

Karst King or Karst Klutz?

Lesson Summary:

This lesson was written to accompany the educational video “Karst in the Ozarks.” Students should watch the video before beginning the lesson. It is available online at [Resources | Karst in the Ozarks](#). In the video students learn how the Ozarks formed and how karst features are created and inter-connected. They are introduced to the ways that groundwater in karst terrain can become polluted with nonpoint source pollution from human activities at the surface. After the video the students, working in pairs, will draw a card, from the provided Karst King or Karst Klutz card pile. They take turns reading and discussing the scenario on the card. The pair needs to decide if the scenario on the card would be the action of a Karst King (someone who understands the surface/groundwater connection) or a Karst Klutz (someone who has not had the opportunity to be educated about the surface and groundwater connection).

Missouri Learning Standards:

5.ESS3.C.1. Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.

6-8.ESS3C.2 Apply scientific principles to design methods for monitoring and minimizing human impact on the environment.

9-12ESS3C.2 Evaluate or refine a technological solution that reduces impacts of human activities on natural systems in order to restore stability and or biodiversity of the ecosystem as well as prevent their reoccurrences.

9-12.ESS3D.2 Predict how human activity affects the relationships between Earth systems in both positive and negative ways.

Related Vocabulary:

Runoff	Point Source Water Pollution
Sediment	Nonpoint Source Water Pollution
Household Hazardous Waste	Karst Features (Caves, Sinkholes, Losing Streams, Springs, Recharge Areas)

Related Web Links / Background Information:

[Living on Karst \(caveconservancyofvirginia.org\)](http://caveconservancyofvirginia.org)

[Illegal Dumping | Missouri Department of Natural Resources \(mo.gov\)](#)

[Keepers of the Karst | Missouri Department of Conservation \(mo.gov\)](#)

Required Materials:

- A class set of “Karst King or Karst Klutz?” cards for the number of participating groups.
- A copy of the Karst King or Karst klutz key for each card set.
- Online video (18:08 minutes) [Resources | Karst in the Ozarks](#)

Time Requirements:

Karst King or Karst Klutz card sets for every two students and an accompanying key will need to be photocopied and cut beforehand.

Lesson Warm Up:

Question the students about their knowledge about karst in the Ozarks. Tell them that they are going to see a video that explains how the Ozarks was formed. It will include information about the karst terrain in the Ozarks and how the surface and subsurface are connected with karst features. Afterwards they will discuss the video and then sort out cards describing how some people's actions can harm groundwater in a karst region. Explain that all residents in the Ozarks depend on groundwater for all their domestic and drinking water derived from wells.

“Karst King or Karst Klutz?” Activity:

1. Show the students the *Karst in the Ozarks* video online at [Resources | Karst in the Ozarks](#) (18:03 minutes). The last two minutes is a song.
2. Ask students to recall what they learned about how karst terrain connects between the surface and subsurface water. Ask them what nonpoint source water pollution sources were in the video. Ask students to explain how groundwater got polluted in the video.
3. Provide each pair of students with a set of “Karst King or Karst Klutz?” cards. Instruct the students to take turns reading the cards and discussing the content. The pair then needs to decide if the action on the card is the action of a Karst King or a Karst Klutz. Explain beforehand that a Karst King is someone who understand the surface and groundwater connection, and that a Karst Klutz is someone who has not had the opportunity to be educated about the surface and groundwater connection.
4. Have students get a key and check their stacks. Have them discuss any mistakes. Discuss any problems they had to make sure they understand the correct answer.

Lesson Wrap Up:

Read through several of the cards and have students explain why the scenario is for either a Karst King or Karst Klutz. Explain that individual actions add up to make our karst Ozarks a safe or unsafe place to get clean drinking water.

Modifications:

The lesson difficulty could be decreased by making the following adaptations:

- The teacher could have a student pull a card and read it to the class. The class then discusses the card and votes to determine if the scenario represents a Karst King or Karst Klutz.

The lesson difficulty could be increased by making the following additions:

- The students could create their own scenarios and see if other groups can determine if these scenarios protect or threaten groundwater.

Assessments:

Provide students some of the examples from the cards again and have them identify if the given scenarios help protect or harm groundwater in the Ozarks.