Top 40 Hits of Planet Earth

Everyday is Earth Day in agriculture. American farmers are stewards of the land. They realize without a healthy Earth, they could not provide us with the safest, most abundant, and most affordable food supply in the world.

Everyday should be Earth Day for all people. It is everyone's responsibility to care for the Earth. Each of us can make a difference.

Dig Deeper:

http://www.americasfarmers.com

How About...Some Food for Thought (video)

Earth Day

Your Way

The <u>Top 40 Hits of Planet Earth</u> is a compilation of 40 great environmental activities and lessons that celebrate the planet Earth.

These activities include lessons about soil, water, recycling, trees, renewable energy, habitats, and more. Each Top 40 Hit will have book suggestions, as well as any websites, videos, Ag Mags or other resources that may complement that Top 40 Hit. The number "40" was chosen in honor of Earth Day's 40th Anniversary on April 22, 2010.

Top 40 Hits of Planet Earth

Hits 1 – 12 = All Around Hits **Hits 13 – 14 = Energy** **Hits 15 – 19 = Recycling**

Hits 20 – 25 = Soil **Hits 26 – 31 = Trees** **Hits 32 – 40 = Water**

Hit #1

EARTH DAY BRACELET

Objective: Students will learn about the 'circles of the Earth.'

Illinois State Goals: 12.A., 12.B., 12.E., 12.F.

Top Book Hits:
Earth Day – Hooray! by Stuart J. Murphy; **ISBN-13:** 978-0060001292
Earth Where Would We Be Without It? by Kathleen W. Kranking;
ISBN-13: 978-0307131720

Materials Needed (1 each per student):

- 12" – 14" brown leather strap
- Clear adjuster pony bead — People
- Blue pony bead — Water
- Green pony bead — Plants
- Brown pony bead — Soil
- Orange pony bead — Day
- Black pony bead — Night
- White pony bead — Air
- Yellow pony bead — Sun

Procedure:

1. Tie a knot on one end of the leather strap at about 4" – 5". String the colored beads to represent the circles of the Earth. Take the end of the leather strap without a knot and lace it through the clear "People" bead. Tie a knot at the end. (Now your clear "People" bead is an adjuster for the bracelet.)
2. People move in circles. The earth provides us with everything we need to survive. We must take care of our valuable resources.
3. Water is a circle. Water rains down on land. Water collects in oceans, rivers, lakes, and streams. It evaporates back up into the sky and collects in clouds. The clouds become heavy, and rain falls down to the land again.
4. Plants and soil are circles. Plants grow from soil. Plants provide food for animals. Animals provide food for other animals. Animals die and decompose. New soil is made. New plants grow.
5. Earth is a circle. Earth is spinning through space, rotating on its axis, revolving around the sun. The Earth and sun give us the circle of the seasons and the circle of night and day.
6. Air is a circle. Animals breathe in oxygen and exhale carbon dioxide. Plants take in carbon dioxide, use it to make food, and give off oxygen. Animals breathe it in again.
7. The sun is a circle. The sun provides warmth and light for all the Earth's circles. Without the sun, plants and animals would not survive. The sun binds us together.

Explore More: Earth Day bracelet illustration www.agintheclassroom.org
The Sun's Chorus: Celebrating Sun, Air, Water & Soil CD by David and Sarah Stokes

Give credit where credit is due…this activity came from Illinois Agriculture in the Classroom.

Hit #2

Earth Day Catch Ball

Objective: Students will learn more about Earth Day.

Illinois State Goals: 11.B., 17. C.

Top Book Hits:
Everything Kids' Environment Book by Sheri Amsel; **ISBN-13:** 978-1598696707
Earth Care by Margaret Read McDonald; **ISBN-13**: 978-0874837841

Earth Book for Kids: Activities to Help Heal the Environment by Linda Schwartz;

ISBN-13: 978-0881601954

The New 50 Simple Things Kids Can Do to Save the Earth by Sophie Javna;

ISBN-13: 978-0740777462

Materials Needed:
- Beach ball with numbers 1-40 written on it randomly
- List of the following 40 questions (elementary and intermediate set provided)

Procedure:
1. Toss the beach ball with numbers around the room, when a student catches the ball have him/her say the number where his/her left thumb lands.

2. Ask that question number to the student.

3. Then the student tosses the ball to another classmate.

4. Repeat steps 1-3 until all 40 questions have been answered.

Give credit where credit is due…inspired by a project from Resourcefulschools.org.

Earth Day Catch Ball Questions

Elementary:

1. When was the first Earth Day celebrated?
   1970

2. What is Earth Day?
   Earth Day is an opportunity for people to express concerns about the environment and is often used for special activities.

