

Watershed Cleanup



Key Groups:
School groups,
Families, Boy
Scouts (ages
12-15)

Subject:
Watershed
Management

Duration: 1
hour

Abilities:
problem-
solving,
research

Materials:
dice, access to
computers

Vocabulary:
watershed,
riparian zone,
carrying
capacity, basin

Background:

A watershed is an area of land which empties its water into a certain river or lake. We all live in a watershed, no matter where we live. Every one of us depends on water to survive. Our decisions regarding the land affect both the quality and quantity of water in our area. Healthy watersheds are crucial for a healthy environment and economy. If we manage watersheds correctly, we can ensure both of these.

Water is used in many

ways. We use it for drinking, bathing, irrigation, industry, boating, swimming and fishing. Many times we are unaware of just how much water we use. We are not the only ones who use it either. Various animals use it for survival and as shelter. It is important that we learn to take care of our watersheds, so they in turn will take care of us. Pollution, such as liter, oil, pesticides, herbicides, and pet waste etc., which flow into storm drains, will eventually

keep animals and ourselves from enjoying the full benefits of water.

Other threats to a watershed include heavy recreation, such as motorcycles and ATVs that disturb riparian (the immediate area around a stream). These activities cause an increase of sediment load in the water. An increase of sediment can harm the gills of aquatic animals by making it harder for them to breathe, as well as causing other negative effects. Ask the kids to offer other possible negative effects increased sediment load might cause.

Increased development next to the forest challenges us to keep a balance between housing and habitats. Logging creates another challenge when fallen timber clogs waterways with excess sediment. Finally, ski resorts take water from various natural water sources to use in their snow-making machines.

These examples demonstrate how much we and other species depend on water every day. There is a limited amount of water, so we always need to be mindful and proactive to insure there is enough to go around.

Method:

Kids will learn how to manage a watershed by playing a board game- attached at the end. Split the kids up into groups of 3-4. The game board will have to be taped together.

Game instructions: Kids roll the dice to determine who goes first (the person who rolls the highest number goes first and then everyone moves clockwise). Everyone will move around the board to the “end” and whoever has the most points when everyone has reached the end is the winner. When a space has a blue dot at the bottom, it means a player must draw a blue card. These cards give the player a chance to earn more points. If a space has a red dot at the bottom, the player will draw a red card. These cards will make a player lose points. All answers on a red card are wrong, but some answers will cost you fewer points than others. Depending on how they respond to what the card says will determine how many points they gain or lose. The cards allow the kids to test their research abilities, as they only have a minute to answer the question once they start typing a search.

Assessment:

- What is a watershed?
- How do humans affect a watershed, for better or worse?

Further Learning:

- Take the kids to visit Mill Creek Canyon and take field notes about the different streams and runoffs. Note the differences in stream makeup based on stream location. Discuss the topics explored in the board game. Take photographs to show how erosion takes place when there's a lack of vegetation and rock, how pollution affects the land and water, and any other watershed concerns or points.

Works Cited

Briney, A. (n.d.). *Watersheds*. Retrieved August 15, 2013, from About.com: Geography: <http://geography.about.com/od/physicalgeography/a/watersheds.htm>

EPA. (n.d.). *Principles of Watershed Management*. Retrieved August 15, 2013, from U.S. Environmental Protection Agency: http://cfpub.epa.gov/watertrain/pdf/modules/Watershed_Management.pdf

EPA. (n.d.). *What is a Watershed?* Retrieved August 15, 2013, from United States Environmental Protection Agency: <http://water.epa.gov/type/watersheds/whatis.cfm>

Reid, L. M. (n.d.). *Cumulative Watershed Effects: Then and Now*. Retrieved August 15, 2013, from fs.fed.us: <http://www.fs.fed.us/psw/publications/reid/ReidWMC2001.pdf>

Fact Sheet

Uses of Freshwater in the U.S.

(Just F.Y.I.)

Power	Irrigation	Public Uses	Industry	Commercial	Domestic	Livestock
49%	33%	9%	6%	1%	1%	1%

Watersheds

Why it's important to care about watersheds:

- So we have enough water supplies
- So we have high water quality
- So we have safe drainage and storm water runoff
- So we can determine water rights
- So we can decide the overall planning and utilization of watersheds

Riparian Zones

Riparian zones are the areas along streams, rivers, lakes, and wetlands.

