SoundWaters Distance Learning Human Impacts

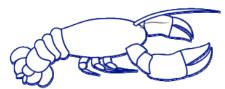
Humans are dependent on all earth systems, which are connected. Discover the positive and negative effects that result from our use of the environment and ways we can mitigate these changes.

Lesson Modules

- Earth Systems
- Marine Debris
- Microplastics
- Water Movement
- Resource Management











Lesson 1: Earth Systems Overview

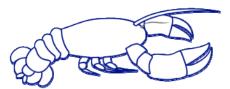
In this video you will learn all about adaptations. This video will be a kickoff to learning animal adaptations all week long.



https://youtu.be/B1P5mqloys8











EARTH SYSTEMS VIDEO REFLECTION

After watching the video, tell me what you thought about			
I really enjoyed	I did not understand	I want to learn more about	

STUDENT'S NAME:



Earth Systems - Vocabulary Words

Geosphere: The portion of the earth that includes rocks and minerals. It starts at the ground and extends all the way down to Earth's core.

Hydrosphere: The total amount of water on the planet. It includes water in the Earth's oceans, rivers, lakes, groundwater and water frozen in glaciers.

Hydrologic cycle: Also known as the water cycle, the movement of water on Earth through evaporation, condensation and precipitation.

Evaporation: The process by which water changes from a liquid to a gas or vapor.

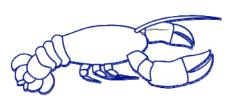
Condensation: The process by which water changes from a gas or vapor to a liquid.

Precipitation: The release of water from clouds in the form of rain, freezing rain, sleet, snow or hail.

Practice the vocabulary words on quizlet: https://quizlet.com/8ait7s?x=1jqt&i=2s8evl











Earth Systems - Vocabulary Words

Biosphere: Made up of all the living things on Earth, including animals and plants.

Food Web: All the food chains in an ecosystem. Food webs depict the way in which energy is transferred through an ecosystem.

Atmosphere: Includes all the gases surrounding the Earth, consisting of 5 layers. It is responsible for Earth's weather.

Brackish Water: The type of water created when fresh and saltwater mix.

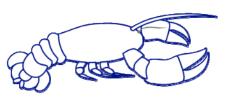
Watershed: The area of land where all the water that falls on that land ends up in one large body of water.

Invasive Species: Any kind of living organism that is not native to an ecosystem and causes harm.

Practice the vocabulary words on quizlet: https://quizlet.com/8ait7s?x=1jqt&i=2s8evl

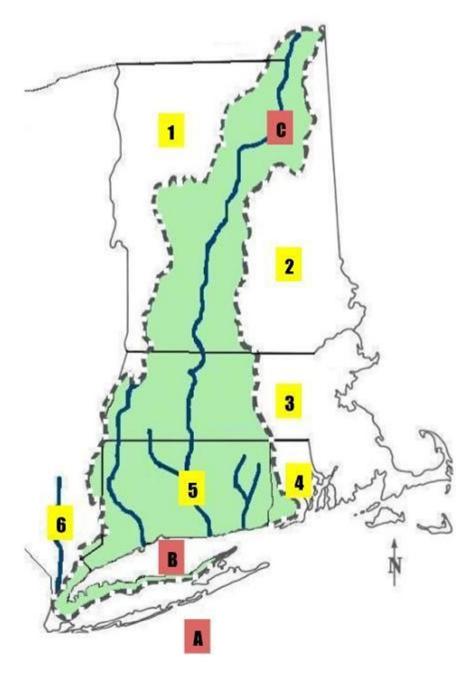












This is the Long Island Sound Watershed.

What is a watershed?

Label the states in the watershed:

- 1)
- 2)
- 3)
- 4)
- 5)
- 6)

Label the bodies of water

- A)
- B)
- C) (Blue line)



EARTH SYSTEM INTERACTIONS

The earth is divided into four major systems: geosphere (G), hydrosphere (H), atmosphere (A), and biosphere (B). These systems interact because they are related to each other.