3. What is a habitat?
   Food, water, shelter and living space for plants or animals.

4. Are dinosaurs extinct or endangered?
   Extinct

5. Every food chain begins with the _____.
   Sun

6. The EPA is a government agency. What do the letters stand for?
   Environmental Protection Agency

7. What was the first national park?
   Yellowstone

8. What is the difference between renewable and nonrenewable resources?
   A renewable resource is capable of being replaced such as trees, corn and soybeans which can be grown. Nonrenewable resources cannot be replaced such as coal and petroleum/oil.

9. What part protects the seed?
   Seed coat

10. What does the earth revolve around?
    Sun

11. What do humans breathe?
    Oxygen

12. What does a plant need in order to grow?
    Water, warmth, light, space/soil/something to grow in, time

13. True or false -When making mini-worm bin, be sure to feed the worms lots of meat and dairy products.
    False - These type of products will cause your worm bin to have an unpleasant odor.

Give credit where credit is due…inspired by a project from Resourcefulschools.org.

14. True or False Petroleum is a renewable resource.
    False – Petroleum is a fossil fuel. Once it is gone, it is gone forever.

15. Name one way that you can save energy at home. ***Answers may vary.***
    Shut off the lights when I leave the room; Do not stand with the refrigerator door open while I decide what to eat.; Use rechargeable batteries.; Replace old incandescent light bulbs with the Compact Fluorescent Lights.

16. What type of energy uses water to generate electricity?
    Hydropower

17. What crop grows in Illinois and is used to produce ethanol?
    Corn

18. True or False Wind is a non-renewable energy source.
    False – Wind is a renewable energy source.

19. What do the "3 R's" stand for?
    Reduce – Reuse – Recycle

20. Why is it important to recycle?
    To save natural resources and save landfill space

21. Name something that can be recycled.
    Aluminum cans, glass, paper, plastic, cardboard, etc.

22. True or False Glass bottles can be recycled.
    True – Glass bottles are recycled and made into new glass bottles. Glass can also be recycled into dishes, jewelry, drinking glasses, and more.

23. True or False One way I can "reuse" an item is to use both sides of a sheet of paper.
    True – Use the back side for scratch paper

24. What can you do with the Sunday comics rather than just throwing them away?
    The Sunday comics can be put into the recycle bin or they can be re-used as wrapping paper for gifts.

25. What is it called when soil is moved from one place to another?
    Erosion

26. How long does it take an inch of top soil to form?
    500 years

Give credit where credit is due…inspired by a project from Resourcefulschools.org.

27. Which soil particle is the largest – sand, silt or clay?
    Sand

28. Tell 2 reasons why trees are good for our earth.
    They provide oxygen for the air, habitat for animals, hold the soil in place, provide a wind block, provide wood for building materials, etc…

29. What is paper made out of?
    Trees

30. Why are leaves important to the tree?
    They make food for the tree.

31. What is a tree cookie?
    A cross section of the tree showing the growth rings.

32. Why is the bark of a tree important?
    Protection

33. Name 3 foods we can get from trees.
    Apples, oranges, figs, olives, kiwi, walnuts, almonds, cherries, peaches, pears, cocoa, maple syrup, etc.

34. Name 3 parts of a tree.
    Leaves, bark, roots, flowers, fruits, seeds, sap

35. Name something that can be made from trees.
    Furniture, paper, houses, etc.

36. Name one way that you can save water. ***Answers may vary.***
    Turning off water when brushing teeth

37. Is there more land or water on earth?
    Water

38. What is the geographic area water drains to called?
    Watershed

39. What are the 3 states of matter?
    Solid, liquid & gas

40. Name a form of precipitation.
    Snow, rain, sleet

Intermediate:

1. Why is habitat important to an animal?
   All the animal's needs are met in their habitat.

2. Give 2 examples of non-renewable resources.
   Petroleum and minerals

3. What is a landfill?
   A site for the disposal of waste materials by burial.

4. Who coordinated the first Earth Day celebration?
   Denis Hayes

5. Name an activity appropriate for Earth Day.
   (answers will vary) Earth Day is an opportunity people often use to share environmental information in the media and schools, plant trees, clean up the environment, recycle, encourage others to be good environmental stewards.

6. In 1974 what act was passed requiring the Environmental Protection Agency to regulate the quality of public drinking water?
   Safe Drinking Water Act

7. When was the first national park named and what was it?
   1872 - Yellowstone

8. Name two examples of renewable resources.
   Trees, corn and soybeans (answers will vary)

9. Where does a seed store its food?
   Cotyledons

10. What is photosynthesis?
    The process which plants that contain chlorophyll make food with energy from the sun

11. How much of the earth is covered by water?
    75%

12. Give an example of a food chain with at least 4 steps.
    Answes may vary. Example: Sun, grass, mouse, snake, owl

13. The earth rotation on its _____ causes night and day.
    Axis

14. What do plants take in and animals exhale?
    Carbon dioxide

Give credit where credit is due…inspired by a project from Resourcefulschools.org.

