

In order for the students to understand the 2017-2018 HYDRO DYNAMICSSM Season, the students needed an in depth understanding of the following vocabulary words in order to be successful in the season:

human water cycle: In the HYDRO DYNAMICSSM Challenge, the human water cycle describes the ways people and, transport, use, and dispose of water in order to meet a specific need or desire.

water footprint The amount of water that a person, family or other group (such as a business) uses in a day.

natural water: The natural process when water evaporates, condenses into clouds, (hydrologic) cycle and then falls back to the ground as precipitation. Water never completely disappears. It goes through the natural water cycle over and over.

Hydrology: The branch of science that deals with the hydrologic cycle in the environment, including land, soil and the atmosphere.

fresh water: Water that contains very low levels of dissolved substances in it. Most people say “fresh water” to mean the water contains little or no salt.

salt water: Water that has a high concentration of dissolved salts in it. (Just like it sounds!) The Earth’s oceans are filled with salt water, but salt water is not drinkable by people unless most of the salts are removed through water treatment.

brackish water: Water that is considered neither freshwater nor salt water, but a mixture of the two. Brackish water is usually found in estuaries, where freshwater (rivers and streams) flows into the ocean.

groundwater Water: that flows or seeps downward and saturates soil or rock, supplying springs and water wells.

aquifer: A source of groundwater in the form of soil, sand or rock below the land’s surface that is saturated with water. Aquifers are capable of yielding water in sufficient quantity for human use; water wells are dug or drilled into aquifers.

surface water: Surface water includes all sources of the Earth’s above-ground water such as streams, rivers, lakes, reservoirs and oceans.

Precipitation: Water that comes from Earth’s atmosphere as a result of rain, snow, hail, sleet, dew, and frost. Precipitation can be collected directly for use by humans with rooftop drains and other means, but it also recharges surface water and groundwater supplies.

Runoff: Runoff is precipitation that flows into sewers, lakes, or other bodies of water as a result of rain, snow melt, or irrigation. Depending on conditions, runoff can carry substances that cause contamination in supplies of surface water and groundwater.

Drought: A period of water shortage that can be brought about by either natural or human causes. Natural causes could be changes in weather or climate; human factors could include the over-use of aquifers or the diversion of rivers for irrigation or flood control.

Irrigation: The use of water to assist in the growing of crops and pastures, or to maintain recreational areas such as golf courses or even yards.

water quality: Water quality describes the chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose. Various forms of water treatment are required to achieve a particular water quality.

potable water: Water that is safe for drinking, cooking or other home uses.

water well: A water well is a human-made hole dug in the ground for the purpose of withdrawing groundwater. Wells are often bored or drilled with machines to reach deep aquifers. Depending on the quality of the water, water collected from water wells may or may not undergo water treatment before use.

surface water intake Intakes are structures or devices designed to collect surface water for human use. Ideally, surface water undergoes some type of water treatment before it is used by humans because it is often more likely than groundwater to contain harmful contaminants. water distribution system

A water distribution system is a set of devices, such as water pumps, water towers, and water pipes that move water from one place to another for human use.

water pump: A water pump is a machine designed to transport water by putting it under pressure. Different types of water pumps use a variety of mechanisms to move water, and they can be powered by hand, electricity, wind or other sources of energy.

water tower: Part of an urban or suburban potable water distribution system that includes a tower supporting an elevated water tank, whose height creates the pressure required to distribute the water through water pipes to homes and businesses.

water pipes: A water pipe is a tube that moves water through a water distribution system. Water pipes can be made of a variety of materials including plastic, copper, iron, lead, concrete or even "fired" clay.

Contamination: The presence of unwanted or unsafe materials in a substance. Contamination of water may include harmful bacteria, parasites, chemicals, or other materials which may hurt humans or the environment.

