

RIVERS

Rivers Instructional Case: A series of student-centered science lessons

Lesson 3

Vocabulary Card Sort



Summary

A vocabulary card sort introduces the geologic features they may observe in a stream table lab. Students experience a model of a stream table to form an understanding of the different variables that can shape a river and its surroundings. The teacher administers a card sort to review/introduce vocabulary pertaining to stream table. This card sort will be used as a guide to identify features the student may see during the stream table lab activity. The students will then question and review each other using the Quiz, Quiz, Trade protocol.

Suggested Timeline

25 minutes

Materials

- Pictures of stream vocabulary
- Vocabulary cards
- Index cards

Prep

1. Print, laminate and cut out a set of cards.
2. Create one set for each group of four students.

Objective

- Students will match the stream vocabulary to a picture
- Students formulate questions and review key terms from the previous lessons in this instructional case.

Teacher Background Knowledge

Research has shown that implementing a systematic and principled approach to teaching and learning vocabulary is a vital component in language learning and reading development. Notice that the vocabulary has not been “front-loaded” but rather fits into lesson 3 after the students have completed two hands-on inquiry activities. This is because the students have had the opportunity to interact with the vocabulary terms doing an activity and seeing the vocabulary in context. The students have received indirect vocabulary instruction through the interaction of the vocabulary words in context with the activities. Direct instruction must also be provided in order to encourage quantity of receptive word knowledge before quality growth will occur.¹ This hands-on activity allows students to see the pictures with the vocabulary word and definitions. Note that these cards can also stay on the table as a resource for students when participating in the Stream Tables activity in lesson 4. The Quiz, Quiz, Trade protocol² is an academic discourse strategy to review the vocabulary learned in this instructional case. This student-centered technique allows students to craft questions and check the answers with their peers.

¹ Beck, I. L., M. G. McKeown & L. Kucan. (2002). *Bringing Words to Life*. New York: The Guilford Press

² Beauchamp, A., Kusnick, J., & McCallum, R. (2011) *Success in science through dialogue, reading and writing*. Davis, CA: The Regents of the University of California, Davis.

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Standards ³⁴

<p>NGSS Performance Expectations: <i>This lesson supports students in progressing toward the NGSS Performance Expectation.</i></p>		
<p>MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. [Clarification Statement: Emphasis is on the processes of melting, crystallization, weathering, deformation, and sedimentation, which act together to form minerals and rocks through the cycling of Earth's materials.]</p>		
<p>Assessment Boundaries: <i>Assessment does not include the identification and naming of minerals.</i></p>		
<p>In this lesson...</p>		
<p>Science and Engineering Practices</p>	<p>Disciplinary Core Ideas</p>	<p>Cross Cutting Concepts</p>
<p>Obtaining, Evaluating, and Communicating Information Students will critically read scientific texts and determine the important vocabulary to describe river evolution and formation. Students will use the information gathered to generate more questions for the subsequent lessons.</p>	<p>ESS2.A: Earth's Materials and Systems All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. Students will understand key vocabulary words to describe the phenomenon of weathering. These vocabulary terms contribute to students being able to model erosion using this academic language.</p>	<p>Patterns Students observe the patterns and relationships that exist between the images and the vocabulary words. The patterns they observe here will further develop their vocabulary comprehension. The recognition of the vocabulary terms will assist them in lesson 4 on stream tables.</p>
<p>In this lesson...</p>		
<p>CCSS Mathematics</p>		<p>CCSS English-Language Arts</p>
		<p>CCSS.ELA-LITERACY.SL.6.1.C Pose and respond to specific questions with elaboration and detail by making comments that contribute to the subject matter of rivers and erosion.</p>

³ NGSS Lead States. 2013. Next Generation Science Standards: For States, By States. Washington, D.C.: The National Academies Press.

⁴ National Governors Association Center for Best Practices, Council of Chief State School Officers Title: Common Core State Standards (insert specific content area if you are using only one) Publisher: National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington D.C. Copyright Date: 2010

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Prior Knowledge

In grades 3-5, students have learned that wind and water change the shape of the land and that rainfall helps to shape the land and affects the types of living things found in a region. Moreover, students have learned that water, ice, wind, organisms, and gravity break rocks, soils, and sediments into smaller pieces and move them around.

In the previous two lessons, students have generated questions and made predictions regarding river movements. Students then make predictions and use a model of sediment tubes as a way of making predictions about river movements from the mountain ranges to the flatlands and to the ocean.

Lesson

1. Distribute the vocabulary cards and pictures
2. Explain to the students that they are to pair up a vocabulary card with its picture
3. Debrief with the students and verify correct responses to the card sort. Here are some questions to debrief with the students:
 - a. Why did you put that picture with that word?
 - b. Which was the hardest picture to match?
 - c. What does the mouth of a stream mean?

First Round

4. Have students write one question about the vocabulary material on an index card. Students will write the answer on the other side. At this time, students can use their own knowledge, the book, or other resources to help them write a thoughtful question and to double check their answer.
5. Have each student find a partner and the student will ask the question then waits for the partner to try and answer the question.
6. The opposite student then asks their question and waits for the other partner to answer the question. Go over with your students the different levels of questioning:

Knowledge	Application	Synthesis
<ul style="list-style-type: none"> • What is an alluvial fan? • What is the difference between an alluvial fan and a delta? • What is a flood plain? 	<ul style="list-style-type: none"> • The flooding of the Nile River in Egypt was an important part of early agriculture there. What kind of sediment do you think the river floods deposited? Where was the sediment deposited during the floods? (very small particles, deposited in fields in the river's flood plain) • Where does sediment that is deposited in a river's flood plain come from? • Over time, what are some of the ways erosion can change a river channel? • Where is the best place to build a house near a meandering river? • What happens to sediment when a stream empties into a lake? 	<ul style="list-style-type: none"> • "How might river erosion be different from wind erosion or erosion by ice (glaciers)? Think about things like particle size (boulders, gravel, sand, dust), speed of travel, etc." • "If you wanted to build a sediment trap that would keep sand, gravel, and other large pieces of sediment from going past a certain place in a river, how would you do it?"

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Second Round

7. Students now repeat the process but move on to higher order questions such as “**application/synthesis**” questions.

Potential Pitfalls

Students may mix up alluvial fan and delta. Students may also not know what the mouth of a stream is. Students also have to know the different levels of questioning and it is important for the teacher to differentiate the levels of questioning for students. Students will also have trouble coming up with different higher order questions.