Chris Kent

Calculating Amounts of Rainwater Runoff

Associated with 4th grade's Land and Water Kit.

GSEs ESS1-3 using tools such as measuring tape an rain gauge. Collecting and organizing data.
ESS1-4 studying the effect of erosion from run-off.

Objectives: Students will show an understanding of implications associated with amounts of water that fall on their school ground in rain events. Students will calculate amounts of rain water run off . Students will create methods of capturing, storing and using run off

Method: By doing real life mapping, data collection and calculations students will be motivated to find uses for fresh rain water that currently runs off of the school and becomes part of the salt water of Narragansett Bay. Students will study erosion effects on hills surrounding school caused by run off.

Materials: flexible tape measures, clip boards, graph paper, pencils, calculators.

Procedure:

1. Students will be divided into groups of 3 or 4.
2. Students will use their prior knowledge of geometry and measurement to calculate area of their schools roof top.
3. They will then draw scale drawings on graph paper of the school.
4. Students will calculate area and report numbers in both square inches and feet.
5. Students will be given a hypothetical over night rain storm amount of 1 inch.
6. Students will calculate the volume of water in cubic inches and convert to gallons: 231 cubic inches = 1 gallon.
7. Students will calculate the weight of that much water: 1 gallon =8.34lbs.
8. If there are 144 cubic inches in a cubic foot how large of a tank would have to be built if that water were to be contained? Tank could be rectangular or cylindrical.
9. They will then use the next large rain event to calculate amounts of run-off. Data can be collected with a rain gauge or Internet research.
10. If the water in not captured, where will it go? Students will try to trace exact route.
11. Students will spend a day researching and brainstorming ideas on use of rain water run-off. What can that water be used for? How could it be stored and delivered?
12. The students will report their findings and recommendations to the head of facilities.

Resources: Out fall map at town of Jamestown website. This map shows where all storm water outlets are. http://www.jamestownri.net/pw/Outfalls.pdf

Evaluation:
Students will be evaluated on their group's map, accuracy of area, calculations of volume and weight. Depth of understanding will be measured with extension questions and their solutions generated for possible storage, distribution and use of the rain water.