

Broad Rock Middle School: A Rainy Day Story



Once upon a Time

- Once upon a time there was a terrific institution of learning called Broad Rock Middle School. In the 7A science classes taught by Mrs. Galoob students were anxiously awaiting to continue their learning about Watersheds.

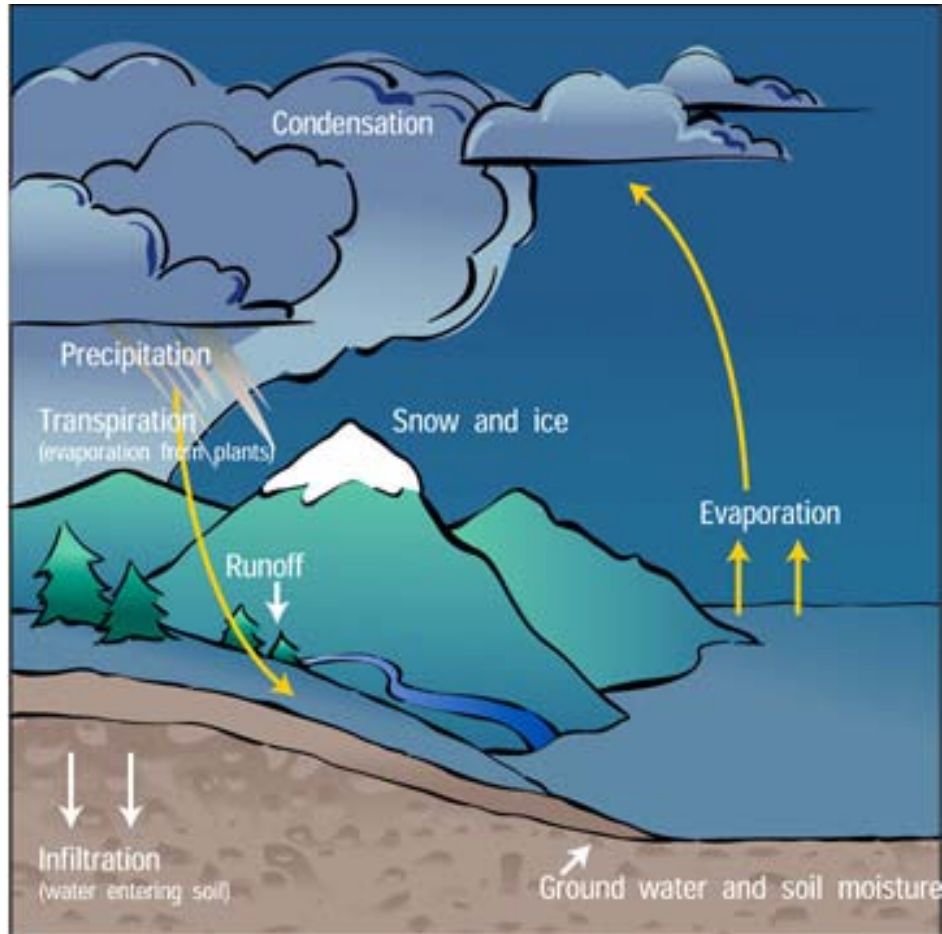
Watershed

- A area of land where all the water that falls on the land area drains to a common outlet, such as the outflow of a lake, the mouth of a river, or any point along a stream channel.

Previously in room 2170

- Students had already seen a model of a watershed, and they had studied several maps including their hometown, South Kingstown, and their beloved school, Broad Rock. However, to really understand how a watershed works it will be useful to imagine yourself as a drop of water. First of all you must recall the water cycle.

The water cycle



Imagine you're a drop of water

- You become part of the water cycle as a drop of precipitation and you drop from higher up in the atmosphere and you land on the BRMS school grounds. If you landed on top of Mrs. Galoob's classroom you would have hit an **impervious surface**.

