all faces are flat: a cube, a triangular prism and a square-based pyramid.

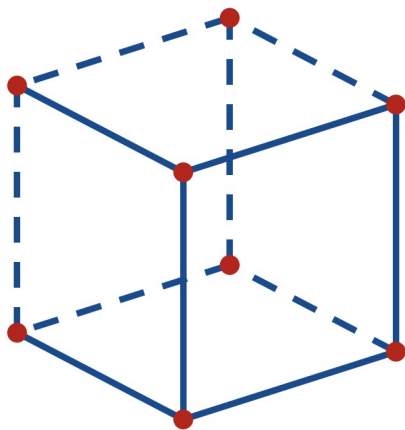
The cylinder, the cone and the sphere have a curved surface. The cube, the triangular prism and the square-based pyramid have flat faces only.

You can use other rules too, such as *does it have a point?* or *does it roll?* When you sort, always say which feature you used.

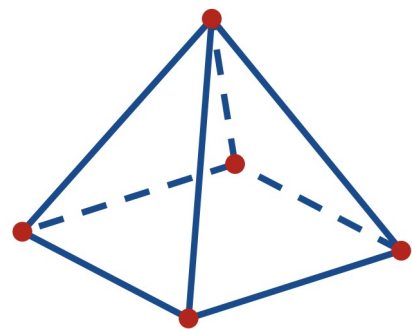
6. Making solid objects: solid form and skeleton form

You can make a solid object in two ways.

You can make it in **solid form** with connecting cubes. Or you can make its **skeleton** with straws and balls of clay. In a skeleton, each straw runs along one edge, and each ball of clay sits at one of the vertices.



cube skeleton — 12 straws, 8 clay joins



square-based pyramid — 8 straws, 5 clay joins

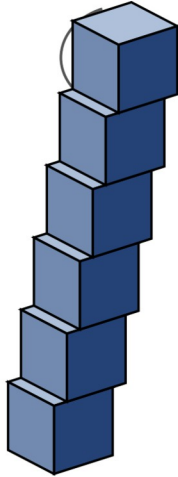
Two skeletons made from straws and balls of clay. Left: a cube skeleton with 12 straws and 8 clay joins. Right: a square-based pyramid skeleton with 8 straws and 5 clay joins.

A cube skeleton needs 12 straws and 8 balls of clay, because a cube has 12 edges and 8 vertices. A square-based pyramid skeleton needs 8 straws and 5 balls of clay, because a square-based pyramid has 8 edges and 5 vertices.

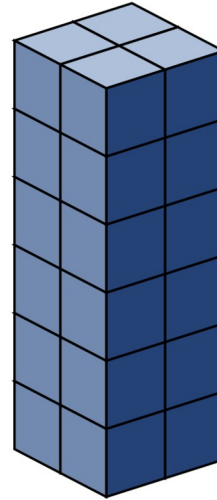
You can also make solid objects on a computer with shape-building software. The object you see on the screen is a picture of the solid.

7. Towers: why features matter

Build a tall tower from connecting cubes. Make the base only one cube wide. The tower wobbles. It can fall over. Now build the same tower on a base that is two cubes wide. The tower stands up well. We say it is **stable**.



base 1 cube wide — it wobbles



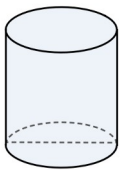
base 2 cubes wide — it stands

Two towers of connecting cubes. Left: a tall tower with a base one cube wide, leaning and wobbling. Right: the same tall tower on a base two cubes wide, standing up straight.

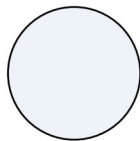
The taller a tower is, the more it wobbles, unless you make its base wider. The features of an object change what it can do.

8. Objects all around you

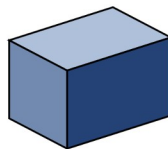
Everyday things look like the solid objects you have met.



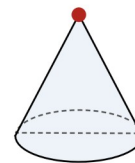
tin can — cylinder



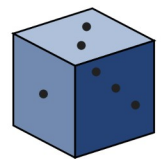
ball — sphere



box — rectangular prism



party hat — cone



dice — cube

Five everyday objects with the solid they look like: a tin can is a cylinder, a ball is a sphere, a box is a rectangular prism, a party hat is a cone and a dice is a cube.

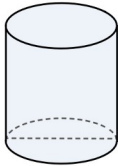
The features tell you why each thing works well:

- A tin can is a cylinder. Its flat faces let cans stack, one on top of another.
- A ball is a sphere. It is curved all over, so it rolls in any way.
- A box is a rectangular prism. Its flat faces let it sit still and stack.
- A party hat is a cone. It has a point at the top and is open underneath, so it fits on a head.
- A dice is a cube. Its flat faces let it sit still on the table.

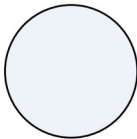
Worked examples

Example 1 — with help

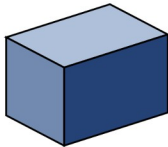
Look at the five objects in the picture above. Sort them into *rolls* and *sits on a flat face*.



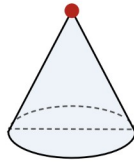
tin can — cylinder



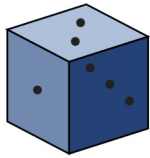
ball — sphere



box — rectangular prism



party hat — cone



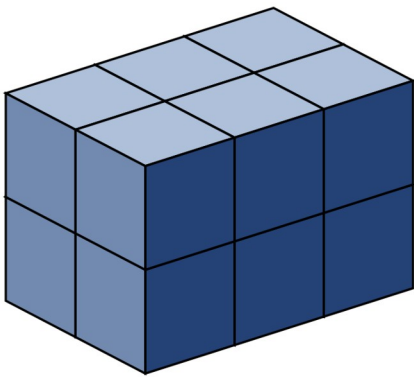
dice — cube

Five everyday objects with the solid they look like: a tin can is a cylinder, a ball is a sphere, a box is a rectangular prism, a party hat is a cone and a dice is a cube.

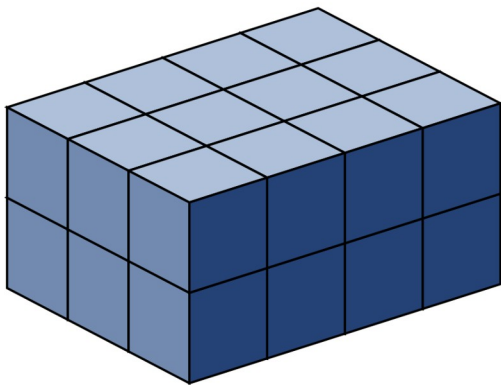
Working	What we did
The ball is a sphere. It is curved all over.	It rolls.
The tin can is a cylinder. It has a curved surface.	It rolls on its side.
The box and the dice have only flat faces.	They sit on a flat face.
The party hat has a flat face underneath.	It sits on its flat face. ✓

Example 2 — with help

Two rectangular prisms are made from connecting cubes. Each prism is 2 layers tall. The left prism is 3 cubes by 2 cubes in each layer. The right prism is 4 cubes by 3 cubes in each layer. Which prism takes up more space?



2 layers, each 3 by 2



2 layers, each 4 by 3

Two solids made from connecting cubes. Left: 2 layers, each 3 by 2. Right: 2 layers, each 4 by 3.

Working	What we did
Left prism: $3 \times 2 = 6$ cubes in one layer.	Counted one layer.
2 layers: $6 + 6 = 12$ cubes.	Counted both layers.
Right prism: $4 \times 3 = 12$ cubes in one layer.	Counted one layer.
2 layers: $12 + 12 = 24$ cubes.	Counted both layers.
$24 - 12 = 12$. The right prism uses 12 more cubes. ✓	Compared the two totals.

The prism with more cubes takes up more space.

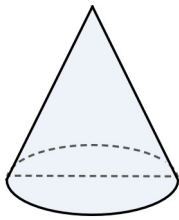
Example 3 — on your own

Mia builds a tower from connecting cubes. The tower is 8 cubes tall, and its base is only one cube wide. It keeps wobbling and falls over. What could Mia change? Why does that help?

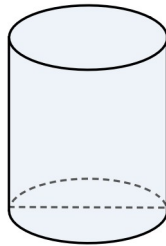
Mia could build the tower on a base that is two cubes wide. A wider base makes the tower stable, so it stands up well. She could also make the tower shorter. Both changes use what you know about features: a tall tower needs a wide base to stand.

Practice questions**With help**

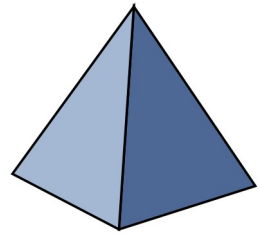
Q1. Name each solid object.



(a)



(b)



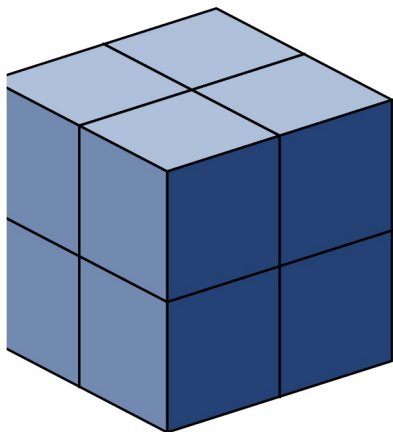
(c)

Three solid objects labelled (a), (b) and (c).

(a) _____ (b) _____ (c) _____

Q2. Fill in each gap. A cube has ___ faces, ___ edges and ___ vertices.

Q3. Count the connecting cubes used to make this solid object.



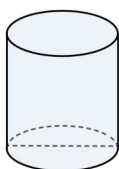
A solid object made from connecting cubes.

There are __ cubes.

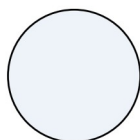
Q4. True or false? (a) A sphere has flat faces. (b) A cylinder has two flat faces. (c) A cone has a point at the top. (d) All the faces of a cube are squares.