Which systems are interacting in each one of these situations (use the letters G,H,A,B)

A deer taking a breath and then eating a piece of grass.	
A windstorm in the desert creates dust clouds in the air	
A wave crashes against a coastline and it starts to erode	
A seedling sprouts up in a garden	
A volcano erupts and many trees become uprooted and fall over	
The tide rises causing mussels to open and feed on plankton	
The leaves on a tree going through photosynthesis	
Evaporation from a river that leads to heavy cloud cover	
Daily rainstorms in a tropical rainforest creating a tree canopy	



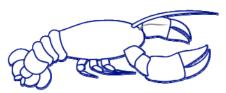
Which of the following is not one of the four systems on Earth?

- A. Hydrosphere
- B. Lithosphere
- C. Atmosphere
- D. Geosphere

Take the quiz online:











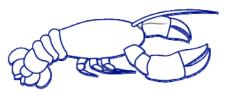
The biosphere is made up of all the _____ things on Earth.

- A. Moving
- B. Abiotic
- C. Microscopic
- D. Biotic

Take the quiz online:











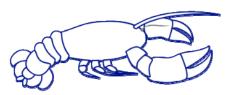
A lot of the oxygen in Earth's atmosphere comes from which of the following marine organisms?

- A. Flounder
- B. Plankton
- C. Oysters
- D. Sea Stars

Take the quiz online:











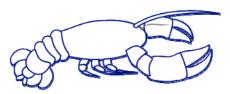
How many states are included in the Long Island Sound watershed?

- A. 6
- B. 5
- C. 4
- D. 3

Take the quiz online:











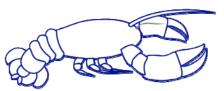
An example of a connection between the GEOsphere and the HYDROsphere is

- A. Ocean currents moving fish around the ocean
- B. Water evaporating to make clouds
- C. Waves eroding rocks on the beach
- D. A tree's roots growing into the ground

Take the quiz online:











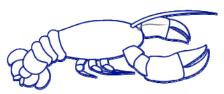
An example of a connection between the GEOsphere and the HYDROsphere is

- A. Ocean currents moving fish around the ocean
- B. Water evaporating to make clouds
- C. Waves eroding rocks on the beach
- D. A tree's roots growing into the ground

Take the quiz online:











Learn More - Earth Systems

Interactions of Earth's Spheres

https://www.generationgenius.com/videolessons/earths-spheresvideo-for-kids/

Hydrosphere

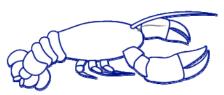
https://youtu.be/AF2BnTSTEFc

Where did Earth's water come from?

https://ed.ted.com/lessons/where-did-earth-s-water-come-from-zachary-metz





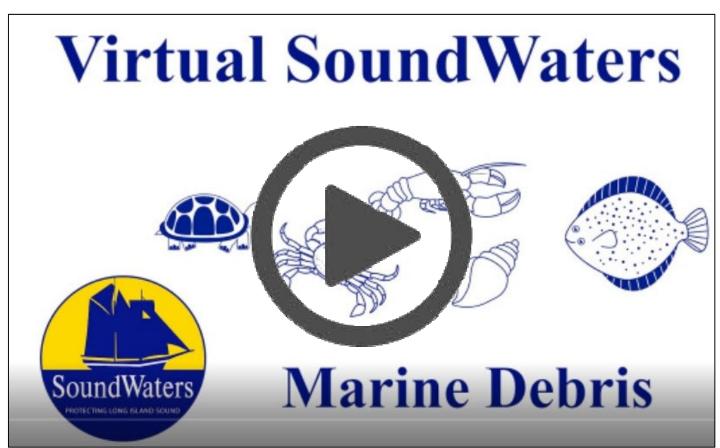






Lesson 2: Marine Debris

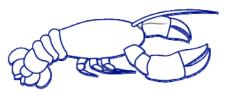
In this video, you will be learning about marine debris and how it affects the animals in Long Island Sound.

