Systems Thinking: Impervious Surfaces Analysis Activity

Overview: Paved surfaces are everywhere. In the United States alone, pavements and other impervious surfaces cover more than 43,000 square miles—an area nearly the size of Ohio. According to research, a quarter of a million U.S. acres are either paved or repaved every year.

Impervious surfaces can be concrete or asphalt, they can be roofs or parking lots, but they all have at least one thing in common—water runs off of them, not through them. And with that runoff comes a host of problems. In this activity you will use Google Earth to calculate how much total surface area is impervious to water infiltration (part of the water cycle) at your school site.

Terms to Define:

- **Area**
- **Impervious**
- **Infiltration**
- **Water Cycle**

Google Image Tips

1. Find your school site

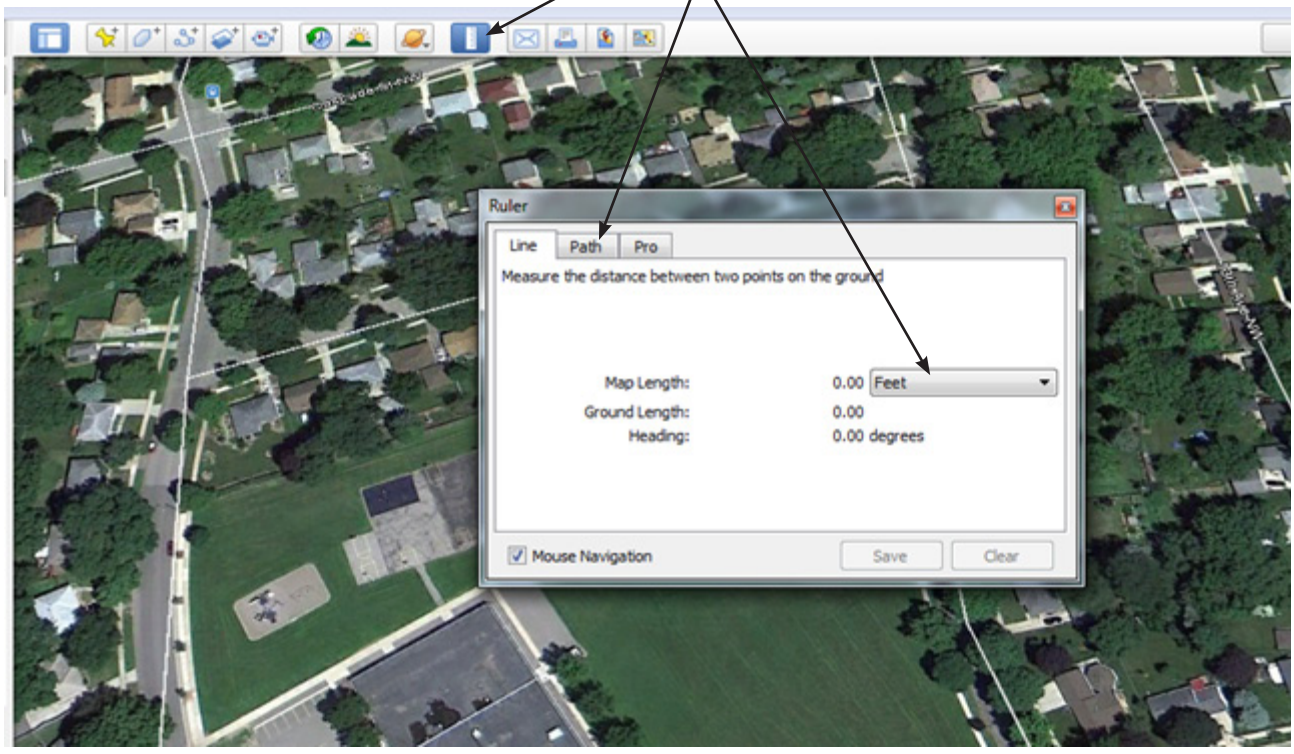
- Zoom in until the entire school ground are visible.

2. Prepare tools

- Click the measuring tool.
- Choose path tab.
- Select units.

3. Measure hard surfaces

- Using the mouse, click along the perimeter of hard surfaces including school buildings and parking lots.



Procedure:

1. Locate your school using Google Images.
2. List areas of impervious surfaces:

A:	E:	I:
B:	F:	J:
C:	G:	K:
D:	H:	L:

Use Google Images to calculate total impervious surfaces vs. natural surfaces and complete the following questions.

1. What is the total area (ft^2) for the school site? If it is not a perfect rectangle break it down into smaller parts and do the best job you can.

Area of schoolyard (ft^2) = Length of schoolyard (ft) x Width of schoolyard (ft)

2. What is the total area of impervious surfaces?

Area of Impervious Surface A (ft^2) = Length of Impervious Surface A (ft) x Width of Impervious Surface A (ft)

Total Impervious Surface Area = Area of Surface A (ft^2) + Area of Surface B (ft^2) + Area of Surface C (ft^2)

3. What percent of the school site is impervious?
   Percent Impervious Surface = (Total Impervious Surface Area (ft^2) ÷ Area of schoolyard (ft^2)) x 100

4. What is the impact of your school site's impervious surfaces and the effect on infiltration (Water Cycle)?

5. Where does the water from the school roof go when it rains at your school site?

6. Where does the water from the other impervious surfaces go when it rains/snow melts at your site?

7. What are some ways we can we slow storm water runoff down and increase infiltration into the ground?