15. What can be done with certain food wastes, wood chips, grass clippings, shredded newspaper, leaves and other organic materials rather than sending them to a landfill?
These items can be composted.

16. What causes the seasons?
Earth's rotation around the sun

17. _____ are a row(s) of trees, planted on the prevailing wind side of a home, to help reduce the force of the wind. This can also help reduce the amount of energy needed to heat a home.
Windbreaks

18. The term for the careful use of our natural resources is _____.
Conservation

19. What is the term for food, water, shelter and space in the proper arrangement?
Habitat

20. What does CFL stand for?
Compact Fluorescent Lights

21. Name 3 types of energy we use on earth.
Wind, solar, and thermal.

22. Name two of the five different types of renewable energy sources.
Biomass, Geothermal, Hydropower, Solar, and Wind

23. Name two of the five different types of non-renewable energy sources.
Coal, Natural Gas, Petroleum, Propane, and Uranium

24. What does closed loop recycling mean?
The original product is reused to make the same product again, such as an aluminum can being recycled to make another aluminum can.

25. How can you reduce the number of plastic bags your family uses?
Use re-useable cloth shopping bags every time that you go shopping. Did you know that Americans use more than 277 million plastic bags a day? Only about 2% of these bags are recycled. Most go to the landfill.

26. What does the symbol of three chasing arrows in a triangular format mean?
This is the recycling symbol. It is used to designate items that can be recycled and/or items that are made from recycled materials.

Give credit where credit is due…inspired by a project from Resourcefulschools.org.

27. What is soil made up of?
Minerals, air, water, organic matter, organisms, and decaying remains.

28. What items help form soil?
Water, nutrients, earthworms, sunshine, bacteria, decaying plants and animals, time

29. What are the 3 soil layers?
Topsoil, subsoil, parent material (bedrock).

30. Name a way to prevent soil erosion.
Windbreaks, conservation tillage, no-till, plant trees, planting grass, filter strips, cover crops, terraces, etc.

31. Name a way that soil can be eroded.
Wind, water, humans, machines, etc.

32. Tell the life cycle of a tree.
Seed, sprout, sapling, mature tree, dead tree, rotting log

33. What is the very middle part of the tree called?
Heartwood

34. How many trees are saved by recycling one ton of paper?
About 17 trees are saved for every ton of paper that is recycled.

35. Explain the water cycle.
Evaporation, cloud, precipitation, condensation
(Infiltration, ground water, transpiration, and river could also be used)

36. What can you do to conserve water? ***Answers may vary.***
Take 5 minute shower, turn off water when brushing teeth, etc.

37. What is a watershed?
A geographic area in which water, sediments and dissolved minerals all drain into a common body of water like a stream, creek, reservoir, or bay

38. Name the watershed you live in.
The following website provides the answers to anywhere in the U.S.
http://cfpub.epa.gov/surf/locate/index.cfm

39. Where can we get fresh water for human use?
Groundwater, freshwater lakes, rivers & streams

40. When water passes from a liquid to a vapor state, it is called _____.
Evaporation

Give credit where credit is due…inspired by a project from Resourcefulschools.org.

Hit #3

EARTH DAY TIMELINE

Objective: Students will identify important dates in environmental history.

Illinois State Goals: 18.B.

Top Book Hits:
I Love Our Earth by Bill Martin, Jr.; **ISBN-13:** 978-1580891066
Earth Day by Linda Lowery; **ISBN-13:** 978-1575056203

Materials Needed:
- Historical event strips for each group

Procedure:
1. Begin by asking students to think about important dates in environmental history.
2. Divide students into small groups. Give them the historical event strips provided with this lesson. (Note: These strips can simply be copied and cut apart. You may want to choose different colored paper for each group set to make sorting them afterwards easier.)
3. Without using any additional materials, have students put the events in order of time they occurred. When all the groups have finished, facilitate a class discussion to determine as a class the proper order. Students could line up in the room to make one large human time line as a class.

Explore More: U.S. Environmental Protection Agency Earth Day & Every Day
http://www.epa.gov/earthday/

Give credit where credit is due…this activity adapted from IL Earth Day Ag Mag.

Earth Day Time Line

1780 John Audubon, founder of the National Audubon society, is born. The society promotes the conservation of wildlife, especially birds.

1872 Yellowstone becomes the nation's first national park.

1881 President authorizes public lands be set aside as forest reserves.

1882 The world's first hydroelectric (water) power station was built in Appleton, Wisconsin.

1897 The National Forest System was established, followed by the United States Forest Service in 1905.

1902 Ansel Adams is born. His famous black and white photographs of our national parks helped the environmental movement.

1905 The United States Forest Service is established.

1908 Henry Ford produced the Model T car which was designed to run on ethanol, gasoline or any combination of the two fuels. This was the first flex-fuel car.

