Build a bug

Type: Warm-up (20 mins) for 'Dot the bug' – rpf.io/dot
For: Single, pairs, or small groups

Overview

Design a bug using cut-out shapes and a coordinate grid. Creators will plan how it looks, arrange its parts, and record the important details, just like a real digital designer!

Setup

Materials needed:
- Grid sheet
- Blank sheet of paper
- Coloured or uncoloured shapes (cut out)
- Glue

How to build a bug

Step 1: Understand the grid
- The grid uses **top-left coordinates**
- (0, 0) is in the **top-left corner**
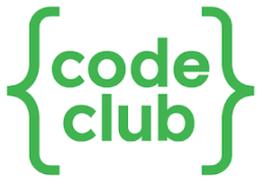- Numbers go **right for X** and **down for Y**

Step 2: Plan your insect

Creators decide what kind of bug to build.
- Will it have **wings**, **legs**, **eyes**, **antennae**?
- Is it **symmetrical**?
- Will they use only cut-out shapes or draw their own, too?

Step 3: Lay out your shapes
- Creators choose and test the shapes by placing them on the grid
- **Layering matters**: The shapes that go on the bottom layer need to be added **first**
- Shapes can be rotated, flipped, or overlapped to create complex designs
- Remind creators not to glue anything yet — they'll do that after planning!

Step 4: Write down each shape
Creators write a list of the shapes they used, in the same order they should be glued down — bottom layer first, top layer last.

How to record shapes:

Shape type to write down	Properties of shape to write down
Circle	Radius, **centre** (x, y)
Ellipse	Width, height, **centre** (x, y)
Rectangle	Width, height, **top-left corner** (x, y)
Triangle	Three points: (x1, y1), (x2, y2), (x3, y3)
Line	Start point (x1, y1), end point (x2, y2)
Your own shape	Name it and give it key points, or describe how to draw it

Step 5: Finalise and glue
When the creators are happy with their layout and have all their shapes listed, they should **glue the shapes down** in the order they wrote. Get them to check that the positions match their notes.

Bonus challenge
Get creators to swap lists and challenge them to find out:
- Can someone else follow your list and recreate your bug?
- Can you build a friend's bug using their shape instructions?

Online project
Now your creators have explored how shapes are drawn with coordinates, they could try out the 'Dot the bug' project! rpf.io/dot