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Idaho Falls
EARTH
DAY

We Are All Connected!

The Earth is a system. A system is a term used for any complex whole, with smaller connected parts working together. Usually, a change or malfunction of one part can affect other parts of the system, and also affect the system itself.

All of the processes on Earth are driven by four 'spheres,' which we describe individually, but are really all connected. They are the Atmosphere, Geosphere, Biosphere, and Hydrosphere.

- **Geosphere:** All the rocks, minerals, and land that are found on and in Earth. The geosphere starts at the crust and extends all the way down to Earth's core. The prefix "geo" means Earth.
- **Biosphere:** All living things on Earth. This includes all animals, humans, plants and trees. The prefix "bio" means life.
- **Hydrosphere:** All the water on the Earth. The prefix "hydro" means water.
- **Atmosphere:** The blanket of the gases surrounding the Earth, including the air we breath. The prefix "atmos" means air.

Sphere Interactions

Earth's spheres are interconnected. What affects one can affect the other. For example, rain (hydrosphere) falls on the soil (geosphere), which causes grass (biosphere) to grow. A cow (biosphere) eats the grass and breathes out carbon dioxide (atmosphere).

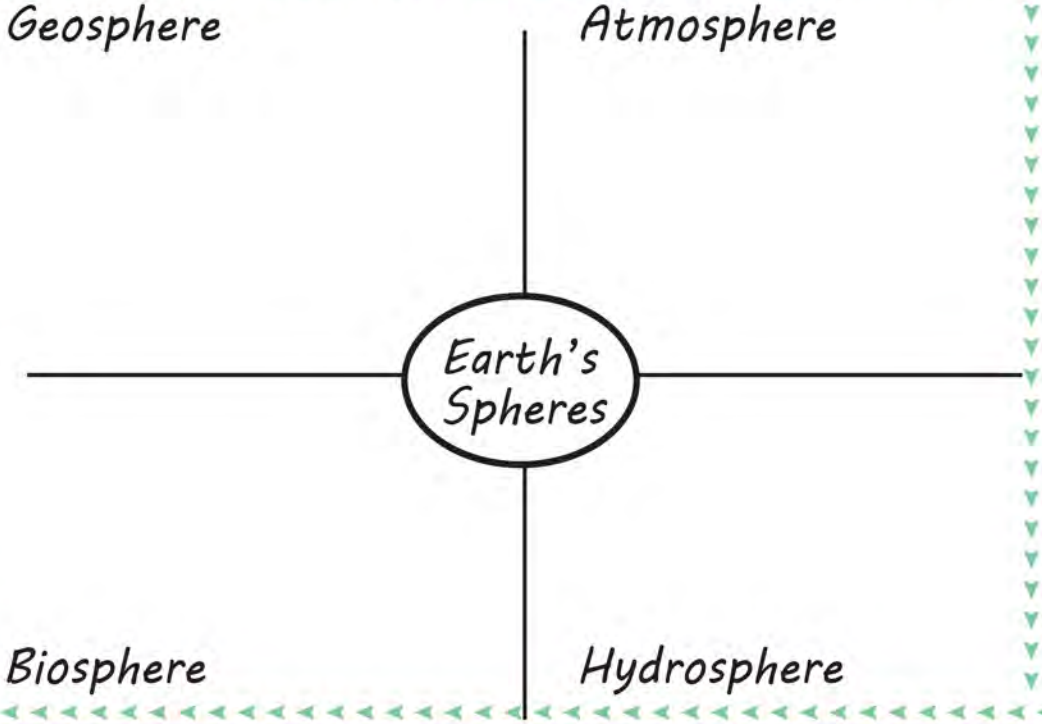
For each of the processes, list the sphere where matter begins the process and the sphere where matter ends in the process.

Hydrosphere	Water in a lake evaporates.	Atmosphere
	Plants absorb water into their roots.	
	Humans breathe in oxygen.	
	Rivers erode their banks	
	Clouds produce rain.	
	Wind generates ocean waves.	

LEARN MORE

Earth System Research Laboratory, NOAA: https://www.esrl.noaa.gov/gmd/education/info_activities/pdfs/TBI_earth_spheres.pdf

Spheres Activities

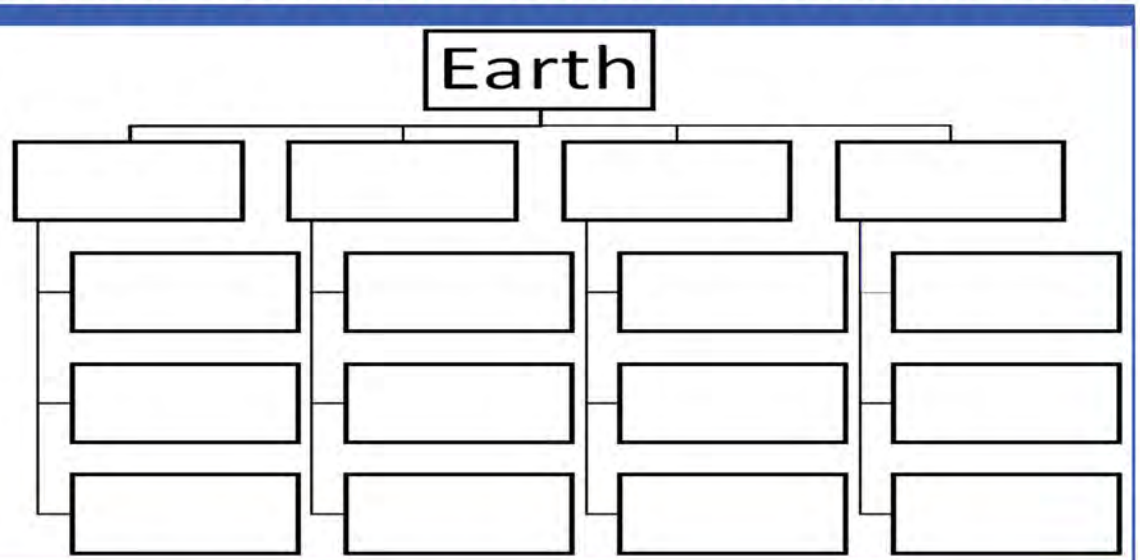


Go outside. Find 12 things you can see and put each item in the sphere in which it belongs.

Answers on Page 15

Make a concept map with the following terms:

Earth	*Hydrosphere*
Animals	*Atmosphere*
Rocks	*Geosphere*
Biosphere	*Oxygen*
Soil	*Ozone*
Rivers	*Plants*
Moutains	*Bacteria*
Wind	*Snow*



Earth's spheres and the flow of energy and matter between them are so closely connected that a change in one sphere often results in a change in one or more of the other spheres. Such changes that take place within an ecosystem are referred to as events.

Events can occur naturally, such as an earthquake or a hurricane, or they can be caused by humans, such as an oil spill or air pollution. An event can cause changes to occur in one or more of the spheres, and/or an event can be the effect of changes in one or more of Earth's four spheres. This two-way cause and effect relationship between an event and a sphere is called an interaction. Interactions also occur among the spheres; for example, a change in the atmosphere can cause a change in the hydrosphere, and vice versa.

There are ten possible types of interactions that could occur within the earth system. Four of these interactions are between the event and each of the earth's spheres. The double-headed arrows in the graphic on the right indicate that the cause and effect relationships of these interactions go in both directions; for example, "event ⟷ hydrosphere" refers to the effects of the event on the hydrosphere, as well as the effects of the hydrosphere on the event.

The ten types of interactions that can occur within the earth system often occur as a series of chain reactions. This means one interaction leads to another interaction, which leads to yet another interaction--it is a ripple effect through the earth's spheres. For example, a forest fire may destroy all the plants in an area (event ⟷ biosphere). The absence of plants could lead to an increase in erosion of soil (biosphere ⟷ geosphere). Increased amounts of soil entering streams can lead to increased turbidity, or muddiness, of the water (geosphere ⟷ hydrosphere). Increased turbidity of stream water can have negative impacts on the plants and animals that live in it (hydrosphere ⟷ biosphere).