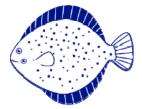


https://youtu.be/hRNUHVLMKAI











MARINE DEBRIS VIDEO REFLECTION

After watching the video, tell me what you thought about			
I really enjoyed	I did not understand	I want to learn more about	

STUDENT'S NAME:



Marine Debris - Vocabulary Words

Pollution: Something that is introduced to the environment that is dirty, unclean or has a harmful effect.

Marine Debris: Man made, solid material that is put into the water, intentionally or unintentionally.

Point Source Pollution: A single identifiable source of air, water, thermal, noise or light pollution.

Nonpoint Source Pollution: Pollution resulting from many diffuse sources. Nonpoint source pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage, or rain and snowfall.

Photodegradation: To be decomposed by the action of light, especially sunlight.

Biodegradation: Decomposed by bacteria or other living organisms.

Bioaccumulation: The accumulation of a substance, such as a toxic chemical, in various tissues of a living organism.

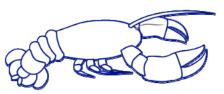
Gyre: Any large system of circulating ocean currents, particularly those involved with large wind movements.

Pacific Garbage Patch: A gyre of marine debris particles in the north-central Pacific Ocean. The collection of plastic and floating trash originates from the Pacific Rim, including countries in Asia, North America, and South America.

Practice the vocabulary words on quizlet: https://quizlet.com/8bhslt?x=1jqt&i=2s8evl





































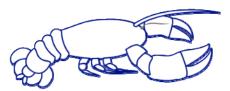
True or False: When a plastic bottle cap enters Long Island Sound it settles and stays in one place.

- A. True
- B. False

Take the quiz online:











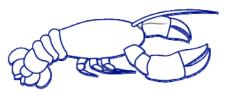
How does marine debris enter the water?

- A. Direct input from people
- B. Wind and rain
- C. Storm drains
- D. All of the above

Take the quiz online:











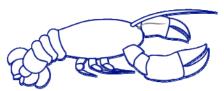
Which of the following is an example of point source pollution?

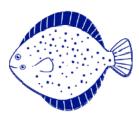
- A. Fertilizer from lawns
- B. Drainage pipe from sewage plant
- C. Oil and gas on the road
- D. Poorly managed construction sites

Take the quiz online:











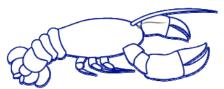
What process can cause toxins to end up in food we eat from the water?

- A. Photodegradation
- B. Biodegradation
- C. Bioaccumulation
- D. Watershed

Take the quiz online:











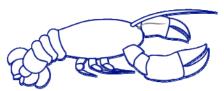
What does it mean for an object to photodegrade?

- A. Eaten by animals
- B. Decomposed by bacteria
- C. Sink
- D. Broken down by light

Take the quiz online:











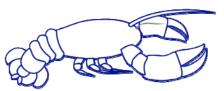
What can fertilizer runoff cause?

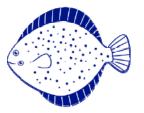
- A. Fish kills
- B. Hypoxia
- C. Algae Blooms
- D. All of the above

Take the quiz online:











Learn More - Marine Debris

Print your own Marine Debris Bookmark

https://marinedebris.noaa.gov/sites/default/files/publications-files/Did You Know Marine Debris Bookmark Series.pdf

Marine Debris Tracker App

https://marinedebris.noaa.gov/partnerships/marine-debris-tracker

Become part of the EPA's Planet Protector Club!

https://www.epa.gov/students/planet-protectors-activities-kids

Trash Talk

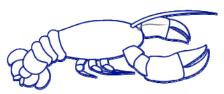
https://marinedebris.noaa.gov/discover-issue/trash-talk

What and Where Are Garbage Patches?

https://marinedebris.noaa.gov/info/patch.html











Lesson 3: Microplastics

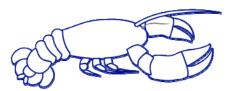
In this video you will be learning about a type of pollution known as microplastics.

