

GEOMETRY

ENQUIRY OF LEARNING How can we ensure our oceans stay amazing?

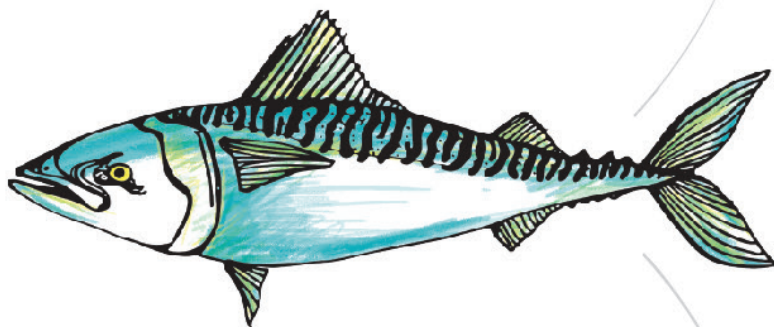
LEARNING QUESTION How can I use a vesica to draw a fish?

This activity is part of an ocean-themed Year 5 enquiry of learning linked to the Harmony principle of Interdependence. The wider enquiry allows students to explore how all living things within our ocean ecosystems are interconnected and how each living thing has a role to play in maintaining the health and balance of those systems. This activity can be used to introduce the learning around sustainable fishing in Week 4 of the enquiry, but would work equally well with other year groups (see below for ideas about adapting this activity).



WHY GEOMETRY?

Learning the geometry of Nature provides students with a new way of looking at the world. The observational skills and careful drawings that are required to recreate this geometry can have a powerful impact on students' understanding of Nature and their place in it. If we are to create a sustainable future, we need to see the world through a different lens, to understand that the patterns of life that exist around us, also exist in us. This way of seeing the world means we view everything from a place of connection, rather than separation. This sense of connection is an essential part of learning to live sustainably.



HOW CAN THIS ACTIVITY BE ADAPTED?

The instructions in this pack involve the use of a compass. If you are working with younger children, or students who find using a compass too challenging, Steps 1-4 can be simplified by giving them a circle template to draw around instead. A circle with a diameter of roughly 14cm would be perfect. They can use this to draw two overlapping circles to create the vesica shape they will use as a guide to sketch the fish. An even simpler approach would be to provide students with a template with the two, overlapping 14cm-diameter circles drawn for them.

It might be that you lead the activity with your students several times, drawing different fish each time or choosing one to perfect. In either case, you may wish to provide a high level of support the first time the activity is attempted, and reduce this for subsequent attempts.

If you're taking either of the approaches outlined above, start following the instructions from Step 5 onwards.

YOU WILL NEED

- A compass
- A ruler
- A pencil
- A fine, black pen
- A sheet of A4 paper
- A good quality eraser
- Fish images



STEP 1 Draw a vertical line in the middle of the paper.

On a sheet of A4 paper (portrait), use a ruler to draw a vertical line down the centre of the page.

STEP 2 Set your compass to 7cm.

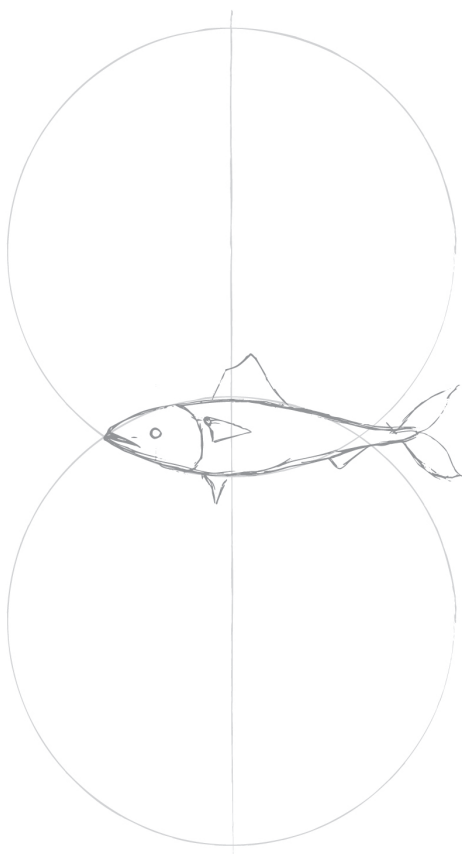
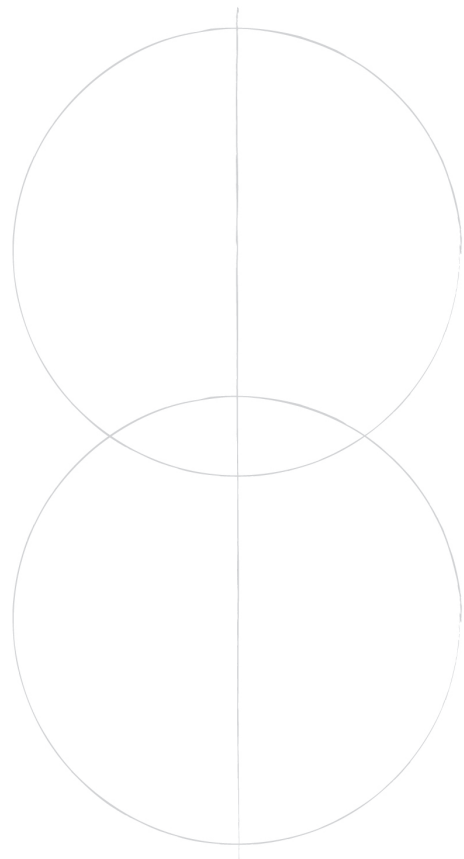
Set your compass so that the point of the needle is 7cm from the point of the pencil (or from the point of the lead, depending on the type of compass you are using).

