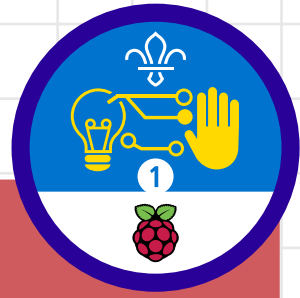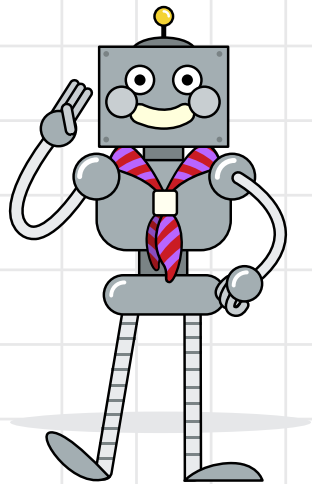# Compass coding (tech-free version)

Overview

This activity fulfills **Stage 1, Requirement 3** of the **Digital Maker Staged Activity Badge** (Write clear instructions for a computer or person to follow to complete a task) and **Stage 1, Requirement 3 of the Navigator Staged Activity Badge** (Learn the four cardinal points of a compass). In this activity, young people will take turns playing the role of a ScoutBot who gets 'programmed' back to camp. The instructions you can use to 'program' the ScoutBot are the same as the four cardinal compass directions: north, east, south, and west. Giving an instruction to the ScoutBot will get it to move one grid square in that direction.

20-30 mins (up to 60 minutes for younger groups)

Flexible (pairs are ideal)

Printed handouts, or source items to use as the start point, camp, and obstacles.

This activity can be done anywhere

You will need:

- Printouts of the Compass coding activity sheets

- 20 sheets of blank paper or masking tape to mark out a 4×5 grid on the floor with squares large enough for a young person to stand in

- Compass, or compass app on a phone

- Scissors to cut out instruction cards (can be done in advance)

Key messages

- Computers can't think for themselves, so they will do **exactly** what you tell them to — even if you get it wrong!

- A computer **program** is a sequence of instructions

- To be good at **computer programming** (coding) you need to be able to plan ahead

- Mistakes in computer instructions are called **bugs**. Fixing them is **debugging**.
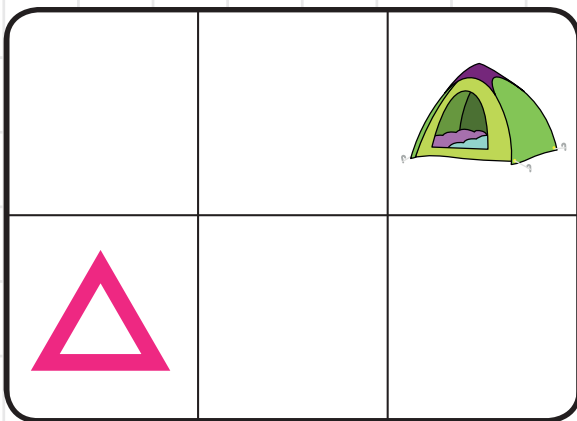
Alternatives

There is a digital version of this activity that can be completed using computers. It can also be tried at home: **rpf.io/compass**

Scouts

Raspberry Pi

Compass coding (tech-free version)

Leader instructions

1 Using a compass, find out which direction is north, or get young people to do this.

2 Create a map using the start and camp sheets and some blank sheets of paper.

3 Choose a young person to play the role of the ScoutBot. The rest of the group are programmers.

4 Programmers should give the appropriate commands 'north/east/south/west' one at a time to program the ScoutBot back to camp; they should use the compass cards to plan a complete program, and then read it out to the ScoutBot.

5 Remember that the ScoutBot should follow the instructions even if they are incorrect. If you realise you have a bug, then any young person can shout 'Halt!' to stop the ScoutBot, debug, and try again from the top.

6 Create new maps and program the ScoutBot back to camp.

7 Young people should take turns in the different roles.

Adaptability

The difficulty of the activity will depend on how you place the start and camp sheets. To make it more challenging, introduce rocks as an obstacle to be avoided, or add firewood for the ScoutBot to collect on the way back to camp, with a new command to pick up firewood. To stop young people slipping, you can use masking tape or sticky tack to stick sheets to the floor.