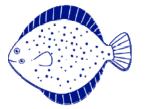


https://youtu.be/qc7kR0_ySt8











MICROPLASTICS VIDEO REFLECTION

After watching the video, tell me what you thought about			
I really enjoyed	I did not understand	I want to learn more about	

STUDENT'S NAME:



Microplastics- Vocabulary Words

Pollution: When the environment is contaminated, or dirtied, by harmful substances.

Microplastic: Pieces of plastic that are smaller than 5 millimeters in size. They come from a variety of sources.

Microbead: A piece of plastic that has been manufactured to be extremely small. They are often used in products such as toothpaste and face wash.

Microfiber: The tiny fibers that make up polyester clothing. Most clothing uses microfibers.

Water treatment plant: A facility that treats water from residential (houses) and commercial (businesses) to remove contaminants before it is returned to the environment.

Biomagnification: The accumulation of a particular substance in the body of the organisms at different trophic levels of a food chain. Higher trophic levels tend to have a larger concentration of a substance.

Microbead-Free Waters Act: An act requiring cosmetic companies to stop using microbeads that can be rinsed off.

Synthetic: (adj.) made or put together by people; (n.) something artificial

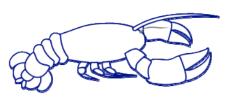
Photodegradation: When materials are altered or broken down by light.

Mechanical degradation: When a physical action, such as waves or weather, break a material down into smaller pieces.

Practice the vocabulary words on quizlet: https://quizlet.com/8awyqy?x=1jqt&i=2s8evl



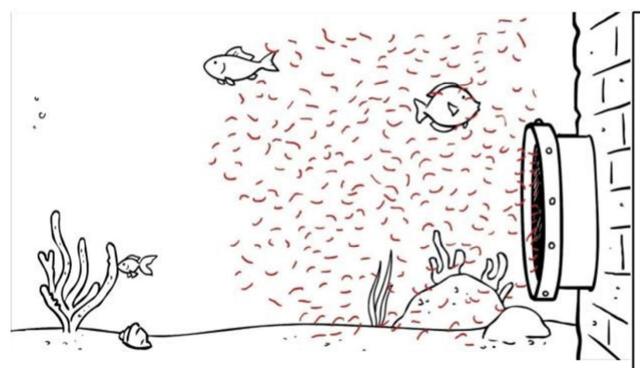








MICROPLASTICS



The pipe in this picture is coming from a water treatment plant. Explain what is happening in the picture and what effect it will have on this aquatic environment

What is one thing you can do to help reduce the amount of microplastics going into Long Island Sound?



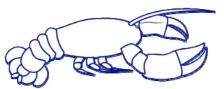
Microplastics can come from a bunch of different places. Which of the following is not one of the places we mentioned in the video?

- A. A plastic bottle breaking down in the environment.
- B. Microfibers from our laundry washing down the drain.
- C. Microbeads coming down from the sky with the rain.
- D. Discarded fishing line breaking down into smaller pieces.

Take the quiz online:











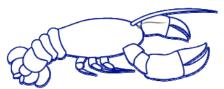
Which of the following can cause a large piece of plastic marine debris to break down in the environment?

- A. The sun's rays making the plastic brittle.
- B. Physical degradation from the movement of the waves and water.
- C. People crumpling up the trash.
- D. Both a and b.

Take the quiz online:











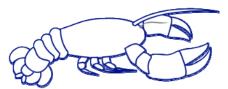
President Obama passed the ______ Act, a law banning companies from delivering rinse-off cosmetic products that use microbeads by 2018.

- A. Clean Water
- B. Microbead-Free Waters
- C. Microbead-Ban

Take the quiz online:











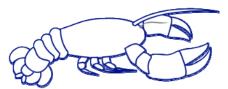
A microplastic is a piece of plastic that is _____ millimeters in length, as small as an ant!

- A. 3mm
- B. 4mm
- C. 5mm
- D. 6mm

Take the quiz online:











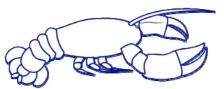
Microplastics are often eaten by animals in the ecosystem. These microplastics are bad for the animals because

- A. The microplastics can absorb toxins in the water and make the animal sick.
- B. The microplastics don't give the animal any energy.
- C. The microplastics make the animal think it is full when it doesn't actually have any food in it's stomach.
- D. All of the above.

