

When engaging in the IEEE REACH hands-on activities contemplated in the IEEE REACH lesson plans please proceed with caution and use all reasonable safety measures. All IEEE REACH hands-on activities are designed for classroom use only, with supervision by a teacher or an adult educator. Please be advised that IEEE shall not be responsible for any injuries or damages related to the use of these lesson plans or any activities described herein.

### Compass Hands-on Activity

Early Maritime Navigation Inquiry Unit  
Compass Lesson Plan - Supporting Question 3

**Task:** With a towel placed over their heads and the only visual being that of a magnetized needle, set on a plastic cap in a bowl of water, students will navigate their way to a predetermined spot.

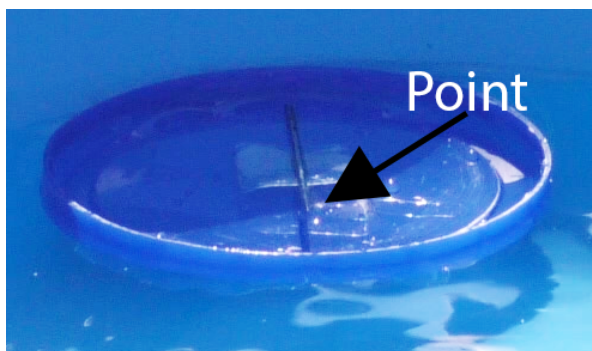
**Learning Outcome:** Students will be able to empathize with early seafarers and understand the challenges faced while traversing and navigating the seas. In addition, they will gain knowledge of how technology plays a role in global preeminence.

Materials Needed:

- Medium sized plastic bowl(s)
- Enough water to fill ~3 - 4 inches
- Sewing needle
- Bar magnet (*Can be found on Amazon*)
- Small Plastic Dish (like a sour cream container lid or something similar)
- Scotch tape
- Towels (same number of towels as bowls)
- Large area (gym or field/lawn will work)
- Cones or floor markers

Instructions

1. Fill the bowl with approximately 3 - 4 inches of water
2. Strike the point of the needle on the north end of the bar magnet ~20 times
3. Strike the the other end of the needle on the south end of the bar magnet ~20 times
4. Using the scotch tape, tape the needle to the plastic dish and place it in the water



a. The point of the needle should point north. If you nudge the needle, you should see it move back into position. If that does not happen, repeat steps 2-4

5. Split your class into manageable groups (keep in mind that each group needs a guide/teacher/teachers' assistant to assist students. It's okay if you only have 1 group)
6. Approximately 15 yards away in a northern direction (if not directly north, instruct students to note the angle of the needle in respect to the cone), set down a cone or floor marker for each group (different colors help)
7. Instruct the first student on each line to walk to their designated marker across the field and to count their steps. Have them announce their number of steps and go back to the front of their line.

8. Drape a towel over the students' heads (make sure they can't see. This is where the guide/teacher/teachers' assistant comes into play), spin them around to disorient them, and instruct them to get to their designated marker across the field. Have them share their experience with the class and send them back to the front of their line.

9. Give the first student on each line a bowl with a magnetized needle. Remind the students that it has been magnetized and will now face north. Instruct them to note the angle of the needle with respect to the marker.



10. Drape a towel over their heads in such a way that they can see the compass and the ground below them only (see picture) (this is really where the guide/teacher/teacher's assistant will have to step up).

Instruct them to use the compass to navigate to their marker.

11. Cycle through all the students on each line.

12. Relate these activities to the challenges of navigating the Mediterranean Sea.

- a. Things to consider – having a fixed point (the cone), having a device that gives a sense of direction, is it accurate? What challenges can you imagine may occur without 100% accuracy? What happens to the compass when going fast and the water in the bowl moves? Imagine what this would be like on a ship in high winds and water swells. Would it help if the compass was stabilized? How so and could that help?

***When engaging in the IEEE REACH hands-on activities contemplated in the IEEE REACH lesson plans please proceed with caution and use all reasonable safety measures. All IEEE REACH hands-on activities are designed for classroom use only, with supervision by a teacher or an adult educator. Please be advised that IEEE shall not be responsible for any injuries or damages related to the use of these lesson plans or any activities described herein.***

This inquiry is brought to you in Memory of John Meredith, and the Institute of Navigation.