You could print the tabletop grid to use with a LEGO figure if you have minimal space. If you would like to do the activity outdoors, make a start position with a leaf and stick, use a bigger stick for the camp and a large stone for the rocks.
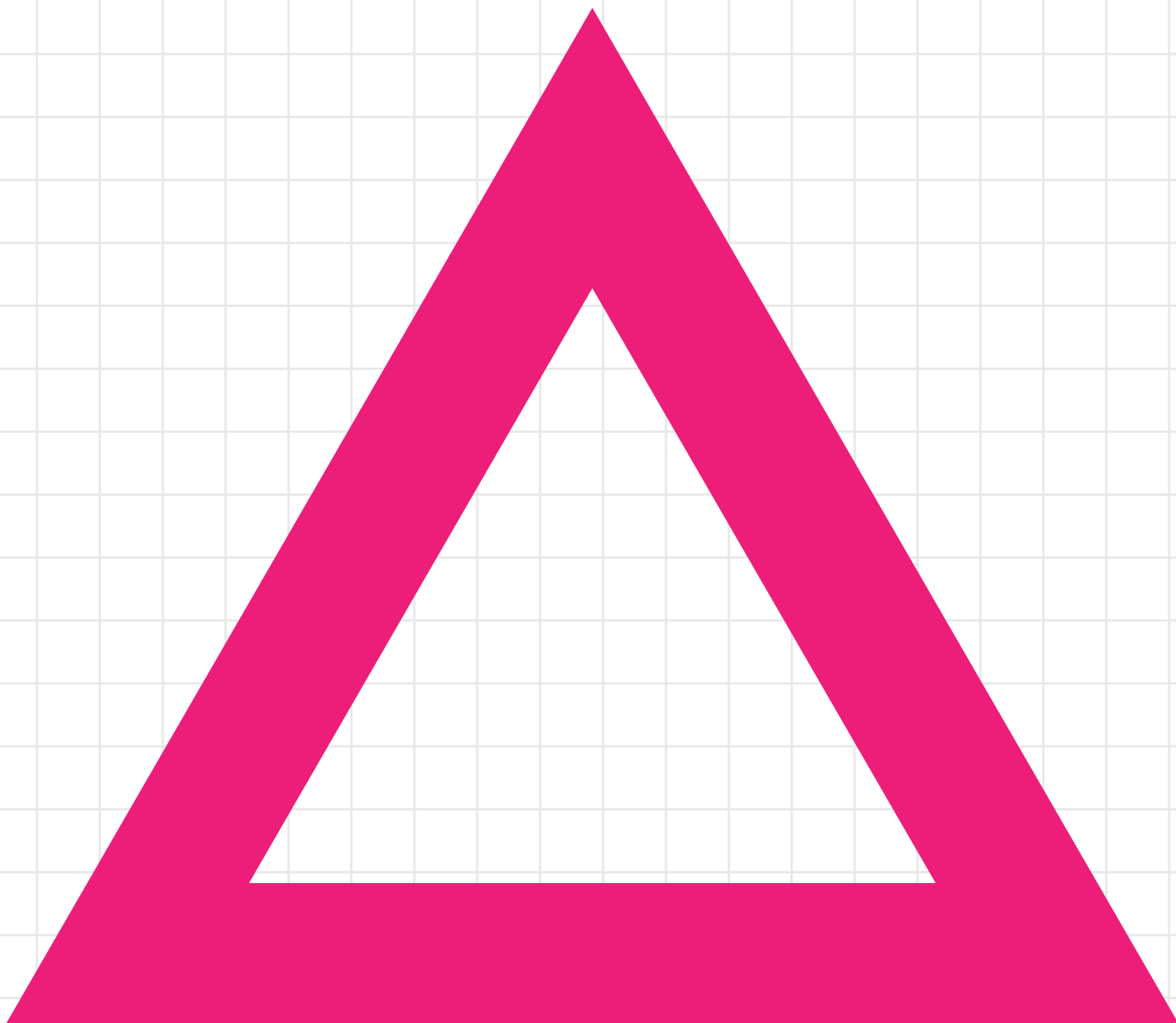
Community and Sharing

