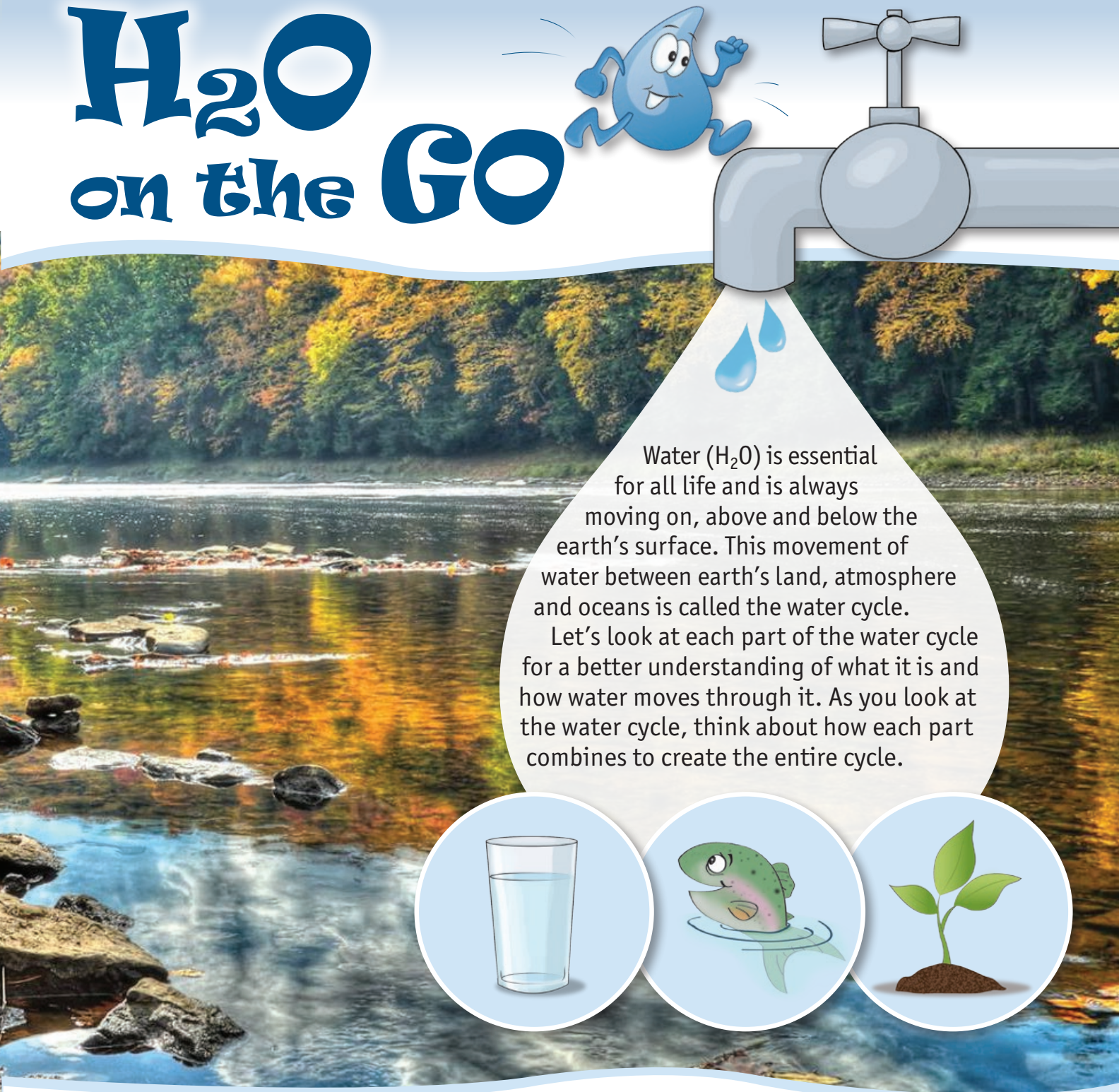
PENNSYLVANIA FISH & BOAT COMMISSION

PLAY

Fall 2019

Pennsylvania • League • of • Angling • Youth

H_2O on the GO



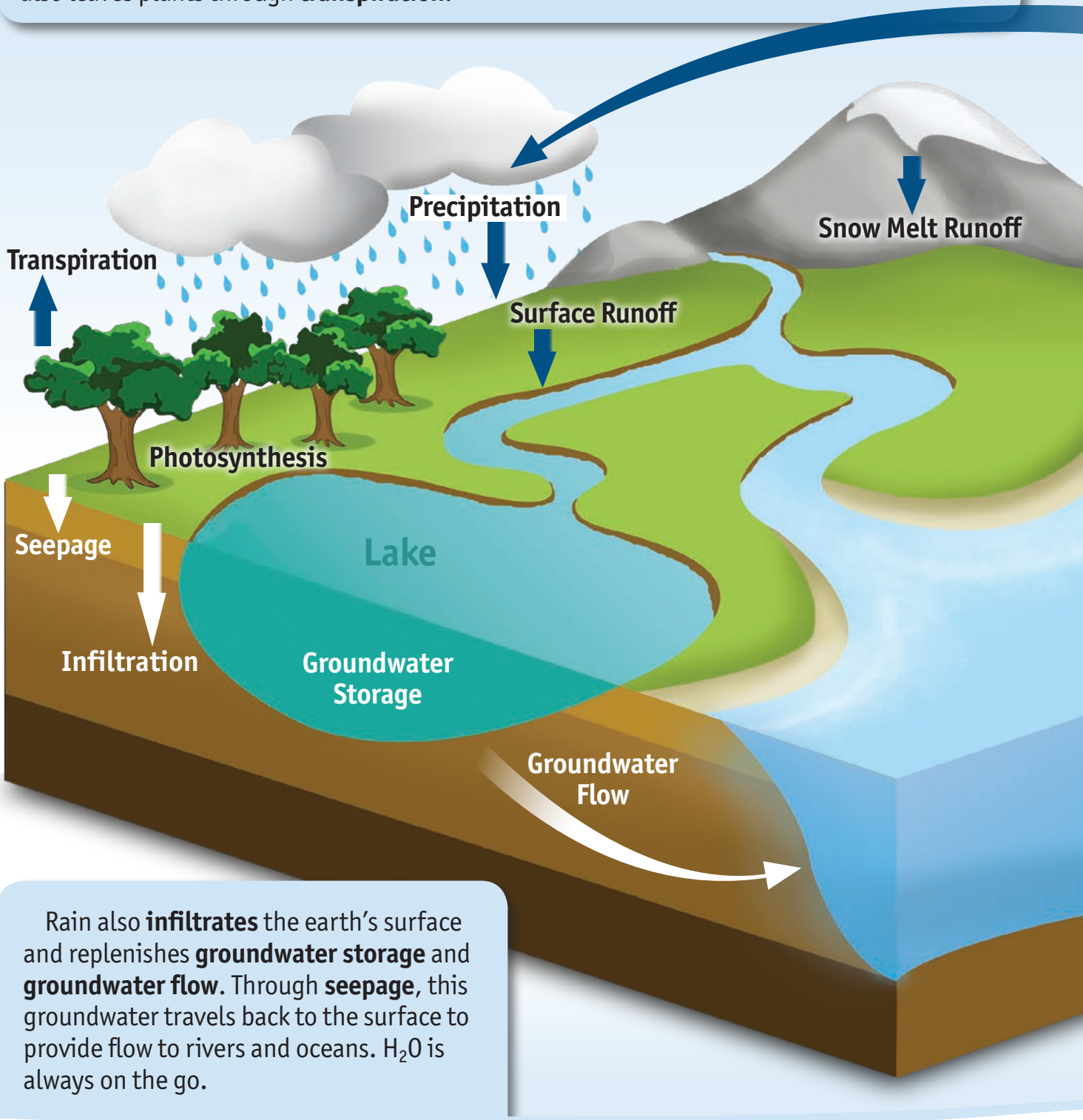
Water (H_2O) is essential for all life and is always moving on, above and below the earth's surface. This movement of water between earth's land, atmosphere and oceans is called the water cycle.