Cause and Effect

Match the cause with the effect by writing the letter in the blank box in the answer column.

#	Answer	Cause	Letter	Effect
1		Mom threw plastic Coke bottles in the trash.	A	Students turned the faucet off while they soaped their hands.
2		The children learned about the environment around their school.	B	Students threw used notebook paper into the recycling bin each day.
3.		The students planted seeds in cups.	C	Paul made a set of bowling pins with the Coke bottles.
4		Students were trying to recycle notebook paper in their classroom.	D	The students cleaned the litter and trash from the school yard.
5		The class decided to reduce their water usage.	E	Students planted a small garden outside the classroom when their seeds sprouted.

Earth's Cycles

Each sphere is constantly changing in a process called cycling. A cycle is something that never stops. It has no beginning and has no end.

Earth is a system of matter (stuff) and energy (ability to do work). Earth is a closed system because matter does not enter or exit the system, but energy does.

The four spheres we discussed earlier are open systems. Matter and energy are constantly exchanged between the spheres. Matter and energy move between spheres in cycles. Through cycles, Earth recycles matter and energy.

Some examples of Earth's cycles are shown below. We'll learn about each of these Earth cycles in the following pages.

Scientists try to figure out how our planet works by studying Earth's cycles. Changes to Earth's cycles can cause changes in the spheres of our planet.

Carbon Cycle

Water Cycle

Ocean Cycle

Energy Cycle

Rock Cycle

Atmosphere Cycle

Nitrogen Cycle

ADAPTATIONS

When natural cycles are changed, the plants and animals have to change, too. Making a change like this is called adapting.

Sometimes a change in a natural cycle is so big, that the animals and plants don't have the time to change. Or, they cannot make the changes they need to make.

LEARN MORE

UCAR Center for Science Education: https://eo.ucar.edu/kids/green/cycles1.htm

My NASA Data, Earth System: https://mynasadata.larc.nasa.gov/basic-page/earth-system-matter-and-energy-cycles

Earth's Energy Cycle

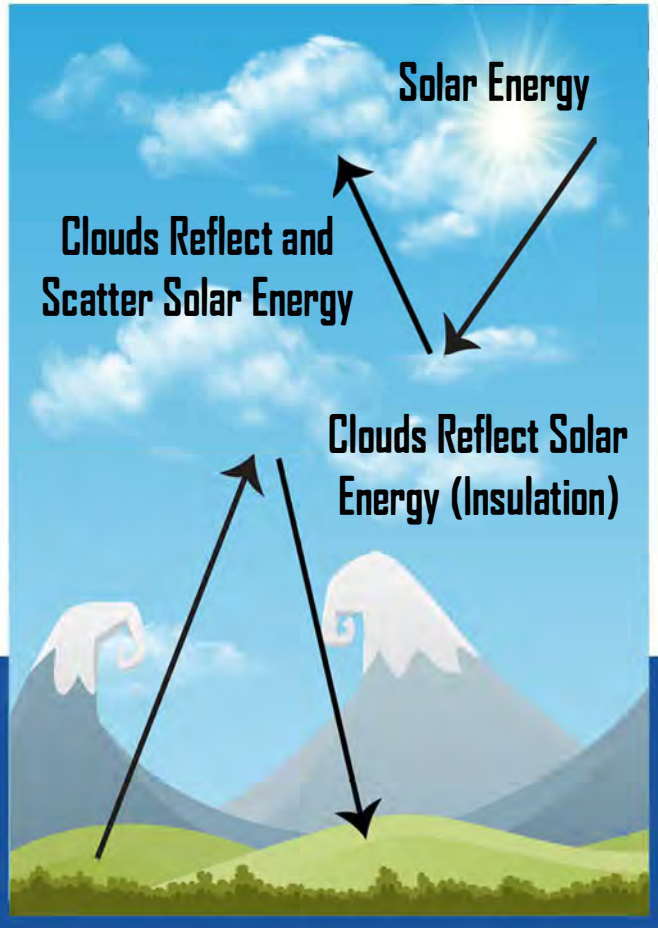
Earth gets all its energy from the Sun and loses energy into space. If more energy is lost into space than is received from the Sun, the planet gets cooler. If it loses less energy than it receives, the planet will warm up.

Clouds play an vital role in the energy cycle.

- Some types of clouds act like giant sun umbrellas, shading the Earth and reflecting the sunlight that hits them.
- Other types of clouds act like a jacket, holding the heat in and preventing it from leaving the atmosphere.

LEARN MORE

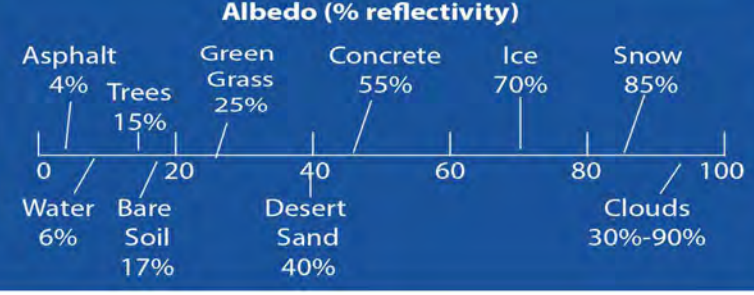
Geography for Kids.com:
www.geography4kids.com/files/cycles_energy.html
Climate.gov:
eo.ucar.edu/educators/ClimateDiscovery/ESS_lesson4_10.19.05.pdf



Earth's surfaces can also reflect solar energy. Albedo is the term scientists use for the amount of light different substances reflect.

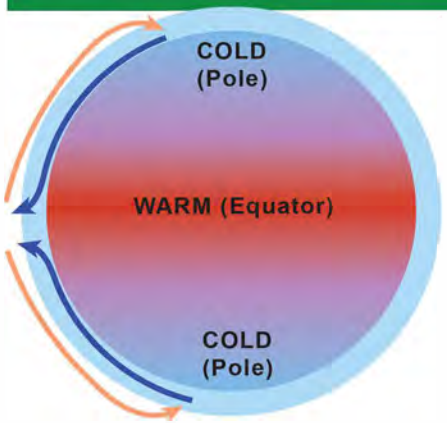
Materials: Sunny day, outdoor space, 6 thermometers, timer, pencil, paper

1. Make sure it is a day with plenty of sunshine.
2. Place each thermometer in one of the following locations in direct sunlight: on or near the edge of blacktop pavement, a grassy area, and on or near a patch of dirt.
3. Place the other three thermometers in one of the following locations in the shade: on or near the edge of blacktop pavement, a grassy area, and on or near a patch of dirt.
4. Write down the starting temperature of each thermometer. Check the thermometers every 2 minutes and record the temperatures. After 10 minutes, record the final temperature of each thermometer.
5. For each location, subtract the starting temperature from the final temperature to see which surface had the biggest temperature change.
6. Rank the surfaces in order from biggest temperature change to smallest temperature change.

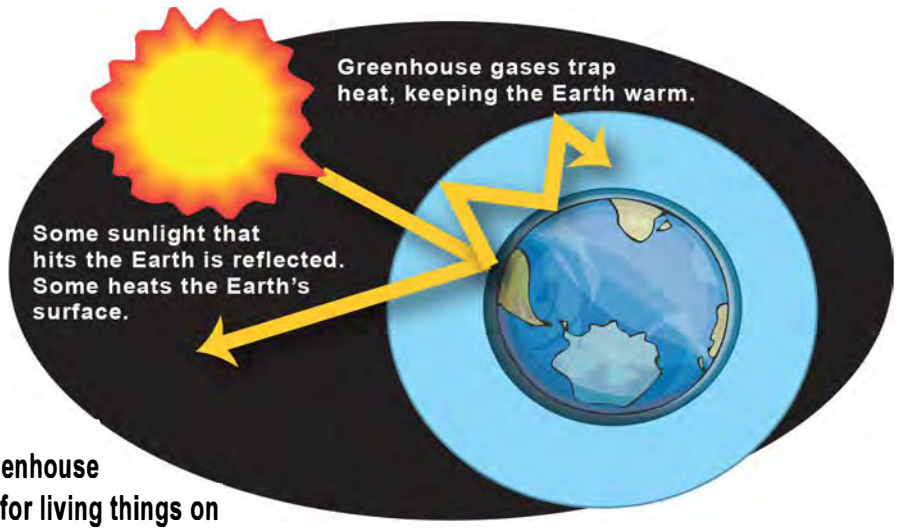


Albedo is measured on a scale of 0-100. 0 means that the surface of a material absorbs all of the sunlight that hits it. 100 means that a material reflects all of the light energy that hits it.