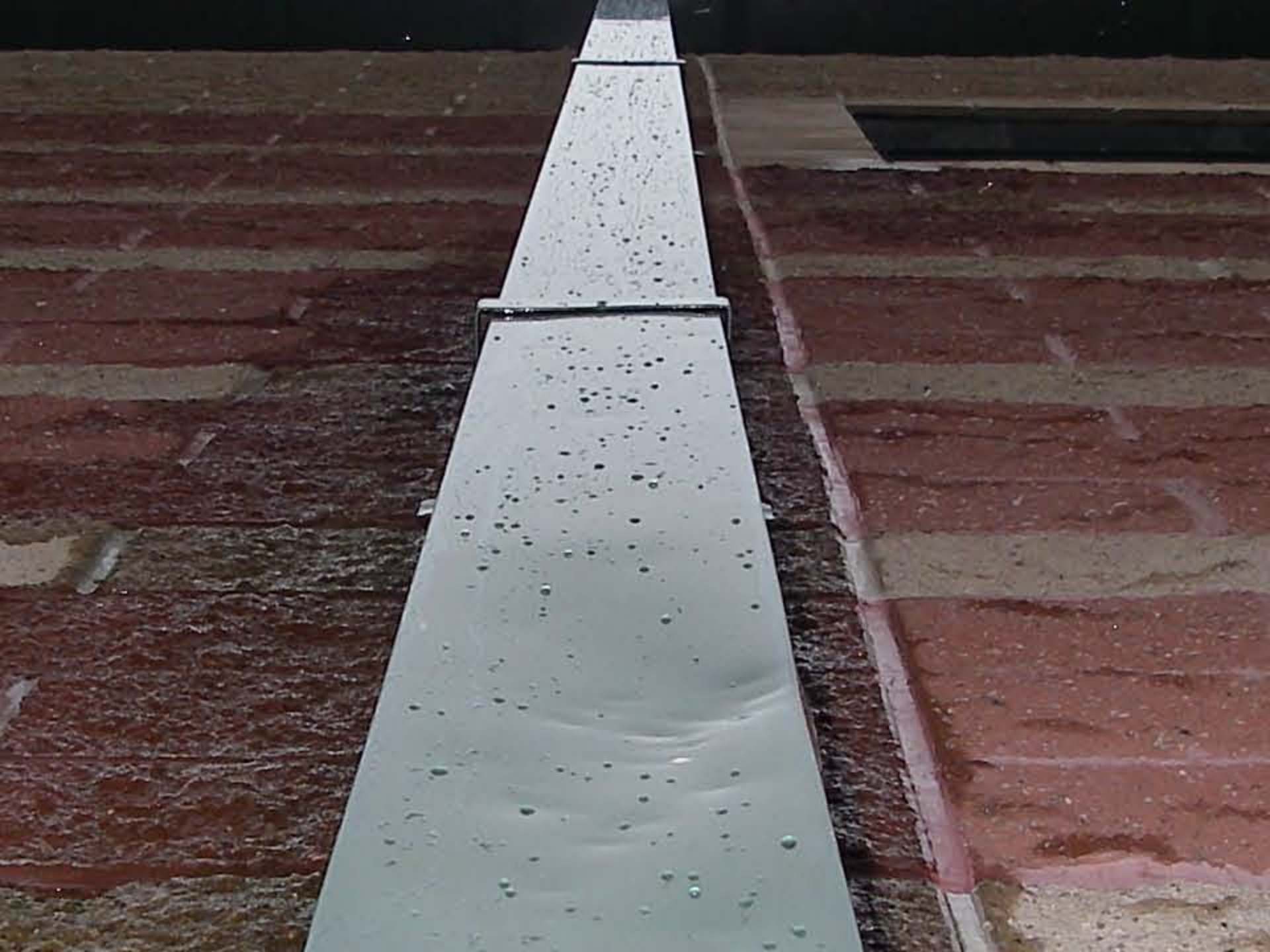
Impervious surfaces



- A substance that does not absorb water or let water move through it.

You've become RUNOFF

- Since you can not soak through the roof and join the class you move with other water molecules downhill. You become runoff and so your journey continues across the school grounds.



Down the gutter



You go in and out of underground water ways



Through many man-made drainage ditches



Joined from water molecules that have fallen anywhere on the BRMS grounds



To the BRMS man made pond



BRMS pond



Then into the Wetlands

- Wetland: an area of land with water at or above the soil line at least part of the year.
- Wetlands are some of the most productive ecosystems in the world because many different types of organisms live there.
- Red Maple Swamp: wetland where a common tree is the red maple.
- Plants that live in wetlands are adapted to wet soils. For example they have roots that can function in soil covered with water.
- Because there are certain types of plants living in wetlands there are certain types of animals.



Wetland plants and animals



Dave Davis

3 Important jobs of Wetlands

1. Wetlands are home to many different species and great quantities of organisms that require the wet habitat.
2. Wetlands act as a filter system cleaning water before it empties into rivers, lakes, or the ocean.
3. When a storm drops a lot of water on an area at once, wetlands can hold water and spread it out keeping rivers, towns, and neighborhoods from flooding.

What needs to be filtered from BRMS water?



- Leaking motor oil, gasoline, brake fluid, other car pollutants
- Sediment = gravel, dirt, dust.
- The car chemicals can poison plants and animals, and sediment can make waterways cloudy preventing plants from being able to grow properly or fish from being able to breath and see.

Are harmful things getting mixed into water here in our own backyard?



How do you measure water quality?

- **Compare water temperature**
- **Compare pH of water**
- **Stream flow**
- **Consider what animals are living in the water**
- Turbidity – How cloudy it is
- Dissolved Oxygen – How much oxygen is in the water.

Temperature

- Organisms from Bacteria to fish require a certain range of temperature to survive. Temperature affects how much oxygen is available in the water.

Species of fish	Max temp for Juvenile growth	Max temp for spawning (laying eggs)	Max temp for eggs hatching
Atlantic Salmon	68 F	41 F	52 F
Bluegill	90 F	95 F	93 F
Brook Trout	66 F	48 F	44 F
Carp	- -	70 F	91 F
Largemouth bass	90 F	70 F	81 F
Smallmouth bass	84 F	63 F	73 F

pH

- pH is a measurement of how acid or basic a substance is.
- Most aquatic animals require a pH between 6.5-8.0

Stream Flow

- How fast the water is moving
- Fast moving water has more oxygen.
- Fast moving water will stay cloudy from sediment longer.
- Polluted water will not stay in fast moving water long.
- Stream flow is affected by the amount of precipitation, amount of evaporation, water being taken out for agriculture or factory use.

Macroinvertebrates

- Animals who live on the bottom of a stream for at least part of their life cycle.
- Different species have different levels of tolerance to water quality.
- Because the animals are there day after day they show the quality of water over a longer time period whereas a temperature measurement only gives you a one time picture.



Through the wetland and into Indian Run Stream



Indian Run to Saugatucket

(pause for 3D show)

The question is. . .

How was the trip?