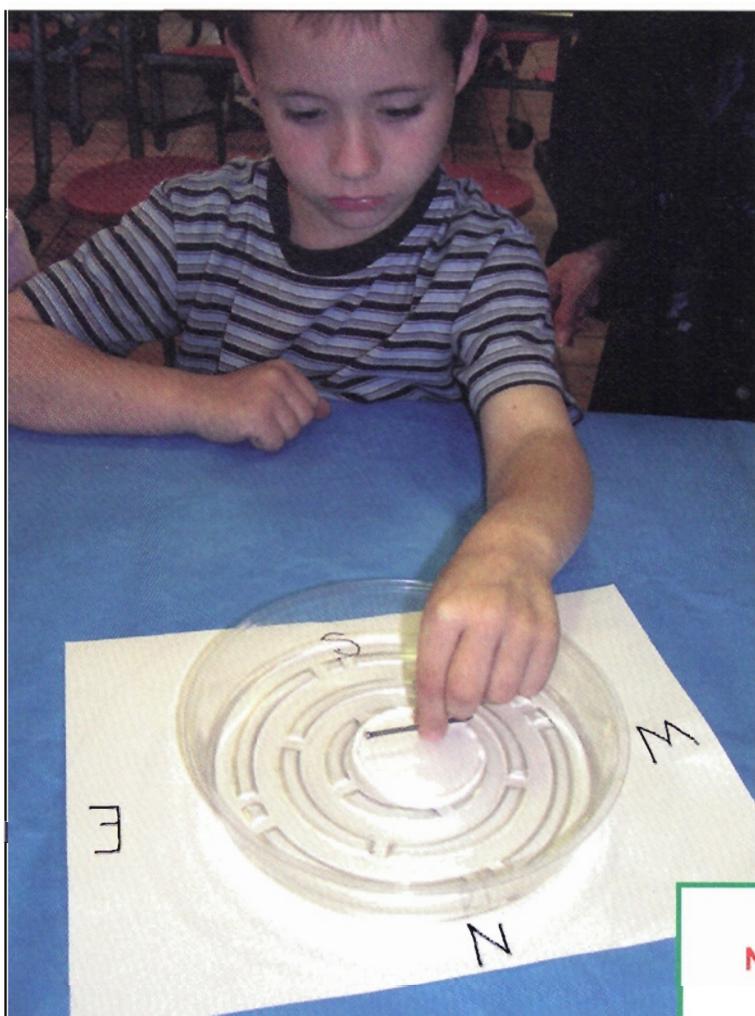


## activity three

# Where Is North?

### OBJECTIVE

Students will build a compass. Students will determine the direction of north, south, east, and west.



### NATIONAL SCIENCE STANDARDS

#### Content Standard B: Physical Science

- Properties of objects and materials
- Light, heat, electricity, and magnetism

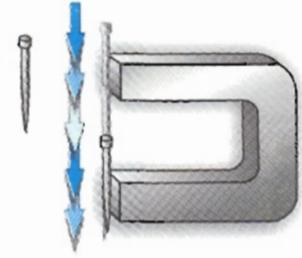
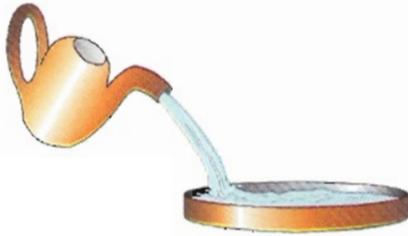
## BACKGROUND

The compass has been used for centuries as a tool for navigation. It is an instrument that aligns a free pivoting bar magnet (called the needle) in Earth's magnetic field.

Since the invisible lines of the magnetic field are oriented in a north/south direction, the needle will orient itself in a north/south direction. The other cardinal points of the compass (east, west, and south) are defined in relation to north.

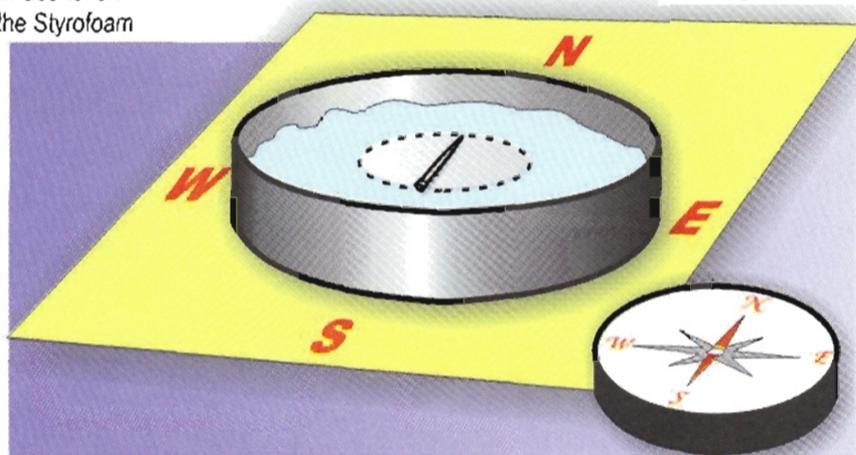
## MATERIALS

- Paper clips
- Fourpenny (4p) finishing nail
- Shallow dish or pan 15-30 cm diameter
- Liquid soap
- Magic markers
- Styrofoam cup, .25 L capacity
- Scissors
- Magnet (must be large and strong in order for this to work properly)



## PROCEDURE

1. Fill a shallow dish with water. Place one drop of liquid soap in the water. This will reduce the surface tension friction and will keep the Styrofoam disk from attaching itself to the container wall.
2. Cut the bottom out of the cup and float it on the water.
3. Magnetize the compass "needle" by rubbing it in one direction on a small magnet.



4. Place the magnetized compass needle on the floating Styrofoam disk. To minimize compass errors, place the compass away from metals, magnets, or electrical wiring.
5. Ask students to observe the compass needle as it aligns parallel with the invisible magnetic field.
6. Discuss ways to verify which end of the needle is pointing north and which end is pointing south. (Sunrise, sunset, shadows, commercial compass).
7. Place a piece of metal near the compass and observe changes in the needle orientation.
8. Write or cut the letter N and position to indicate the north direction. Follow this by placing the letters S, E, and W around the edges of the compass.

## EXTRA

Hide "prizes" at different locations in the classroom. Have students locate the prizes using a compass while following teacher's directions (north, south, southeast, etc.).

## ASSESSMENT

Identify an object in the classroom and ask students to state what direction the object is from the student by using the compass.