1916 The National Park System is established.

1970 The first Earth Day, coordinated by Denis Hayes, gave 20 million Americans a chance to express concerns about the environment.

1970 The Environmental Protection Agency is established.

1972 The Clean Water Act becomes a law.

1973 The Endangered Species Act becomes a law.

1974 The Safe Drinking Water Act was passed and required the Environmental Protection Agency to regulate the quality of public drinking water.

1990 The National Environmental Education Act is established to educate the public about environmental decisions.

1990 Federal agencies begin using recycled products.

1992 EPA launched the Energy Star® Program to help consumers identify energy-efficient products.

1994 The bald eagle is moved from an "endangered" species to a "threatened species".

2003 The Clean School Bus USA program updated 4000 school buses to reduce air pollution.

2005 The Energy Policy Act created regulations to ensure all gasoline sold in the U.S. contains set percentages of renewable fuels (such as ethanol).

2005 National NeighborWoods month was created to celebrate organizations that participate in local tree planting programs.

2006 WaterSense is launched to raise awareness about the importance of water efficiency.

2009 The "Change the World, Start with Energy Star" national campaign was launched to help fight climate change through energy efficiency.

Give credit where credit is due…this activity adapted from IL Earth Day Ag Mag.

Sequencing Strips of Events

Recommendation: These strips can simply be copied and cut apart. You may want to choose different colors for each group set to make sorting them afterwards easier. Please be sure to mix these strips up as they are listed in order

John Audubon, founder of the National Audubon Society, is born. The society promotes the conservation of wildlife, especially birds.

Yellowstone becomes the nation's first national park.

President authorizes public lands be set aside as forest reserves.

The world's first hydroelectric (water) power station was built in Appleton, WI.

The National Forest System was established, followed by the United States Forest.

Ansel Adams is born. His famous black and white photographs of our national parks helped the environmental movement.

The United States Forest Service is established.

Henry Ford produced the Model T car which was designed to run on ethanol, gasoline or any combination of the two fuels. This was the first flex-fuel car.

The National Park System is established.

The first Earth Day, coordinated by Denis Hayes, gave 20 million Americans a chance to express concerns about the environment.

The Environmental Protection Agency is established.

Give credit where credit is due…this activity adapted from IL Earth Day Ag Mag.

The Clean Water Act becomes a law.

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The Safe Drinking Water Act was passed and required the Environmental Protection Agency to regulate the quality of public drinking water.

The National Environmental Education Act is established to educate the public about environmental decisions.

Federal agencies begin using recycled products.

EPA launched the Energy Star® Program to help consumers identify energy-efficient products.

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WaterSense is launched to raise awareness about the importance of water efficiency.

The “Change the World, Start with Energy Star” national campaign was launched to help fight climate change through energy efficiency.

Give credit where credit is due…this activity adapted from IL Earth Day Ag Mag.

Earth's Resources

Consumption – Conservation – Preservation

Objective: Students will demonstrate the difference between resource consumption, conservation, and preservation.

Illinois State Goals: 12.E.

Top Book Hits:
Exploring Your Environment; **ISBN-13:** 978-2-7641-2188-7
The Abcs of Habitats (Abcs of the Natural World) by Bobbie Kalman; **ISBN-13:** 978-0778734314

Materials Needed:
- small piece of candy for each student (Tootsie Roll, Hershey's Kiss, etc.)

Procedure:
In our efforts to protect the environment we sometimes confuse the terms conserve and preserve. This activity is designed to help students understand the difference between conservation, preservation, and consumption.

1. Give each person a piece of candy with instructions not to do anything with it yet.
2. Divide them into three groups by numbering off 1, 2, 3.
3. Tell Group 1 that they may eat their candy. They represent **consumption** – the utilization of the resource.
4. Tell Group 2 that they have to make their candy last by unwrapping it slowly, eating small bites, licking on it, savoring it, etc. They represent **conservation** – the careful use of the resource.
5. Tell Group 3 that they get to admire their candy but they cannot eat it. Ask them to admire the wrapper, the shape, the smell, etc. They represent **preservation** – saving of the resource for the future.
6. Finish by letting them know that there is a place for all of these concepts in our world. Have students think and discuss these concepts as they relate to more specific scenarios. Possible scenarios could include prairies, water, trees, soil, land use, and habitats. *Consider utilizing Top 40 Hits Lesson #5 From Bluestem and Bison to Corn and Cattle located in this booklet.*

   As with many areas of decision making, there are no right and wrong answers. Students are encouraged to examine different aspects or viewpoints of the situation, make their decision, and then defend that decision.

Explore More: Backyard Conservation http://www.nrcs.usda.gov/feature/backyard/
Illinois mAGic Kit - Science Lesson 2 – Saving IL Soil from Going Downhill & Lines on the Land available through local agricultural literacy coordinator.

Give credit where credit is due… adapted Julie Marshall & Utah Agriculture in the Classroom.