Let's look at each part of the water cycle for a better understanding of what it is and how water moves through it. As you look at the water cycle, think about how each part combines to create the entire cycle.

The Water Cycle

The major ways of moving water through the water cycle are **evaporation**, **transpiration**, **condensation** and **precipitation**. Evaporation occurs when the sun's energy turns liquid water on the earth's surface into **water vapor**. Water vapor also leaves plants through **transpiration**.

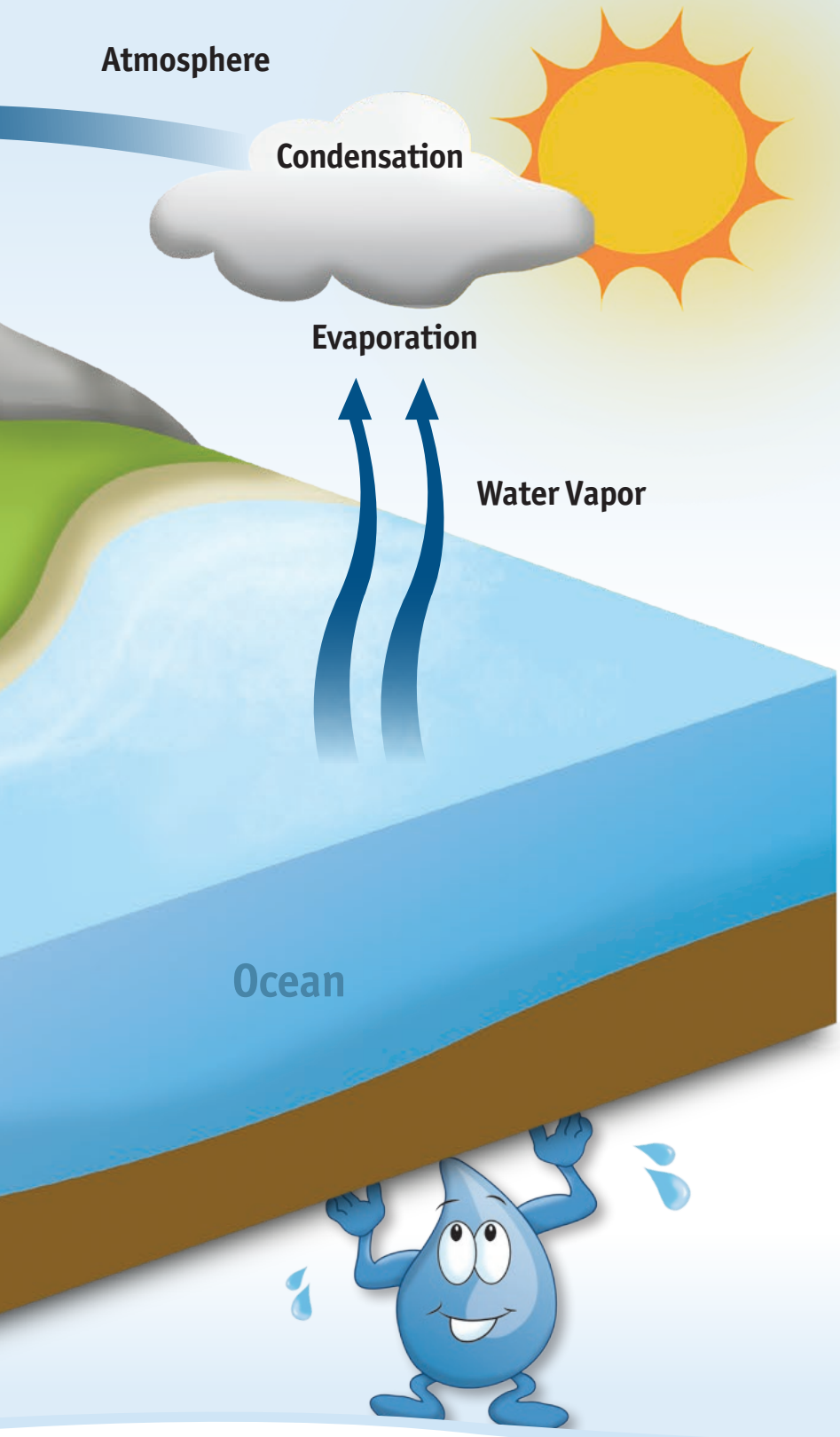
Water vapor in the **atmosphere** cools and **condenses** to form clouds. Precipitation then falls to earth. In winter, snow melts, and becomes **snow melt runoff**. During other times of the year, rain falls and runs off the land into waterways as **surface runoff**.