Atmospheric Cycle



The atmosphere is a thin blanket of gases that surrounds Earth and transports heat. Whether it is just a gentle breeze or a hurricane-force gale, Earth's atmosphere is constantly on the move. When the atmosphere moves, it evens out differences in temperature between the chilly poles and the warm equator. Warm air from the equator moves toward the poles and cold air from the poles moves toward the equator.



Greenhouse Effect

The greenhouse effect is a process that occurs when gases in Earth's atmosphere trap the Sun's heat, similar to the glass roof of a greenhouse. Some of the main greenhouse gases in our atmosphere are water vapor, carbon dixoide and ozone.

During the day, the Sun shines through the atmosphere. Earth's surface warms up in the sunlight. At night, Earth's surface cools, releasing heat back into the air. But some of the heat is trapped by the greenhouse gases in the atmosphere and keeps the atmosphere the ideal temperature for living things on Earth.

Let's take a closer look at the greenhouse effect.

Materials: two thermometers, glass vase, clear plastic wrap, recording sheet

1. Lay both thermometers outside in a sunny area for a few minutes.
2. Mark down the time and the temperatures of both thermometers on your record sheet.
3. Place a vase in the sun with a thermometer in it. Cover it with a plastic wrap.
4. Place the second thermometer next to the vase (not in the shade).
5. Record the temperatures on both thermometers every 5-10 minutes.

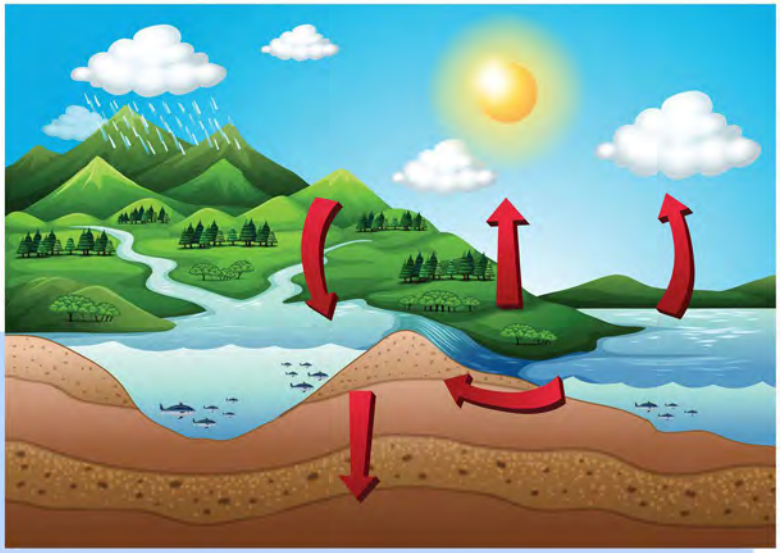
Why are the temperatures inside and outside of the vase different? Solar energy (light) goes inside the vase and is changed into thermal energy (heat). This heat cannot escape the vase. It's trapped, and the air inside of the vase gets warmer and warmer as more light (solar energy) enters the vase. In our experiment, the plastic wrap is trapping the thermal energy.

What traps the sun's thermal energy in the Earth's atmosphere? Greenhouse gases!

LEARN MORE

NASA Climate Kids:
climatekids.nasa.gov
/greenhouse-cards/
EPA: www.epa.gov/
ghgemissions/overview-
greenhouse-gases

Water is always on the move! The Sun's energy causes water to evaporate from oceans and lakes into the atmosphere. Plants and animals also release water vapor into the atmosphere as they breathe. When the atmosphere cools, water vapor condenses; making clouds that might produce rain or snow. Water has been recycled in its different forms as ice, liquid, or vapor --for more than 3.5 billion years.



Water Cycle in a Bag

Materials: plastic zip-lock bag, permanent markers, water, blue food coloring, clear tape

1. Decorate your bag using permanent markers. Draw the sky in the upper half of the bag. Include clouds and the sun, as they are important parts of the water cycle.
2. Fill a cup with water. Add a couple of drops of blue food coloring to make the water easier to see.
3. Carefully pour the water into the plastic bag and zip it closed. Make sure it's tight! You don't want any water to escape.
4. Hang up the bag on a window that gets lots of sunshine. Cut two long strips of tape and stick them to the corners of your bag. Press the tape tightly to the window, making sure it's well attached. You don't want your bag to fall down.
5. Wait a couple of hours and check on your experiment.

Eventually you will begin to see droplets of water sticking to the side of the bag. Some drops will be high (in the clouds) and some will fall back down to the bottom of the bag like rain.

Why is this happening? It's because the water in the bag is being heated up against the sunny window. That water turns into a gas through the process called evaporation. In nature, evaporated water vapor goes into the atmosphere, but in our bag, it has nowhere to go, so it ends up sticking to the sides of the bag, turning back into a liquid as condensation. That condensed water then slides back into the pool of water below as "rain".

Keep checking back on your experiment a few times a day, or anytime it's sunny to see the water cycle progress!

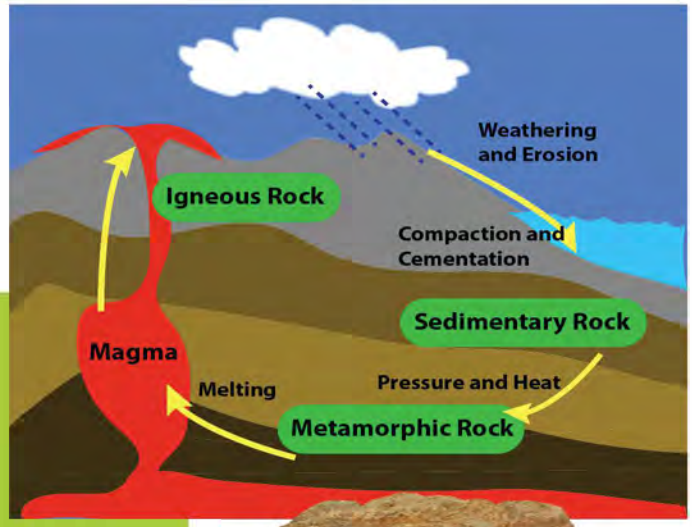
LEARN MORE

USGS Water Cycle for Kids:water.usgs.gov/edu/watercycle-kids-adv.html
NASA Precipitation Education: pmm.nasa.gov/education/water-cycle

Earth's Rock Cycle

A rock is made up of a bunch of different minerals. Scientists classify rocks by how they were made or formed. There are three major types of rocks: metamorphic, igneous and sedimentary.

Each of these rocks can change into the other kinds by physical processes: cooling, melting, heat, weathering/erosion, compacting (squeezing tightly together), cementing, and pressure.



Metamorphic Rocks

Metamorphic rocks are igneous or sedimentary rock that has been heated and squeezed. Metamorphic rocks can be eroded and weathered into smaller pieces and may become sedimentary rocks. If metamorphic rocks are melted, they become magma and when cooled become igneous rocks.

Igneous Rocks

Igneous rock is cooled and hardened magma. They can be formed either above the ground or below the ground. If eroded, igneous rocks are broken into sediments and may become sedimentary rocks. If they are squeezed and heated deep within the earth, they may become metamorphic rocks.

Sedimentary Rocks

Sedimentary rock is sediments that have compacted and glued together by minerals that are carried between the sediment pieces by water. When the water evaporates, the mineral gets left behind and glues the sediments together into sedimentary rock. Sedimentary rocks can be eroded and become sediments or they can be pressurized into metamorphic rock.