Hit #5

From Bluestem and Bison To Corn and Cattle

Objective: Through a classroom demonstration, students will discover the dramatic change that took place in the Illinois prairie landscape.

Illinois State Goals: 16.E., 17.D.

Top Book Hits:
If You're Not From The Prairie by David Bouchard;
ISBN-13: 978-0689820359
The Prairie Builders by Collard B. Sneed III; **ISBN-13:** 978-0547014418

Materials Needed:
- 8.5"x 11" sheet of copy paper

Procedure:
In the early 1800's, almost sixty percent of Illinois was covered by prairie. In fact, well over 21,000,000 acres of Illinois was covered in Big Bluestem. When early settlers realized the richness of these soils, much of the prairie was converted to agricultural land. Today, less than 2,100 acres of native Illinois prairie exists. The following can be used as a classroom demonstration to show how little native prairie exists in Illinois today.

1. Using a 8.5"x 11" sheet of copy paper, tell students that this sheet of paper represents the 21,000,000 acres of prairie that existed in Illinois in the early 1800s.

2. Fold the sheet of paper in half and tear. With each paper tear, tell students how many acres of prairie remain in Illinois from the chart on the next page.

3. Repeat this process until the paper has been reduced in size to represent the remaining 2,100 acres of native prairie. In all, the paper will be folded and torn thirteen (13) times.

4. When completed, only a "speck" of paper will be left.

Give credit where credit is due…adapted from U.S. Fish & Wildlife Prairie Resources

Below are the numbers for the demonstration:

21,000,000 Acres (Early 1800's) (Round to 20,000,000)
10,000,000
5,000,000
2,500,000
1,250,000
625,000
312,500 (Round to 300,000)
150,000
75,000
37,500
18,750 (Round to 18,000)
9,000
4,500 (Round to 4,000)
2,000 (Number of native prairie acres that exist today)

Think about this: In Illinois, only 1/100th of 1 percent of native prairie still exists. Native tall grass prairie is the MOST ENDANGERED ecosystem in North America.

Explore More: IDNR's "Illinois Prairies Resource Trunk" dnr.teachkids@illinois.gov
Prairie lessons from the Illinois mAGic Kit available through local agricultural literacy coordinator.

Give credit where credit is due…adapted from U.S. Fish & Wildlife Prairie Resources

Hit #6

Habitat Lap Sit

Objective: Students will be able to understand that all living things, including humans, depend on specific habitats, which include clean water and suitable space; describe the components of wildlife habitat and describe how human activities can threaten habitats.

Illinois State Goals: 12.B.

Top Book Hits:
Animal Habitats! by Judy Press; **ISBN-13:** 978-0824967567
The Usborne World of Animals by Susanna Davidson & Mike Unwin; **ISBN-13:** 978-0439798068
A Forest Habitat (Introducing Habitats) by Bobbie Kalman; **ISBN-13:** 978-0778729792

Materials Needed:
- None

Procedure:
People and other animals share some basic needs. Every animal needs a place in which to live. The environment in which an animal lives is called "habitat". An animal's habitat includes food, water, shelter, and space in an arrangement appropriate to the animal's needs.

If any on these components of habitat is missing or is affected significantly so that the arrangement for the individual animal or population of animals is no longer suitable, there will be an impact. The impact will not necessarily be catastrophic, but could be. There are a great many additional limiting factors beyond those of suitable food, water, shelter and space. For example, disease, predation, pollution, accidents and climatic conditions are among other factors which can have impact. All things are interrelated. When we look at a biological community, we find interrelationships and interdependencies between plants and plants, plants and animals, as well as animals and animals. These interrelationships and interdependencies are important.

The major purpose of this activity is for students to become familiar with the correspondence of habitat, and to recognize that it is not sufficient for there to be food, water, shelter and space in order for animals to survive—those components of habitat must be in suitable arrangement.

Give credit where credit is due…this activity came from Project WILD.

Steps:

1. Introduce the concept of habitat. Ask students what they need to survive and group these requirements into the four habitat categories: food, water, shelter, and space (some may end up in a fifth category — "other"). Explain that all living things must have their needs meet in all four categories. In this activity, students will form a marine animal's habitat and see what happens if one or more of the creature's needs are not met.
2. Take the class to a grassy area outside or a large, open indoor space. Ask the students to number off from "one" to "four." All the "ones" go to one corner of the space, the "twos" to another, and so on, leaving a clear space in the middle.
3. Using the polar bear or another creature as an example, assign each group a habitat requirement as follows: "ones" represent food (ringed seals), "twos" represent water (rain and snow), "threes" represent shelter (dens built in snow drifts or in the ground), and "fours" represent space (open seas and pack ice). You can use any habitat as an example, prairie, woods, etc.
4. Now, it's time to form a circle! This is done by building the circle in chains of food, water, shelter, and space. A student from each of the four groups walks toward the cleared area. The four students stand next to each other, facing in toward what will be the center of the circle. Four more students — one from each group — join the circle. Keep adding to the circle in sets of four until all the students are in the circle.
5. All students should now be standing shoulder to shoulder, facing the center of the circle.
6. Ask the students to turn to their right, at the same time taking one step toward the center of the circle. They should be standing close together, with each student looking at the back of the head of the student in front of him or her.
7. Ask everyone to listen carefully. Everyone should place their hands on the shoulders of the person in front of them. At the count of three, you want the students to sit down on the knees of the person behind them, keeping their own knees together to support the person in front of them. You then say, "Together you represent suitable polar bear habitat — food, water, shelter, and space all arranged just right."
8. The students at this point may either fall or sit down. When their laughter has subsided, talk with them about the necessary components of suitable habitat for people and wildlife.