Rain also **infiltrates** the earth's surface and replenishes **groundwater storage** and **groundwater flow**. Through **seepage**, this groundwater travels back to the surface to provide flow to rivers and oceans. H_2O is always on the go.

How is Rain Made?

As clouds are formed by condensed water, the individual water droplets collide and combine to make bigger water droplets. When water droplets are too heavy to float in the air, it falls as rain.



Vocabulary

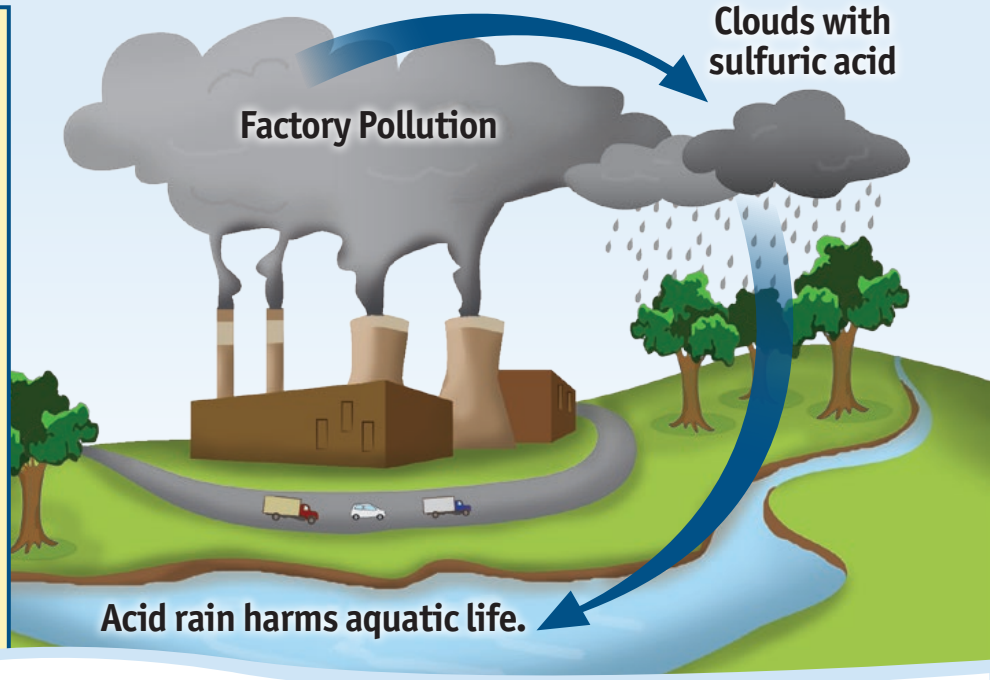
- **Atmosphere** - the layer of gases surrounding a planet
- **Water Vapor** - the gas phase of water
- **Photosynthesis** - the process in which plants use sunlight, water and air to create its food
- **Groundwater Storage and Groundwater Flow** - water stored underneath the surface of the earth
- **Condensation** - the process of water vapor in the air turning into liquid water
- **Evaporation** - the process of liquid water becoming water vapor
- **Transpiration** - evaporation of water from plant leaves during photosynthesis
- **Seepage** - movement of water through small openings of material into surface or subsurface water
- **Infiltration** - flow of water from the surface into the ground
- **Precipitation** - water is released from clouds into the form of rain, freezing rain, sleet, snow or hail
- **Snow Melt Runoff** - Surface water produced by melting snow
- **Surface Runoff** - is the flow of water "running off" the land surface from precipitation into streams, lakes and oceans

