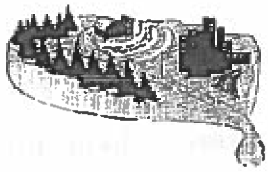
We ALL Live in a WATERSHED



Watershed Do's and Don'ts

What is a "Watershed"?

- **Answer: The land area from which water drains into a stream, channel, lake, reservoir or other body of water is a watershed**
  - Watersheds are named after the body of water that the land drains into.
  - In Southwestern PA most of us live in the Allegheny River Watershed, the Monongahela River Watershed and/or the Ohio River Watershed.

How does MY behavior impact the watershed?

- **Answer: Many sources of pollution start in your own backyard!**
  - The health of our rivers and streams is closely linked to activities undertaken in our homes, yards, schools, and businesses.
  - Lawn care, gardening practices, car care, pet waste, paving, and the use and disposal of toxic household chemical products all contribute to nonpoint source pollution (NPS) and affect the water quality in our rivers and streams.

Water is life!

Your student has participated in a Watershed Awareness Program sponsored by the Pennsylvania Resources Council. **It is important that students AND their families work together too protect the watershed.**

***Please read the watershed awareness materials that your student has brought home and SIGN, CUT, AND RETURN the "tear-off" portion at the bottom of this page indicating that you have read the information.**

✂- -

I have read the attached Watershed Awareness materials that my student brought home.

Signature of Parent/Guardian____________________________Date______________

Watershed "Dos"

Lawn and Garden

- Use natural, non-toxic pesticides and fertilizers in the lawn and garden
- Use mulch in the garden to keep moisture in and weeds out
- Control soil erosion by planting a ground cover and/or native plants
- Seed bare soil and cover it with mulch ASAP to minimize erosion
- Compost grass clippings and leaves.
- Keep fallen leaves out of the ditch or street gutter
- Clean up pet waste to keep nutrients and bacteria out of the waterways
- If using salt on sidewalks, steps, or driveways use it sparingly
- Direct downspouts away from paved surfaces toward an absorbent area (lawn or garden)
- Clean up spilled brake fluid, oil, grease and antifreeze immediately. You can use kitty litter to absorb it.

Car Care

- Wash your car on the lawn or in a grass or gravel area so that the water can percolate into the soil. The ground filters it before it reaches the river or stream
- Take used motor oil to a service station that recycles it.
- Take used batteries and oil filters to participating service stations for recycling.
- Check your car every couple of months for leaks in the oil, fuel, brake, and cooling systems.
- Carpool or use public transportation whenever possible

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Household Products

- Use non-phosphate laundry detergents and non-toxic cleaning products.
- Instead of fabric softener use baking soda in the final rinse.
- Use latex paint instead of oil-based paint whenever possible.
- Practice the 3 "R's" (Reduce, Reuse, Recycle).

Watershed Don'ts

Lawn and Garden

- NEVER use pesticides if it looks like rain.
- Never allow leaves and grass clippings to wash into roadways where they will reach storm drains.

Household Chemicals

- Don't Pour It Down the Drain!
  - Anything you pour down your drain or flush down your toilet will enter your community's sewer system or streams.
- Don't Put It in the Trash!
  - As rain and snow pass through the landfill, the water can become contaminated by hazardous products and eventually carry them into the groundwater and surface water.
- Don't Dump It on the Ground!
  - Hazardous wastes dumped on or buried in the ground can contaminate the soil and leach down into the groundwater or be carried into a nearby river or stream by runoff during rainstorms.

Household Hazardous Waste

- Never dump HHW down storm sewers or in the backyard
- Never burn or bury HHW
- Never place HHW in the trash

Litter

- Don't be a litterbug!

