

# EXPLORING 2D & 3D SHAPES

## Learning Intentions:

National Curriculum - KS2 Maths

- Recognise 2D and 3D shapes, recognise 2D shapes on the surface of 3D shapes
- Draw 2D shapes and make 3D shapes using modelling materials
- Recognise 3D shapes in different orientations and describe them
- Handle and name a variety of common 2D and 3D shapes including quadrilaterals and polygons, cuboids, pyramids, prisms and more complex polyhedra and identify the properties of each.
- Pupils use vocabulary precisely such as sides, edges, vertices and faces.
- Pupils read and write names for shapes.
- Pupils draw lines and shapes using a straight edge.



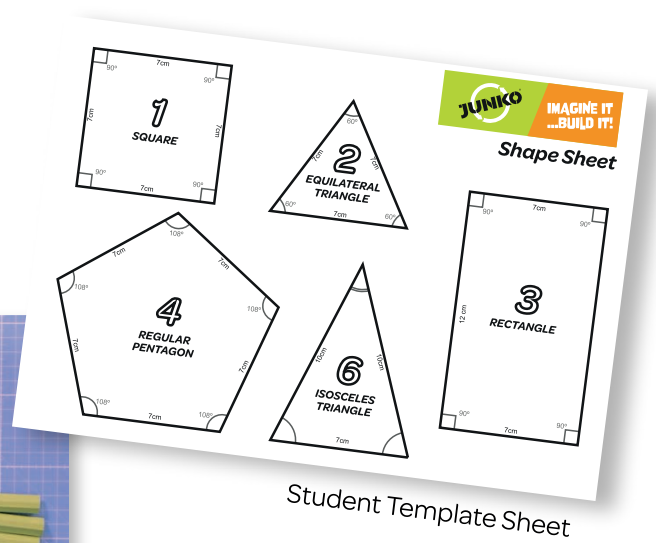
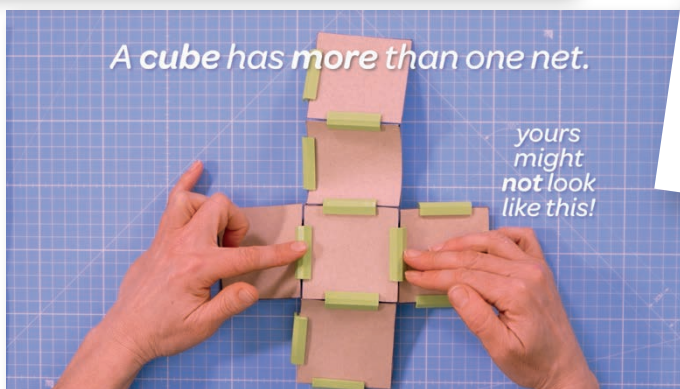
**A CUBE is a 3D shape**

**A 3D shape is known as a POLYHEDRON**

**A CUBE is a POLYHEDRON with:**

- 6 square faces**
- 12 edges**
- 8 vertices (corners)**

PAUSE continue when you're ready



LESSON 1  
**Squares & Cubes Worksheet**

1 How many sides in a square?

2 How many degrees are all 4 angles inside a square?

3 A 2D shape is known as a...

4 How many faces in a cube?

5 How many edges in a cube?

6 How many vertices (corners) in a cube?

7 Which one of these is NOT the net of a cube? (Circle your answer):

8 A 3D shape is known as a...

Student Worksheet

## Lessons overview:

Each lesson has a Video and Worksheet focusing on building a 3D shape using cereal box card and 3D modelling clips ('Magic Corners') which are made from recycled plastic. There is a 'Shape Sheet' which contains templates for each of the shapes needed for the lessons. The shapes becoming gradually more complex as the lessons progress.

The 2D shapes made in earlier lessons can be repurposed to make the more complex polyhedrons in the later lessons - this saves time and helps children to see how the same primitive 2D shapes can make different 3D forms. The 3D forms can be part disassembled to reveal the various nets.

The Lesson videos live on our YouTube channel: [www.youtube.com/planetjunko](http://www.youtube.com/planetjunko) in this playlist:  
**Schools - Exploring 2D & 3D Shapes - KS2 UK Curriculum**

### 1. Squares and cubes

Cut out a **square**, look at its properties, use square as a template to make 5 more squares, build a **cube**, look at the properties of the 3D shape, investigate nets.

### 2. Triangles and pyramids

Cut out an **equilateral triangle**, look at its properties, use as a template to make 3 more triangles, build a **tetrahedron**, look at properties, investigate nets.

EXTRA TASK >>

Build a **square based-pyramid**, look at properties, investigate nets.

### 3. Prisms

Cut out shapes and build a **square prism**, look at properties, investigate nets.

EXTRA TASKS >>

Build a **triangle prism** and then build a **pentagonal prism**, looking at properties and investigating nets of each.

### 4. Octahedrons

Cut out **equilateral triangles** and build a regular octahedron, look at its properties.

EXTRA TASK >>

Build an **octahedron** using isosceles triangles and look at properties

**Extensions** (More complex, so possibly teacher led - recombining the class's shapes to make these polyhedra)

### 5. Dodecahedron

Use 12 regular pentagons to build a regular dodecahedron

### 6. Icosahedron

Use 20 equilateral triangles, build a regular icosahedron

## Resources required:

Clear desk area for crafting, cereal box card (minimum 1 box per child or pair if working in pairs), craft materials: pencil, rubber, ruler, eraser, scissors, protractor (optional).  
 A copy of the Shape Sheet for each pupil

## Adult Support:

Teacher to introduce project then circulate as necessary. Children with motor skills difficulties may struggle so adults may particularly focus on these children for support.

If appropriate a child could be nominated to operate video as there are manual 'PAUSE' points throughout activities to enable whole class to work at same pace.

Tasks can be completed by individuals, partners or larger groups. In partnerships one child can build shapes while partner completes worksheet. In larger groups repetitive cutting tasks can be shared.

> Please note - check if any pupils have nut allergies as some cereals contain nuts

# TEACHER ANSWER SHEET

## LESSON 1

### **Squares & Cubes Worksheet**

1. 4
2. 90
3. Polygon
4. 6
5. 12
6. 8
7. b
8. polyhedron

## LESSON 2

### **Triangles & Pyramids Worksheet**

1. 3
2. 60
3. Tetrahedron
4. 4, 6, 4
5. c
6. 4
7. 1
8. 5, 8, 5

## LESSON 3

### **Prisms Worksheet**

1. 6, 12, 8
2. a
3. 7, 15, 10

## LESSON 4

### **Octahedron Worksheet**

1. 8, 12, 6
2. a
3. b

## LESSON 5

### **Dodecahedron Worksheet**

1. 12
2. b
3. b