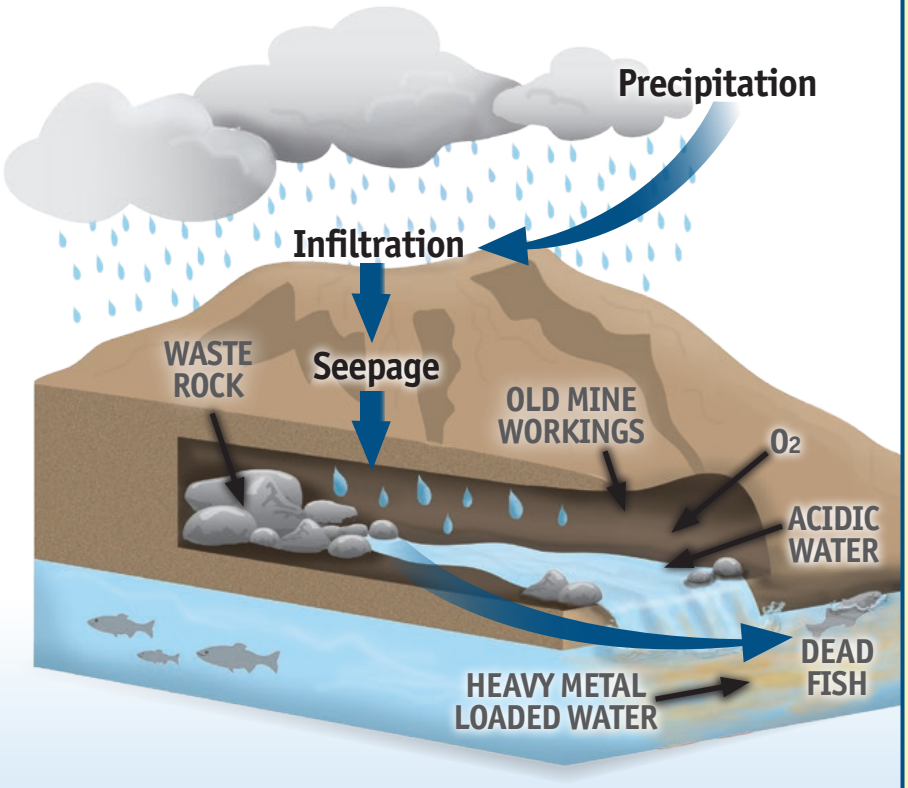
Water Cycle and Pollution

The oceans contain 97 percent of the water on earth. That leaves 3 percent of water as fresh water, and of that, only 2 percent is available for our use. Because our water supply is so small, it is important to protect our water. Sadly, humans have impacted that small bit of water through pollution. Let's look at some of the major causes of water pollution.

Acid Rain

The chemicals present in smoke pollution from sources such as factories, power plants and vehicles are transported with water vapor. This polluted water vapor follows the water cycle, eventually falling back down to earth as precipitation and is known as acid rain. After this polluted water is on earth's surface, where else can the water cycle transport it?





Acid Mine Drainage

Acid Mine Drainage (AMD) is one Pennsylvania's worst pollutants. Most AMD comes from abandoned coal mines. Acidic water is formed when sulfur from minerals meets ground water. This polluted ground water reaches the surface through seepage. AMD can be easy to see. Sediments can be red, orange or yellow.

This stream has been affected by Acid Mine Drainage.