Car Care

- Never pour motor oil or anti-freeze in the storm drain

Become an Ambassador for the Watershed

Receive a certificate proclaiming you to be an
"Ambassador for the Watershed"

Students are invited to act as "Ambassadors for the Watershed". Please review this list of actions that students and families can take that can contribute to improved water quality and healthier watersheds:

- Use green cleaning products
- Keep your yard free of pet waste to keep nutrients and bacteria out of the waterways
- Pick up litter and pledge not to litter
- Recycle
- Reduce your use of lawn pesticides and chemical fertilizers
- Practice organic lawn and garden care
- Compost grass clippings and leaves
- Check your car regularly for leaks
- Wash your car on a grassy or gravel area
- Install a rain garden or rain barrel

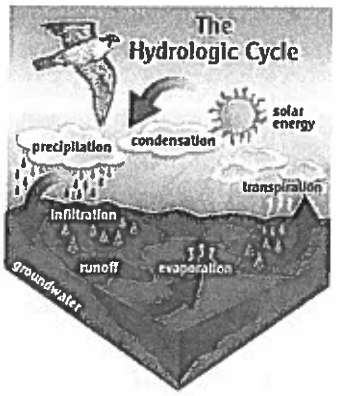
As "Ambassadors" you will share watershed protection information with your family. From there pick one watershed protection action that you can take with your family. This will extend watershed and water quality improvement beyond the classroom while helping your local environment and watershed. We encourage you to add one action monthly.

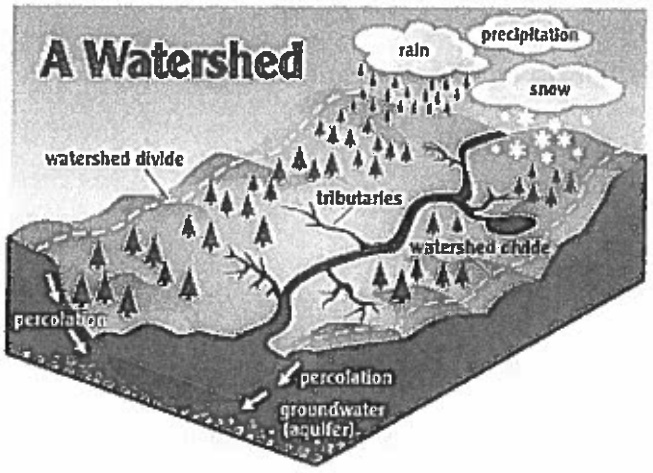
Students who complete the in-school Watershed Awareness Program and pledge to take watershed protection action will be awarded a certificate proclaiming you to be an "Ambassador for the Watershed" and "Environmental Steward". This certificate will be awarded to students who:

- Complete the Watershed Awareness 2-session program
- Return a form signed by an adult at home stating that the information was shared with the family
- Pledge to take action to protect the watershed.

WATERSHED AWARENESS

STUDENT GUIDE





Presented by:

Pennsylvania Resources Council, Inc.

"Working to protect the environment since 1939

Water Facts

(Source: United States EPA - Office of Water)

Facts About Water

The most common substance found on earth is water.

Water is the only substance found naturally in three forms: solid, liquid, and gas.

The amount of water is constant and recycled throughout time; actually, it is possible to drink water that was part of the dinosaur era.

Eighty percent of the earth's surface is water.

Ninety-seven percent of the earth's water is saltwater in oceans. Of the 3% that is freshwater, only 1% is available for drinking - the other 2% is frozen.

Water serves as nature's thermometer, helping to regulate the earth's temperature.

Water freezes at 32 degrees Fahrenheit, 0 degrees Celsius.

Water boils at 212 degrees Fahrenheit, 100 degrees Celsius.

Forty trillion gallons of water a day are carried in the atmosphere across the USA.

An acre of corn gives off 4,000 gallons of water per day in evaporation.

It would take 1.1 trillion gallons of water to cover one square mile with one foot of water.

One gallon of water weighs 8.34 pounds

A person can live without water for approximately one week.

A clothes washer uses about 50 gallons of water.

It takes 12 to 20 gallons of water to run an automatic dishwasher for one cycle.

About 25 - 50 gallons are needed for a tub bath.

You can refill an 8 oz. glass of water approximately 15,000 times for the same cost as a six pack of soda pop. And, water has no sugar or caffeine.

A single quart of motor oil can pollute 250,000 gallons of water in our rivers and lakes.

How much water does it take to grow a hamburger?

