# Maritime History Compass Plan (STEM ideas for consultation)

## Overview

Compasses have long been used by mariners to help them navigate. Examples in the collections can be studied, including on the bridge of the Arctic Corsair. What happens when magnetic compasses are used near certain metals? Models could be used to show the difference. What did ship designers do to compensate for this?

Today, tiny compasses, called magnetometers, are found on many devices including smartphones. The micro:bit has a magnetometer and it can be programmed to act as a compass and be compared to the magnetic compass and further hands-on activities undertaken. These could include outdoor activities. How can we use the skills and knowledge gained in our and others’ lives today?

This can be adapted and extended into KS3, KS4 and FE/HE.

## Attainment targets (KS2 used as an example)

### History

Pupils should

* gain historical perspective by placing their growing knowledge into different contexts
* learn about a local history study (Hull’s maritime history and the fishing industry of the 20th century)
* study of an aspect or theme in British history that extends pupils’ chronological knowledge beyond 1066.

### Cross Curricular Links (can also include reading and writing):

### Computing

Pupils should

* design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems
* use sequence and repetition and selection in programs; work with variables and various forms of input and output
* select, use and combine a variety of software on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

### Science

Pupils should

* develop scientific knowledge and conceptual understanding through the specific disciplines of physics
* making systematic and careful observations
* notice that some forces need contact between 2 objects, but magnetic forces can act at a distance
* compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials

## Outline of progression of STEM links

KS2 – write code for a micro:bit using the blocks editor to make the micro:bit act as a compass. Compare it to a magnetic compass. Investigate the effects of magnetic metals.

KS3/4 – use a text-based editor to program a compass, perhaps including the four intercardinal directions. This could also employ a larger display which displays the direction in degrees. A detailed study could be made of which metals effect the reading given and by how much.

FE/HE – Create a compass using an external magnetometer connected to a micro-controller or a Raspberry Pi. Consider use of materials used for a housing.

All groups can consider how a similar device could be used to make a difference in their own lives or the lives of their family or community. Examples could be a compass used for walking/hiking outings or orienteering, or as a sensor for detecting nearby metal – a bit like a homemade metal detector.