Give credit where credit is due…this activity came from Project WILD.

9. After the students understand the major point — that food, water, shelter, and space are necessary for any animal's survival and comprise suitable habitat — let them try the circle activity again. Remind them that together they represent polar bear habitat. This time, ask them to hold their lap-sit posture. As the students lap-sit, identify some of threats to habitat. For example, explain that climate change could result in shorter periods when pack ice is available. Remove some of the "space" people. Then say that, with less pack ice available as a platform for hunting ringed seas, polar bears will have diminished access to food. Remove some of the "food" people. Then explain that mining and oil-drilling developments will result in the loss of denning sites. Remove some of the "shelter" people. At some point, the circle will collapse. Ask the students what will happen to the polar bear when its habitat is no longer suitable.
10. Ask the students to talk about what the activity means to them. Have them summarize the main ideas. Be sure to address the following:
    1. Food, water, shelter, and space, in their appropriate arrangement, are called habitat.
    2. Humans and marine species depend on habitat.
    3. Loss of any of the elements of habitat has serious impact on the animals living there.
    4. Humans often damage or destroy marine habitats with developments or make them unsuitable through climate change or contamination.

Alternate Hits: Modifications for younger or challenged students:

Younger or challenged students may be unable to successfully lap-sit. If so, follow the instructions up to step 6. With hands on each other's shoulders, instead of sitting down, they should pass a gentle "squeeze" around the circle (each person squeezes the shoulders of the person in front of him or her after his or her own shoulders have been squeezed). Choose a student to start the "squeeze." If the "squeeze" makes it back around to the person who started, the habitat is complete enough for the animal to survive. Remove students from the circle, but don't allow them to make the circle smaller. At some point, the remaining students will not be able to reach each other to pass on the "squeeze." Then the habitat is no longer suitable.

Give credit where credit is due…this activity came from Project WILD.

HABITAT LOSS ACTIVITY

Objective: Students will describe the possible negative consequences for people and wildlife under conditions of crowding.

Illinois State Goals: 12.A.,12.B., 13.B., 21.A.

Top Book Hits:
The Usborne World of Animals by Susanna Davidson & Mike Unwin; **ISBN-13:** 978-0439798068
The Abcs of Habitats (Abcs of the Natural World) by Bobbie Kalman; **ISBN-13:** 978-0778734314
Kids' Easy-to-Create Wildlife Habitats: For Small Spaces in City-Suburbs-Country... (Quick Starts for Kids!) by Emily Stetson; **ISBN-13:** 978-0824986650

Materials Needed:
- An open space for students to be during the activity

Procedure:
1. Tell the students that they will be able to spread out and walk around in a large area, always listening to your directions. Be sure to show the students the area that they can be moving within. Allow the students to move around the large area, only stipulation is they have to keep walking at all times.
2. After about 2 minutes, have the students move in closer to you, making their area about 2 feet smaller in circumference.
3. Repeat the reduction of their area until it is very small and they are unable to move.
4. Ask the students to tell you how they felt as the area got smaller and smaller.
5. Discuss with the students how habitats shrink as new housing or shopping developments come into the area. The activity showed how the animals and people feel when pushed closer and closer together.
6. Discuss why animals come into populated areas, due to their loss of habitat. (Raccoons, deer, skunks, opossums, and other wild animals have been seen in residential areas.)

Alternate Hits: Begin reading a short book to your students as they are seated at their desks. After a few minutes, have the students come sit on the floor as you read. Then ask your students to sit very close together in a group on the floor. They should be fairly tightly packed together. Continue read the book. Once finished with the reading, ask the students to describe what happened during the reading. Did they act or feel differently as they moved closer together? Did any of them become uncomfortable when they moved closer together? Do they think that people act differently in a large city than in a rural area? What about animals, do they think they would act differently when crowded together?

Give credit where credit is due…this activity adapted from lessons in Project WILD.

Hit #8

Lend a Hand for the Heart of the Earth

Objective: Students will discover what to do to help the environment.