Pretty much everything we eat needs water to either grow or create. This water is either supplied by nature as precipitation or added by man during the growing/production process. You can't tell by the size or texture of a food how much water was actually used to produce the food item. To grow that hamburger, for example, it takes water to grow the vegetation the cow eats, water for the cow to drink, water for processing the meat, maybe even water for a cow bath! It all adds up.

Almonds: 12 gallons
Chicken: 400 gallons
French Fries: 6 gallons
Hamburger: 1,300 gallons
Lettuce: 6 gallons
Milk: 65 gallons
Rice : 35 gallons
Tomatoes: 3 gallons
Watermelon: 100 gallons
1 Egg: 120 gallons
Loaf of bread: 150 gallons
1 Car: 65,000 gallons

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http://ga2.er.usgs.gov/edu/sc1action.cfm

LESSON ONE: Water Cycle Vocabulary

aquifer: underground spaces where water is stored and through which it moves slowly under the influence of gravity

condensation: the process by which a vapor becomes a liquid

contaminant: any substance that when added to water (or another substance) makes it impure

ecosystem: a biological community (community of organisms) and its environment functioning as an ecological unit

environmental stewards: caretakers of the earth

evaporation: the process by which liquid turns into vapor (usually as a result of the application of heat energy)

groundwater: water that is found underground in cracks and spaces in the soil, sand and rocks and that moves under the influence of gravity

habitat: the place where an animal or human lives

impervious (surface): Impermeable: unable to penetrate. Impervious surface: a material, such as asphalt, covers the soil and does not allow water to penetrate into soil layers below. Prevents infiltration.

infiltration: the downward movement of water into the soil

natural resource: a substance that exists in nature that we can use for food, building, manufacturing, etc

precipitation: water falling to Earth in the form of rain, snow, sleet or hail

recharge: to replenish or refill groundwater supplies with rain or snowmelt

runoff: Rainfall or snowmelt that flows over the land surface without soaking into the soil, or over impervious surfaces (like parking lots) to lower elevations

surface water: water on the surface of the land , including lakes, streams, rivers, ponds, and runoff

transpiration: the process by which the surface of a plant gives off internal fluids as a vapor, usually from the leaves

water cycle: the paths water takes through its various states (liquid, vapor, solid) as it moves throughout the ocean, atmosphere, ground, rivers, etc.

The Water in YOU ! (Check this out !!)

Think of what you need to survive, really just survive. Food? Water? Air? MTV?

Naturally, I'm going to concentrate on water here. Water is of major importance to all living things; in some organisms, up to 90 percent of their body weight comes from water.

Up to 60 percent of the human body is water.

The brain is composed of 70 percent water.

The lungs are nearly 90 percent water.

About 83 percent of our blood is water, which helps digest our food, transport waste, and control body temperature.

Each day humans must replace 2.4 litres of water, some through drinking and the rest taken by the body from the foods eaten.

There just wouldn't be any you, me, or Fido the dog without the existence of an ample liquid water supply on Earth. The unique qualities and properties of water are what make it so important and basic to life. The cells in our bodies are full of water. The excellent ability of water to dissolve so many substances allows our cells to use valuable nutrients, minerals, and chemicals in biological processes.

Water's "stickiness" (from surface tension) plays a part in our body's ability to transport these materials all through ourselves. The carbohydrates and proteins that our bodies use as food are metabolized and transported by water in the bloodstream. No less important is the ability of water to transport waste material out of our bodies.

Thirstin's Word Scramble Game

Put the letters in the right order to complete the sentence:

All living things need _____ (tawer) to live.

When water evaporates, it travels into the air and becomes part of a _____. (dlocu)

Less than 1% of all the water on the earth is _____ (sefrh) water.

We _____ (ikrdn) water in the liquid form.

Check for leaks and save hundreds of _____ (allogns) of water a day.

