Background

As you remember from the Water Cycle, when it rains, some of the rain *infiltrates*, or seeps into the ground. Some runs off into streams or lakes. Some evaporates. In forests, much of the rain infiltrates into the ground because the surface is *permeable*, meaning that it has small holes that water can enter and pass through. Permeable surfaces allow the rain drops to soak into the ground. If the ground itself is porous (filled with small holes), the water will continue percolating down through the soil; in the process, many pollutants will be filtered out before the water reaches a stream or ground water.

In contrast, when it rains in urban areas, the water cannot infiltrate into *impermeable* surfaces such as roofs, roads, and sidewalks. With nowhere else to go, the rain water runs rapidly off the surfaces and carries pollutants into the nearest body of water. This is called *stormwater runoff*.

It is important to keep in mind that not all surfaces have the same level of permeability. Some areas are compacted by machines or foot traffic. This reduces the amount of pores on their surfaces and in the underlying ground. In the following assignment, you will consider the factors that influence an area's permeability and predict which areas on your school campus are more permeable than others.

Definitions

Permeable or pervious describes a surface that allows water (or fluid) to pass through.

Impermeable or impervious describes a surface that does not allow water to pass through.

Instructions

You are given a map of your school with a grid. The grid on the map divides your school campus into small sections. Predict how permeable the area in each box is by writing a rating of 0, 1, or 2 in the box. A rating of 0 means that stormwater runoff cannot enter the ground. A rating of 2 means that stormwater runoff enters the ground very easily.

- 0 = impermeable
- 1 = a little permeable
- 2 = very permeable

When you have completed the grid, answer the questions on page 2.

Questions

1. What percent of your school campus was rated as 0, impermeable?

2. What percent of your school campus was rated as 1, semi-permeable?

3. What percent of your school campus was rated as 2, permeable?

Calculations:				
$\frac{\text{\# of boxes for rating}}{\text{Total \# of boxes}}$	**x**	**100**	**=**	**%**
Example:				
$\frac{\text{60 boxes for rating of 0}}{\text{216 boxes}}$	**x**	**100**	**=**	**27.8% impermeable**

4. Which areas did you rate as 1 and why?

5. Based on your map and what you have learned, how do you think the amount of impermeable surfaces on your school grounds affects the quality of your stream next to your school? Explain why and provide examples.

Extra Credit

1. Using a red marker, circle areas on the map where you think the most stormwater runoff comes from during a rain storm.

2. Using a blue marker, put stars on spots where you think a Best Management Practice (BMP) could help reduce the amount of stormwater runoff on your school campus. BMPs include rain barrels, trees, and gardens.