These changes to rocks in the rock cycle can occur in different orders. The cycle goes on forever.

Sandstone (Sedimentary)

Basalt (Igneous)

Gneiss (Metamorphic)

Starburst® Rock Cycle

Materials: Starburst® candy, zip-lock bag, small cup, plastic knife, plate, microwave (blow dryer will work)

1. Cut one of each color Starburst into fourths. These will be sediments.
2. Compact the pile of Starburst sediments together. (Don't squeeze them yet!) These show the process of making a sedimentary rock.
3. Apply heat and pressure to the "Sedimentary Starburst Rock." Put the rock in the bag and use your hands to squish them around. This shows the process of making a metamorphic rock.
4. Place the "Metamorphic Starburst Rock" on plate and heat in the microwave for 30 seconds to turn the metamorphic rock into magma. (The candy will be hot. Be careful!)
5. Cool the Starburst magma. This is the process of making an igneous rock.
6. Break the Starburst Igneous Rock into pieces. You have eroded the igneous rock into sediments and you can begin the Rock Cycle again.

LEARN MORE

Ducksters Education Site: https://www.ducksters.com/science/rocks.php

Mineralogy4Kids: http://www.mineralogy4kids.org/?q=rock-cycle

The ocean water is in constantly in motion. It's like a global conveyer belt that moves water and heat around the Earth.

A large movement of water in one direction is a current. The largest currents shape the Earth's global climate patterns by moving heat around the world.

Currents start to move because of differences in temperature and saltiness in the oceans. The oceans are mostly composed of warm, salty water near the surface over cold, less salty water in the ocean depths. These two regions don't mix except in certain special areas, which creates a large slow current called the thermohaline circulation. Scientists refer to this system as the Global Conveyer Belt.

Water that is warmed at the sea surface near the equator moves toward the chilly poles. Cold, salty currents sink into the deepest parts of the sea. This deep water moves horizontally until it can find an area on the world where it can rise back to the surface and close the current loop. This usually occurs in the oceans near the Equator. The Global Conveyer Belt moves a lot of water--more than 100 times the flow of the Amazon River.

The conveyor belt is a vital part of the global ocean nutrient and carbon dioxide cycles. Warm surface waters are depleted of nutrients and carbon dioxide, but they are enriched again as they travel through the conveyor belt as deep or bottom layers. The base of the world's food chain depends on the cool, nutrient-rich waters that support the growth of algae and seaweed.

This graphic shows the path of the global conveyer belt. The blue arrows indicate the path of deep, cold, dense water currents. The red arrows indicate the path of warmer, less dense surface waters. It is estimated that it can take 1,000 years for a "parcel" of water to complete the journey along the global conveyor belt. Graphic: National Ocean Service, NOAA

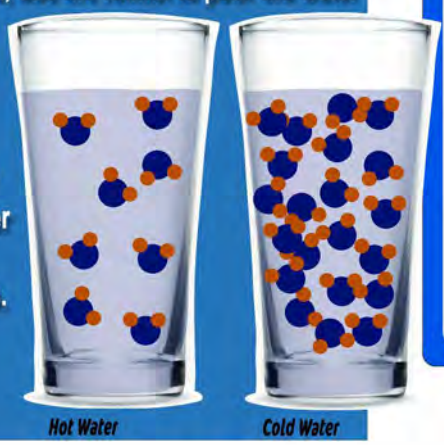
See How Currents Form

Materials: Red balloon, blue balloon, deep, clear container, water ice, microwave, funnel

1. Chill some water with ice. When the ice has melted and the water is cold, use the funnel to pour the water into the blue balloon.
2. Heat some water in the microwave (ask an adult to help). Using the funnel, carefully pour the hot water into the red balloon.
3. Fill the clear container with hot temperature water.
4. Gently place the balloons into the clear, deep container. What happens?

The red balloon with hot water will float above the balloon with cold water because it is less dense. This is why it's often more comfortable to swim along the surface of a lake rather than dive down to the colder depths.

In polar regions warmer water will float above colder water. The colder water sinks. This is the way the Global Conveyer Belt begins.



LEARN MORE

National Geographic: https://www.nationalgeographic.org/media/global-conveyor-belt/

NOAA:https://oceanservice.noaa.gov/education/tutorial_currents/05conveyor2.html

Carbon Cycle

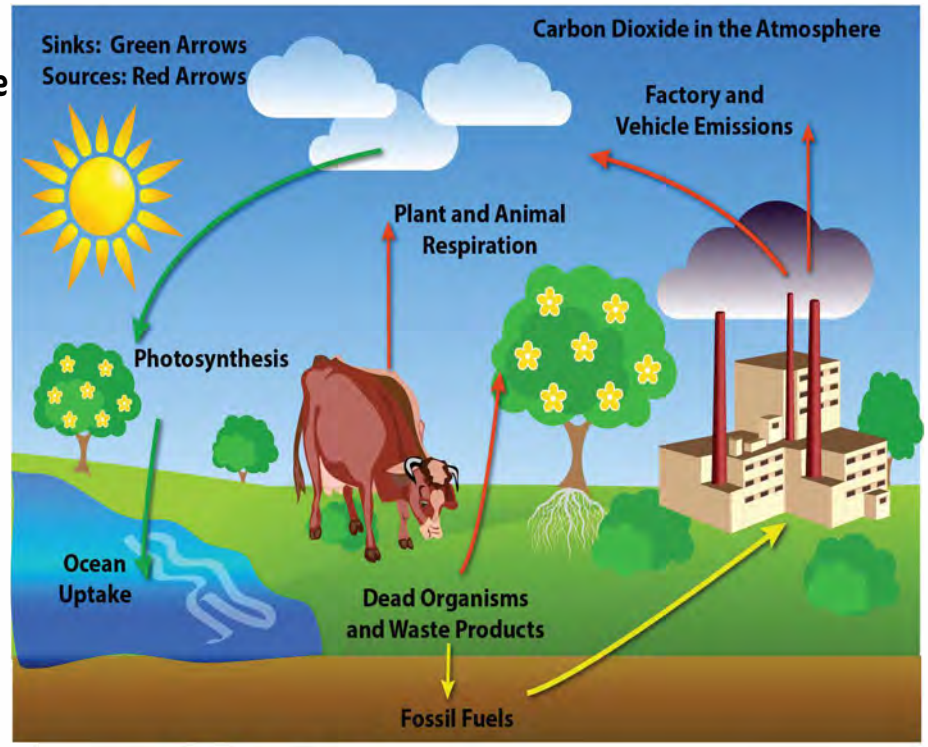
All living things are made of carbon. Carbon is also a part of the ocean, air, and even rocks. Because the Earth is a dynamic place, carbon does not stay still. It is on the move!

The carbon cycle traces carbon's path from the atmosphere, into living organisms, then turning into dead organic matter, going into the oceans, and back into the atmosphere.

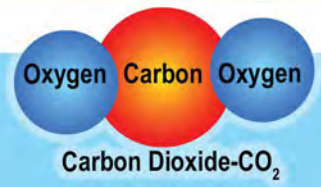
Carbon exists naturally in the Earth's atmosphere primarily as the gas carbon dioxide (CO_2). Plants use carbon dioxide in photosynthesis. Carbon becomes part of the plant. Plants that die and are buried may turn into fossil fuels made of carbon like coal and oil over millions of years. All that carbon stored in all those plants and animals over all those years gets pumped back into the atmosphere when fossil fuels are burned in a much shorter time.

Scientists describe the cycle in terms of sources (parts of the cycle that add carbon to the atmosphere) and sinks (parts of the cycle that remove carbon from the atmosphere).

The key to keeping everything in balance is for the sources (red arrows) and sinks (green arrows) to have the same amount of carbon dioxide.



Carbon Dioxide



Carbon Dioxide-CO_2

Carbon dioxide is a colorless, odorless gas. It's what makes soft drinks fizzy and makes up the air you breathe out. Let's find out more about the carbon dioxide you exhale.