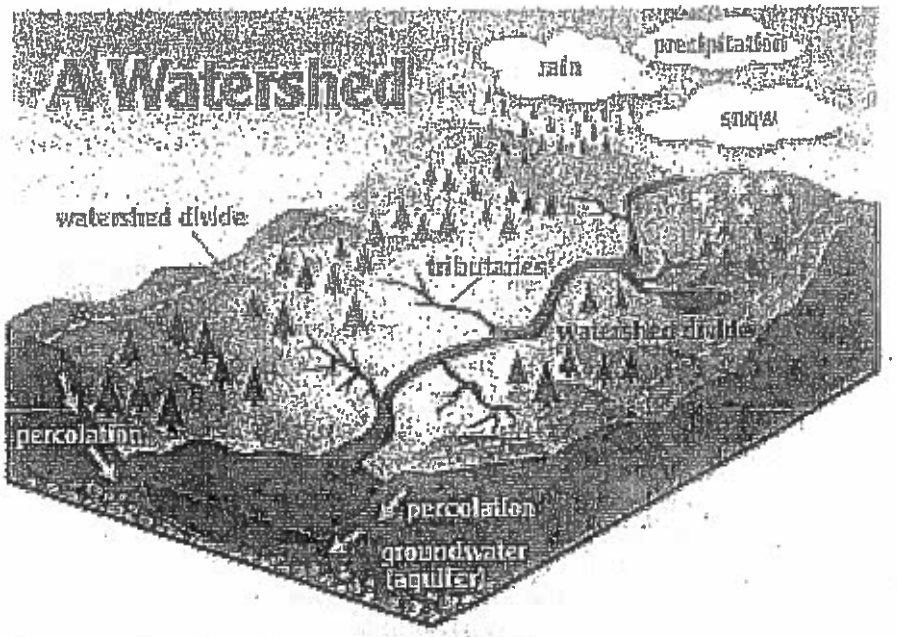
You'll save water by taking a quick _____ (howser).

Wash bikes and cars with a _____ (kecbut) and sponge instead of a running hose.

Ask your _____ (mfaiyl) to look for ways to save water.

Lesson 2

THE WATERSHED



Watershed: Water what ?

The area of land that drains into streams, lakes, estuaries or other bodies of water are known as watersheds. They are also known as drainage basins or catchments. As precipitation falls to the ground, the water is pulled downhill by gravity, which causes it to flow over the landscape or infiltrate through the soil into the groundwater. Topography - the hills, valleys, and other features that define the landscape - determine the boundaries of watersheds.

Every stream, regardless of its size, has a watershed. Smaller watersheds are contained within larger watersheds. For example, The Streets Run Watershed in southwestern Pennsylvania is part of the Monongahela River Watershed, which in turn is part of the Ohio River Watershed, which is part of the Mississippi River Watershed. **No matter where you live, you live within a watershed. Just as you have a home and school address, you also have a watershed address.**

Watershed Vocabulary

Aquifer: underground spaces where water is stored and through which it moves slowly under the influence of gravity

Collection site: a stream, lake, or other body of water fed by water drained from a watershed

Combined Sewer Overflow (CSO): in urban and suburban areas, runoff from roads, parking lots, and rooftops is often channeled into storm sewer pipes that combine with human sewage. During storms, human waste and storm water can overload the system, resulting in an overflow of water and untreated sewage into creeks and rivers. It occurs most often in areas with aging sewage systems.

Contaminant: a substance that when added to water (or another substance) makes it impure

Ecosystem: a biological community and its environment functioning as a unit

Environmental stewards: caretakers of the earth

Groundwater: water that is found underground in cracks and spaces in the soil, sand and rocks and that moves under the influence of gravity

Headwaters, headwater stream: A small creek or stream that begins in the highest elevations of a watershed.