Young people should have the opportunity to explain their 'code' or how they found or fixed a bug to the rest of their group.
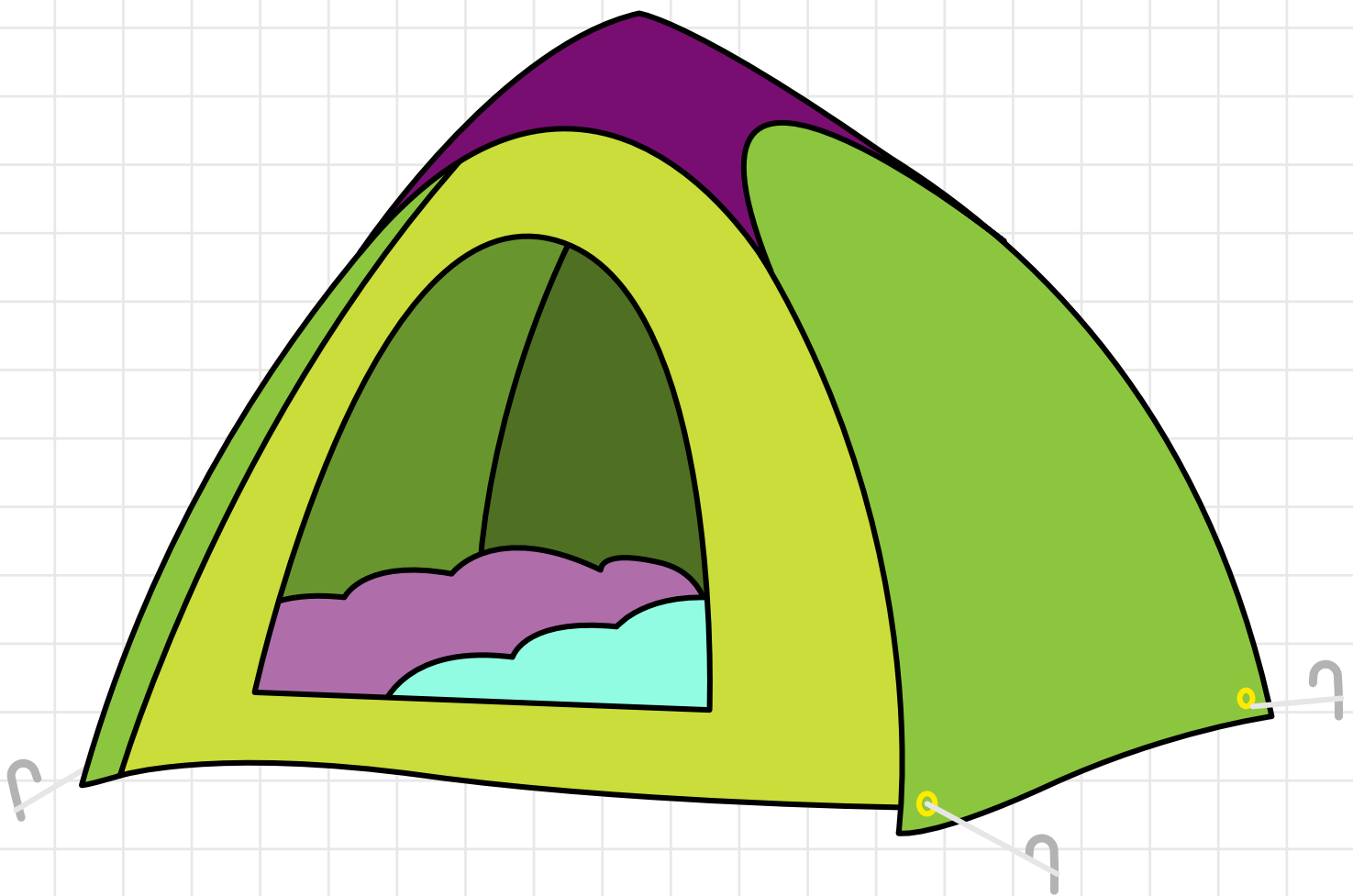
Start

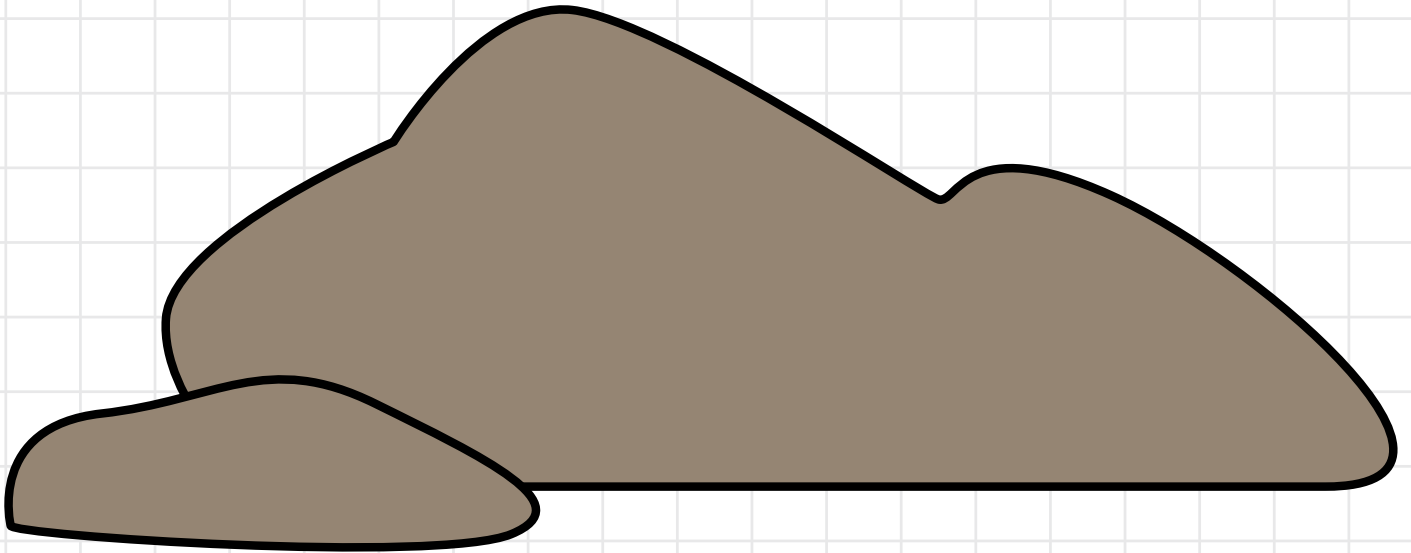Place this sheet on the floor to show the ScoutBot where to start.

