

# Shape

Age Range: 4 years +

Subjects: Art, design & technology, maths

## Stage One: Identify the concept

Shape is a fascinating concept. Young children enjoy talking about shapes because they are central to their ongoing exploration of the world around them. Older children become very interested when we begin to ask questions such as, 'does everything have a shape?' or 'do ideas have shapes?' (if not then what does the phrase, 'our ideas are starting to take shape' mean?)

Key distinctions to bear in mind when challenging students about shape is:

- Shape is formed when lines meet. Shapes are always 2D. Some shapes are geometric (circle, rectangle, triangle, etc) and some are organic or irregular.
- Forms are 3D. They have height, width and thickness. Common forms include spheres, cubes, cylinders, cones and pyramids.

Problems within the concept

- Does everything have a shape?
- Do abstract notions, such as 'ideas' have shape?
- Can smells, tastes or sounds have shape?
- Is there really such a thing as the 'perfect shape'?

## Stage Two: Problematising the concept

The following dialogue with 9 year olds gives some ideas as to how children's notion of 'shape' might be challenged.

TEACHER: How many shapes can you see in the room?

*The children begin to name shapes*

TEACHER: Does everything have a shape?

CHILDREN: Yes

TEACHER: So what shape is this book?

CHILDREN: Square

TEACHER: And what about this apple?

CHILDREN: Round (or circle)

TEACHER: What about this hoop?

CHILDREN: Round (or circle)

TEACHER: But the hoop and the apple look very different to me, so how can they have the same shape?

*Various answers*

TEACHER: So some shapes of the same name can look different to each other; how strange! Let's see if the same can be said of rectangles.

*Gather together a set of different sized/shaped rectangles*

TEACHER: What do they have in common?

CHILDREN: They all have 4 sides

TEACHER: But so do squares, don't they?

CHILDREN: Yes, but rectangles have sides with different lengths

TEACHER: So, this shape is a rectangle is it because it has different length sides? (*showing a right-angled triangle*)

CHILDREN: No! Rectangles have all got 4 sides

TEACHER: Ah, ok. Like this then:



CHILDREN: No. They have to have 2 lots of 2 lines of the same length

TEACHER: Like this?



CHILDREN: No, that's a bow tie. The lines are not allowed to cross on a rectangle

TEACHER: So, this is not a rectangle then?



*Many opinions are shared at this point!*

## Deepening the learning pit

Questions to ask young children (3 – 7)

- How many shapes can you see right now?
- Do you have a favourite shape? Why?
- Is every shape like the one you're describing, your favourite?
- Does everything have a shape?
- What shape is a teddy bear?
- What shape are you?
- What shape are your dreams?
- Do sounds have shapes?
- When you look at a circle, how do you know it's a circle? (*for 6 and 7 year olds*)

### Additional questions to ask students aged 8 - 14

- What is a shape?
- Does every shape have a name?
- If we all look at this shape, are we all seeing the same shape?
- Could things be the same shape but a different size?
- Could things be the same size but a different shape?
- What shape would the colour red be?
- What shape is the sound of a police siren?
- What shape is the smell of coffee?
- Does the taste of lemon have a shape?
- Do feelings have shape? For example, happiness or sadness?
- Do ideas have shapes?
- What do we mean when we say, 'his idea was beginning to take shape'?
- What shape are your dreams?

### Further questions to ask older students (14 – 18)

- Is there such a thing as the 'perfect' shape?
- Can you imagine the perfect shape?
- Does the perfect shape exist only in our minds?
- Is a cube a square? What are the similarities and differences?
- What's the difference between looking like a cube and being a cube?
- What does the phrase, 'the shape of things to come' mean?
- What is meant by 'shape up or ship out'?
- Are there an infinite number of shapes in the same way as there are an infinite number of numbers?
- If 2 things were of the same shape but different size, would that make one a model of the other?

## Stage Three: Construct understanding

The following activities should help your students to begin constructing a conceptualisation of shape.

### Suggested activities (3 – 7)

1. Group objects into different categories of shapes. For example, begin with shapes that have curves, and shapes that only have straight lines. Then progress onto shapes that have agreed names and shapes that don't (organic shapes)
2. Count the number of different shapes the children can see in the classroom

3. Look at photographs together and ask the children to name all the different shapes they can see
4. Ask the children to each draw 10 different shapes and then place them into 3 categories

#### Additional activities (8 – 14 year olds)

1. Shapes in the alphabet (see additional handout)
2. Work out how many shapes can be made from 4 cubes, 5 cubes, and 6 cubes
3. Predict the number of shapes that could be made from 7, 8 and 9 cubes
4. Find as many examples of organic shapes as possible then create names for them
5. In pairs, one student describes a shape (without naming it) for the other one to draw

### Stage Four: Reviewing the learning journey

#### Possible metacognition questions

- What are shapes?
- Why are shapes important?
- Does everything have a shape?
- Do abstract notions such as ideas, thoughts, smells or tastes have shape?
- Does the perfect shape exist?
- How does your idea of shape differ from the beginning of the lesson?
- What questions about shape are you left with?

#### Notes

## Alphabet Shapes

Here is a set of letters. What do they have in common?

J C U

Here is the same set, with another letter added. Now what features do they share?

J C U S

Here's another set. Say what is different about the shape of these compared to the first set

H M W K

Here are two different ways to write the letter, 'j'. How would this difference affect the set it belonged to?

j J

Create 4 sets of letters, each with different properties. Ask your friend to guess which properties you used in each case. Here's one to start you off.

D P B

#### Discussion Time

- The letter X seems to be different to all the other letters. Why?
- Which are the most artistically pleasing letters?
- Which letters do you like writing most and why?
- Which are the three best letters and why?
- If you wrote all the letters in lower case, how would this change their properties?
- Here are some letters used in other languages. What do you think of them?

À Ø Ê Æ Ω Œ Δ И