Illinois State Goals: 12. A., 12. B.

Top Book Hits:
Everything Kids' Environment Book by Sheri Amsel; **ISBN-13:** 978-1598696707

Earth Book for Kids: Activities to Help Heal the Environment by Linda Schwartz;

ISBN-13: 978-0881601954

The New 50 Simple Things Kids Can Do to Save the Earth
by Sophie Javna; **ISBN 13**- 978-0740777462

Materials Needed:
- Recycled Paper
- Pencil
- Scissors
- Stapler

Procedure:
1. Trace around your hand on recycled paper.
2. Cut out.
3. Write on your hand what you are doing to help the Earth.
4. Staple hands to make a bulletin board collage.

Grow Further: Green Deeds: Students create chains using scraps of used paper that has been cut into strips. When a student does something that benefits the environment, they write the "deed" on the strip of paper and attach it to the chain. See how far around the room the chain can reach!

Give credit where credit is due…http://www.freekidscrafts.com/earth_day_helping_hands-e329.html.

Hit #9

Little Sprout

Objective: Students will learn about the parts of a seed and their function.

Illinois State Goals: 12.A.

Top Book Hits:
Oh Say Can You Seed! by Bonnie Worth; **ISBN-13:** 978-0375810954
A Seed in Need by Sam Godwin; **ISBN-13:** 978-0750024976

Materials Needed:
- Backpack
- Rain jacket
- Paper labels for seed parts – Seed Coat, Cotyledon, Root, Leaves, and Embryo
- Snack stashed in main compartment of backpack
- Water bottle with attached straw
- Hat (preferably green)

Procedure:
1. Dress up a student as a well-prepared hiker wearing a backpack and rain jacket. Introduce the student to the class as "Sprout." Explain that Sprout and seeds have a lot in common.
2. Ask the students what a well-prepared hiker wears to protect him/herself from the wind, rain, and cold. (A coat.) Explain that seeds also have coats for protection. Attach the seed coat label to the coat the volunteer is wearing. Explain that when the conditions change, Sprout can take his/her coat off and enjoy the warm, sunny weather. Similarly, when conditions are right for growth, the seed absorbs water, the seed coat cracks open, and the seed begins to sprout roots and leaves, or germinate. Have the volunteer remove his/her coat and hang it so that the seed coat label is clearly visible.
3. Ask the students what else a well-prepared-hiker brings. (A backpack with supplies.) Let sprout discover the snack in the main compartment of the backpack. (This can be shared at the end of the activity – it can even have some peanuts or other edible seeds inside to dissect!) Explain that seeds also have a supply of stored food. Our hiker's food is stored in a backpack. A seed stores its food in cotyledons. Attach the cotyledon label to the backpack. Cotyledons provide the plant with the initial energy to germinate and grow. Once the plant has established itself, the cotyledons fall off.

4. Sprout expends a lot of energy hiking and eventually gets thirsty. What else is important to bring along on a hiking trip? (A water bottle.) Have Sprout remove the water bottle from the backpack. Plants also need water and minerals to grow. How do the plants get this water and minerals? (Roots.) Attach the root label to the straw of the water bottle.

Give credit where credit is due…Shelburne Farms, Project Seasons by Debra Parrella.

5. Ask the students what other item is useful to have on a hiking trip, especially on bright and sunny days. (A hat.) Have Sprout remove a hat from the backpack and place it on his/her head. Compare the hat to the first green leaves a seedling puts out to absorb sunlight. Attach the leaves label to the hat. The leaves use sunlight to make food for the plant. This process of making food from sunlight is unique to plants and is called photosynthesis. Soon the cotyledons will fall off and the plant is now able to get energy from the sun. Have the volunteer remove the backpack and place it next to the seed coat.
6. Explain that the leaves and roots grew from a tiny plant inside the seed called the embryo. Place an embryo label around the volunteer's neck showing the connection between these two parts. Review the various parts of the seed and their functions using the props.

Grow Further: Plant mAGic Kit - Science Lesson 1 – Exploring Types of Seeds Monocots & Dicots available through local Agricultural Literacy Coordinator.

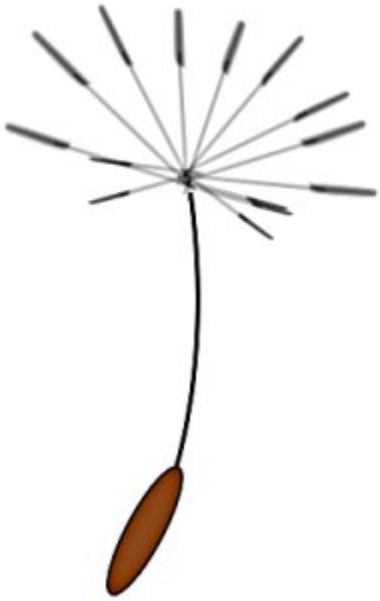
Give credit where credit is due…Shelburne Farms, Project Seasons by Debra Parrella.