STEP 3 Draw a circle towards the bottom of the line.

Place the point of your compass on the line, roughly 8cm from the bottom of the page, and carefully draw a circle.

STEP 4 Draw an overlapping circle above the first one.

Now place the point of your compass on the line again, this time roughly 8cm from the top of the page, and draw a circle. The new shape that has been created where the two circles overlap is called a **vesica** or **vesica piscis** (in Latin, **vesica** means vessel and **piscis** means fish). The vesica piscis is a shape that is found in the traditional art of many different cultures. It also echoes the shape of many fish.



TOP TIP

Before you move on to the next step, look through a selection of fish images and choose a fish to draw. Think carefully about its appearance. What shape are its fins and its tail? How big are they and where on its body are they found? Where on its head is its eye? What shape is its mouth? We've chosen a mackerel, which is native to the seas around the UK and has distinctive markings.

STEP 5 Draw the outline of the body of the fish.

Using the shape of the vesica as a guide, draw the outline of the fish you have chosen to focus on.

STEP 6 Add the gills, eye, fins and tail.

With the outline drawn, sketch in the shape of the features of the fish's body, such as the gills, eye, fins and tail. Using the images of the fish will help you to draw both the shape and position of these features as accurately as possible.



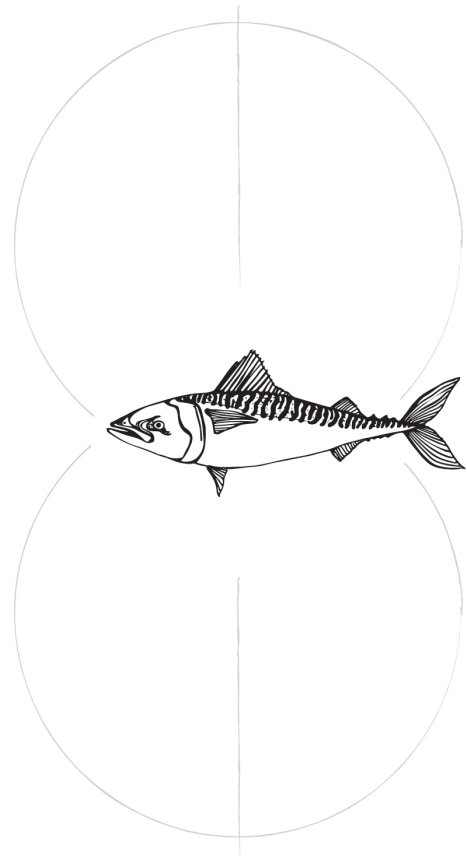
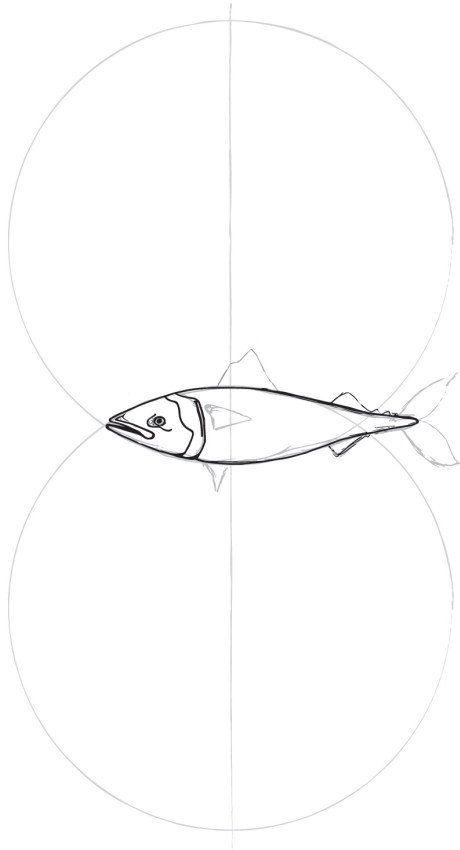
DID YOU KNOW?

The stripes on a mackerel's back aren't there to provide camouflage from predators. Scientists think the stripes help the fish pick out the movement of other mackerel and that this helps them to swim closely together in a shoal.

STEP 7 Add detail to the fish.

When you are happy with the shape and position of the features of the fish's body, use a fine, black pen to go over the pencil lines you have drawn. Wait for a few minutes for the ink to dry, then rub out the pencil lines using a good quality eraser.

Now add in the detail of the patterns and markings on the fish. You could use shading to create a monochrome artwork, or add colour using ink, paint, coloured pencils or watercolour pencils.



TEACHER TIP

If the focus of this Geometry activity is tropical fish, adding colour to the sketches will really help bring them to life. As a follow-on activity, students can use papier maché to create sculptures of the fish they have studied.