Q5. Sort these solid objects into two groups: *has a curved surface* and *all faces are flat*. The objects are: a cube, a cylinder, a sphere and a triangular prism.

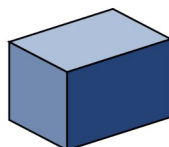
Q6. Name the solid object each thing looks like.



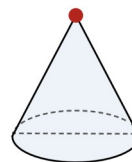
(a)



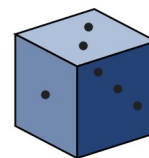
(b)



(c)



(d)



(e)

Five everyday objects labelled (a), (b), (c), (d) and (e): a tin can, a ball, a box, a party hat and a dice.

(a) _____ (b) _____ (c) _____ (d) _____ (e) _____

Q7. You make a skeleton of a cube with straws and balls of clay. (a) How many straws do you need? (b) How many balls of clay do you need?

Q8. Look around your room. Find 2 things that look like a cylinder and 1 thing that looks like a sphere. Say their names.

On your own

Q9. Write the feature word for each sentence. (a) A flat side of a solid object is a _____. (b) The line where two faces meet is an _____. (c) The corner points where edges meet are the _____.

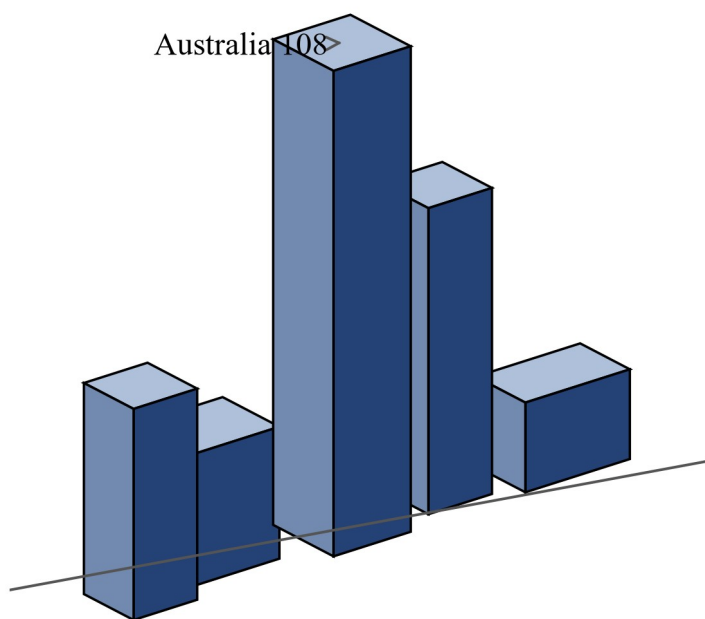
Q10. Build a solid object with connecting cubes: 2 cubes long, 2 cubes wide and 3 cubes tall. How many cubes did you use?

Q11. A rectangular prism has 2 layers. Each layer has 4 rows of 2 cubes. How many cubes are there in all?

Q12. True or false? Give a reason. (a) A sphere has no edges and no vertices. (b) A cone and a cylinder both have a point. (c) A triangular prism has flat faces only.

- Q13.** Sort these solid objects by a rule you choose: a cube, a cone, a cylinder and a sphere. Tell someone your rule.
- Q14.** A ball rolls, but a dice does not roll. Use the word *features* to say why.
- Q15.** Tom makes a skeleton with 8 straws and 5 balls of clay. Which solid object did he make?
- Q16.** Mia's tower is 10 cubes tall. Its base is one cube wide. Say why the tower wobbles, and one way to make it stand up well.
- Q17.** Tin cans stack up in a shop, one on top of another. Balls do not stack. Use features to say why.
- Q18.** Leo says, "A cone and a cylinder have the same features." Use features to show that Leo is wrong.
- Q19.** Australia 108 is a skyscraper in Melbourne. It is about 317 m tall and has 100 floors.

Source: Wikipedia, *Australia 108*, retrieved 2026-08-20.



Australia 108 is about 317 m tall and has 100 floors.

A row of tall city buildings in the shape of rectangular prisms, with the tallest one labelled Australia 108. The words say: Australia 108 is about 317 m tall and has 100 floors.

- (a) Which solid object does Australia 108 look most like?
 - (b) Name two features of that solid object.
 - (c) Why is that shape a good shape for a tall building?
-

Answers

Q1. (a) cone (b) cylinder (c) square-based pyramid. **Q2.** 6 faces, 12 edges, 8 vertices. **Q3.** 8 cubes. **Q4.** (a) false (b) true (c) true (d) true. **Q5.** Has a curved surface: cylinder, sphere. All faces are flat: cube, triangular prism. **Q6.** (a) cylinder (b) sphere (c) rectangular prism (d) cone (e) cube. **Q7.** (a) 12 straws (b) 8 balls of clay. **Q8.** Answers will be different. **Q9.** (a) face (b) edge (c) vertices. **Q10.** 12 cubes. **Q11.** 16 cubes. **Q12.** (a) true (b) false (c) true. **Q13.** Answers will be different. **Q14.** The ball is curved all over, so it rolls; the dice has flat faces, so it sits still. **Q15.** A square-based pyramid. **Q16.** The base is only one cube wide; make the base two cubes wide (or make the tower shorter). **Q17.** Cans have flat faces at each end, so they stack; a ball is curved all over, so it rolls away. **Q18.** A cone has one flat face and a point; a cylinder has two flat faces and no point. **Q19.** (a) a rectangular prism (b) any two of: flat faces, 12 edges, 8 vertices (c) its flat faces stack in layers, and a wide base helps it stand.

Worked answers

Q1. (a) The solid has one point at the top and one flat face underneath, so it is a cone. (b) The solid has two flat, round faces and a curved surface, so it is a cylinder. (c) The solid has a square base and four triangle faces that meet at a point, so it is a square-based pyramid.

Q2. Count the parts of a cube: 6 faces, 12 edges and 8 vertices.

Q3. The solid is 2 cubes long, 2 cubes wide and 2 cubes tall. Count by layers: the bottom layer has 4 cubes and the top layer has 4 cubes. $4 + 4 = 8$ cubes.

Q4. (a) False — a sphere is curved all over and has no flat faces. (b) True — a cylinder has a flat face at each end. (c) True — a cone has a point at the top. (d) True — every face of a cube is a square.

Q5. The cylinder and the sphere have a curved surface. The cube and the triangular prism have flat faces only.

Q6. (a) The tin can looks like a cylinder. (b) The ball looks like a sphere. (c) The box looks like a rectangular prism. (d) The party hat looks like a cone. (e) The dice looks like a cube.

Q7. Each straw runs along one edge, and a cube has 12 edges, so you need 12 straws. Each ball of clay sits at one of the vertices, and a cube has 8 vertices, so you need 8 balls of clay.

Q8. Answers will be different. Check that each thing you found has the features of the solid: a cylinder has two flat faces and a curved surface; a sphere is curved all over.

Q9. (a) face (b) edge (c) vertices — these are the three feature words from this topic.

Q10. One layer is 2 by 2, so one layer has $2 \times 2 = 4$ cubes. There are 3 layers: $4 + 4 + 4 = 12$ cubes.

Q11. Each layer has 4 rows of 2 cubes: $4 \times 2 = 8$ cubes in one layer. There are 2 layers: $8 + 8 = 16$ cubes.

Q12. (a) True — a sphere is curved all over, so it has no edges and no vertices. (b) False — a cone has a point, but a cylinder has no point; it has two flat faces. (c) True — a triangular prism has flat faces only.

Q13. Answers will be different. Check that the rule is a feature, such as *has a curved surface* or *has a point*.

Q14. A ball is a sphere, and its only surface is curved, so it rolls. A dice is a cube, and all its faces are flat, so it sits still instead of rolling.

Q15. A square-based pyramid has 8 edges and 5 vertices, so its skeleton uses 8 straws and 5 balls of clay.

Q16. The tower wobbles because it is tall and its base is only one cube wide. Mia can make the base two cubes wide, so the tower is stable. Making the tower shorter also helps.

Q17. A tin can is a cylinder with a flat face at each end, so cans can sit on top of one another. A ball is a sphere and is curved all over, so it cannot sit still in a stack.

Q18. A cone has one flat face, one curved surface and one point at the top. A cylinder has two flat faces, one curved surface and no point. So their features are not the same.

Q19. (a) Australia 108 looks most like a rectangular prism. (b) A rectangular prism has flat faces, 12 edges and 8 vertices; any two of these. (c) The flat faces stack in layers, like the floors of the building, and a wide, flat base helps a tall building stand up well.

Two-dimensional representations of familiar environments

Code: VC2M3SP02 (.E01, .E02, .E03, .E04, .E05)

You know what your classroom and your playground look like when you stand in them. But what do they look like from high up, like a bird? In this section you will look at flat drawings of places you know. Drawings like these are called **plans** and **maps**. You will learn to read them, find things on them, and make your own.

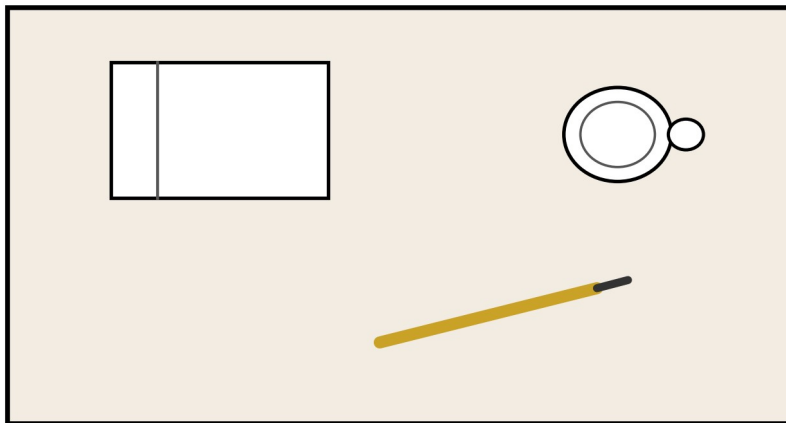
You will need: paper, a pencil, scissors, and some small paper shapes or counters.

