Name _____ Class _____ Date _____

READING 4

# Planet Earth

GEOGRAPHY

## Earth's Rotation in Our Daily Lives

*When moving about on Earth's surface, we do not feel the rotation of our planet. But it does affect us in some very important ways. In this reading, a geographer discusses some proven effects and possible consequences of Earth's rotation.*

The Earth's rapid rotation affects all moving objects on the Earth's surface and above it. It affects you when you drive your car, planes when they fly on a given course, space shuttles when they take off, winds when they blow, ocean currents as they drift, rivers where they flow.

The scientist who first analyzed the effect of the Earth's rotation on all moving things was a Frenchman, Gustave-Gaspard de Coriolis (1792–1843). . . . Ever since, it has been known as the *Coriolis* Force.

The practical effect of what Coriolis discovered is [that] . . . in the Northern Hemisphere, all moving objects are pushed to the right of their intended direction. In the Southern Hemisphere, moving things are pushed to the left. Here's one very obvious consequence: in the North Atlantic Ocean, water circulation moves in a clockwise direction, westward from Africa toward the Caribbean, northward in the Gulf Stream, southward along the northwest African coast. But in the South Atlantic Ocean, water moves counterclockwise: southward in the Brazil Current, eastward in the West Wind Drift, and northward along the African coast in the Benguela Current.

So it is in other oceans and in the atmosphere. Air circulation, too, is affected by the Coriolis Force. In the Northern Hemisphere, low-pressure systems (the kind that include fronts and storms) circulate counterclockwise. In the Southern Hemisphere, these circulate clockwise. An American weather forecaster who took a job with an Australian television station would have a tough time adjusting to this!

On September 1, 1983, a South Korean commercial airliner flying from Anchorage, Alaska, to Seoul [South Korea] strayed from its assigned course, crossed into . . . territory [of what was then the Soviet Union], and was shot down by a Soviet jet fighter, with a loss of 269 lives.

Why KL 007 should have strayed off course has remained a mystery. It was not, as the Soviets alleged [claimed], a spy plane. But if its computer program, inserted in Anchorage, failed to adjust for the Coriolis effect, the plane would have drifted to the right of its intended course, to just about the degree [of longitude and latitude] where its fatal encounter took place.

We may not notice the effect of the rotation of the Earth in our daily routines, but don't underestimate what this force is capable of. For example, if we were . . . blindfolded and asked to walk in a straight line, we would (on a perfectly flat surface) walk in a large circle, clockwise in the

Northern Hemisphere, where we'd be pushed to the right, and counterclockwise in the Southern Hemisphere. . . .

We may be able to see the Coriolis Force at work when large crowds of people walk long distances. In Britain, where the rule is to keep left, . . . there are signposts, even lines on sidewalks, urging people to walk to the left. But people seem to move to the right anyway. I've spent quite a bit of time in Edinburgh, Scotland, on assignments. Every time I've been there, overlooking Princes Street, I've noticed that people there seem to walk on the right as they promenade by the thousands along the wide sidewalks. On the other hand, in Southern Hemisphere Buenos Aires, Argentina, the rule is to keep right, but try that on fashionable Florida Avenue. There, they seem determined to keep left.

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**Understanding What You Read** After you have finished reading the selection, answer the following questions.

1. What is the Coriolis Force and how did it get its name?

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2. How does Earth's rotation affect the movement of objects on its surface in the Northern Hemisphere?

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3. Why would a blindfolded person who tried to walk a long distance in a straight line, eventually make a large circle instead?

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4. According to the author, how does geography influence people in Argentina to walk on the left side of paths and sidewalks, even though the rule is that they keep to their right?

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