Materials: shredded red cabbage, 2 cups water, stove top, 2 small plastic cups, straw

1. Make red cabbage juice by boiling the shredded cabbage and water for 10 minutes. The juice should be purple. You have just made a pH indicator. The cabbage juice turns blue if exposed to a basic substance, but it turns pink when exposed to an acid.
2. Put 1 teaspoon of cabbage juice into a small plastic cup labeled "Control" and another teaspoon into a cup labeled "Test."
3. Put the straw into the Test cup. Blow through the straw for a few minutes. Did the cabbage juice change color? From the color change, can you decide if carbon dioxide is an acid or a base?
4. Test this theory further by adding carbonated water to another cup of cabbage juice.

LEARN MORE

NASA Earth Observatory:
https://earthobservatory.nasa.gov/features/CarbonCycle

Teach Engineering:
https://www.teachengineering.org/lessons/view/cub_carbon_lesson01

Earth's Nitrogen Cycle

Nitrogen is an element that is found in both the living portion of our planet and the inorganic parts of the Earth system. Living things cannot exist without nitrogen. Nitrogen atoms slowly cycle between living things, dead things, the air, soil and water. These movements are called the nitrogen cycle.

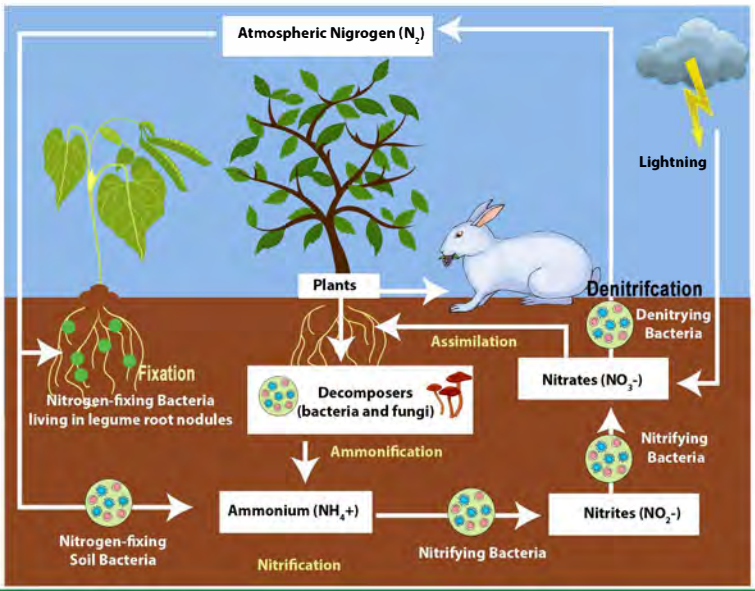
Fixation: Most of the nitrogen on Earth is in the atmosphere. Even though there is an abundance of nitrogen available, the most common form of nitrogen (N_2) cannot be used by plants. Fixation is the first step in the process of making nitrogen usable by plants. Here bacteria change nitrogen into ammonium. Lightning can also add nitrogen to the soil.

Nitrification: This is the process by which ammonium gets changed into nitrates by bacteria. Nitrates are what the plants can then absorb.

Assimilation: This is how plants get nitrogen. They absorb nitrates from the soil into their roots. Then the nitrogen gets used in amino acids, nucleic acids, and chlorophyll.

Ammonification: This is part of the decaying process. When a plant or animal dies, decomposers like fungi and bacteria turn the nitrogen back into ammonium so it can reenter the nitrogen cycle.

Denitrification: Extra nitrogen in the soil gets put back out into the air. There are special bacteria that perform this task as well.



Plants Need Nitrogen

Although nitrogen is the most abundant element in the air we breathe, that form of nitrogen cannot be used by plants. Nitrogen contained in fertilizer, on the other hand, is readily taken up by plants.

Materials: 8 small plant pots, potting soil, packet of seeds, commercial nitrogen fertilizer for house plants (e.g., Miracle Gro or equivalent), bottle for mixing nitrogen fertilizer.

1. Make sure pots have holes in the bottom to allow the roots to "breathe" and excess water to drain.
2. Measure equal amounts of soil into each of the pots.
3. Moisten the soil in each pot with the equal amounts of water.
4. Label four pots with "nitrogen fertilizer" and four pots with "no nitrogen added."
5. Plant seeds in each pot according to seed packet instructions.
6. Place plants near a sunny window or under a grow light.
7. Check your plants regularly and water when needed. Soil should be kept moist.
   - Water the "no nitrogen added" pots with regular water.
   - Water the "nitrogen fertilizer" pots with water mixed with nitrogen fertilizer. Follow the fertilizer manufacturer's recommendations for preparing this solution.
   - All plants should receive the same amount of liquid at each watering.
8. Every 3 days, record observations on the growth of the plants (e.g., height, number of leaves, color of leaves).

LEARN MORE

Frontiers for Young Minds, What Is the Nitrogen Cycle and Why Is It Key to Life?: https://kids.frontiersin.org/article/10.3389/frym.2019.00041

Human Impact

Humans can have major impacts on all the spheres.

Negative impacts, such as burning fossil fuels, pollute the atmosphere. Piling up our waste in landfills affects the geosphere. Pumping waste into the oceans harms the hydrosphere. And overfishing and habitat destruction can reduce the diversity of living things in the biosphere.

However, people everwhere are working to change things. Recycling efforts are increasing all over the world, and companies are finding new ways to reduce fossil fuels. In the US alone, people are recycling six times more than a generation ago.

REDUCE REUSE RECYCLE = for a HEALTHIER EARTH

Have you ever heard the term the "3Rs"? 3Rs refers to three terms: Reduce, Reuse, and Recycle. The 3Rs are ways we can all help Earth's spheres stay healthy and balanced.

- **Reducing** is reducing the amount of materials and goods we consume and cutting back on the amount of trash we make.
- **Reusing** is the act of taking old items that you might consider throwing away and finding a new use for them.
- **Recycling** is using trash to remake new goods that can be sold again.

Reduce, Reuse, Recycle Sort

Place the different types of waste into categories: Reduce, Reuse or Recycle. You can put the same item in more than one cateogory).


Water Bottle


Glass Jar


Old Clothes


Cloth Bag


Notebook


Batteries


Tire


Book


Paper Bag


Plastic Bag

GARBAGE

The world throws away over **750 million** tons of garbage each year

51 billion plastic bottles are used every year, only 1 in 5 are recycled

70% of garbage can contents can be recycled

The average family throws away **6 TREES** worth of paper per year

LEARN MORE

Your Plan, Your Planet: www.yourplanyourplan-et.sustainability.-google/

Weather or Climate?

Climate is what you expect. Weather is what you get.

Weather describes the conditions outside right now in a specific place. For example, if you see that it's raining outside right now, that's a way to describe today's weather. Rain, snow, wind, hurricanes, tornadoes – these are all weather events.

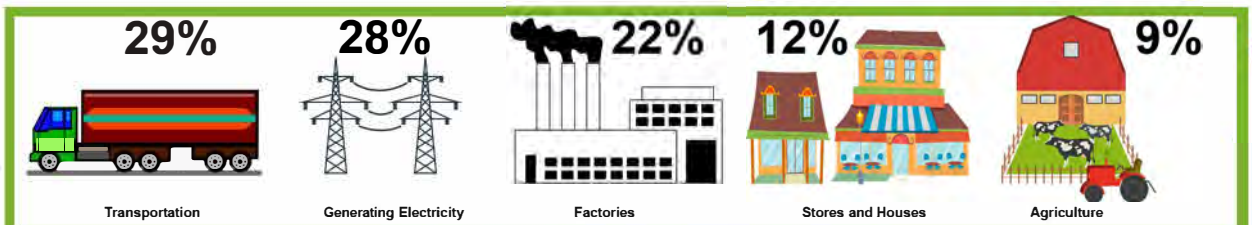
Climate is more than just one or two rainy days. Climate describes the weather conditions that are expected in a region at a particular time of year. A region's climate is determined by observing its weather over a period of many years—generally 30 years or more.

What is Climate Change?