They can be streamside forests, floodplains, or just plain stream banks. They have one of a kind soil and vegetation. They are highly affected by water. Riparian zones are basically the boundary between the water and the land, and they have several benefits, that make them important to us.

-What Riparian Zones Do:

-Water storage. Riparian zones are able to retain water during a flood when the water rises up and over the banks of the stream. This stops further

flooding downstream and also traps sediments and nutrients.

-Sediment retention. Sediment from upland erosion can be trapped and retained in the zone, stopping it from reaching local waterways, where it is harmful to stream habitat, fish, and downstream drinking water.

-Nonpoint source pollution buffer. Although riparian buffers cannot absorb endless pollution, they are effective at removing or storing a large amount of nutrients (phosphorus and nitrogen) and other contaminants.

-Stream bank stabilization. The roots of trees, grasses, and shrubs help to stabilize stream banks and keep them from eroding.

-Habitat. Riparian areas are often more varied, because this environment represents a grade in vegetation, moisture, and soils that creates several kinds of habitats. Twigs, branches, and leaves falling from the riparian vegetation into the water also provide important in-stream habitat and food for aquatic organisms like insects and fish.

Start



You gain membership with a club to protect the environment.

2 Points

Your area's carrying capacity has been exceeded.



You flush trash down the toilet instead of throwing it away.

Move back 1 space

You use an excess amount of fertilizer, which enters the storm drains.

Miss next turn

You don't clean up your dog's waste when you go hiking.

-1 Point

You get your soil tested to determine its quality.

Move ahead two spaces

Too many trees are being cut down in your area

Move back 2 spaces

End



You start a fire outside your designated fire-ring and cause nearby vegetation to ignite.

Miss next turn

Watershed

You help to pass an environmental protection law.

Move ahead 2 spaces



You camp outside of the designated camping site.



You help your town prioritize its water usage.



Your town puts in new pavement, which allows liquid to soak through it.

Move ahead 1 space

You reuse your tap water to water your plants and animals.

2 Points

While on a hike, you pick up litter you see on the ground to throw away.

1 Point

You discard plastic, cans, and paper, which can be recycled.

-1 Point

You report a toxic substance dripping into a stream.

2 Points

You research your town's storm water regulations.

2 Points

<p>You vote to protect the environment.</p> <p>Roll again</p>	<p>You adopt sustainable agriculture practices.</p> <p>●</p>	<p>You meet with other volunteers to do a stream enhancement project.</p> <p>1 Point</p>	<p>You stray off the designated trail.</p> <p>-1 Point</p>	<p>You washed your car letting the oil wash down the storm drain.</p> <p>Miss next turn</p>	<p>You bury your trash at your campsite.</p> <p>Move back 1 space.</p>	<p>You take your hazardous materials to a safe site.</p> <p>2 Points</p>	<p>You cut down on your water usage.</p> <p>1 Point</p>
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You dispose of an old car out in the forest.

●

Cleanup

You plant native vegetation along a stream to stabilize the bank.

Roll again



You ride your ATV and bike off the designated trail.

