



Karst Geology Post-visit

Classroom Activity

Brief Synopsis:

While at Eagle Bluff the students will be investigating sedimentary rocks and karst features. Back at school several demonstrations can be done in the classroom. There are several activities online that will help students' understand how a karst landscape is especially susceptible to contamination.

Ages: Designed for 7th–12th grade

Time Considerations:

Karst Mountain: Two 45 minute sessions each on a separate day

Seepy Sandwich: Brief demonstration, about a minute, discussion could take much longer

Turmoil in Town: About an hour

Materials:

Karst Mountain: box of sugar cubes for each group of four students, royal icing (whites from 3 large eggs, 1/2 teaspoon cream of tartar, 1 pound confectioner's sugar), food coloring, eye droppers, small cups, foil pans

Seepy Sandwich: slice of bread, food coloring, spray bottle

Turmoil in Town: script from the website

Vocabulary: Fertilizers, Pesticides, Coliform bacteria, Environmental Protection Agency (EPA),

Outcomes:

1. Students will identify the most common sedimentary rocks in Southeastern Minnesota.
2. Students will explain how the chemical and physical properties of sedimentary rocks shape the local landscape.
3. Students will demonstrate how karst topography is sensitive to both natural and human activities.

Minnesota Academic Standards:

Science: 5.I.B.1, 7.IV.C.1

Language Arts: 5.I.A.2, 6.I.A.2, 6.III.A.1, 3&6, 7.I.A.2, 7.III.A.1&6, 8.III.A.1, 2&7

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Set-up:

The following activities will require the teacher to have access to the internet. “Karst Mountain” and “Seepy Sandwich” activities involve various props and “Turmoil in Town” activity involves printing off copies of a script for students to use.

Activity 1: Karst Mountain

Background: This activity is from The Educator’s Reference Desk, submitted by Judy Ware and Earle Maxwell. Students will review how water forms a karst landscape by building a “mountain” out of sugar cubes covered by icing.

Procedures: Visit the website <http://askeric.org/cgi-bin/printlessons.cgi/Virtual/Lessons/Science/Geology/GLG0001.html> Review the “Karst Topography” activity and gather materials. Make the royal icing ahead of time using the directions from the website. Distribute cubes and icing to each group. Instruct students to make a mountain by cementing the cubes together with the icing and then coating the entire mountain with icing. Allow mountains to sit at least overnight. In the next session distribute droppers and cups with dyed water to each group. Instruct students to add the liquid to the mountain drop by drop and to observe and record the results. Before the mountain is completely dissolved instruct the students to break open their mountain for viewing.

Assessment: Students can have a “show and tell” style presentation of their mountain using karst and geologic vocabulary. Engage the students in discussion. Did all the projects have the same outcome? What is the same and what is different? If some formed differently, why?

Extensions:

- Locate karst regions world wide
- Research how non-karst caves are formed



Activity 2: Seepy Sandwich

Background: This activity was created by Joe Pitts of the Missouri Department of Conservation. Students will use bread and food coloring to demonstrate how contaminants are moved through limestone in karst regions.

Procedures: Visit the website <http://www.nps.gov/ozar/skindeep.htm> and review the “Seepy Sandwich” activity. Distribute a slice of bread, dropper and food coloring to each student. Instruct each student to hold the bread vertically, apply a drop of coloring to the top crust of the bread, and then spray the bread with water from the spray bottle. Have the students record their observations to share with the rest of the class.

Assessment:

- The website lists several discussion questions.

Activity 3: Turmoil in Town

Background: This activity was created by Joe Pitts of the Missouri Department of Conservation. Students will take on the identity of town citizen in a role playing activity that discusses ground water contamination.

Procedures: Visit the website <http://www.nps.gov/ozar/skindeep.htm> and review the “Turmoil in Town” activity. Copy and distribute the script for each student. Assign or let students choose their role from the script. After each student speaks allow time for discussion from the class.

Assessment: By the end of the meeting have the citizens formed any conclusions? Who is to blame for the poor water quality? What action will the community take? Allow students to come out of their citizen roles (if they haven’t already) and discuss what was or was not realistic about this exercise. Could this have really happened? How does the local geology impact land use choices of the land?

Extensions:

- Have students can seek out articles about water quality or water use issues from their community.
- Have students locate the closest karst region to their community.

“Seepy Sandwich” Teacher Tips

- Select an area that can get a little messy from food dye and spraying water. Setting up plastic sheeting or using a large sink or tub may help.
- Have each student add a different number of drops to the bread slice.
- Use multiple colors to represent multiple contaminants.

“Turmoil in Town” Teacher Tips

- There are ten citizen roles and one mayor who leads the meeting. If there are more than eleven students in class additional roles or city council members will need to be added.
- Hand picking outspoken students for particular roles may increase the turmoil in town.
- The teacher may need to assist in the discussions by asking questions during the role playing portion of the activity.

Additional Resources

<http://www.deq.state.va.us/kids/scientst/inves3.html>

Website with description of an activity involving the construction of two watersheds, one karst and one not and comparing water quality.

<http://education.usgs.gov/common/primary.htm#caverns>

Obtain some 3D glasses and tour Carlsbad Caverns and Mammoth Cave in 3D!

<http://geology.wr.usgs.gov/parks/cave/karst.html>

This thorough article on karst has a glossary and quiz at the end.

<http://www.goodearthgraphics.com/virtcave/virtcave.html>

This link contains a cave diagram with numerous cave features that can be selected for more information.

<http://www.karstwaters.org/educationlinks/teachers.htm>

Karst resources for teachers; many links.

<http://www.ups.gov/ozar/skindeep.htm>

Karst related activities.