Climate change describes a change in the average conditions — such as temperature and rainfall — in a region over a long period of time. NASA scientists have observed Earth's surface is warming, and many of the warmest years on record have happened in the past 20 years. (NASA.gov)

Earth's climate has constantly been changing, even long before humans came into the picture. Scientists are not completely sure about what causes climate change. There are lots of factors that contribute to Earth's climate. However, scientists agree that Earth has been getting warmer in the past 50 to 100 years.

Most of the energy we use to make things, keep the lights on and our homes warm, turn on the air conditioning and power transportation, comes from burning fuels like oil, gas and coal. These are called fossil fuels and when they are burned, they release carbon.



Total Greenhouse Emissions by Economic Sector (2017)

When carbon and other greenhouse gases trap heat that would otherwise escape Earth's atmosphere, the planet's temperature rises. This matters because the biosphere, geosphere, hydrosphere, atmosphere and energy from the Sun all have an effect on one another. The combined effects of all these things give us our global climate. In other words, Earth's climate functions like one big, connected system.

LEARN MORE

What is your carbon footprint? www3.epa.gov/carbon-footprint-calculator/

Climate Kids: https://climatekids.nasa.gov/

What Can I Do?

The following is a list of steps YOU can take to reduce greenhouse gas emissions.

- **Reduce, Reuse, Recycle**: By recycling half of your household waste, you can save 2,400 pounds of carbon dioxide each year.
- **Use Less Heat and Air Conditioning**: Set your furnace 2 degrees lower in winter and higher in summer could save about 2,000 pounds of carbon dioxide each year.
- **Replace Your Light Bulbs:** If every family replaced one regular light bulb with a CFL, it would eliminate 90 billion pounds of greenhouse gases, the same as taking 7.5 million cars off the road.
- **Drive Less:** Walking, carpooling and biking are great ways of reducing greenhouse emissions. Every gallon of gas you save keeps 20 pounds of carbon dioxide out of the atmosphere.
- **Use the "Off" Switch**: Save electricity by turning off lights when you leave a room. And remember to turn off your television and computer when you're not using them. While brushing your teeth, shampooing the dog or washing your car, turn off the water until you actually need it for rinsing.
- **Plant a Tree**: Trees absorb carbon dioxide and give off oxygen. A single tree will absorb approximately one ton of carbon dioxide during its lifetime.
- **Encourage Others to Conserve**: Share information about recycling and energy conservation with your friends and famiy.

Earth Day Pledge

My pledge to the earth...

I WILL _____

_____

_____

I WON"T_____

_____

_____

Signed: _____

Big Questions and Answers

We know that Earth is constantly changing. Some of the changes happen quickly and some of the changes take years to occur. Changes are natural as Earth's spheres recycle their resources. But some changes occur because of decisions we make. You are the future caretakers of our planet and will have to work together to answer some big questions about how to keep our Earth healthy.

Why should I care about the Earth's health?
How does global environmental change affect me?
Do I have to make different choices in my every day routines?
Is there anything I can do to help endangered animals and plants?
How can technology be good for the environment?
How could we start saving paper at school?
What are some ways we could save energy?

You could also:

1. Draw a poster promoting Earth Day. Include a slogan to encourage people to take better care of the Earth.
2. Write down 10 words related to nature, then compose a poem including these words.

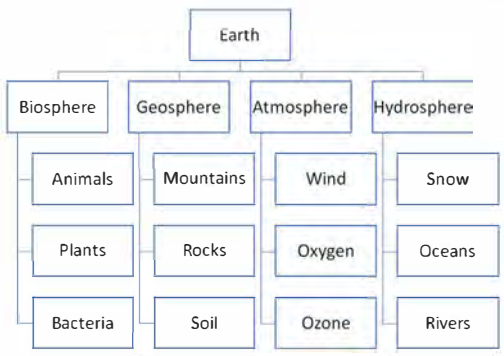
If you have an answer to the above questions, art or poetry you'd like to share with our community, please submit them to alana.jensen@vnsfs.com or mail them to Veolia, 120 Technology Drive, Idaho Falls, ID 83401. Answers will be published on the www.ifearthday.com website. Selected submissions will appear in the Post Register's Ask a Scientist column (Tuesday edition). Thank you for working together to make a better future for everyone!

Answers

Sphere Interactions (Page 2)

Hydrosphere	Water in a lake evaporates.	Atmosphere
Biosphere	Plants absorb water into their roots.	Hydrosphere
Biosphere	Humans breathe in oxygen.	Atmosphere
Hydrosphere	Rivers erode their banks	Geosphere
Atmosphere	Clouds produce rain.	Hydrosphere
Atmosphere	Wind generates ocean waves	Hydrosphere

Spheres Concept Map (Page 3)



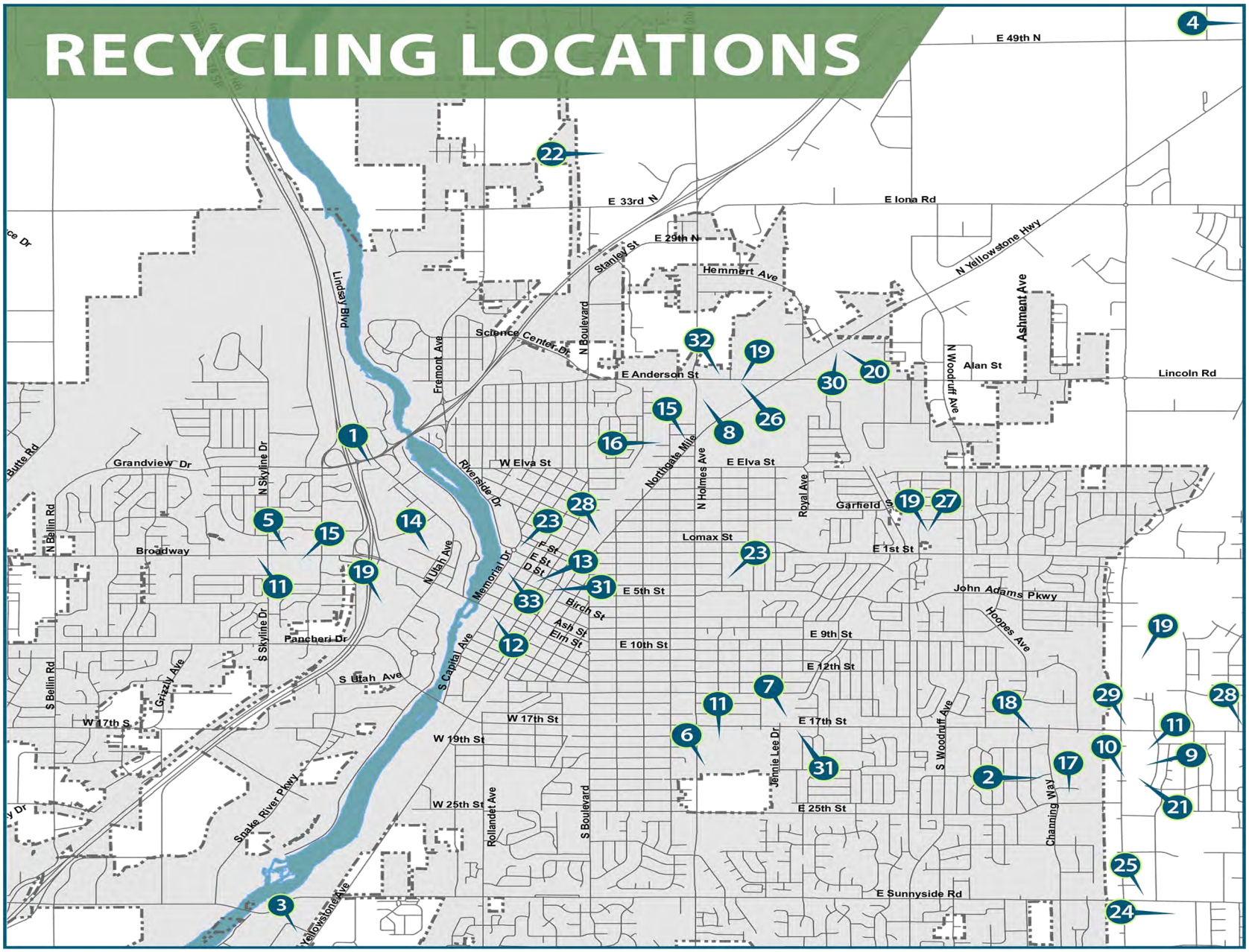
Cause and Effect (Page 4)

