



arm

Lesson 14

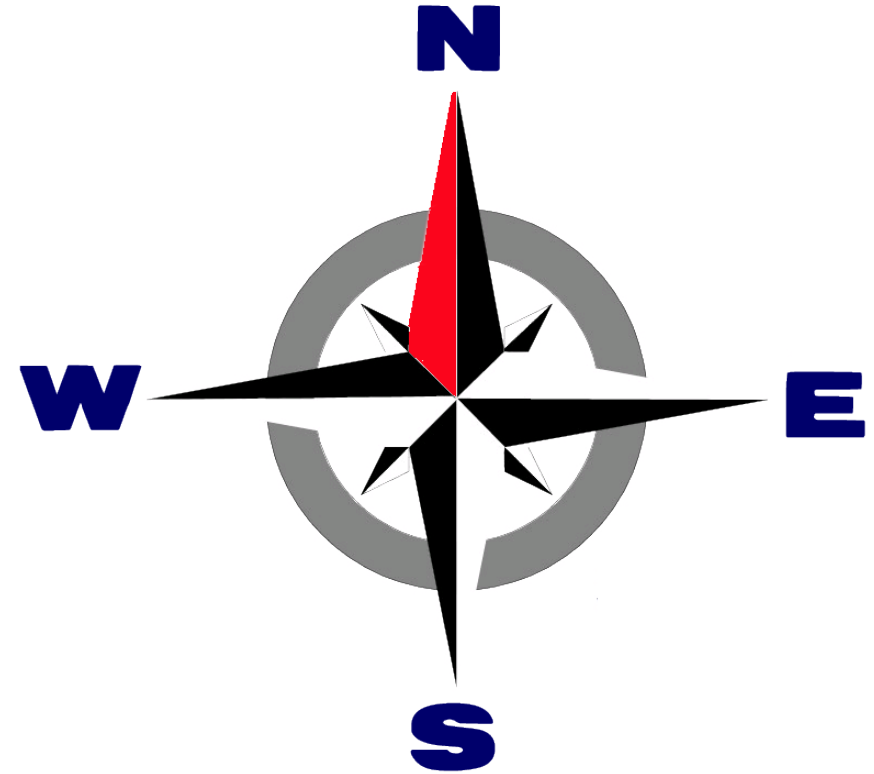
Making a Compass



arm School Program

Making a Compass

- A compass can be used to determine which direction you are pointing in
- This can be useful when navigating
- A compass can be used when reading a map to help you to ensure that you are heading in the correct direction
- You can use your micro:bit as a compass



How Does a Compass Work?

- The Earth is a magnet with a North Pole' and South Pole
- The end of a compass is a magnet that will align with the Earth's magnetic field
- The micro:bit has a built in compass called a magnetometer
- This digital compass works by:
 - A current runs through a conductor
 - The voltage changes according to the Earth's magnetic field
 - This is measured and used to determine the direction



[This Photo](#) by Unknown Author is licensed under [CC BY-SA](#)

micro:bit Sensors

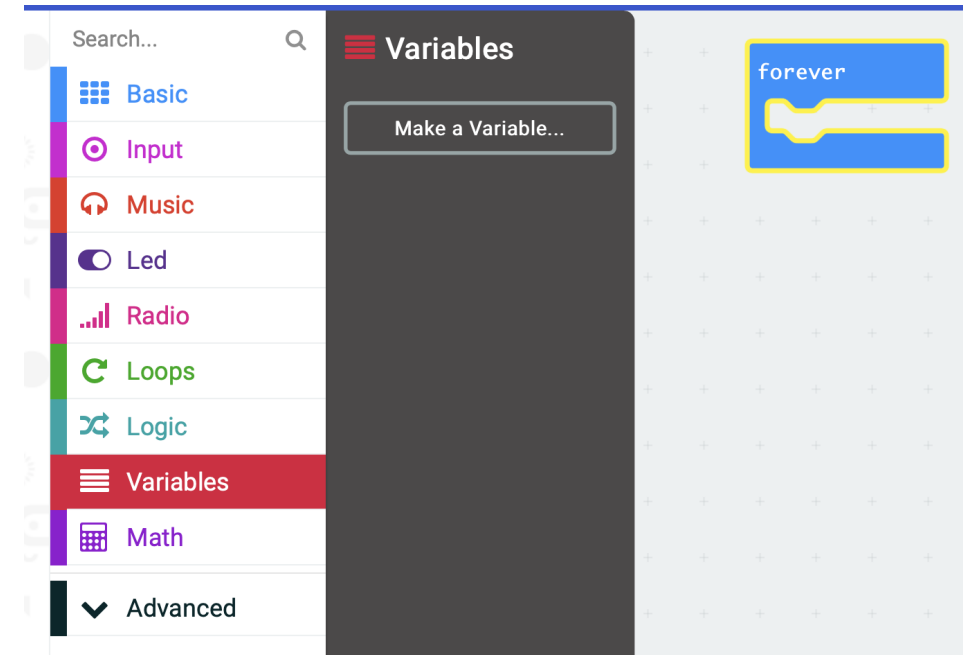
- The micro:bit has a number of built-in **sensors**
- One of the sensors can tell you which direction you are pointing in – your **heading**
- This sensor will read the result of the direction you are pointing in as degrees
- You can then write a program which will display whether the direction is North, East, South or West
- If the number of degrees is measured as being less than 45 or more than 315 then you will be pointing North
- Can you think what type of code structure could be used to program this?

Planning the Algorithm

- Using the compass worksheet you should create a flow chart to plan your algorithm, using **selection**
- Use the following rules to help you:
 - **If** the compass heading is less than 45 degrees or more than 315 degrees **then** you are pointing North
 - **If** the compass heading is less than 135 degrees **then** you are pointing East
 - **If** the compass heading is less than 225 degrees **then** you are point South
 - **Else** you are pointing West

Writing the Code

- You are now going to create your own compass on your micro:bit using **If Then Else** loops
- When the sensor determines the compass heading you will need to save this as a variable
- Remember that a **variable** is a named location in memory where you can store data
- Work through the 'Compass' Worksheet to help you write your code on the MakeCode website
- If you complete the task can you try the Stretch Tasks to include the directions North East, South East, South West or North West



Thank You

Danke

Merci

谢谢

ありがとう

Gracias

Kiitos

감사합니다

धन्यवाद

תודה



arm School Program