●

<p>You build a dam in a stream and choke the flow of water.</p> <p>Miss next turn</p>	<p>Over-development causes harmful effects to your area and water.</p> <p>●</p>	<p>You washed your car on the lawn instead of the driveway to keep oil from going in the storm drains.</p> <p>1 Point</p>	<p>You write to your Representative and oppose proposed plans which will harm your watershed.</p> <p>Roll again</p>	<p>You support a City Council Member who tries to protect your watershed.</p> <p>●</p>	<p>You build a pond to keep your dogs from going in a river.</p> <p>2 Points</p>	<p>You burn trash in your fire pit.</p> <p>Miss next turn</p>	<p>You wade and swim in a water source where it is prohibited.</p> <p>Move back 1 space</p>
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<p>#1 What is a watershed?</p> <ul style="list-style-type: none"> a. all the water area that drains to a certain body of water b. a building that stores water for our daily use c. all the land where water drains into certain body of water d. how much water we use in a given period of time 	<p>#2 About how much land is zoned as urban land use in our country each year?</p> <ul style="list-style-type: none"> a. 50,000 super stores b. over one million acres c. 500,000 acres d. no net loss 	<p>#3 How much water does one person use on average per day?</p> <ul style="list-style-type: none"> a. 500 gallons b. 50 gallons c. 150 gallons d. 300 gallons
<p>#4 What is the best watershed unit for local management?</p> <ul style="list-style-type: none"> a. subwatershed b. catchment c. sub-basin d. watershed 	<p>#5 What is the largest unit in watershed management?</p> <ul style="list-style-type: none"> a. catchment b. sub-basin c. basin d. watershed 	<p>#6 What three pollutants are most often found in storm drains?</p> <ul style="list-style-type: none"> a. dilithium, laetrile, Prozac b. total phosphorus, copper zinc, fecal coliform bacteria c. vanadium, copper, fecal coliform bacteria d. copper zinc laetrile, dilithium
<p>#7 Stream order is used to:</p> <ul style="list-style-type: none"> a. classify a stream based on its characteristics b. prevent stream change by giving a regulatory permit c. prevent water from running downhill d. classify different streams based on their relative location in the drainage area 	<p>#8 What is the best advice for someone applying fertilizer?</p> <ul style="list-style-type: none"> a. Apply based on the results of a soil test b. Apply while the sprinklers are on c. Apply after a heavy rain d. Apply more than the package directs 	<p>#9 What percentage of water on the Earth can we use?</p> <ul style="list-style-type: none"> a. 0.01% b. 0.1 % c. 1 % d. 10%

<p># 1 What is a watershed?</p> <ul style="list-style-type: none"> a. all the water area that drains to a certain body of water b. a building that stores water for our daily use c. How much water is expended in one year in an area d. how much water we use in a given period of time 	<p>#2 About how much land is zoned as urban land use in our country each year?</p> <ul style="list-style-type: none"> a. no net loss b. 500,000 acres c. 50,000 super stores d. 1,000 acres 	<p>#3 How much water does one person use on average per day?</p> <ul style="list-style-type: none"> a. 25 gallons b. 50 gallons c. 75 gallons d. 100 gallons
<p># 4 What is the best watershed unit for local management?</p> <ul style="list-style-type: none"> a. basin b. catchment c. sub-basin d. watershed 	<p>#5 What is the largest unit in watershed management?</p> <ul style="list-style-type: none"> a. catchment b. sub-basin c. sub-watershed d. watershed 	<p>#6 What three pollutants are most often found in storm drains?</p> <ul style="list-style-type: none"> a. dilithium, laetrile, prozac b. laetril copper zinc, fecal coliform bacteria c. vanadium, copper, fecal coliform bacteria d. copper zinc laetrile, dilithium
<p>#7 Stream order is used to:</p> <ul style="list-style-type: none"> a. classify a stream based on its characteristics b. prevent stream change by giving a regulatory permit c. prevent water from running downhill d. classify how large a stream is 	<p>#8 What is the best advice for someone applying fertilizer?</p> <ul style="list-style-type: none"> a. Apply while the sprinklers are on b. Apply after a heavy rain c. Apply more than the package directs d. All the above 	<p>#9 What percentage of water on the Earth can we use?</p> <ul style="list-style-type: none"> a. 0.001% b. 0.01 % c. 1 % d. 10%

Answers to Card Questions:

Blue Cards:

Right answers will get you 5 points. If you gave a wrong answer, the space you landed on will still get you 3 points.

#1 c

#2 b

#3 d

#4 a

#5 c

#6 b

#7 d

#8 a

#9 c

Red Cards:

#1 a. -2 points, b. -5 points, c. -3 points, d. -4 points

#2 a. -5 points, b. -2 points, c. -3 points, -4 points

#3 a. -5 points, b. -2 points, c. -3 points, d. -4 points

#4 a. -5 points, b. -2 points, c. -4 points, -3 points

#5 a. -5 points b. -2 points, c. -3 points, d. -4 points

#6 a. -5 points, b. -2 points, c. -4 points d. -3 points

#7 a. -2 points, b. -3 points, c. -4 points, d. -5 points

#8 a. -2 points, b. -3 points, c. -4 points, d. -5 points,

#9 a. -3 points, -2 points, c. -4 points, d. -5 points