**5E Template- Science**

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| **Name: Jessica James** | **Date: 7/2011** |
| **Content Area: Science** | **Grade Level(s): 6** | **Topic(s): Land Use** |

**Standards (SOL)**

6.1 The student will plan and conduct investigations in which

a) observations are made involving fine discrimination between similar objects and organisms;

c) precise and approximate measurements are recorded;

k) an understanding of the nature of science is developed and reinforced.

6.7 The student will investigate and understand the natural processes and human interactions that

affect watershed systems. Key concepts include

a) the health of ecosystems and the abiotic factors of a watershed;

b) the location and structure of Virginia’s regional watershed systems;

f) major conservation, health, and safety issues associated with watersheds;

6.9 The student will investigate and understand public policy decisions relating to the environment.

Key concepts include

c) the mitigation of land-use and environmental hazards through preventive measures; and

d) cost/benefit tradeoffs in conservation policies.

**Objectives (UKD’s)**

I can investigate how land use can affect the health of the Chesapeake Bay watershed.

**Materials & Resources**

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| * White paper with an outline of school in center (shrink a school emergency exit map)
* Clipboards
* Rulers
* Pencils
 | * Colored pencils
* Computer paper (1 per pair)
* Permanent markers
* Washable markers
* Several spray bottles with water
* Paper towels
* Projector
* Computer with Google Earth
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**Safety Considerations**

Set clear expectations for behavior outside

**Engage – Time Estimate 10 minutes**

* In pairs have students take computer paper and crumple into a ball
* Loosely unfold paper and where there are ripples and ridges trace those with a permanent marker
* Explain to students that this is a watershed
* Using washable markers have students sketch a community (school, neighborhood, mall, roads etc)
* Using the spray bottles spray the community and observe what happens.

Ask pairs to discuss what happened to the marker after the “rain came”

Ask students to discuss in pairs what run off is

**Explore – Time Estimate 60 minutes (depends on schoolyard size)**

* Hand out maps and clipboards
* With the groups ask them to discuss what impervious and pervious may mean. Come together as a class to discuss
* Students will go outside and map out schoolyard
	+ Parking lots (impervious surface)
	+ Side walks
	+ Eroded areas
	+ Sports fields
	+ Trees
	+ Forested Areas
	+ Down Spouts
	+ Storm Water Trains
	+ Buffer Zones
	+ Creeks/lakes/streams
	+ Grass areas

Be sure to point out areas where the land slopes (if there is a stream/body of water close by note where the slope of the land is in relationship to the body of water, typically the slope goes towards the water)

Inside students can color maps encourage students to fill up entire page

It may be helpful to pull up a google earth overhead view of the school

**Explain -- Time Estimate 20 minutes**

Assess how the school uses the land around the building. Prior to class teacher should come up with a “report card” for students to analyze how well the school uses the land. Report card could include items like amount of grass mowed, do most students in the room ride bus/carpool, how much of the ground is covered by impervious surfaces etc.

**Extend -- Time Estimate 15 minutes**

Students could do an assessment of how the land is used where they live and recommend improvements.

**Evaluate -- Time Estimate 5 minutes**

Exit slip:

How can the school IMPROVE the way the land is used?

What is the school doing well?

**Plans for Diversity**

*Students who have issues with fine motor skills may need assistance getting the outlines of objects completed. Provide a personal map printed from Google Earth for these students to have on the clipboard as they walk around the building.*

**Connections**

If everyone in the Chesapeake Bay watershed used the land the way we did how would that effect the water quality?

Students could also evaluate the types of energy sources used on the school property as well.