Student Name: _____ Date: _____

Model My Watershed

Students will be able to identify the effect of land development on rain runoff depending on the amount of precipitation. They will be able to see the correlation between the amount of rain infiltration and the type of development of an area.

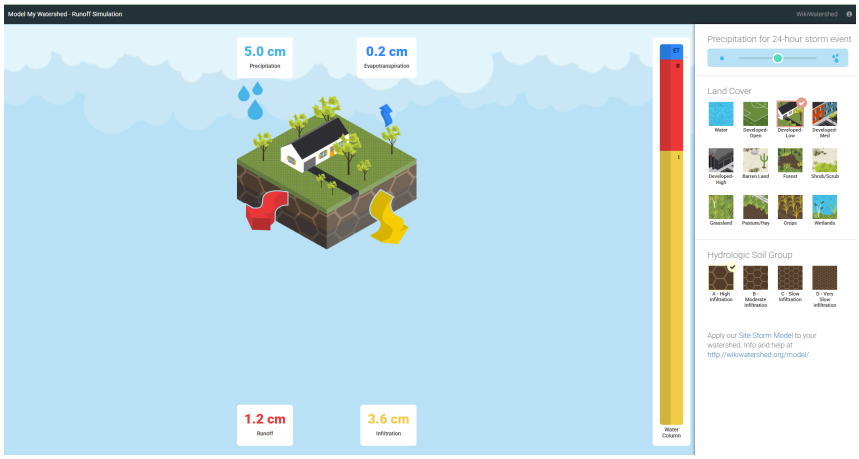
Standards: MS.ESS2.4, MS.ESS3.3

Vocabulary - Runoff, Precipitation, Infiltration, Evapotranspiration

To start the Runoff Simulation click on the title.

Take a look at the simulation What are the variables that you can change in order for you to collect data from the simulation?

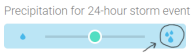
When you open the simulation it is set for medium precipitation, developed-low area, and high infiltration hydrologic soil group.



There is already data on the screen, let's start off by discussing what this data is. **Precipitation** is the amount of precipitation that fell over a 24-hour period. **Evapotranspiration** is the amount of water that evaporated from that system during the same 24-hour period. **Runoff** is the amount of water that left the system and moved somewhere else. **Infiltration** is the amount of water that drains into the underground aquifers.

Worksheet created by Kimberly Locke using pictures and direct content from the Model my Watershed Simulation found at runoff.modelmywatershed.org

Let’s give the simulation a try:

Set the precipitation slide all the way to the three dots 

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Click on crops.

Click on slow infiltration.

Now look at the numbers in the four boxes on the simulation screen, write the numbers in the spaces below.

Amount of precipitation -

Evapotranspiration -

Runoff -

Infiltration -

What do you notice about the level of runoff compared to the amount of precipitation in this scenario?

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Let’s explore and record some data.

If you slide your mouse over each land cover and soil group you will get a description of each.

Complete the following table with information on all four (4) soil groups and the four (4) types of land cover **that you are choosing to explore** below.

Soil group/Land Cover	Description
A - High Infiltration	
B - Moderate infiltration	
C - Slow Infiltration	
D - Very Slow Infiltration	

For each soil group, choose 4 types of land cover. **Complete** the rest of the table with the information provided in the simulation after you choose your land cover type. **Choose** a precipitation type but use the same amount for all trials.

Hydrologic Soil Group	Land Cover	Precipitation (cm)	Evapotranpiration (cm)	Runoff (cm)	Infiltration (cm)
Example: C - Slow Infiltration	Pasture/Hay	8.0	0.5	2.6	4.9
A - High Infiltration					
A - High Infiltration					
A - High Infiltration					
A - High Infiltration					
B - Moderate infiltration					
B - Moderate infiltration					
B - Moderate infiltration					
B - Moderate infiltration					
C - Slow Infiltration					
C - Slow Infiltration					
C - Slow Infiltration					
C - Slow Infiltration					
D - Very Slow Infiltration					
D - Very Slow Infiltration					
D - Very Slow Infiltration					
D - Very Slow Infiltration					

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Calculate the percentage of runoff, evaporation, and evapotranspiration for one (1) land cover from each of the four soil groups.

The formula to calculate each of these is

$$\frac{\text{Runoff amount}}{\text{Precipitation amount}} * 100 = \text{percentage of runoff}$$

	Runoff (runoff precipitation*100)	Infiltration (infiltration precipitation*100)	Evapotranspiration (evapotranspiration precipitation*100)
A - High Infiltration			
B - Moderate Infiltration			
C - Slow Infiltration			
D - Very Slow Infiltration			

Data Analysis/Conclusions:

Of the four types of land cover that you chose, which one had the most runoff? Which had the least? Use data to support your answer.

When looking at all of your scenarios, which one is the best to allow for water management to reduce runoff and maximize infiltration? Use data to support your answer.

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Imagine that you live in a medium developed area, can you think of anything short of knocking down every building that might be able to help with the transpiration levels?