Learn about plans and maps

1. See it from above

You can stand beside Mia's desk and look at it from the side. But what does the desk look like from above?

Mia's desk from above



The desk is a rectangle. The book is a rectangle. The top of the cup is a circle.

Mia's desk seen from above. The desk is a rectangle. A book on the desk is a rectangle too, the top of a cup is a circle, and a pencil lies on the desk. The words say, 'Mia's desk from above'.

From above, the desk is a rectangle. The book is a rectangle too. The top of the cup is a circle. The pencil is a long, thin shape.

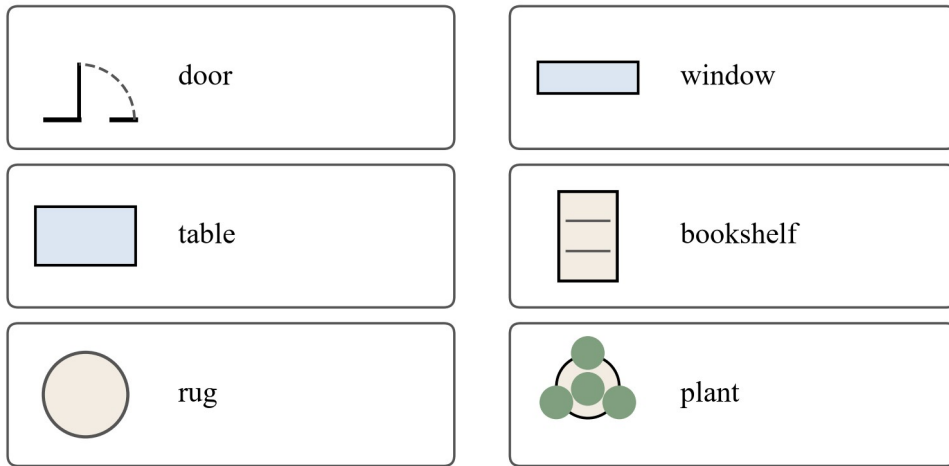
A drawing like this is **two-dimensional**. That means it is flat, like paper. It shows a real place, but flat.

2. Plans use small pictures

A **plan** is a two-dimensional drawing of a place, seen from above. A plan uses small pictures to show the things in the place. Each picture stands for one thing.

A plan also has a **key**. The key tells you what each picture means. Here is the key for the classroom plan you will see next.

The key tells you what each picture means

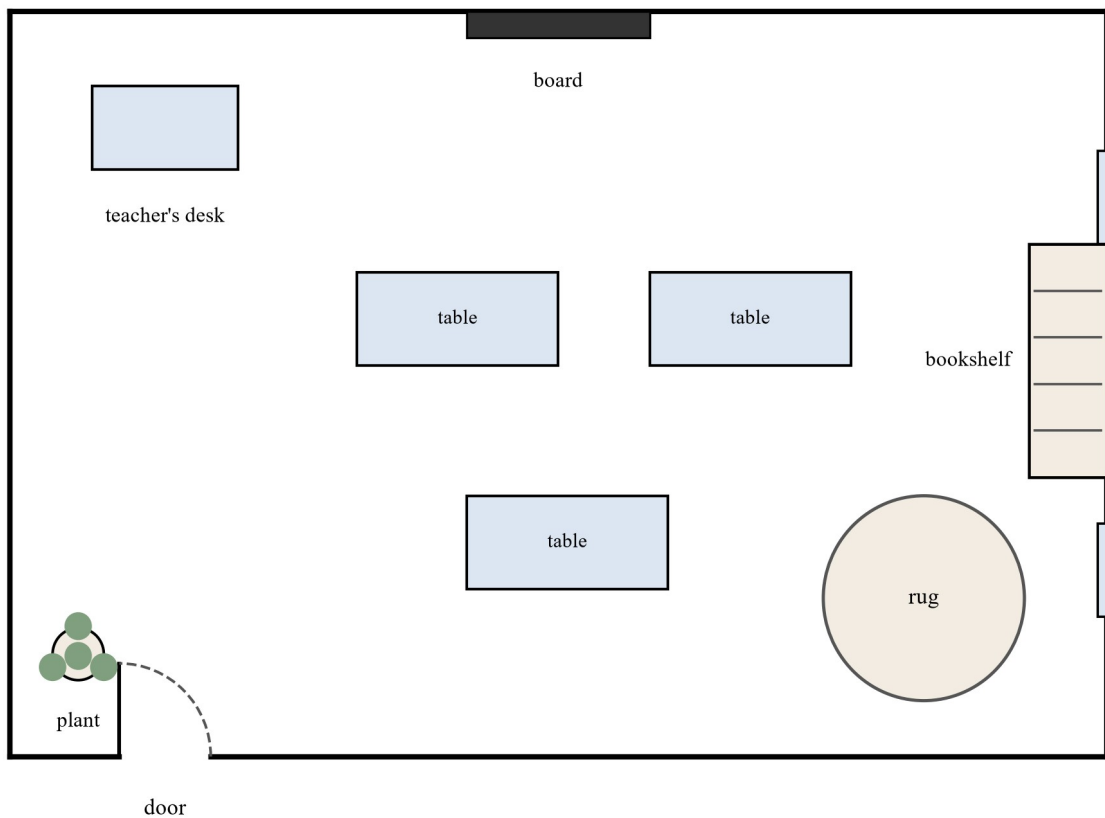


A key with six small pictures and their words: a door, a window, a table, a bookshelf, a rug and a plant. The words at the top say, 'The key tells you what each picture means'.

3. Read the plan of a classroom

Here is a plan of a classroom. It shows the room seen from above.

A plan of a classroom



A plan of a classroom seen from above. There is a door on the bottom wall and a board on the top wall. Inside the room there is a teacher's desk, three tables, a bookshelf on the right wall between two windows, a round rug in the corner, and a plant next to the door. The words at the top say, 'A plan of a classroom'.

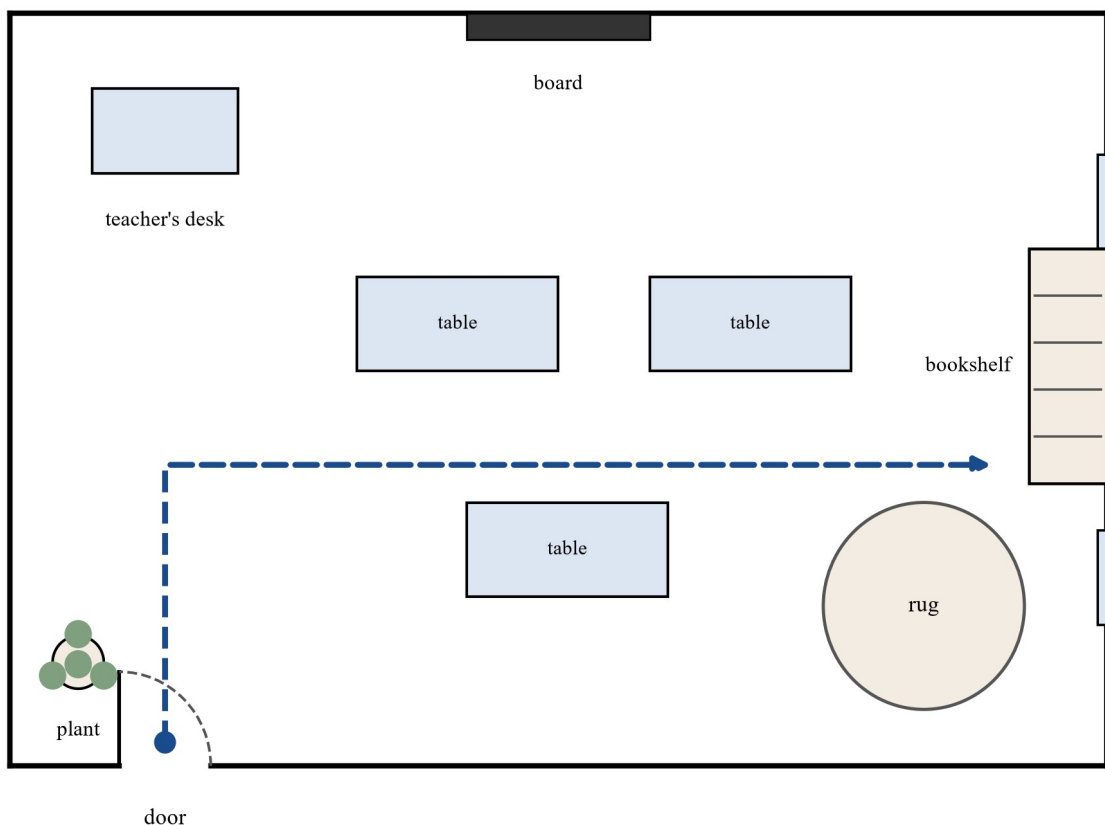
On a plan, we use words to say where things are. We use words like **next to**, **between**, **near**, **in front of** and **behind**.

- The plant is next to the door.
- The bookshelf is between the two windows.
- The rug is in the corner, near the bookshelf.
- The board is on the top wall.
- There are three tables in the middle of the room.

4. Follow a way on a plan

A plan can also show you how to walk from one place to another.

A plan of a classroom



Start at the door. Walk straight. Turn right. The bookshelf is in front of you.

The same classroom plan with a dashed blue line showing a way to walk. The words under the plan say, 'Start at the door. Walk straight. Turn right. The bookshelf is in front of you.'

Start at the door. Walk straight into the room. Turn right. The bookshelf is in front of you. Now you can tell a friend how to get to the bookshelf.

5. Make your own plan

You can make a plan too. Here is an empty games room. The door is on the bottom wall.