Take the quiz online:











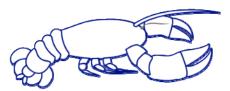
What is biomagnification?

- A. The build-up of a toxic chemical in the body of a living organism.
- B. When a toxic material increases in amount each time it moves up a trophic level in the food chain.
- C. The increase in size of a microplastic to a plastic piece larger than 5mm.
- D. The weight increase of an animal after eating a toxic chemical.

Take the quiz online:











Make a Public Service Announcement

A Public Service Announcement (PSA) is a way to inform people and tell them why they should do or not do something. Below are links for examples of a PSA video and a PSA poster.

Use the PSA worksheet to make your own PSA to inform people about microplastics! You can use words or pictures.

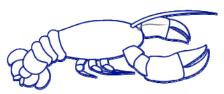
PSA Examples

https://sbt.blob.core.windows.net/siteimages/create/infographics/psa-example.png

https://youtu.be/l1ahuBI4QFU











PSA TITLE

What is the issue or problem you are talking about?

Who or what does the issue affect?

The environment, people, animals

How can people fix or help with the issue

Learn More - Microplastics

What are microplastics?

https://oceanservice.noaa.gov/facts/microplastics.html

Understanding Microplastics In Seafood

https://blog.marinedebris.noaa.gov/understanding-microplastics-seafood

Microplastics explained (explainity® explainer video)

https://youtu.be/49OJoTsZYO0

Ocean Confetti, the challenge of micro-plastics

https://thekidshouldseethis.com/post/ocean-confetti-microplastics

How to discover hidden microplastics!

https://youtu.be/Hh1cGaVZL2s

Microplastic Marine Debris Fact Sheet

https://marinedebris.noaa.gov/sites/default/files/Microplastic%20Marine%20Debris%20Fact%20Sheet.pdf

Elementary school students build machine to pull tiny pieces of plastic from sand

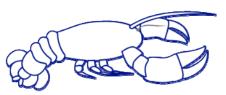
https://www.nbc12.com/2019/09/04/elementary-school-students-build-machine-pull-tiny-pieces-plastic-sand/

Laundry ball that catches all those nasty microfibers

https://youtu.be/P 6EpIW2Ew4











Lesson 4: Runoff

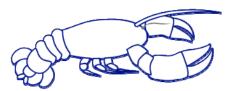
In this video, you will be learning about runoff and how it affects Long Island Sound.

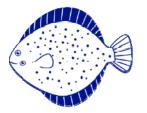


https://youtu.be/XhLSgPpHtag











RUNOFF VIDEO REFLECTION

After watching the video, tell me what you thought about			
I really enjoyed	I did not understand	I want to learn more about	

STUDENT'S NAME:



Runoff- Vocabulary Words

Runoff: The draining away of water (or substances carried in it) from the surface of an area of land, a building or structure, etc.

Fertilizer: A chemical or natural substance added to soil or land to increase its fertility.

Hypoxia: Low or depleted oxygen in a water body, often associated with the overgrowth of certain species of algae, which can lead to oxygen depletion when they die, sink to the bottom, and decompose.

Wastewater Treatment Plant: Facility in which a combination of various processes (e.g., physical, chemical and biological) are used to treat industrial wastewater and remove pollutants.

Storm Drain: A drain built to carry away excess water in times of heavy rain.

Permeable: (of a material or membrane) allowing liquids or gases to pass through it. An example would be grass or the salt marsh.

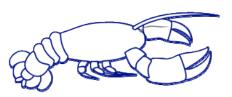
Impermeable: Not allowing fluid to pass through. An example would be concrete or asphalt

Harmful Algae Bloom: Occur when colonies of algae — simple plants that live in the sea and freshwater - grow out of control and produce toxic or harmful effects on people, fish, shellfish, marine mammals and birds.

