Coriolis Effect

The **Coriolis effect** describes how Earth's rotation steers winds and surface ocean currents (**Figure** below). Coriolis causes freely moving objects to appear to move to the right in the Northern Hemisphere and to the left in the Southern Hemisphere. The objects themselves are actually moving straight, but the Earth is rotating beneath them, so they seem to bend or curve. That's why it is incorrect to call Coriolis a force. It is not forcing anything to happen!

An example might make the Coriolis effect easier to visualize. If an airplane flies 500 miles due north, it will not arrive at the city that was due north of it when it began its journey. Over the time it takes for the airplane to fly 500 miles, that city moved, along with the Earth it sits on. The airplane will therefore arrive at a city to the west of the original city (in the Northern Hemisphere), unless the pilot has compensated for the change. So to reach his intended destination, the pilot must also veer right while flying north.

As wind or an ocean current moves, the Earth spins underneath it. As a result, an object moving north or south along the Earth will appear to move in a curve instead of in a straight line. Wind or water that travels toward the poles from the Equator is deflected to the east, while wind or water that travels toward the Equator from the poles gets bent to the west. The Coriolis effect bends the direction of surface currents to the right in the Northern Hemisphere and left in the Southern Hemisphere.

Summary

Earth rotates beneath freely moving objects like water and air. Compared with a spot on the planet, the freely moving objects appear to be moving.

Freely moving objects appear to move right in the Northern Hemisphere and left in the Southern Hemisphere.

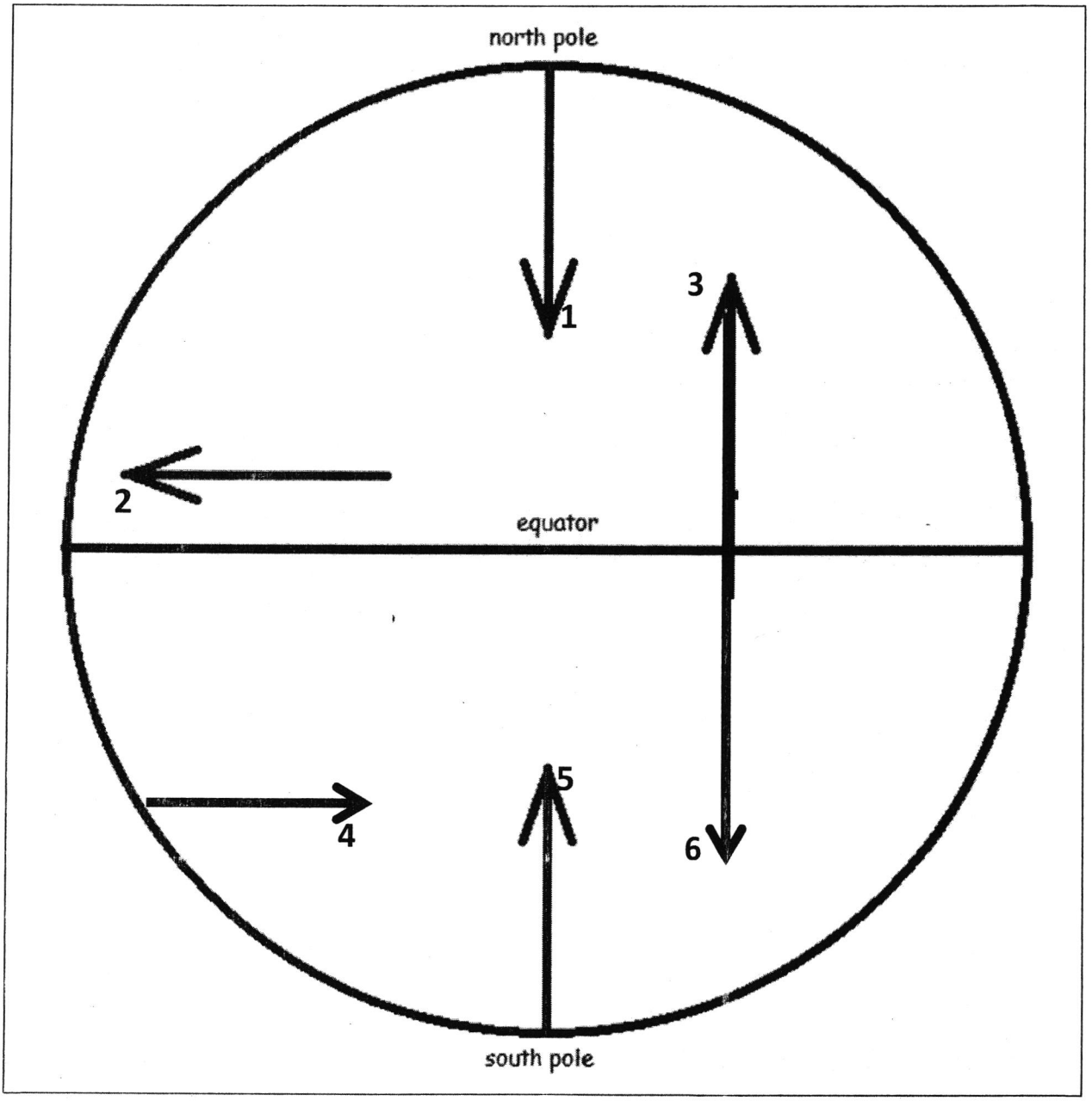
Coriolis is an effect rather than a force because it is not forcing a motion, it's just an appearance of a change of motion

Questions

1. Why does some land on Earth move faster than other land? Where is the fastest and slowest land?
2. If you are at the equator and try to throw a ball to your friend at the north pole, what happens to the ball? What if your friend is at the south pole?
3. What would happen to the winds if Earth didn't rotate? What do they do instead?
4. If an airplane flies from east to west in the Northern Hemisphere without changing latitude at all, in which direction will it appear to curve?
5. If an airplane flies from south to north in the Southern Hemisphere, in which direction will it appear to curve?

CORIOLIS EFFECT*

The diagram to the right represents the Earth divided into two hemispheres along the equator. The **6 arrows** on the diagram <u>show **wind directions** in the Northern and Southern hemispheres</u>. Using your knowledge of the Coriolis Effect, draw dashed lines to show how winds would be **deflected (curve)** due to Earth's Rotation (Coriolis Effect).



HINT: To draw the curved arrows, in order to show the wind deflection due to the Coriolis Effect, **turn your paper** around in such a way that **<u>the arrow faces away from you</u>**.
Remember to **deflect (curve)** your arrows to the **<u>RIGHT i</u>**<u>n the Northern Hemisphere</u> and to the **<u>LEFT</u>** <u>in the Southern Hemisphere</u>.