Turbidity: Turbidity is a measure of the amount of solid particles that are suspended in water. Water that is very turbid causes light rays shining through the water to scatter, making the water cloudy or even opaque in extreme cases. The turbidity of water is one important measure of water quality.

water treatment: Water treatment is the process of making water suitable for a particular purpose, such as drinking water, water for industrial uses or even purifying wastewater so that it can be returned to lakes and rivers to re-enter the hydrologic cycle. Some type of water treatment is also often required before groundwater or surface water is fit for human use.

Chlorination: Chlorination is a type of water treatment where chlorine is added to a potable water supply primarily for the purpose of killing harmful organisms.

Fluoridation: Fluoridation is a type of water treatment where fluoride is added to a potable water supply to reduce tooth decay.

Wastewater: Water that has been used in homes, industries, and businesses that is not normally for reuse unless it undergoes water treatment.

Blackwater: Blackwater is wastewater that is contaminated by human, animal or food waste.

Greywater: Greywater is wastewater from clothes washing machines, showers, bathtubs, and sinks. In some instances, if it is not too contaminated, greywater can be reused for activities like using a toilet, or irrigating plants.

Sediment: Solid material, often sand, silt or clay, moved or suspended in water. Water high in sediment content will usually have high turbidity.

septic system: A method of water treatment for household wastewater that uses a settling (septic) tank. Septic systems allow solids to sink or stay trapped in the settling tank, and liquids to be distributed to a drain field for soil absorption.

sanitary sewer: A sanitary sewer is a system of underground pipes that carries wastewater from homes, factories and businesses to a wastewater treatment plant where it is filtered, treated and discharged.

storm sewer: A storm sewer carries runoff such as street wash and snow melt from the land to a discharge point. In a separate storm sewer system, storm sewers are completely isolated from sanitary sewers, and discharge into lakes, rivers, streams, or the ocean. However, some cities and towns send the water from storm sewers to a water treatment plant to protect the environment from harmful runoff that might come from contamination, such as motor oil on roads, or fertilizers in gardens.

manhole cover: A removable plate or lid that allows access to a sanitary sewer system for maintenance and inspection. Manhole covers are usually located in streets and made of heavy cast iron.

Infiltration: The process in which water enters the soil. This could be from precipitation, runoff, irrigation, or other sources. Infiltration is also a term that describes when runoff enters a sanitary sewer by accident, potentially overwhelming the sewer system, and resulting in sewage contamination in the environment.

water treatment plant A facility designed to improve the quality of water. The most common types of water treatment plants are those used to make groundwater and surface water suitable for use in homes and businesses (making potable water), and those used to make wastewater clean enough to be returned to the environment. Wastewater treatment usually involves a series of steps, most commonly filtration, aeration and sedimentation.

Filtration: Filtration is the process of removing solid contamination from water, most often through the use of screens, sand filters and activated charcoal.

Aeration: Aeration is the process of adding oxygen back to wastewater to return it to a more natural state.

Sedimentation: Sedimentation is the process of using gravity or chemicals to settle-out large solid contaminants during the water treatment process in order to reduce its turbidity.

sewage sludge: A thick mixture of solids and liquid that is a by-product of a wastewater treatment plant or a septic system. Sewage sludge is the solid matter that has been separated from the wastewater, it can contain contamination, and is usually disposed of through incineration or by spreading it over land or burying it in landfills.

Desalination: Desalination is the removal of salts from salt water to provide fresh water. This method is becoming a popular way of providing fresh water to populations with a ready supply of salt water, but it can be expensive and current methods require a large amount of energy.

reverse osmosis: A type of desalination that removes salts from salt water using a membrane. With reverse osmosis, salt water is forced through a fine membrane that traps dissolved salts, and the salt waste (or brine) is removed and disposed.

