

# Earth's Water: Upland Karst Features

# Teacher's Guide

**Subject:** Integrated Science (Earth-Space and Physical)

**Topic:** Sedimentary Rocks, Karst Topography, Weathering and Erosion, Dissolution

**Summary:** Students locate, measure, and identify six unique Karst features at Florida Caverns State Park. Emphasis will be on measurement and classification of three karst features.

After completing the field lab, students will be able to:

**Objective(s):**

1. Identify three different kinds of Karst features and explain how they were formed;
2. Determine the origin of the sedimentary rock (optional)
3. Observe a portion of the "rock cycle" (optional)
4. Measure the grain sizes of stream sediment (optional)

**Ecosystem(s):** Rivers/Springs

**Equipment:**

- GPS Receivers
- Tape Measure
- Clear plastic hose 0.25" diameter (optional)
- pH test kit (optional)
- Two-way radios
- Karst Features Ref. Chart
- Digital Camera (optional)

**Background:**

- **Reference Material:** Florida Science (Glencoe Grade 7) Chapter 8: Rocks and Minerals; chemical reactions in limestone; groundwater flow; [www.exploreflorida.org/karst](http://www.exploreflorida.org/karst); <http://www.karstwaters.org/files/glossary.pdf>; *Water's Journey* Language Arts activities; Video on Wakulla Springs
- **Vocabulary:** upland karst, karst, outcrop, depression or sinkhole, conduit, limestone, permeable/impermeable, erosion, spring vent, spring, aquifer, groundwater, surface water, water table, watershed/ spring basin, runoff, detritus/detrital

**Procedure (Engage; Explore; Explain)**

1. Ask the students to assemble at the blue hole/horse camp trailhead.
2. Upon reaching the first stop, ask students to describe the kinds of shapes or features they might expect to find if they all sprayed squirt guns filled with hot water onto a large block of ice.
3. Explain to them that the underlying rock is a sedimentary rock formed in the ocean hundreds of thousands of years ago. Explain that limestone can be eroded by physical weathering as well as chemical weathering if it is exposed to acidic water. Relate this to the melting of the block of ice with hot water.
4. Explain to the students that they will observe and measure six different Karst features along the trail. They will compare their observations and measurements with a reference chart attached to their data sheet to determine what type of Karst feature they found.
5. If time permits, students will also take measurements of water clarity, temperature and pH at features where water is present. This information will be used to compare with measurements in the future during different seasons.

**Sunshine State Standards:**

**Science:** SC.D.1.3.1; SC.H.1.3.4; SC.H.2.3.1; **Language Arts:** LA.A.1.3.3; LA.B.2.3.1; LA.C.1.3.1; **Mathematics:** MA.B.1.3.3; MA.B.3.3.1; MA.B.4.3.1-2; MA.D.2.3.1; **Social Studies:** SS.A.2.3.4; SS.A.3.3.3; SS.A.6.3.5

# Earth's Water- Upland Karst Features

# Data Sheet

## General Information

Full Name:		Date:	
School (teacher):		Time:	
Latitude:	<i>Enter in table below</i>	Longitude:	<i>Enter in table below</i>

## Hypothesis:

If a group of five students were to spray hot water from squirt guns onto a block of ice, what kinds of shapes and features might begin to appear? \_\_\_\_\_

## Field Observations/Measurements/Data

Parameter	Karst 1	Karst 2	Karst 3	Karst 4
Latitude				
Longitude				
Does it have an opening?(Y/N)	Y N	Y N	Y N	Y N
Is limestone rock visible?(Y/N)	Y N	Y N	Y N	Y N
Shape of opening, if present				
Estimated width of opening (in meters), if present				
Estimated length of opening (in meters), if present				
Estimated depth of opening (in meters), if present				
Is water visible in the feature?(Y/N)	Y N	Y N	Y N	Y N
If water is visible, is it moving or not?				
If water is moving, what direction: in, out, or through?				
Using your reference chart, classify this feature?				

# Earth's Water- Upland Karst Features

# Assessment

1. What was the deepest feature that you observed?

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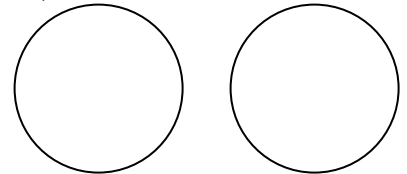
2. Of the four Karst features that you observed, create a pie chart (using the circles) indicating what percentage had: 1) water present; and 2) exposed rock.

1) number of features with water / 4 x 100 =

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2) number of features with exposed rock / 4 x 100 =



3. Did any of the features you observed match any of those you wrote in your hypothesis? Describe the similarities and differences between ice and warm water, and limestone and acidic water.

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4. The karst features you have observed are found in a state park with few, if any, sources of water pollution. What would happen if these karst features, which are connected to the aquifer, were found in an area where there were many human sources of pollution?

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5. If karst features make our groundwater vulnerable to pollution, what actions can be done to prevent the pollution from entering them?

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6. Think about what you learned in this lab. Has it generated any new question? Write a new question (related to the subject) about something you want to learn more about?

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## Earth's Water- Upland Karst Features

## Reference Chart



**Sinkhole:** a depression in the ground that can have gently or steeply sloping sides; water may be present in the bottom.



**Outcrop:** a visible extension of bedrock limestone jutting out from the surface either vertically or horizontally.



**Natural Bridge:** A rock bridge spanning a conduit and not yet eroded away.



**Ravine:** relatively large dissolutional voids, including enlarged fissures and tubular tunnels; they have very steep sides and are typically very long and fairly narrow.