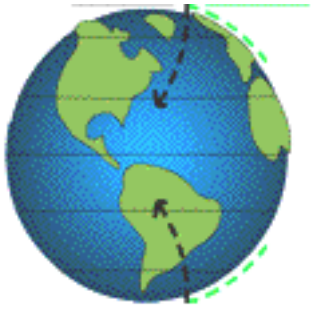
Coriolis Demonstration



Students should work in pairs or small groups and take turns so each student has a chance to try this activity.

Materials

- stiff paper such as a manila folder, cut into circles about 8 " (about 20 cm) in diameter
- corrugated cardboard cut into squares about 10" (about 25 cm) on a side
- push pin or thumb tack
- ruler
- pencil

Procedure

1. Push the pin through the center of the paper circle and pin the circle in the center of the cardboard so that it can rotate freely.
2. Place the ruler so that it crosses the center of the circle.
3. Have one student practice smoothly turning the circle counter-clockwise while holding the ruler in place. The rotation represents the spinning of the earth from the point of view of looking down from the north pole (counter-clockwise rotation) or looking up from the south pole (clockwise rotation). The ruler will allow the second student to draw a straight line while the earth is turning.
4. To model the effect of Coriolis in the northern hemisphere, have the second student draw a straight line at a constant rate along the ruler from the center of the circle to the edge (from the pole to the equator) while the circle is being turned counter-clockwise.
5. Repeat the action, this time drawing a straight line from the edge of the circle to the center (from the equator toward the pole) while the circle is being turned counter-clockwise.

You should notice a definite curve to the line, despite the fact that the drawing was linear. Repeat the demonstration by rotating the opposite direction to model Coriolis in the southern hemisphere; you should be able to draw some conclusions about the direction of apparent deflection in the northern hemisphere versus the southern hemisphere.

Questions: What happened to the line as you rotated the cardboard?

What happens to the line as you get further toward the edge?

What happens if you spin it fast or slow?

Look at a satellite image, observe the pattern of clouds or storm systems, and describe how Coriolis might help explain their motion.

You can do the same demonstration as above with an inflatable globe and a washable marker, or a solid globe and a piece of chalk. This is a more realistic way to demonstrate the Coriolis effect.