In order for the students to understand the 2016-2017 Animal Allies Season, the students needed an in depth understanding of the following vocabulary words in order to be successful in the season:

Allies-People, countries, or other groups that have joined together for a special purpose.

animal-In the ANIMAL ALLIESSM Challenge, an animal is any member of the scientific animal kingdom (besides humans) that is currently alive today.

animal kingdom-Scientists divide all living things into groups called “kingdoms.” These kingdoms help us understand the variety of life found on Earth. The Animal Kingdom is the group that includes most of the living things we see: mammals, reptiles, birds, insects, and many more.

bioload -The number and type of animals an aquarium tank can hold.

biomimicry-Applying lessons from animals and plants to the invention of healthier, more sustainable technologies for people.

conservation-The care and protection of animals and/or natural resources such as forests and water.

ecosystem -The physical habitat and all of the animals and plants that live there.

enrichment-Activities and challenges added to an animal’s routine to make their lives better through physical or mental exercise. Finding proper enrichment for each species can be a great challenge.

feces-Poop from an animal. Also known as manure, scat, waste, droppings, guano, or dung (depending on the animal).

habitat-The place where an animal or plant lives. An animal’s “natural habitat” is where this animal would normally live without human intervention.

livestock-Animals kept and raised on a farm to benefit people. Some examples may include cows, horses, pigs, and sheep.

manure-Feces from a large livestock animal like a cow or horse.

plasticity-How adaptable an animal is to changes in its environment or its ability to move between environments.

Prosthesis-A device designed to replace a missing body part or to make a part of the body work better.

taxonomy-Sorting or classification of living things into groups that have specific traits in common.

In order for the students to understand the 2015-2016 Trash Trek Season, the students needed an in depth understanding of the following vocabulary words in order to be successful in the season:

Biodegradable- Able to be broken down easily by bacteria and other organisms into basic materials which do not harm the environment.

Composting- A process where food and plant waste (like a banana peel, food scraps, or dry leaves) breaks down. The composted food becomes fertilizer you can use to help plants grow.

Dispose of- To dispose of something means to get rid of it or send it someplace else.

Fertilizer- Food for plants that helps them grow bigger and stronger.

Hazardous waste- Specific types of trash that may cause special harm to people or the environment, so they cannot be sent to a regular landfill. These include items like paint, chemicals used for cleaning, and some types of light bulbs. Hazardous waste must go to a special site.

Incentive- An offer or reward that motivates people to take a specific action. Incentives such as discounts are often used to encourage people to recycle or reduce waste.

Incinerator- A machine that burns trash. Incinerators often burn trash to create energy to power homes or businesses.

Landfill- A place where lots of trash is stored. Most landfills start with a hole in the ground which is covered with a protective lining, then with layers of trash, soil, and other materials.

Leachate-Liquid that passes through a landfill and now contains particles or substances from the landfill. Leachate may be caused by rain water entering the landfill from above or liquids inside the trash.

Material Recovery-An MRF is a recycling facility where recyclable materials are sorted and prepared. The sorted Facility (MRF) recyclables are usually sold to another company that makes them into something new. MRF is often pronounced "murf."

Municipal- Solid Name for normal trash produced in homes and businesses.

Waste (MSW) Post-consumer waste- A finished product that has been used for its intended purpose and is either disposed of or recycled. This is different from post-industrial waste, which is trash created during a manufacturing, building, or other business process.

Recyclables-Materials that can be broken down and made into something new, such as bottles, cans, paper, and cardboard.

Recycle-To process an item so it can be used to create something new. This usually involves cleaning, chopping or breaking down, and then melting or mashing.

Sanitation-Keeping clean and healthy living conditions by disposing of trash and sewage away from the places people live.

Single stream-A method of collecting recyclables where a person puts all of his or her recyclables into one zero sort recycling bin instead of sorting them by material. The company that collects the recyclables uses machines and people to sort the recyclables after they are collected.

Transfer station- A place (usually a building) where trash is stored for a short time after being collected from homes and businesses. A larger truck usually picks up the trash from the transfer station and transports it to a recycling facility, landfill, or other location.

Trash-Anything you throw away because you are done with it. Trash might also be called garbage, rubbish, waste, or debris by different people.

Textile-Woven or knitted fabric used to make clothes.

Waste stream- The total amount of trash produced from a specific area or source. For example, "the residential waste stream" would be all the trash produced in peoples' homes.