

## Shape wheels

*Children make a sequence of coloured shapes, changing one attribute at a time so that the sequence can end where it started, forming a circular sequence.*

## Skills practised:

- Recognising 2D shapes
- Creating sequences

**Conjecture:** *It is possible to make a sequence of red, blue and yellow squares, triangle and circles, changing just colour of shape each time to form a 'shape wheel'.*

### What to do:

*Children work in pairs.*

*Each pair needs one each of the following shapes: blue square, blue circle, blue triangle, red square, red circle, red triangle, yellow square, yellow circle and yellow triangle.*

1. Show children the following sequence of shapes:



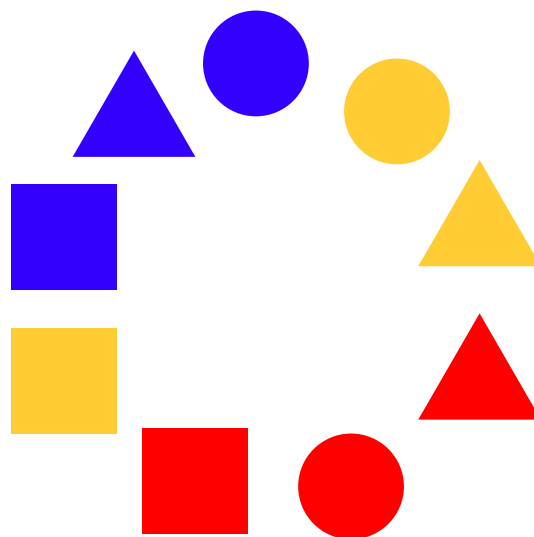
Say that only the shape OR colour changes as we add another shape.

*What shape could come next?*

Agree that this could be a yellow triangle, or a blue square (as the red square is already used).

2. Explain the task for children is to create a sequence like this where the next shape in the sequence changes only in colour OR shape, not both.
3. The next challenge is to create a similar sequence BUT this time their sequence must be a wheel shape so that the last of the nine shapes is followed by the first shape in the sequence!

**CHALLENGE:** Can children make a shape wheel which uses all nine shapes? For example:



Can they create a different shape wheel?

**Y2 CHALLENGE:** Add a green square, a green triangle and a green circle so that children have 12 shapes. They use these to create a shape wheel, where the next shape in the sequence changes only in colour or shape.

They could make a really big wheel using 16 shapes by adding a green rectangle, a blue rectangle, a yellow rectangle and a red rectangle!

### Aims:

- To create sequences according to a given rule
- To use trial and improvement
- To begin to plan ahead to solve a problem
- To realise that some mathematical problems have more than one solution

### Minimum number of calculations expected

N/A

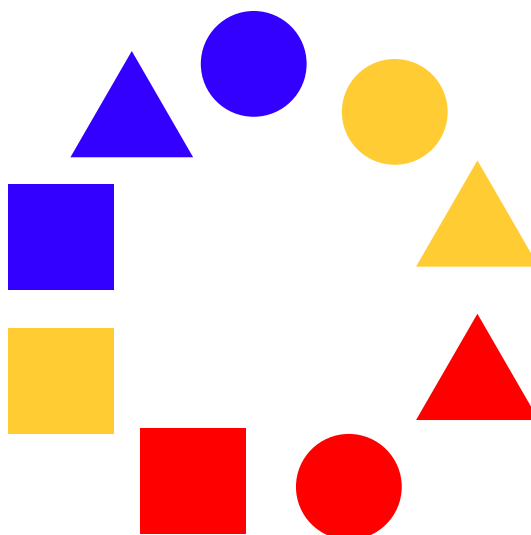
## Shape wheels

1. Look at the sequence of shapes:



Only the shape OR colour changes as we add another shape.  
What shape could come next?

2. Create a sequence like this where the next shape in the sequence changes only in colour OR shape, not both.
3. Create a new sequence BUT this time your sequence must be a wheel shape so that the last of the nine shapes is followed by the first shape in the sequence! Like this:



### Challenge

Can you make a shape wheel which uses all nine shapes?  
Can you create a different shape wheel?

### Y2 Challenge

Add a green square, a green triangle and a green circle so that you have 12 shapes. Use these to create a shape wheel, where the next shape in the sequence changes only in colour or shape. You could make a really big wheel using 16 shapes by adding a green rectangle, a blue rectangle, a yellow rectangle and a red rectangle!