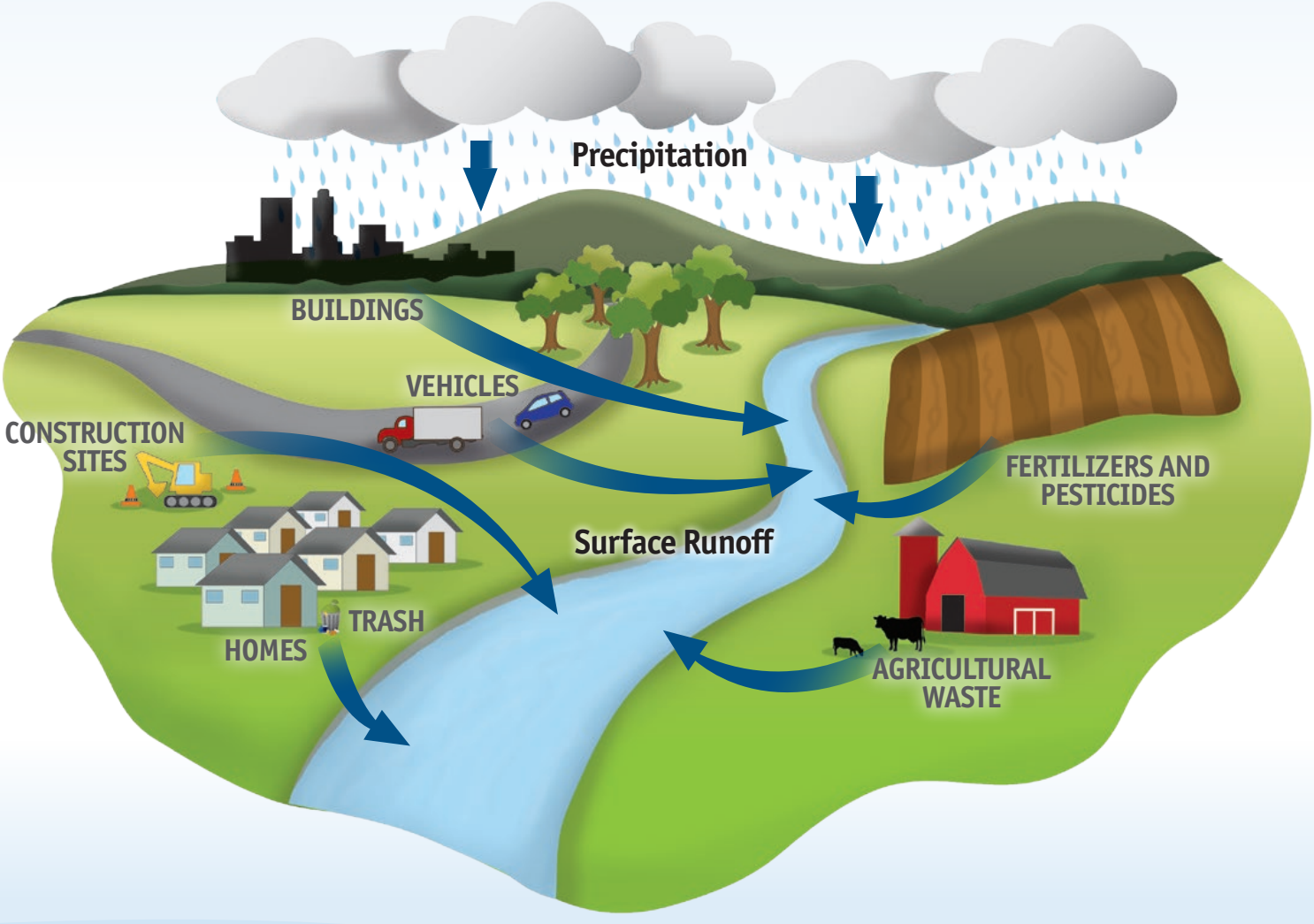
Surface Runoff

Parking lots, roads and buildings create hard surfaces that prevent infiltration and increase surface runoff. Water has nowhere to go and brings everything with it including pollution on the surface.

Pollution sources from surface runoff includes:

- Soil that washes off construction sites
- Trash and litter
- Fluids and oils from vehicles
- Fertilizers and pesticides from lawns and farm fields
- Nutrients from agricultural waste
- Salt from roadways

One branch of the Susquehanna River is clear while the other is affected by surface runoff.