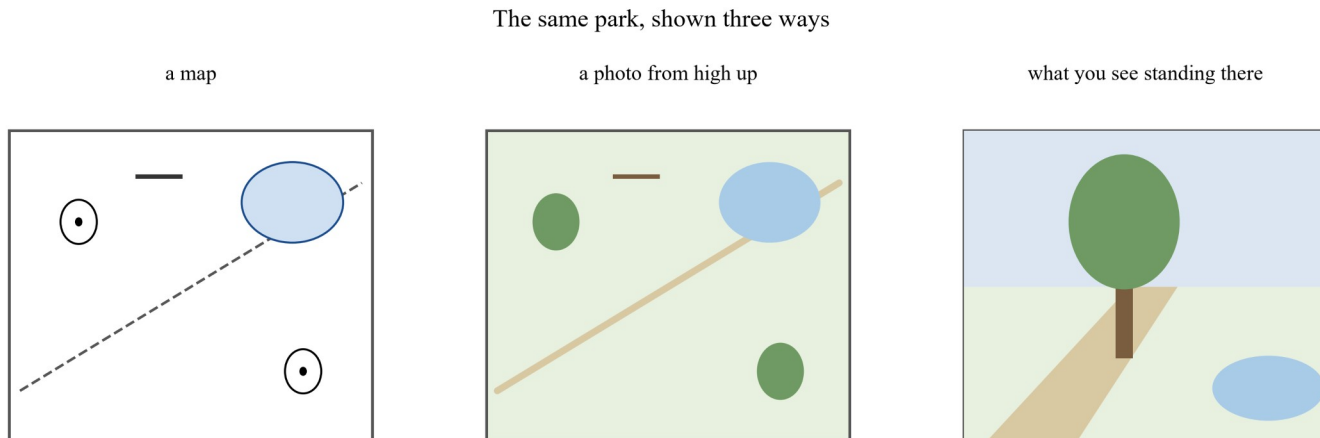
The room is empty. The shapes are furniture seen from above.

An empty games room seen from above, with a door on the bottom wall. On the right side there are five cut-out shapes seen from above, each with its word: a sofa, a round table, a TV, a shelf and a bean bag. The words say, 'The room is empty. The shapes are furniture seen from above.'

The shapes on the right are **cut-outs**. They are furniture seen from above: a sofa, a round table, a TV, a shelf and a bean bag. To plan the room, put each cut-out where you want it. Make sure the door can still open!

6. The same place, shown different ways

One place can be shown in different ways. Look at these three pictures of the same park.



The same park shown three ways, side by side. The first is a map with a dashed path, a pond and two trees. The second is a photo from high up, with green trees and a blue pond. The third shows what you see when you stand in the park: one big tree, the path and the pond. The words at the top say, 'The same park, shown three ways'.

- The **map** uses pictures to show where things are. It is the best one to help you find your way.
- The **photo from high up** shows what the park really looks like from the sky.
- The third picture shows **what you see standing there**. You can see one big tree and the pond, but not the whole park at once.

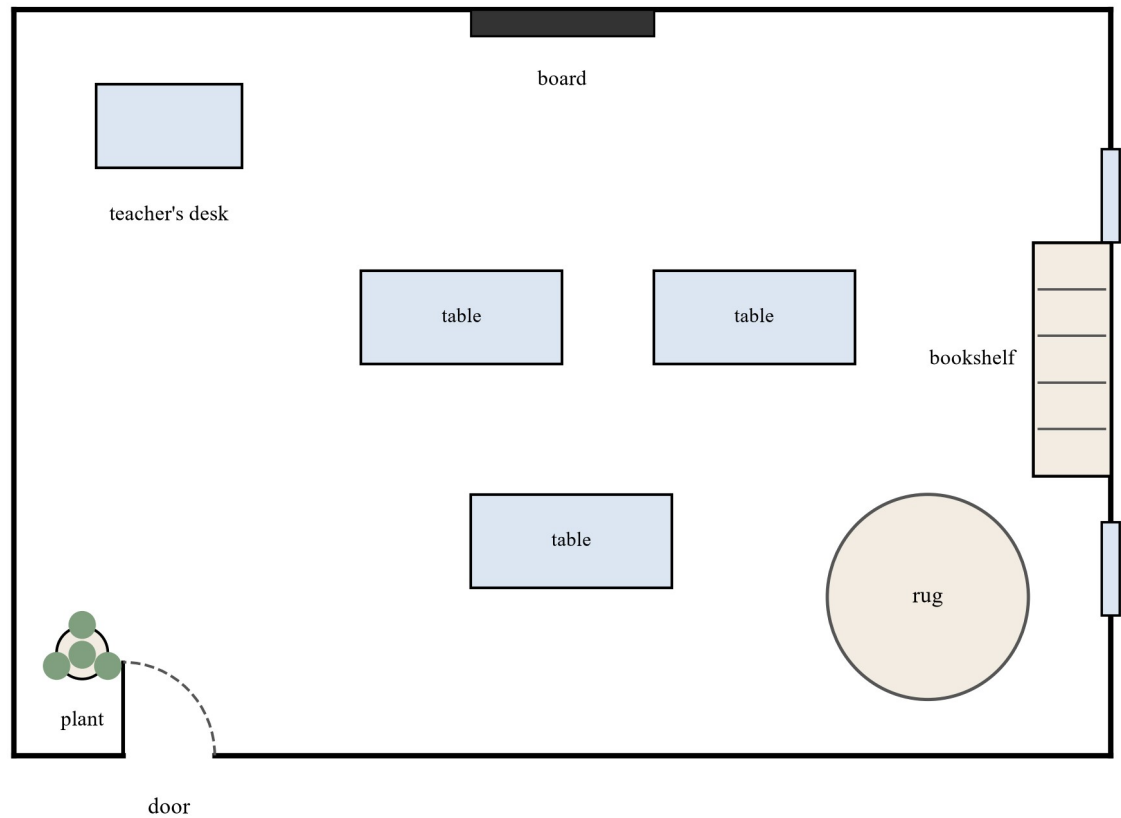
Each picture tells you different things about the same park.

Worked examples

Example 1 — with help

Look at the plan of the classroom.

A plan of a classroom



A plan of a classroom seen from above. There is a door on the bottom wall and a board on the top wall. Inside the room there is a teacher’s desk, three tables, a bookshelf on the right wall between two windows, a round rug in the corner, and a plant next to the door. The words at the top say, ‘A plan of a classroom’.

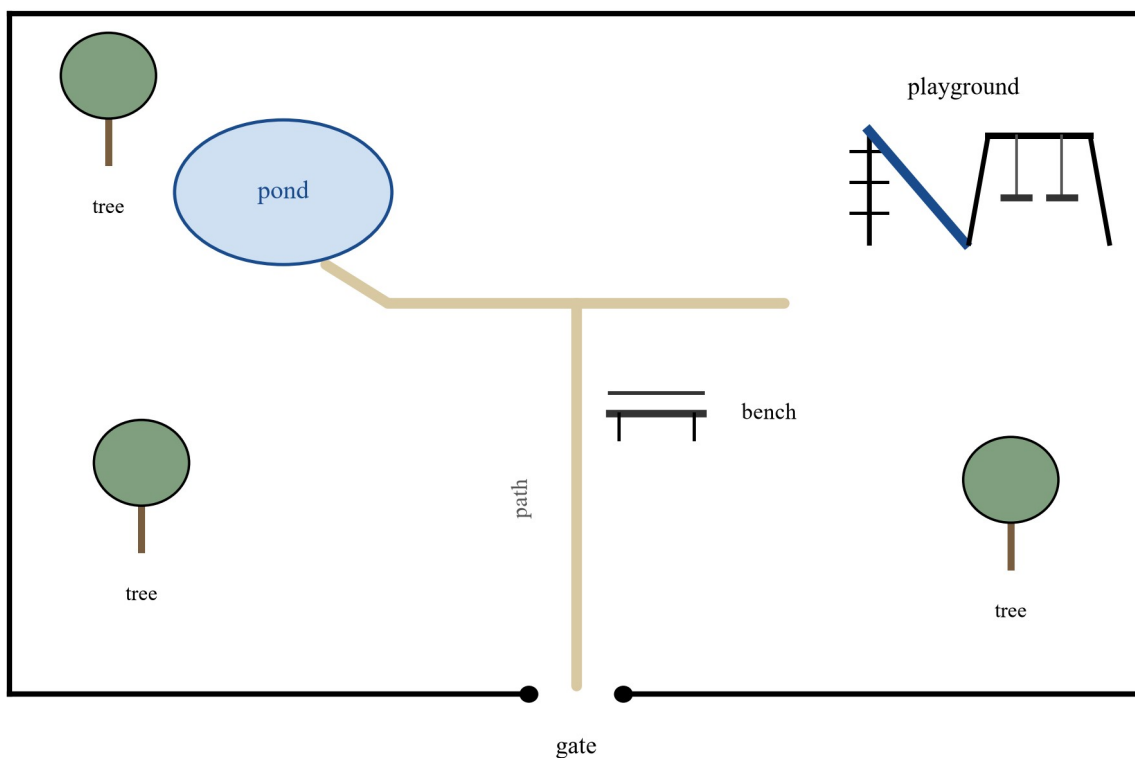
- (a) What is next to the door?
- (b) What is between the two windows?
- (c) How many tables are there?

Working	What we did
(a) Find the door on the bottom wall. The plant is next to it.	Found the door first, then looked next to it.
(b) The two windows are on the right wall. The bookshelf sits between them.	Looked for the thing that sits between two others.
(c) Count the tables: 1, 2, 3. There are three tables.	Counted the tables on the plan.

Example 2 — with help

Look at the plan of the park. You walk in through the gate. You follow the path, and you turn left where the path bends. What do you reach?