Camp

Place this sheet on the floor and use the compass coding cards to program the ScoutBot to move to here from the Start.
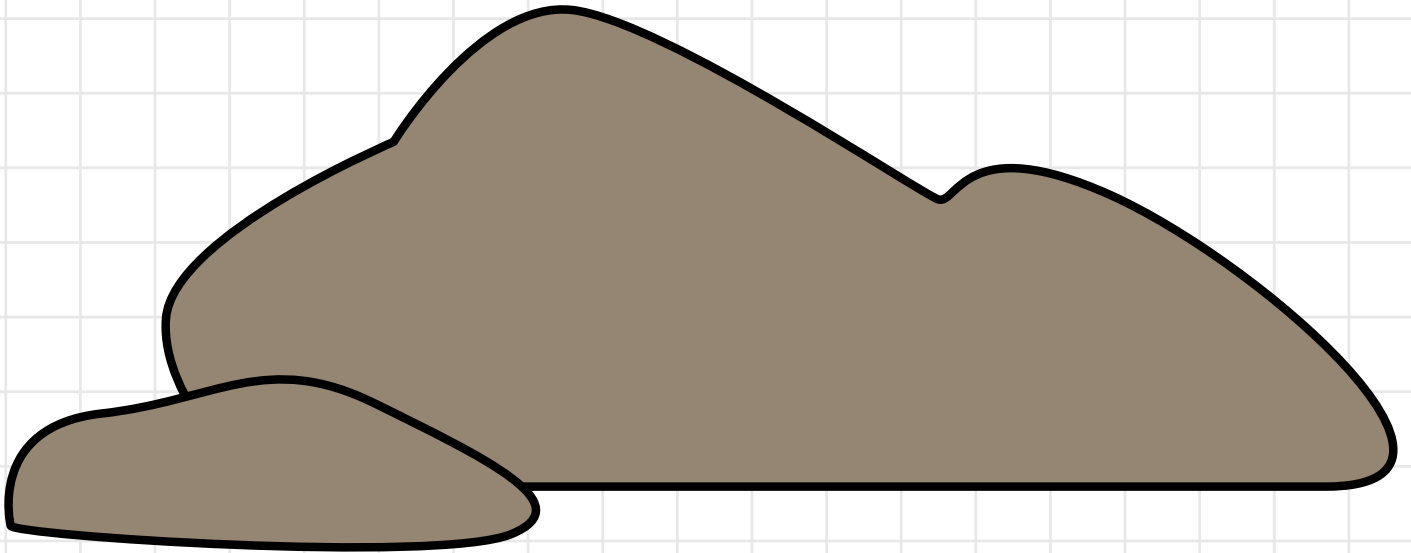
Rocks

Place this sheet on the floor to create an obstacle to program the ScoutBot around.

Rocks

Place this sheet on the floor to create an obstacle
to program the ScoutBot around.

Firewood

Place this sheet on the ground and program the ScoutBot to collect firewood on the way back to camp.

Firewood

Place this sheet on the ground and program the ScoutBot to collect firewood on the way back to camp.

Direction cards

Place direction cards in a row to program the ScoutBot from the Start Triangle back to Camp.

N

N

N

N

E

E

E

E

S

S

S

S

W

W

W

W

Direction cards

Place direction cards in a row to program the
ScoutBot from the Start Triangle back to Camp.

N

N

N

N

E

E

E

E

S

S

S

S

W

W

W

W

Tabletop version

If you have minimal space, you can use this sheet to complete the activity with a LEGO figure. Cut out the pictures below and place them around the grid to create your map. Place your LEGO figure on the start position and follow the rest of the leader instructions to complete the activity.