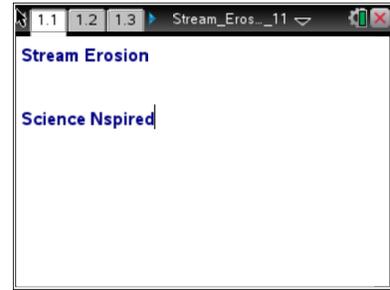




Science Objectives

- Students will recognize the difference between erosion and deposition.
- Students will understand the relationship between the slope of a watershed and the rates of runoff, erosion, and deposition.



Vocabulary

- erosion
- deposition
- flow rate
- slope

About the Lesson

- In this lesson, students can manipulate the slope of the surface over which the water is flowing to show varying rates of erosion and deposition.
- As a result, students will have a better understanding of
 - how slope affects flow rate.
 - how flow rate affects erosion and deposition in a stream.



TI-Nspire™ Navigator™

- Send out the .tns file.
- Monitor student progress using Class Capture.
- Use Live Presenter to spotlight student answers.

Activity Materials

- Compatible TI Technologies:  TI-Nspire™ CX Handhelds,  TI-Nspire™ Apps for iPad®,  TI-Nspire™ Software

Tech Tips:

- This activity includes screen captures taken from the TI-Nspire CX handheld. It is also appropriate for use with the TI-Nspire family of products including TI-Nspire software and TI-Nspire App. Slight variations to these directions may be required if using other technologies besides the handheld.
- Watch for additional Tech Tips throughout the activity for the specific technology you are using.
- Access free tutorials at <http://education.ti.com/calculators/pd/US/Online-Learning/Tutorials>

Lesson Files:

Student Activity

- Stream_Erosion_Student.doc
- Stream_Erosion_Student.pdf

TI-Nspire document

- Stream_Erosion.tns



Discussion Points and Possible Answers

Have students read the background information stated on their activity sheet.

Move to pages 1.2 – 1.3.

Have students answer questions 1 and 2 in the .tns file, the activity sheet, or both.

Q1. When the slope of the ground increases, the flow rate of a stream _____.

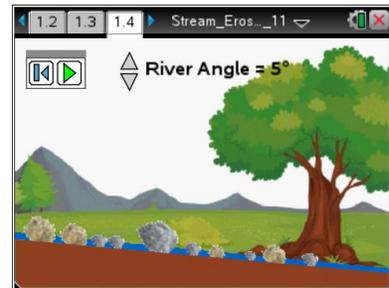
Answer: A. increases

Q2. When the flow rate of a stream increases, the size and amount of rock particles it erodes_____.

Answer: A. increases

Move to page 1.4.

1. Students should read the directions on page 1.4 and then close the directions box by selecting .
2. Students will select the up and down arrows of the River Angle slider to change the slope of the watershed. Then, they should select the play button and make observations about how the slope affects the water's ability to carry away the rock particles (designated as brown squares).



 **Tech Tip:** Students can select the  button to reset the simulation to the original slope of the watershed and number of rock particles.

 **Tech Tip:** To read the directions again, students can select **Menu** or  **> Watersheds > Directions**. Students may need to back-out to the main Tools Menu  to see the desired menu option.

Q3. At what angle was the flow rate of the stream strong enough to erode all of the rock particles?

Answer: 6° or 7°



Q4. Which size of rock particle was deposited first when the flow rate of the water was decreased?

Answer: A. large

Q5. What happened to the flow rate as the angle (slope) of the stream bed was decreased?

Answer: B. The flow rate decreased.

Q6. What happened to the number of rock particles that were eroded as the flow rate increased?

Answer: A. More eroded.

Q7. In order for the flow rate to increase, what has to happen?

Sample Answer: The slope or angle of the stream bed must increase.

Q8. In order for larger rocks to be eroded, what has to happen to the flow rate?

Sample Answer: The flow rate must be increased.

Q9. What force is causing the water to flow?

Answer: gravity



TI-Nspire Navigator Opportunities

Make a student a Live Presenter and have the student demonstrate how to reset the simulation and point out the different sizes of rocks. Throughout the activity, monitor student progress. At the end of the activity, retrieve the .tns file and save to Portfolio. Discuss activity questions using Slide Show.



Wrap Up

Assessment

- Formative assessment will consist of questions embedded in the .tns file. The questions will be graded when the .tns file is retrieved. The Slide Show will be utilized to give students immediate feedback on their assessment.
- Summative assessment could consist of questions/problems on the chapter test or a performance assessment involving collecting actual stream table data and analyzing it.