A plan of a park



A plan of a park seen from above. There is a gate on the bottom wall, and a path goes up into the park, with one part going left and one part going right. There is a pond, a playground with a slide and swings, a bench next to the path, and three trees. The words at the top say, 'A plan of a park'.

Working

What we did

Start at the gate on the bottom wall.

Found where to start.

Walk straight along the path.

Followed the path.

The path bends. Turn left there and walk on.

Turned left at the bend.

The path ends at the pond. You reach the **pond**.

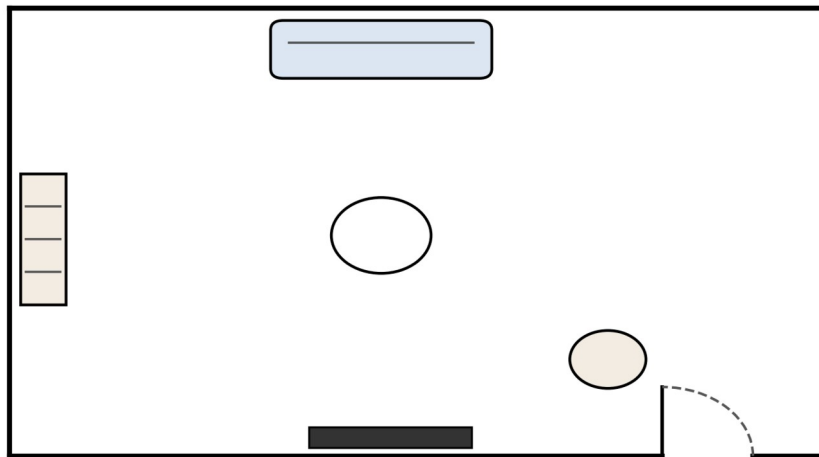
Named the place at the end.

Example 3 — on your own

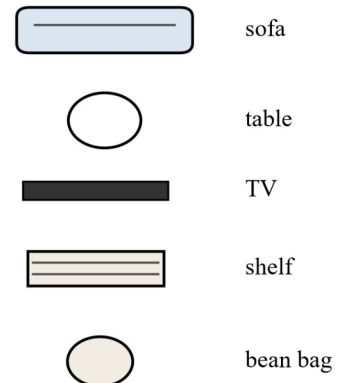
Design the games room. Put the sofa, the round table, the TV, the shelf and the bean bag in the room. Make sure the door can open.

One way to plan the room is below. Your plan can be different.

One way to plan the games room



Key



Your plan can be different. Check that the door can still open.

One way to plan the games room. The sofa is near the top wall, the TV is on the bottom wall, the round table is in the middle, the shelf is on the left wall and the bean bag is near the door. A key on the right shows what each shape means. The words under the plan say, 'Your plan can be different. Check that the door can still open.'

The sofa is near the top wall. The TV is on the bottom wall. The round table is in the middle. The shelf is on the left wall. The bean bag is near the door.

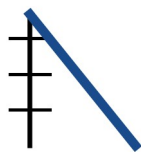
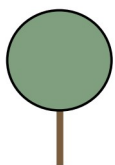
Check the door. Nothing sits in front of it, so it can open. ✓

Practice questions

With help

Q1. Draw a line from each picture to its word.

Draw a line from each picture to its word



pond

tree

bench

slide

Four pictures above four word cards. The pictures are a tree, a slide, a pond and a bench. The word cards say pond, tree, bench and slide. The words at the top say, 'Draw a line from each picture to its word.'

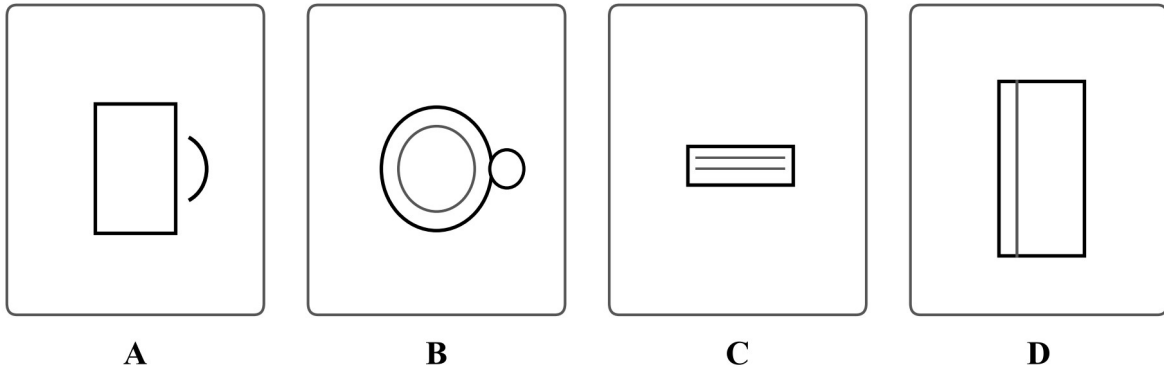
Q2. Look at the picture of Mia's desk from above. (a) What shape is the desk? (b) What shape is the book? (c) What shape is the top of the cup?

Q3. Look at the plan of the classroom. (a) How many tables are in the room? (b) What is next to the door? (c) What is on the top wall?

Q4. On a copy of the plan of the classroom, draw a way from the door to the rug.

Q5. Look at the four pictures. (a) Which picture shows the cup from above? (b) Which picture shows the book from above? (c) Which picture shows the cup from the side?

Which picture shows the cup from above? Which shows the book from above?



Four pictures labelled A, B, C and D. A shows a cup from the side. B shows a cup from above. C shows a book from the side. D shows a book from above. The words at the top ask which picture shows the cup from above and which shows the book from above.

Q6. Look at the plan of the park. (a) How many trees can you see? (b) What is next to the path? (c) Where is the playground?

Q7. Zac puts the sofa near the top wall of the games room. Where is a good place for the TV? Explain your answer.

Q8. Look at the three pictures of the same park. (a) Which picture is a map? (b) Which picture is a photo from high up? (c) Which picture shows what you see standing in the park?

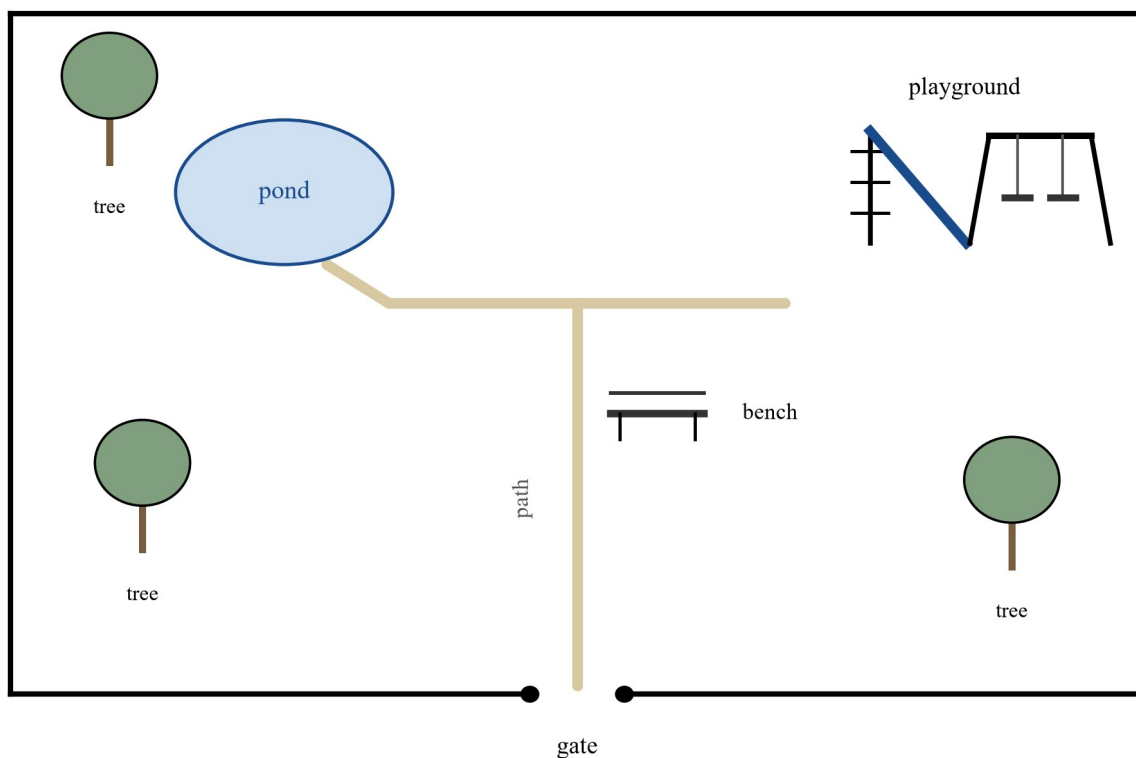
On your own

Q9. Look at the plan of the classroom. Name two things that are rectangles seen from above.

Q10. Why does a plan need a key?

Q11. Look at the plan of the park.

A plan of a park



A plan of a park seen from above. There is a gate on the bottom wall, and a path goes up into the park, with one part going left and one part going right. There is a pond, a playground with a slide and swings, a bench next to the path, and three trees. The words at the top say, 'A plan of a park'.

- (a) Where is the bench? (b) What is near the pond? (c) You walk in through the gate and look into the park. What is on your left?

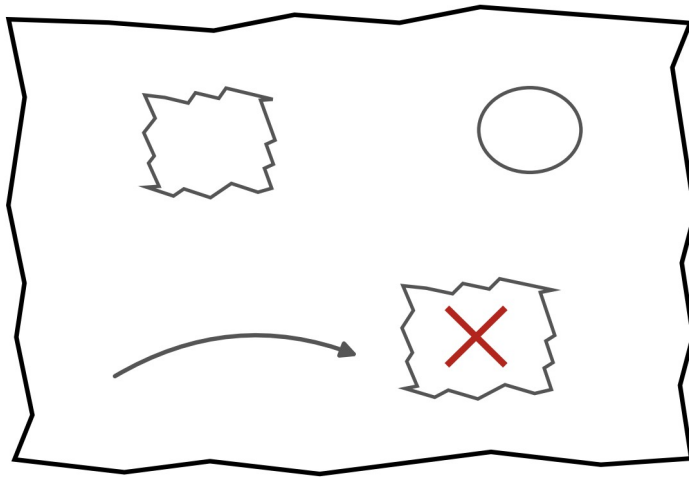
Q12. You walk in through the gate of the park. Tell the way to the playground. Use the words *walk*, *turn left* and *turn right*.