Practice the vocabulary words on quizlet: https://quizlet.com/8bhzrn?x=1jqt&i=2s8evl











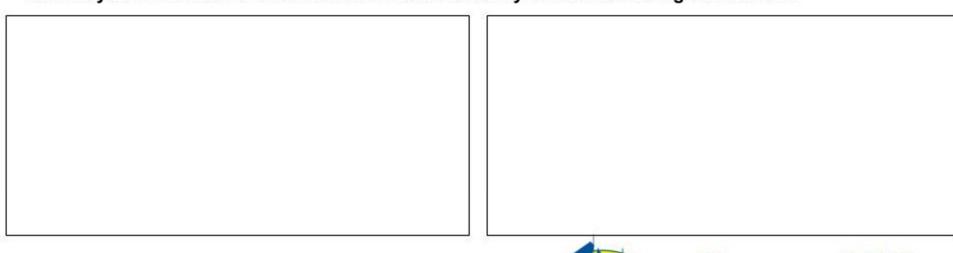
RUNOFF

Runoff occurs when rain water moves over the earth. When that happens, the rain water can move different materials with it. Permeable and impermeable surfaces can affect the amount of runoff that happens.





How do you think each of these areas will be affected by runoff from a large rainstorm?





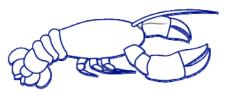
How many people can affect the quality of the water in Long Island Sound?

- A. 100,000
- B. 1 million
- C. 4 million
- D. 8 million

Take the quiz online:











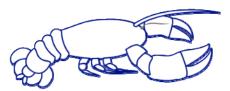
Why has the amount of runoff increased?

- A. It rains more often
- B. There are more storm drain pipes
- C. There are more impermeable surfaces
- D. There is more salt marsh

Take the quiz online:











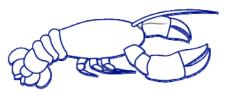
What can fertilizer runoff lead to?

- A. Harmful algae blooms
- B. Hypoxia
- C. Fish kills
- D. All of the above

Take the quiz online:











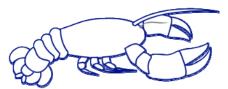
Which of the following is a natural source of runoff?

- A. A drain pipe from storm drains
- B. Fertilizer from lawns
- C. Wastewater treatment plant
- D. Mill River emptying into Long Island Sound

Take the quiz online:











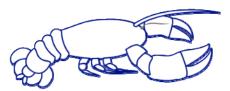
True or False: Long Island Sound is cleaner than it has been in the past 3 decades

- A. True
- B. False

Take the quiz online:











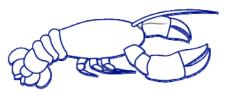
What harmful substances can be in runoff?

- A. Fertilizer
- B. Sewage
- C. Heavy metals, tire rubber
- D. Gas and oil
- E. All of the above

Take the quiz online:











Learn More - Runoff

Ever wonder where the rain goes?

https://youtu.be/LMq6FYiF1mo

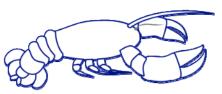
Learn more about stormwater runoff

https://youtu.be/jNs28UcjNbk

Lets start thinking about runoff near your house. Use this activity to take a walk around your house and observe and record things like a scientist would! https://water.unl.edu/documents/Stormwater%20Walk%20opt.pdf











Lesson 5: Remediation

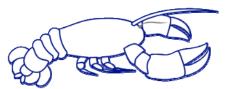
Watch this video to discover how to combat human impact.

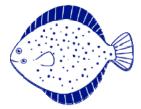


https://youtu.be/0Fo243iJq-g











REMEDIATION VIDEO REFLECTION

After watching the video, tell me what you thought about			
I really enjoyed	I did not understand	I want to learn more about	

STUDENT'S NAME:



Remediation - Vocabulary Words

Impermeable: Impassable, not allowing passage through (such as by a liquid).

Trench: A long, narrow ditch.

Compost: Partially decomposed organic plant and animal matter used as a soil conditioner or fertilizer.

