Hurricane Motion

Answer Key

Vocabulary: air pressure, Coriolis effect, eye, hurricane, knot, meteorologist, precipitation

Prior Knowledge Questions (Do these BEFORE using the Gizmo.)
[Note: The purpose of these questions is to activate prior knowledge and get students thinking. Students are not expected to know the answers to the Prior Knowledge Questions.]

A **hurricane** is a large, rotating tropical storm with wind speeds of at least 74 miles per hour. Since 1990, **meteorologists** have regularly used satellite images to track hurricanes.

1. The satellite image at right shows Hurricane Katrina just before it hit New Orleans in 2005. Label the hurricane on the image.

2. How do you think meteorologists predicted the arrival of a hurricane before the 1990s?

   Answers will vary. [Meteorologists used ship reports, air pressure readings, airplane reconnaissance, etc.]

Hurricane →

Gizmo Warm-up

You can use data collected from weather stations to study the characteristics of hurricanes. The *Hurricane Motion* Gizmo™ has three simulated weather stations. Turn on **Show weather station data**. Make sure **Wind**, **Cloud cover**, and **Pressure** are all checked.

The tails on each station symbol point in the direction the wind is coming from. The flags on the tail indicate wind speed, measured in **knots**. (One knot is equal to 1.151 mph.) A short line extending from the tail indicates 5 knots of wind. A longer line indicates 10 knots. A triangular flag indicates 50 knots. Add all the flags together to get the wind speed.

The number in the station's upper right is the **air pressure**, which is measured in millibars (mb).
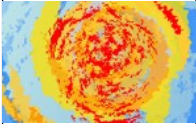
The circle symbol indicates the percentage of cloud cover, as shown in the table at right.

Degree of Cloud Cover

Clear	1/8	1/4	3/8	1/2	5/8	3/4	7/8	Overcast
○	◍	◔	◕	◑	◒	◕	◖	●

Use the information above to complete this table for station **A** on the Gizmo.

Wind speed (knots)	Wind from	Cloud cover	Pressure (mb)
30 knots	*North*	*1/8*	*1023.5 mb*

Gizmos

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| Activity A:

Hurricane characteristics | <u>Get the Gizmo ready</u>:

• Make sure **Practice**, **Show hurricane**, and **Show weather station data** are selected. | |

Introduction: Hurricanes form when an area of low pressure forms over warm water. Wind blows toward the low pressure, but are deflected by Earth's rotation. The **Coriolis effect** causes winds to curve to the right in the Northern Hemisphere and to the left in the Southern Hemisphere. This results in a counterclockwise rotation for Northern Hemisphere hurricanes and a clockwise rotation for Southern Hemisphere hurricanes.

Question: What are some characteristics of hurricanes?

1. <u>Observe</u>: In which hemisphere is the hurricane shown on the Gizmo? *Northern*

   How do you know? *The hurricane winds are circulating counterclockwise.*

2. <u>Describe patterns</u>: Under **Show hurricane**, make sure **Radar** is selected. Radar is used to determine where **precipitation**, such as rain, is falling. Blue indicates light rainfall. Heavier rain is shown with yellow and then orange. Red indicates the heaviest rainfall.

   A. Where within the hurricane is the lightest rainfall? *The outer areas of the hurricane*

   B. Where within the hurricane is the heaviest rainfall? *The interior of the hurricane*

   C. Describe any patterns you see in the distribution of a hurricane's rain.

   The rain in distributed in curved bands that spiral around the storm's center.

3. <u>Observe</u>: Under **Show hurricane**, select **Satellite**. Satellite images are taken from cameras built into satellites orbiting Earth. These images are used to study cloud coverage over large areas, including the clouds associated with a hurricane.

   A. Which is larger, the area of rainfall or the area of cloud cover? *Cloud cover*

   B. Where is the cloud cover most dense? *Near the center of the hurricane*

   C. Where is the cloud cover least dense? *Around the outer areas of the hurricane*

4. <u>Identify</u>: The center of rotation of a hurricane is called the **eye**. The eye of a hurricane is a core of warm, relatively calm air with low pressure and light winds. Label the eye on the hurricane at right.

(Activity A continued on next page)

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