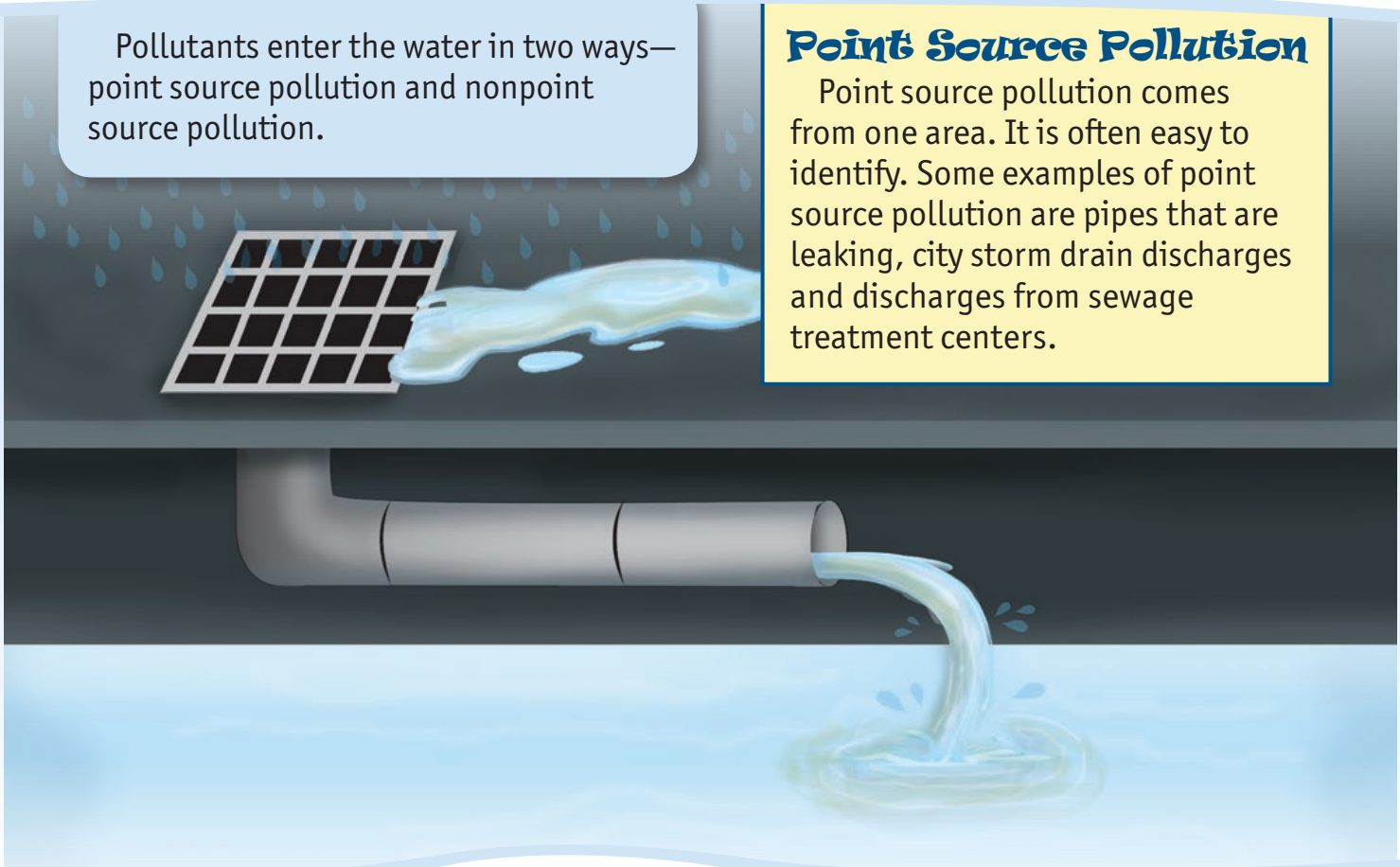


Pollution Points

Pollutants enter the water in two ways—point source pollution and nonpoint source pollution.