Q13. Zac says the bench is next to the playground. Is Zac right? Explain your answer.

Q14. Draw a plan of your own bedroom, seen from above. Show the bed, the door and one more thing. Draw a key for your plan.

Q15. Mia hid a counter in the classroom. This is her map.

Mia hid a counter in the classroom. This is her map.



A rough map of a classroom, made by hand. It shows some rough shapes but no words, no key and no door. A red cross marks one spot. The words at the top say, 'Mia hid a counter in the classroom. This is her map.'

- (a) What does the red cross show?
- (b) Write one thing that is good about Mia's map, and one thing that is hard to follow.

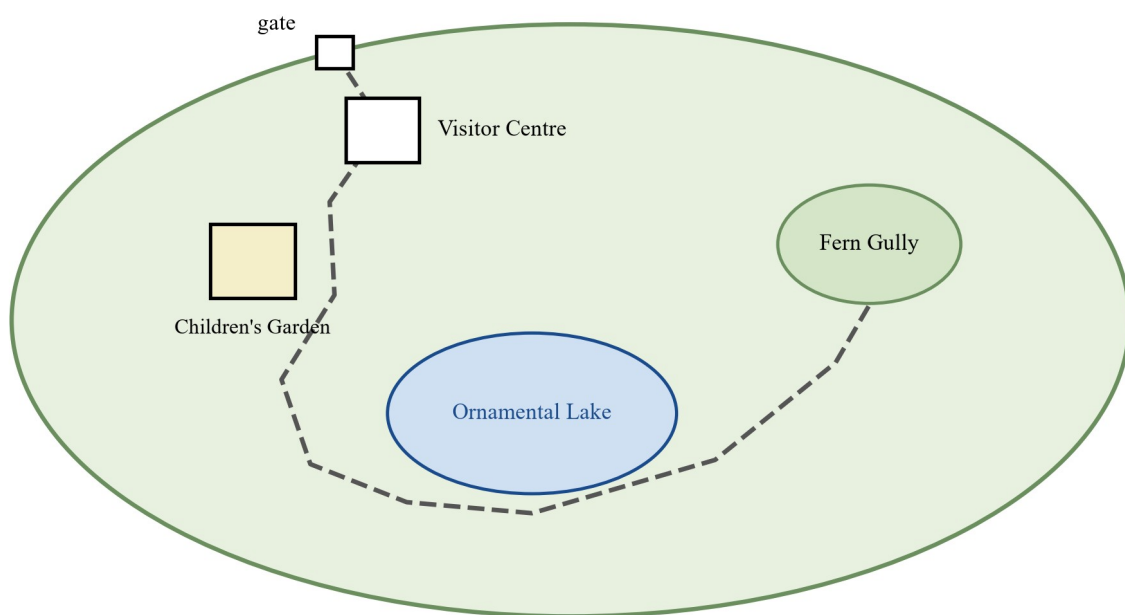
Q16. Look at the plan of the classroom. Tell the way from the door to the teacher's desk.

Q17. True or false? Use the plan of the classroom. (a) The plant is next to the door. (b) The board is on the bottom wall. (c) There are four tables in the room. (d) The rug is a circle.

Q18. You want to find the pond in the park. (a) Which of the three pictures of the park is the best one to use? (b) What does the map show you that the picture from the ground does not?

Q19. The Royal Botanic Gardens in Melbourne are big, real gardens next to the Yarra River. This sketch shows some of the places in the gardens. The shapes and sizes are not exact.

Source: Wikipedia, *Royal Botanic Gardens Victoria*, retrieved 2026-08-20.



A simple sketch of part of the Royal Botanic Gardens, Melbourne

The shapes and sizes are not exact.

A simple sketch of part of the Royal Botanic Gardens, Melbourne. The Yarra River runs along the top. A dashed path starts at a gate and goes past the Visitor Centre and the Children's Garden, around the Ornamental Lake, and ends at Fern Gully. The words under the sketch say the shapes and sizes are not exact.

- You walk in through the gate and follow the path. What place do you reach first?
- Does the path go past the Children's Garden? Explain your answer.
- Mia says she can walk from the Visitor Centre to the Ornamental Lake on the path. Is Mia right? Use the sketch to explain.

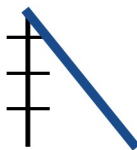
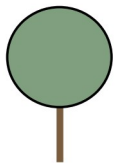
Answers

Q1. Tree — tree; slide — slide; pond — pond; bench — bench. **Q2.** (a) a rectangle (b) a rectangle (c) a circle. **Q3.** (a) three (b) the plant (c) the board. **Q4.** Answers will be different. The way should start at the door and end at the rug. **Q5.** (a) B (b) D (c) A. **Q6.** (a) three (b) the bench (c) in the corner at the top right of the plan. **Q7.** Answers will be different. One good place is the bottom wall, far from the door. Then you can watch the TV from the sofa, and the door can still open. **Q8.** (a) the first picture (b) the second picture (c) the third picture. **Q9.** Any two of: the tables, the teacher's desk, the bookshelf. **Q10.** The key tells you what each picture means. Without it, you do not know what the pictures show. **Q11.** (a) next to the path (b) a tree (c) a tree. **Q12.** Walk straight along the path from the gate. Turn right where the path goes two ways. Walk on, and the playground is in front of you. **Q13.** No. The bench is next to the path. The playground is in the corner at the top right of the plan, and you must walk on to get there. **Q14.** Answers will be different. Check that the plan is seen from above, and that the key matches the pictures. **Q15.** (a) It shows where the counter is hidden. (b) Answers will be different. Good: it shows where the counter is. Hard to follow: it has no key and no words, so you do not know what the shapes are. **Q16.** Walk into the room. Walk along the left wall, past the plant. The teacher's desk is in front of you, near the board. **Q17.** (a) true (b) false — the board is on the top wall (c) false — there are three tables (d) true. **Q18.** (a) the map (b) It shows where everything in the park is, all at once. **Q19.** (a) the Visitor Centre (b) Yes — the path runs beside the Children's Garden. (c) Yes — follow the dashed path from the Visitor Centre and it goes around the Ornamental Lake.

Worked answers

Q1. Each picture matches the word that names it. The tree matches *tree*. The slide matches *slide*. The pond matches *pond*. The bench matches *bench*.

Draw a line from each picture to its word



pond

tree

bench

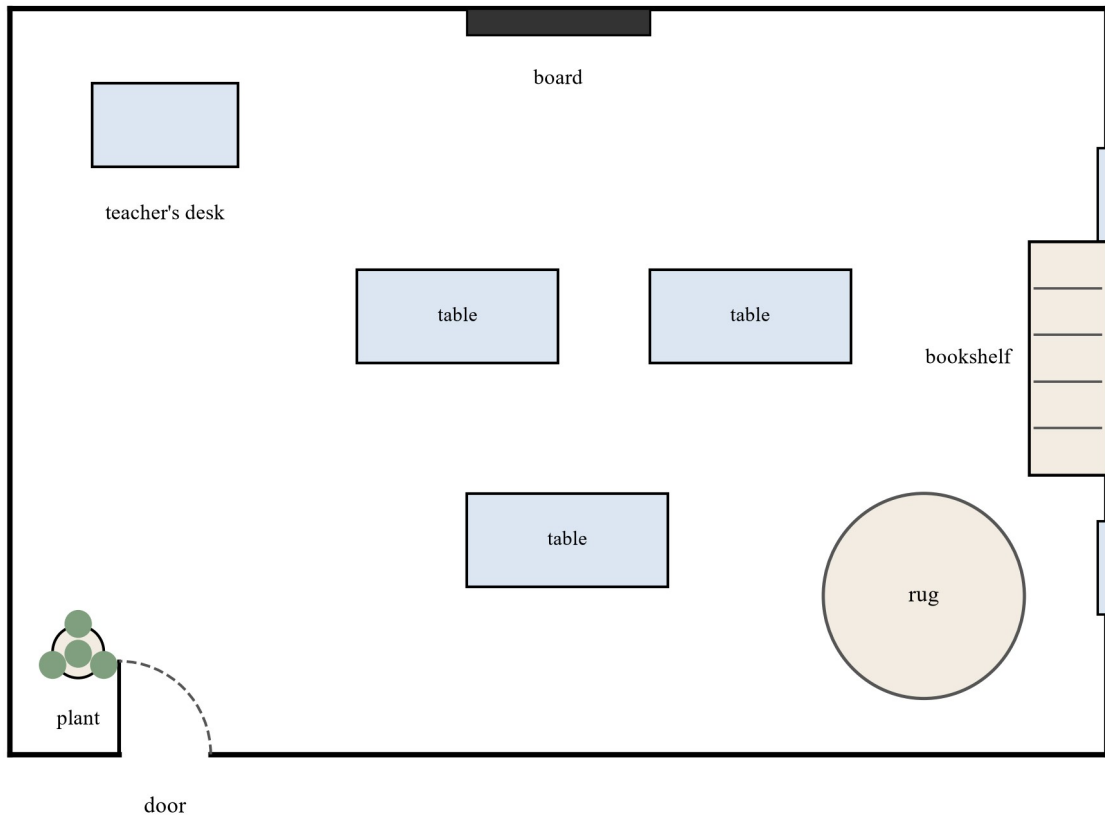
slide

Four pictures above four word cards. The pictures are a tree, a slide, a pond and a bench. The word cards say pond, tree, bench and slide. The words at the top say, 'Draw a line from each picture to its word.'