1 - C
2 - D
3 - E
4 - B
5 - A

Reduce, Reuse, Recycle Sort (Page 13)

Reduce, Reuse, Recycle Sort
Water Bottle: Reuse, Recycle
Glass Jar: Reuse, Recycle
Old Clothes: Reuse
Cloth Bag: Reduce
Batteries: Recycle
Tire: Reuse, Recycle
Book: Reuse, Recycle
Paper Bag, Reuse, Recycle
Plastic Bag: Reuse, Recycle

RECYCLING LOCATIONS



MATERIALS

BATTERIES (Lead-Acid)

1. Automotive Charging/Starting, *935 Lindsay Blvd*
2. Batteries Plus, *2182 Channing Way*
3. The Battery Guy, *1345 Enterprise St*
4. Start Specialists, *3125 E 49th N*
5. Auto Parts Stores (various, contact first), *1562 W Broadway St | 2517 N Holmes Ave*

BATTERIES (Rechargeable)

2. Batteries Plus, *2182 Channing Way*
6. Home Depot, *2075 S Holmes Ave*
7. Lowe's, *925 E 17th St*
8. Office Max/Depot, *1425 Northgate Mile*
9. Staples, *1999 S 25th E*
10. uBreakiFix, *2003 S 25th E D-2*

BOOKS

11. Albertsons (outside bins 3 locations), *1705 W Broadway St | 590 E 17th St | 1901 S 25th E*
12. Idaho Falls Public Library, *457 W Broadway St*

LOCATIONS & ADDRESSES

Recycle IF

INL Idaho National Laboratory

MATERIALS	LOCATIONS & ADDRESSES
BULBS (CFL/Florescent)	**2.**Batteries Plus, *2182 Channing Way* **6.**Home Depot, *2075 S Holmes Ave* **7.**Lowe's, *925 E 17th St*
CARDBOARD	**13.**City of Idaho Falls(13 locations outside bins), *308 Constitution Way* **14.**Western Recycling (outside bins), *1020 Denver St* **15.**U-Haul, *1091 Northgate Mile | 1545 W Broadway St* **16.**Pacific Steel and Recycling, *1155 N Higbee Ave*
ELECTRONICS	**2.**Batteries Plus, *2182 Channing Way* **17.**Best Buy, *2404 S 25th E* **18.**Cartridge World, *2064 E 17th St #2* **19.**eco ATM (4 locations inside kiosks), *500 S Utah Ave | 333 N Woodruff Ave |1555 Northgate Mile | 1201 S 25th E* **20.**ECyclers, *1976 N Yellowstone Hwy* **7.**Lowe's, *925 E 17th St* **8.**Office Max/Depot, *1425 Northgate Mile* **9.**Staples, *1999 S 25th E* **21.**Target, *2171 S 25th E* **10.**uBreakiFix, *2003 S 25th E D-2* **16.**Pacific Steel and Recycling, *1155 N Higbee Ave*
INK CARTRIDGES/ TONER	**18.**Cartridge World, *2064 E 17th St #2* **20.**ECycler, *1976 N Yellowstone Hwys* **8.**Office Max/Depot, *1425 Northgate Mile* **6.**Home Depot, *2075 S Holmes Ave* **9.**Staples, *1999 S 25th E* **21.**Target, *2171 S 25th E*
GLASS	**13.**City of Idaho Falls (13 locations outside bins), *308 Constitution Way* **21.**Target, *2171 S 25th E*
HAZARDOUS WASTE	**22.**Bonneville Cty Transfer Station, May 19 & Sept 12, 2020 *3690 Recycle Road*
PAPER	**14.**Western Recycling (outside bins), *1020 Denver St* **23.**Post Office (customers only inside bin), 875 N Capital Ave | 605 4th St **12.**Idaho Falls Public Library (for shredding only), *457 W Broadway St*
PLASTICS (#1& 2)	**14.**Western Recycling (outside bins), *1020 Denver St* **21.**Target (#'s 1-7), *2171 S 25th E*
PLASTIC BAGS/FILM	**11.**Albertsons (3 locations inside bins), *1705 W Broadway St | 590 E 17th St | 1901 S 25th E* **24.**Broulim's (2 locations inside bins), *2730 E Sunnyside Rd* **25.**Kohl's, 3175 S 25th E **21.**Target, *2171 S 25th E* **26.**Fred Meyer, *1555 Northgate Mile* **27.**WinCo, *333 N Woodruff Ave*
SCRAP METAL	**17.**Best Buy (appliances, *2404 S 25th E*) **16.**Pacific Steel and Recycling, *1155 N Higbee Ave* **14.**Western Recycling, *1020 Denver St*
TIN/ALUMINUM	**13.**City if Idaho Falls (9 locations outside bins), *308 Constitution Way* **14.**Western Recycling (outside bins), *1020 Denver St* **16.**Pacific Steel and Recycling, *1155 N Higbee Ave* **21.**Target, *2171 S 25th E*
TIN/ALUMINUM	**28.**Big O, *265 Northgate Mile | 3193 E 17th St* **29.**Discount Tire, *2523 E 17th St* **30.**Fred and Wayne's, *1970 N Yellowstone Hwy* **31.**Les Schwab, *210 Constitution Way | 970 E 17th St* **32.**Jack's Tire and Oil, *595 E Anderson St | 4490 Andco Dr*
UNUSED/ DISCARDED MEDS	**33.**Bonneville Cty Law Enforcement, *605 N Capital Ave*
CHRISTMAS TREES	**13.**City of Idaho Falls (seasonal), *308 Constitution Way*

Curbside Recycling Providers

Note: Due to international ban on importing certain materials, most locations no longer accept plastics #3-7.

Area Curbside recycling programs:

Ammon, Idaho Falls, and Rigby (and some surrounding areas)

Western Recycling 529-9908
www. westernrecycling.net
Email: curbside@westernrecycling.net
$7/month residential – newspapers, magazines, paper, cardboard, #1&2 plastic, aluminum, tin.

City of Chubbuck 237-2400
cityofchubbuck.us/streets-sanitation/
$5/month – All paper, cardboard, #1&2 plastic, aluminum, tin.

Blackfoot, Firth, Snake Rivrer area Bingham Curbside Recyclers 681-8597
$5.50/month – Paper, cardboard, plastic, aluminum, tin.

City of Pocatello 234-6192
pocatello.us/395/Recycling-Programs
Email: pocatellorecycles@pocatello.us
Included in City garbage service – paper, Newspaper, magazines, cardboard, #1&2 plastic, aluminum, tin.

** Locations provided as information only. Listing does not indicate endorsement of listed business. Subject to change. All City locations now have bins to accept glass bottles for recycling.*

What can I do at home?

Unplug batter chargers or power adaptors, or plug TVs and radios into a power strip and turn off when not in use.

Check air filters and replace as needed.

Install a programmable thermostat (could save about $175/yr).

Seal outlets and electrical boxes on outside walls with outlet gaskets.

Plant trees or shrubs around windows to block heat in summer and insulate in winter.

Set your water heater to 120°F or less.

Ride a bus or a bike to school, or carpool.

Plan your errands to reduce trips.

Recycle.

Wash only full loads of dishes & clothes.

In winter, open south facing window coverings during the day and close at night.

Install insulation: energy-efficient appliances, windows or doors, or renewable energy systems (see energystar.gov/taxcredits for tax credit info).

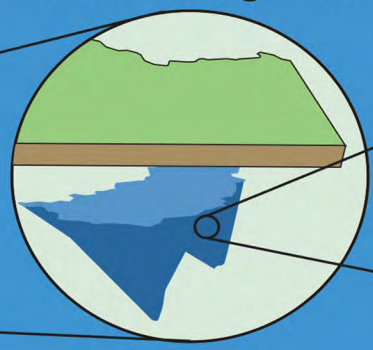
Replace incandescent light bulbs with CFL or LED bulbs and turn off when not in use.