Rain Garden: A runoff area that is planted with water-tolerant plants to slow runoff and promote water infiltration.

Retaining Wall: A wall built up from low ground to hold the higher ground in place.

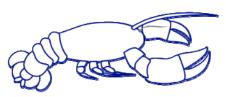
Remediation: The return of a degraded or toxic area to its original state.

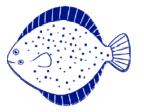
Bioremediation: The use of living organisms to detoxify and restore polluted and degraded ecosystems.

Practice the vocabulary words on quizlet: https://quizlet.com/8b1n9u?x=1jqt&i=2s8evl











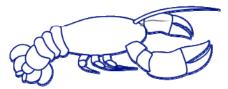
What is an example of bioremediation?

- A. Digging a trench to redirect water
- B. Properly disposing of plastic material
- C. Growing kelp
- D. Doing a beach cleanup

Take the quiz online:











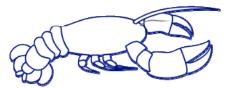
Which would produce the LEAST amount of runoff?

- A. Building a rain garden
- B. Paving a parking lot
- C. Buying a car to replace your bike
- D. Using solar panels

Take the quiz online:











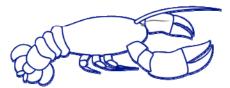
True or False: Vegetation helps prevent erosion by root networks holding the soil into place.

- A. True
- B. False

Take the quiz online:











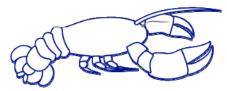
What creates erosion on beaches?

- A. Tides
- B. Wind
- C. Waves
- D. All of the above

Take the quiz online:











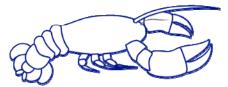
Kelp helps the environment simply by growing! What toxin does kelp remove from the water?

- A. Neptunium
- B. Nitrogen
- C. Sulfur
- D. Iron

Take the quiz online:











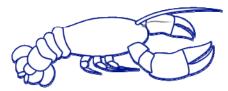
What can be composted?

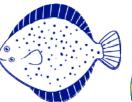
- A. Metals
- B. Organic material
- C. Plastic
- D. Synthetic clothing

Take the quiz online:











MAKING A DIFFERENCE IN YOUR COMMUNITY

A clean-up is one of the easiest ways to make a difference and help the environment. Conduct a clean-up in your neighborhood and fill in this clean-up sheet to show what you found! Make sure to wear gloves!

You can also take a picture of everything you found and insert it into this document.

ITEM	Amount Found
Bag (plastic or paper)	
Bottles/Cans	
Food wrappers	
Straws	
Cigarette butt	
Plastic Bottle Caps	
Other: Type here	
Other: Type here	

Were you surprised about any of the items you found? Explain

What was the most common item you found? Why do you think that is?



REMEDIATION



There are many ways we have impacted the environment. Below are examples of some of those impacts. Describe the remediation technique developed for each impact



It is estimated that the average American generates 4.5 pounds of waste a day, rapidly filling landfills..



The development of roads and structures changed the movement of water, causing erosion.



The addition of impermeable surfaces to the landscape increase the amount of water running of the land, carrying excess nitrogen.

Learn More - Remediation

His Epic Message Will Make You Want to Save the World https://youtu.be/B-nEYsyRlYo

Oil-Eating Bacteria Could Be a Solution to Spill Cleanups | National Geographic https://youtu.be/sPgLJrk0sGQ

Kelp Could Save Our Oceans — If You Eat It https://youtu.be/vjGFRZSiKYc

Not sure how your town recycles? Check out this link to find out! https://berecycled.org/

Making a Homemade Composter! | Full-Time Kid | PBS Parents https://youtu.be/kA3q07paNbE

Learn How to Compost For Beginners | Georgia-Pacific https://youtu.be/-1IPTfdb8bI

How it Works: Single Stream Recycling

https://youtu.be/hdGjiKJsgRk

What is the trash skimmer?

https://soundwaters.org/trash-skimmer/