Impervious (surface): prevents water from entering soil directly

Infiltration: the downward movement of water into the soil

Non-point source pollution: pollution that originates over a widespread region from a variety of sources rather than a single point or location

Point source pollution: pollution that originates at a specific point or location, such as a factory or sewage plant (end-of-pipe sources)

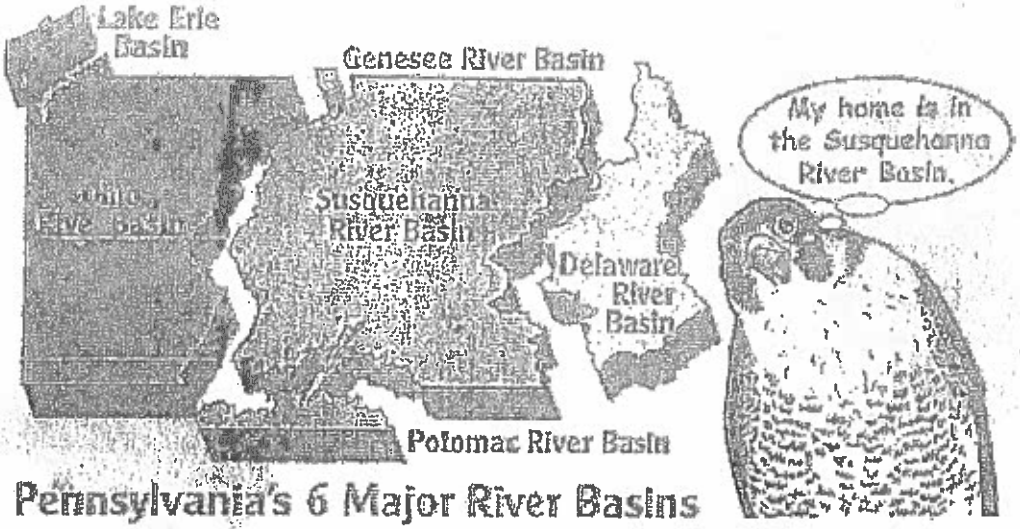
Recharge: to replenish or refill groundwater supplies with rain or snowmelt

Runoff: rainfall or snowmelt that flows over the land surface without soaking into the soil or that flows over impervious surfaces (like parking lots)

Surface water: water on the surface of the land, including lakes, streams, rivers, ponds and runoff

Tributary: a smaller channel of water that drains into a larger body of running water: a creek that empties into a stream; a stream that empties into a river.

Watershed: the land area from which surface runoff drains into a stream, channel, lake, reservoir or other body of water (collection site)



Pennsylvania's 6 Major River Basins

Pennsylvania has over 2000 miles of streams that flow into hundreds of subwatersheds, that flow into 104 different watersheds, that flow into subbasins, which flow into 6 major river basins in Pennsylvania: the Ohio, the Genesee, the Susquehanna, the Delaware, the Erie, and the Potomac. These watersheds are also known as river basins because they are named after major river systems in our state. These river basins or watersheds then eventually drain into larger bodies of water, such as the Chesapeake Bay and Lake Erie. Finally, larger bodies of water like the Chesapeake Bay, flow into the ocean.

Definition

wa.ter.shed \ *n* **1 :** land area from which water drains toward a common watercourse in a natural basin

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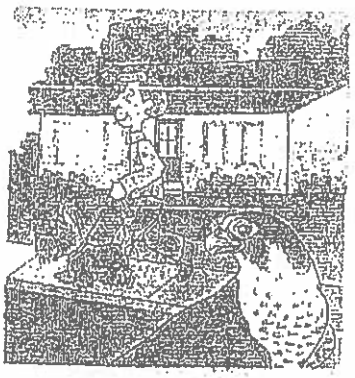
Most of us know our political address; the name of the city, borough, or township where we live. We know the name of our county. And, of course, we know our home state and country.

Less well known to each of us is our **natural** address.

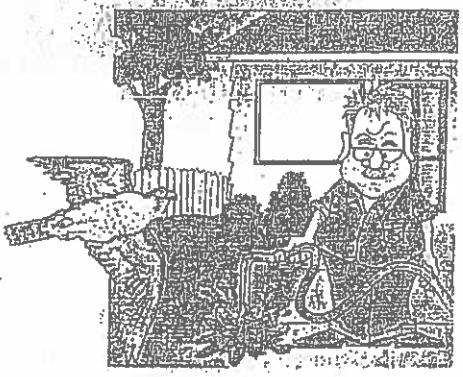
- Do you know the name of your local stream?
- Can you name your home watershed?
- Do you know what larger watershed you live in and where your home stream reaches the sea?