"Your Planet Needs You"

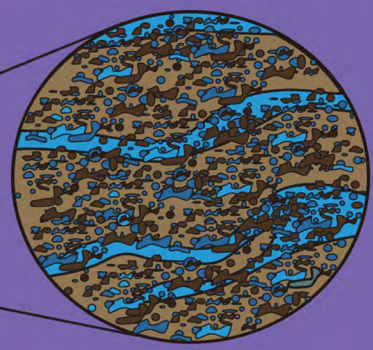
Protecting Our Water is Critical

IDAHO's Snake River Plain Aquifer

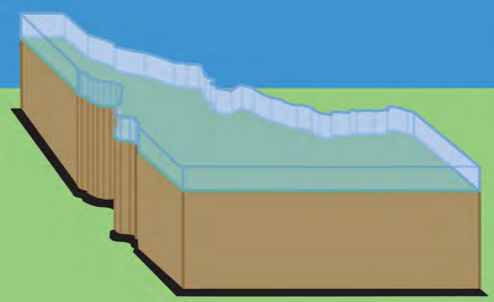
The Snake River Plain Aquifer is a large body of water located underground.



This water surrounds, layers of rock, stones, sand and soil.



The aquifer contains enough water to cover Idaho with 4 to 5 1/2 feet of water.



4 feet of water is enough water to reach the nose of an average 10 year old.

Sometimes bad things get into the water and need to be removed.

Part of Fluor Idaho's mission is to ensure the water in the aquifer is safe.

This ensures clean water for now and in the future.

Fluor
IDAHO

Visit Fluor Idaho's booth at the earth day celebration to learn more about protecting the aquifer.

The Idaho Snake River Plain Aquifer contains 200,000,000 to 300,000,000 acre feet of water.
The State of Idaho has a total of 54,484,851 acres of land and water.

G2697A

ROCKY MOUNTAIN ADVENTURE SUMMER CAMPS

MUSEUM of IDAHO

CAMPS FOR KIDS

Jr. Adventure Camp
Ages 6–10
July 27–30, 9am–12pm

Original Adventure Camp
Ages 10–13
July 6–9, 9am–4pm

High Adventure Camp
Ages 12–16
July 13–16, 9am–4pm

CAMPS FOR EDUCATORS

Habitat Contrasts
June 29–30, 1 Credit

Geology
July 1–2, 2 Credits

Astronomy
July 20–21, 1 Credit

Scholarships are available for kids camps!

VEOLIA

Come Hang with Our Gang!

Student Challenge

Identify the main idea and supporting details in the paragraphs below.

IDAHO FALLS ZOO AT TAUTPHAUS PARK

www.idahofallszoo.org

African, or black-footed penguins are native to the coast of South Africa and most endangered penguin species. They are carnivores that feed mainly on fish like sardines, anchovies, mackerel, herring and have been known to also eat squid and crustaceans.

Commercial over-fishing, loss of nesting sites, and people collecting their eggs for food has caused the wild African penguin popoulation to drop over 70% in the last 20 years.

Your Idaho Falls Zoo has 17 African penguins and works with other zoos and aquariums, as well as SANCCOB, a conservation organization in Cape Town, to save these magnificent birds from extinction.

Benefits of Growing and Protecting Trees

ASK A SCIENTIST

What is the Biggest Insect?
How Do Birds Fly?
Why Does Sound Travel Better in Water?

It's time to ask those burning science questions! We've assembled a panel of local scientists who are ready and willing to answer your questions. A featured question will be highlighted in the Ask a Scientist column in the Post Register each Tuesday.

HAVE A QUESTION?

E-mail your questions to Ask a Scientist at alana.jensen@vnsfs.com

Check out our idahoaskascientist.com blog for past questions and fun activities.

www.idahoeser.com

NEWSPAPER IN EDUCATION
Post Register

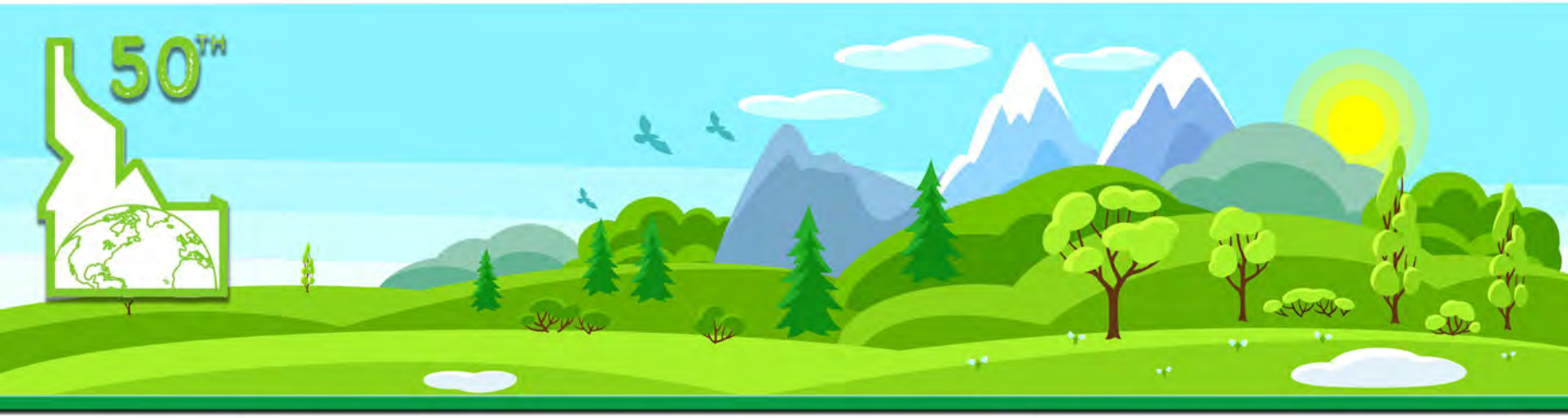
ESER
Environmental Surveillance, Education, and Research Program

VEOLIA

Is feeding birds in the winter good or bad for the birds?

Question Answered by Dr. Chuck Trost, ISU Emeritus Professor

As long as the feeders are clean, the food gives birds the energy to survive during a stressful period. Personally I feed birds because I like to watch them. I'll have to admit that it does concentrate them, and predators such as cats and hawks can prey on them. But all in all, bird feeding provides an educational opportunity for the person feeding, as well as their children.



Earth DAY

Idaho Falls Earth Day Celebration Goes Digital!

Due to the COVID-19 pandemic, events for the 50th anniversary of Earth Day will be digital.

Education Resources for School or Home

Big Questions Activity
Check out Page 16
for details.
Earth Day packet created by
INL ESER Program

CELEBRATE April 20-25

#IFEARTHDAY

Facebook: Idaho Falls Earth Day Celebration
Instagram: @ifearthday

YouTube: Idaho Falls Earth Day Celebration
SnapChat: ifearthday70

Earth Week Activites

Monday: E-Critical Mass Race
Tuesday: Podcast
Wednesday: Art Day
Thursday: Symphony Live
Friday: Book Night
Saturday: Plogging Race & Earth Day FaceBook Fair

WWW
IFEarthDay.com

Idaho Falls Earth Day Celebration Made Possible by:

Idaho Falls EARTH DAY
EASTERN IDAHO Environmental Education Association
IDAHO FALLS ZOO AT TAUTPHAUS PARK
IDAHO FALLS
IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY
SANDHILL MEDIA GROUP
99 KUPI
ARROW 107.1
100.7 MYfm TODAY'S BEST MUSIC
PR Post Register
Local • Proven • Essential
INL Idaho National Laboratory
Fluor IDAHO
VEOLIA
MUSEUM of IDAHO
NORTHWIND A CIRI COMPANY
NEWSPAPER IN EDUCATION
ne Post Register