Q2. (a) The desk is a rectangle. (b) The book is a rectangle too. (c) The top of the cup is a circle.

Q3. (a) Count the tables on the plan: 1, 2, 3. There are three tables. (b) The door is on the bottom wall. The plant is next to it. (c) The board is on the top wall.

A plan of a classroom

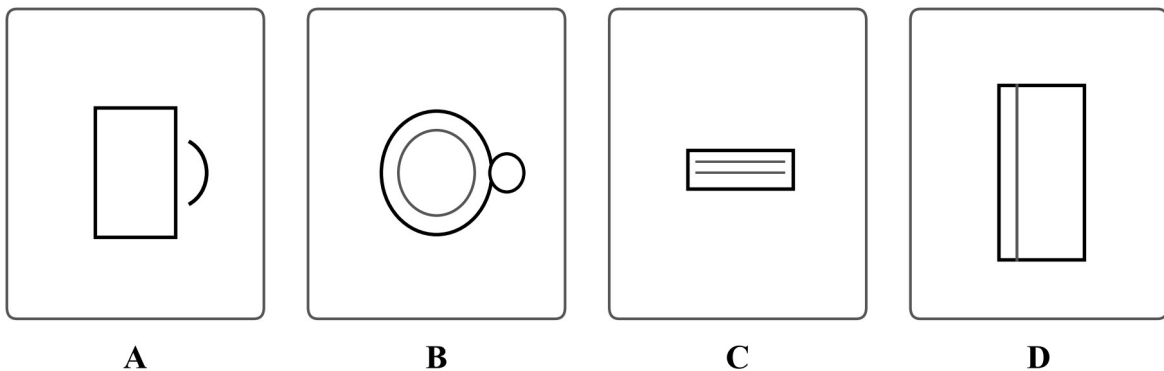


A plan of a classroom seen from above. There is a door on the bottom wall and a board on the top wall. Inside the room there is a teacher's desk, three tables, a bookshelf on the right wall between two windows, a round rug in the corner, and a plant next to the door. The words at the top say, 'A plan of a classroom'.

Q4. Answers will be different. Start your line at the door on the bottom wall. Keep your line inside the room. End your line at the round rug. One way is to walk straight into the room and then turn right, past the tables.

Q5. (a) Picture B shows the cup from above. The cup looks like a circle. (b) Picture D shows the book from above. The book looks like a rectangle. (c) Picture A shows the cup from the side.

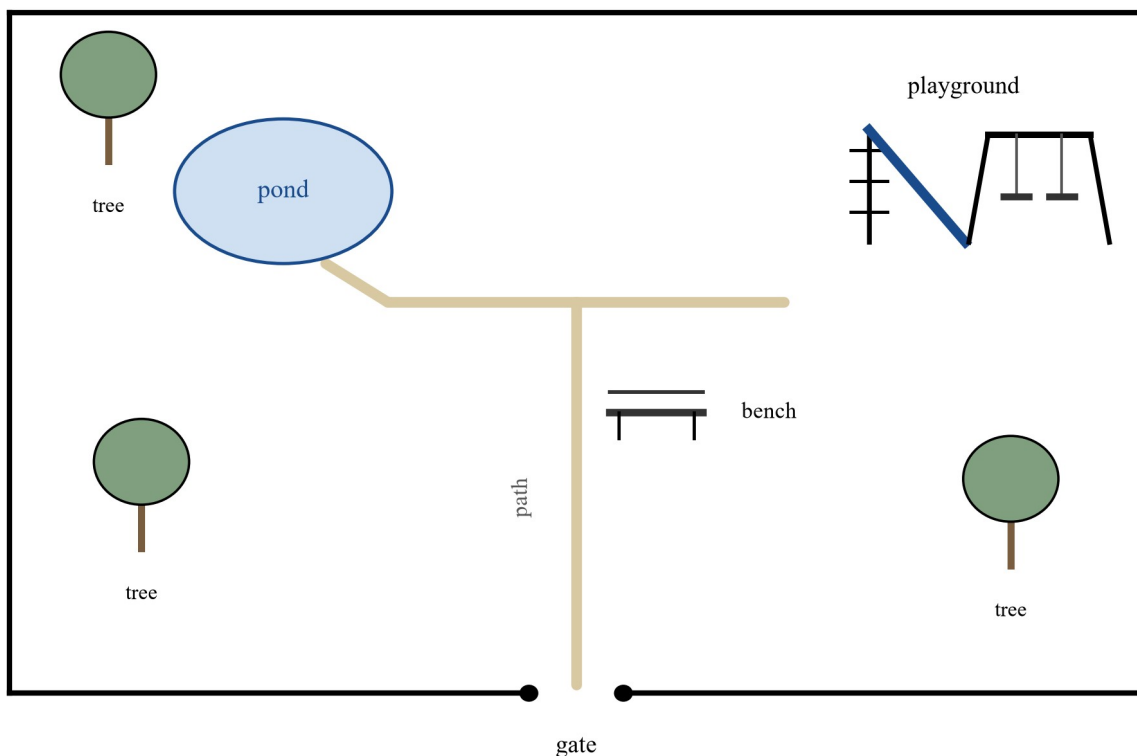
Which picture shows the cup from above? Which shows the book from above?



Four pictures labelled A, B, C and D. A shows a cup from the side. B shows a cup from above. C shows a book from the side. D shows a book from above. The words at the top ask which picture shows the cup from above and which shows the book from above.

- Q6.** (a) Count the trees: 1, 2, 3. There are three trees. (b) The bench is next to the path. (c) The playground is in the corner at the top right of the plan.
- Q7.** The TV can go on the bottom wall, far from the door. Then you can watch the TV from the sofa. The door has nothing in front of it, so it can still open. Your answer can be different, as long as the door can open.
- Q8.** (a) The first picture is the map. It uses pictures to show where things are. (b) The second picture is the photo from high up. (c) The third picture shows what you see standing in the park.
- Q9.** Seen from above, the tables are rectangles. The teacher's desk is a rectangle too, and so is the bookshelf. Name any two of these. The rug is a circle, not a rectangle.
- Q10.** A plan uses small pictures, and each picture stands for one thing. The key tells you what each picture means. Without a key, you do not know what the pictures show.
- Q11.** (a) The bench is next to the path. (b) A tree is near the pond. (c) You walk in through the gate and look into the park. Your left side is the left side of the plan, and there is a tree there.

A plan of a park

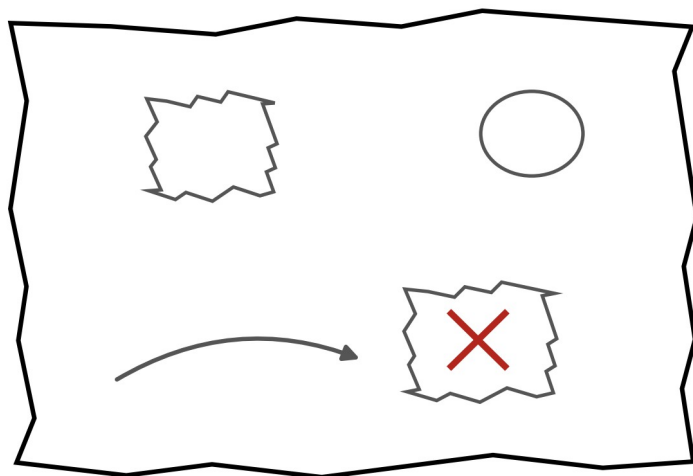


A plan of a park seen from above. There is a gate on the bottom wall, and a path goes up into the park, with one part going left and one part going right. There is a pond, a playground with a slide and swings, a bench next to the path, and three trees. The words at the top say, 'A plan of a park'.

- Q12.** Walk straight along the path from the gate. Turn right where the path goes two ways. Walk on, and the playground is in front of you.
- Q13.** No, Zac is not right. The bench is next to the path, in the middle of the plan. The playground is in the corner at the top right of the plan. You must walk on along the path to get from the bench to the playground, so they are not next to each other.
- Q14.** Answers will be different. Your plan should show the room seen from above. The bed, the door and one more thing should each be a picture. Your key should match your pictures. Check that the door can open.

Q15. (a) The red cross shows where the counter is hidden. (b) One good thing: the map shows where the counter is. One thing that is hard to follow: the map has no key and no words, so you cannot tell what the shapes are. The room's door is not shown either.

Mia hid a counter in the classroom. This is her map.



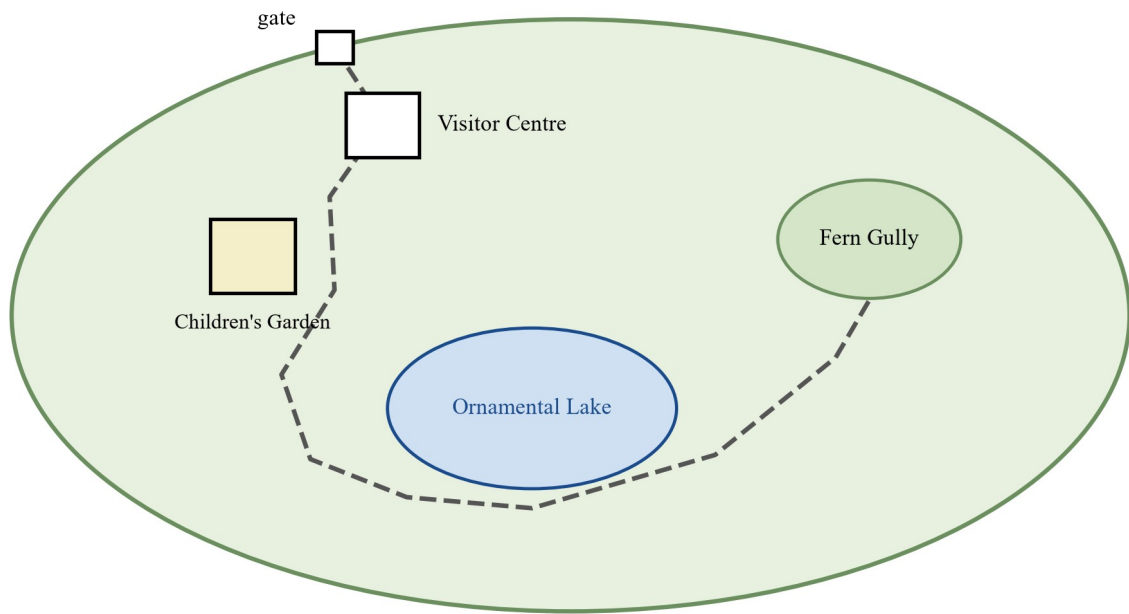
A rough map of a classroom, made by hand. It shows some rough shapes but no words, no key and no door. A red cross marks one spot. The words at the top say, 'Mia hid a counter in the classroom. This is her map.'