Department of Environmental Protection

What WE can Do...



It is important to always pick up after our pets. Their waste is very harmful to our streams and rivers. Pet waste has dangerous germs that can make plants, other animals and even people that swim in dirty water sick



Mr Green is watering his grass again. We usually don't think about how much water we use because it seems like we'll always have enough. But that won't be the case if we don't use water wisely. That's why it is very important to conserve what we have. Awareness is the first step in conservation. So next time you take a shower or wash your hands think about how much water you're using and how you can use less!

Here comes a car. Look at all that black smoke coming out the pipe in the back. Did you ever think something in the air like that could pollute the water? Well it can. What goes up must come back down. All that gross smelling smoke that comes out of cars and busses will eventually land on the ground or in a creek, river lake or ocean.

There sure is a lot of litter lying around in the street. Street litter, like plastic bags, cups, and candy wrappers, often gets swept away when it rains into the storm drains and can end up floating in the ocean or washing up on our beaches.
A lot of animals that live in the ocean can mistake this trash for food and get tangled up or sick.

Adapted from
http://www.depweb.state.pa.us/justforkids/site/default.asp?depNav=|

Mr. Greenthumb is washing his car again. Seems harmless to the watershed right? Well, rain and water from hoses when washing the car carries the soap and all the other chemicals in its path to the storm drain. From the storm drain, water flows to the nearest stream – soap, dirt, litter and all!

Hey, there's Greta Greenthumb taking care of her garden. Some plant food, like fertilizer, or bug killers called pesticides can wash into the streams and storm drains when it rains too. These chemicals can take the oxygen out of the water and harm animals, bugs and plants who need it to breathe

Let's walk down by the stream. The water looks a little cloudy. Seems like there is a lot of dirt in there. Did you know that a little bit of dirt in a stream is natural but too much from erosion is bad? Erosion is when dirt slides off a hill or the side of the stream and lands in the water. This dirt can make the water cloudy making it hard for fish to breath or find places to lay their eggs. Dirt can also clog up streams like this and make them disappear all together!

Adapted from http://www.depweb.state.pa.us/justforkids/site/default.asp?depNav=|

BLUE THUMB WORD SEARCH

Most people in North America get their water from a public water utility. Public utilities are companies or government agencies that supply needs such as electricity, gas, or water to the public. Water utilities get their water from rivers, lakes, reservoirs, or underground aquifers. Often, the water must be treated to make it safe to drink.

We reuse the same water over and over and it can become polluted by people and industry. Even deep underground aquifers can be polluted from the surface. For example, many household items, such as car wax, spot remover, or floor polish, should not be poured down the drain nor thrown out in the trash. Even lawn chemicals and other garden toxins used outdoors can contaminate water sources by running off the land into storm drains. And water can end up in lakes and rivers.

Let's take care of our water resources. Use your "Blue Thumb" to conserve water, protect it, and get involved.

(circle each one)

nature	recycle	treatment
drink	pesticide	leaks
toxic	oil	tap
fertilizer	batteries	pollute
paint	contaminate	protect
gasoline	hazardous	safe
clean	wells	water sources

W	E	L	L	S	D	M	P	Q	S	V	F
L	A	B	O	T	P	O	L	L	U	T	E
H	Z	T	R	E	A	T	M	E	N	T	R
C	P	A	E	R	I	C	B	C	U	E	T
O	Y	P	C	R	F	E	N	L	K	D	I
N	A	H	Y	J	S	T	M	E	H	I	L
T	E	A	C	P	Z	O	C	A	L	C	I
A	F	Z	L	K	T	R	U	N	T	I	Z
M	A	A	E	D	O	P	E	R	B	T	E
I	S	R	I	X	X	N	W	G	C	S	R
N	M	D	P	A	I	N	T	S	L	E	V
A	B	O	I	L	C	F	S	M	O	P	S
T	F	U	O	D	R	I	N	K	T	E	S
E	D	S	L	M	O	H	J	L	A	M	R
P	A	T	B	A	T	T	E	R	I	E	S
G	K	U	E	F	N	A	T	U	R	E	L