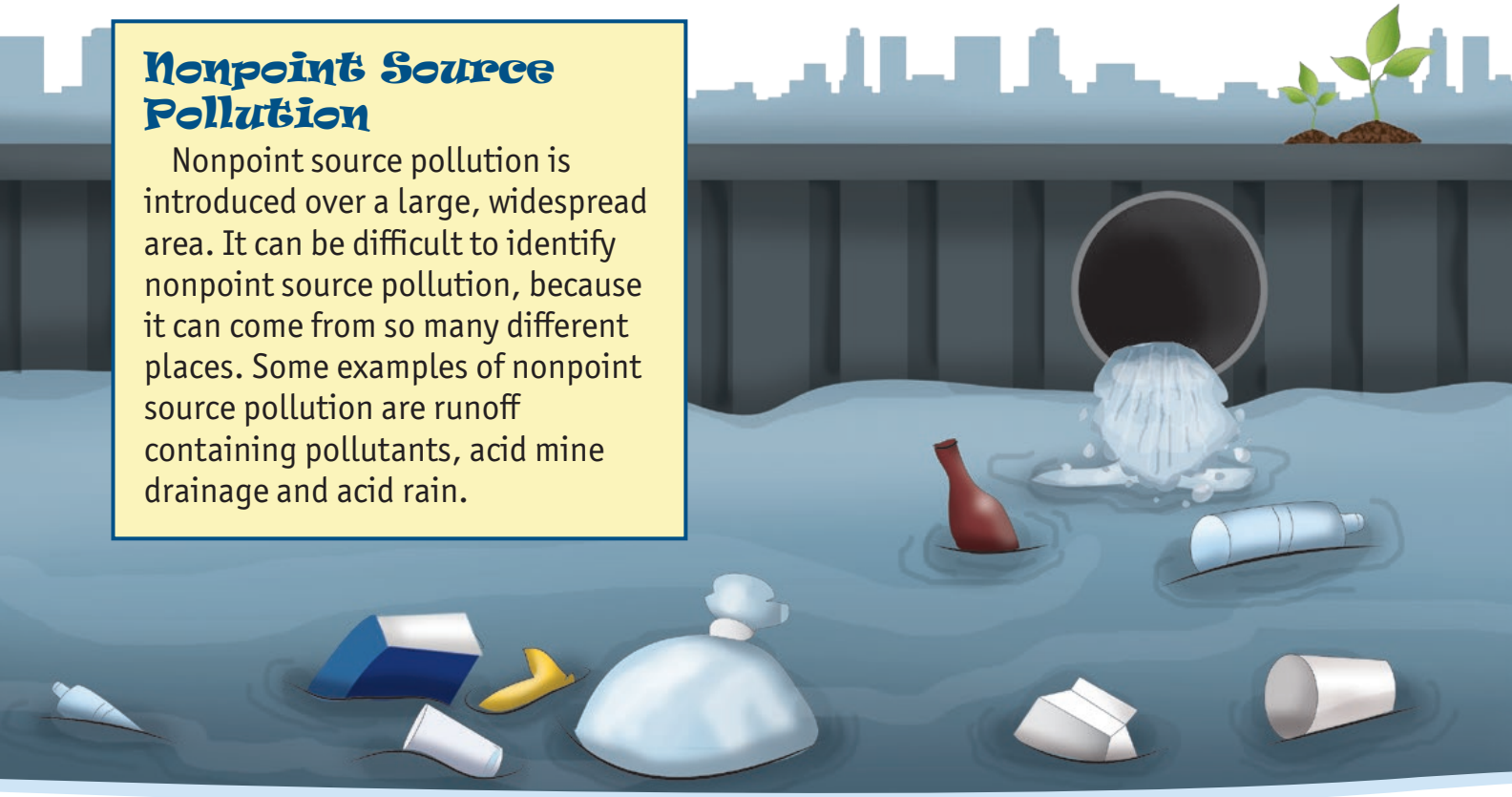
Point Source Pollution

Point source pollution comes from one area. It is often easy to identify. Some examples of point source pollution are pipes that are leaking, city storm drain discharges and discharges from sewage treatment centers.



Nonpoint Source Pollution

Nonpoint source pollution is introduced over a large, widespread area. It can be difficult to identify nonpoint source pollution, because it can come from so many different places. Some examples of nonpoint source pollution are runoff containing pollutants, acid mine drainage and acid rain.



Water Cycle and Water Pollution WORD SEARCH

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S W A T E R C Y C L E R A M D
I N F I L T R A T I O N P C P

Word List

AMD
ATMOSPHERE
CONDENSATION
EVAPORATION
GROUNDWATER
INFILTRATION
PHOTOSYNTHESIS
POLLUTION
PRECIPITATION
RUNOFF
SEEPAGE
TRANSPIRATION
WATER
WATER CYCLE

*(**Hint:** Some words may appear backwards.)*

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