Q16. Walk into the room through the door. Walk along the left wall, past the plant. The teacher's desk is in front of you, near the board.

Q17. (a) True — the plant is next to the door. (b) False — the board is on the top wall, not the bottom wall. (c) False — there are three tables, not four. (d) True — the rug is a circle.

Q18. (a) The map is the best picture to use. It uses pictures to show where things are. (b) The map shows where everything in the park is, all at once. When you stand in the park, you can only see what is near you.

Q19. (a) Walk in through the gate and follow the path. The first place you reach is the Visitor Centre. (b) Yes. The path runs beside the Children's Garden. (c) Yes, Mia is right. Follow the dashed path from the Visitor Centre. It goes down past the Children's Garden and around the Ornamental Lake.



A simple sketch of part of the Royal Botanic Gardens, Melbourne

The shapes and sizes are not exact.

A simple sketch of part of the Royal Botanic Gardens, Melbourne. The Yarra River runs along the top. A dashed path starts at a gate and goes past the Visitor Centre and the Children's Garden, around the Ornamental Lake, and ends at Fern Gully. The words under the sketch say the shapes and sizes are not exact.

Test

Test T5 · Chapter 5 — Space

Mathematics Level 3 (Year 3) · Victorian Curriculum 2.0

Codes assessed: VC2M3SP01 · VC2M3SP02

Name: _____ Date: _____

Total marks	10
Guidance duration	20 minutes
Timing	This is a classroom check, not an exam. There is no strict time limit. Your teacher will let you finish.
Equipment	You may use connecting cubes, straws, small balls of clay, and some everyday things such as a tin can, a ball and a box. You will need a pencil. Your teacher will give you a copy of the classroom plan for Question 2.
Calculators	The content descriptions VC2M3SP01 and VC2M3SP02 do not say “without a calculator”, so a calculator is allowed. You do not need one for any question in this test.

Attempt every question. Show your working where the question asks for it.

Question 1 — Three-dimensional objects (5 marks)

(a) Which solid object has two flat faces and one curved surface? (1 mark)

- A. cube
- B. sphere
- C. cylinder
- D. cone

(b) You build a skeleton of a square-based pyramid. You use straws and balls of clay. You may build it first if that helps. (2 marks)

Straws needed: _____

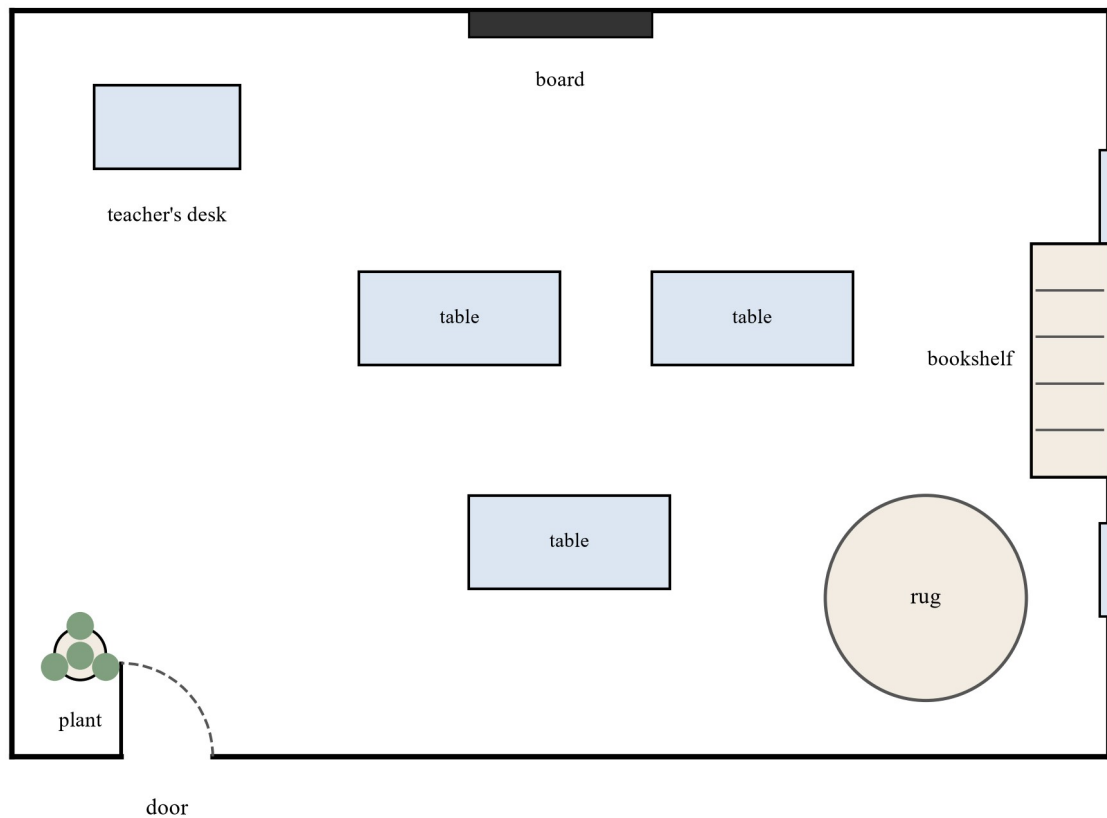
Balls of clay needed: _____

(c) Soup tins are stacked one on top of another on a shelf. Balls are never stacked. Use features to say why tins stack but balls do not. (2 marks)

Question 2 — Plans and maps (5 marks)

Look at the plan of the classroom.

A plan of a classroom



A plan of a classroom seen from above. There is a door on the bottom wall and a board on the top wall. Inside the room there is a teacher's desk, three tables, a bookshelf on the right wall between two windows, a round rug in the corner, and a plant next to the door.

- (a) What is between the two windows? (1 mark)
- (b) How many tables are there in the room? (1 mark)
- (c) Your teacher gives you a copy of the plan. On the copy, draw a way from the door to the round rug. (1 mark)
- (d) Mia says the plant is behind the teacher's desk. Is Mia right? Use the plan to explain your answer. (2 marks)

Total: 10 marks

Solutions

Teacher-facing. Test T5 is a classroom check, not an exam: untimed in principle with a 20-minute guidance duration, materials permitted, and neither content description says “without a calculator”, so no question is calculator-free. VC2M3SP01 is also assessed by the construction task K4 (§7); T5 carries it in written form so a student absent for the task is not left with an unassessed CD.

Coverage and mark map

CD	Subtopic	Questions	Marks
VC2M3SP01	5A Making, comparing and classifying three-dimensional objects	Q1	5
VC2M3SP02	5B Two-dimensional representations of familiar environments	Q2	5
Total			10

Every CD contributes at least 3 separately scored marks, as §7 requires. Multiple choice is 1 mark of 10 (10%), inside the one-quarter cap: Q1(a), four options A–D.

Answer key

Q	Part	Answer	Marks
1	(a)	C (cylinder)	1
1	(b)	8 straws; 5 balls of clay	2
1	(c)	Tins (cylinders) have flat faces, so they stack; balls (spheres) are curved all over, so they roll	2
2	(a)	The bookshelf	1
2	(b)	Three	1
2	(c)	A way that starts at the door and ends at the round rug	1
2	(d)	No — the plant is next to the door	2

Worked solutions

Q1. (a) A cube has flat faces only. A sphere is curved all over, with no flat faces. A cone has one flat face and one curved surface. A cylinder has two flat faces, one at each end, and one curved surface. The answer is **C**.

(b) In a skeleton, each straw runs along one edge, and each ball of clay sits at one of the vertices. A square-based pyramid has 8 edges, so it needs **8 straws**. A square-based pyramid has 5 vertices, so it needs **5 balls of clay**.

Marks: 1 for each correct count. If the student builds the pyramid first and counts correctly from the model, award both marks.

(c) A soup tin looks like a cylinder. It has a flat face at each end, so tins can sit on top of one another and stack. A ball looks like a sphere. It is curved all over, so it rolls away and cannot sit still in a stack.

Marks: 1 for naming the flat faces of the tin (cylinder) as the feature that lets tins stack; 1 for naming the ball (sphere) as curved all over as the feature that stops it stacking. Award each mark for the feature stated in the student’s own words.

Q2. (a) The two windows are on the right wall of the plan. **The bookshelf** sits between them.

- (b) Count the tables on the plan: 1, 2, 3. There are **three** tables. The teacher's desk is a desk, not one of the tables.
- (c) The way should start at the door on the bottom wall, stay inside the room, and end at the round rug in the corner. Accept any way that starts at the door and ends at the rug.
- (d) No, Mia is not right. The plant is next to the door on the bottom wall. The teacher's desk is near the board on the top wall, so the plant is not behind it.

Marks: 1 for the correct judgement (No); 1 for saying where the plant really is on the plan (next to the door). Accept any explanation that uses the plan to show the plant is not behind the teacher's desk.