Hit #10

NATURE JOURNAL WALK

Objective: Students will make a nature walk notebook to hold materials and their writings found on a walk.

Illinois State Goals: 12.E., 13.A.



Top Book Hits:
Ten-Minute Field Trips, Third Edition by H. R. Russell; **ISBN-13:** 978-0873550987
No Student Left Indoors: Creating a Field Guide to Your Schoolyard by Jane Kirkland; **ISBN-13:** 978-0970975454

Materials needed:
- Paper bags, brown or white lunch sized
- Rubber bands
- Small sticks

Procedure:
1. After making the booklets, take the students outside on a nature walk.

2. The theme of this walk could be seeds, leaves, a particular color, or a season.

3. Have the students take their books out with them to fill with found objects.

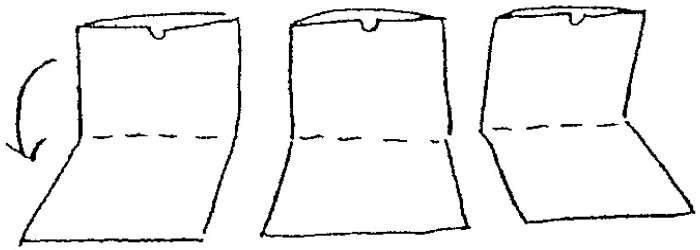
4. Once back in the classroom, the students may share with others what they found on the hike. If they'd like, they can label their book pages or decorate them with found objects.

Explore More: A Walk in the Woods – http://urbanext.illinois.edu/woods/

Give credit where credit is due…this activity booklet adapted from Smart Lesson Plans.

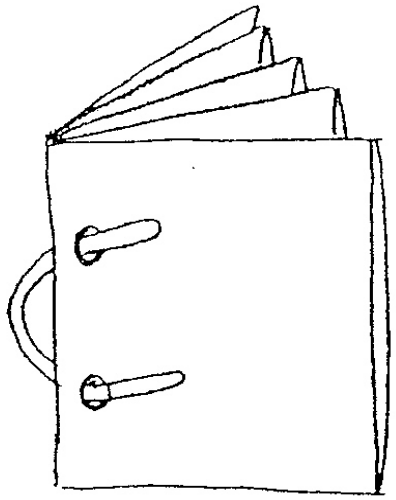
Step 1: **Fold Bags**

Use 3 bags per book. Fold all 3 bags in half.



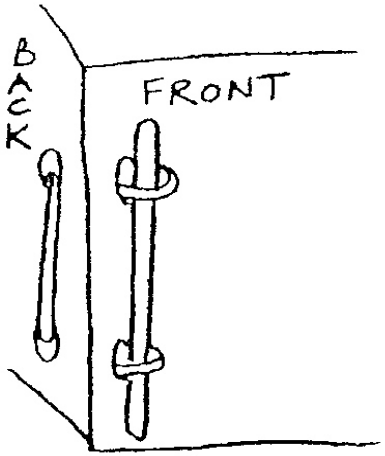
Step 2: **Insert Rubber Band**

Punch two holes at folded edge and insert rubber band from back.



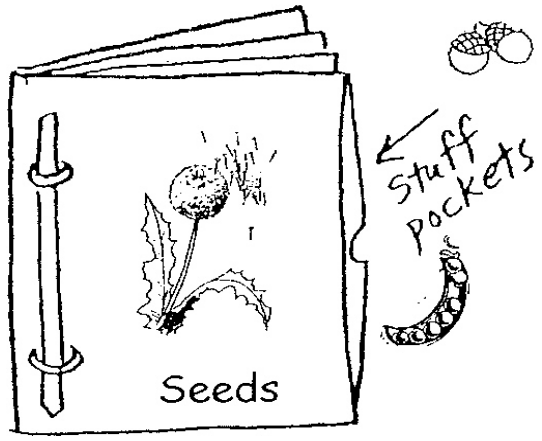
Step 3: **Insert Stick or Twig**

Insert stick through rubber band loops at front. Insert top first, then bottom.



Step 4: **Decorate**

Decorate as you choose.



Give credit where credit is due…this activity booklet adapted from Smart Lesson Plans.

"R" YOU READY TO HELP THE PLANET?

Objective: Students will research ways to help the planet by using words that begin with the letter "R."

Illinois State Goals: 1.A., 12.E., 17.C.

Top Book Hits:
Earth Book For Kids by Linda Schwartz; **ISBN 13**- 978-0-88160-195-4
365 Ways to Live Green for Kids by Sheri Amsel;
ISBN 13- 978-60550-634-0
The Everything Kids' Environment Book by Sheri Amsel;
ISBN 13- 978-1-59869-670-7
The New 50 Simple Things Kids Can Do to Save the Earth
by Sophie Javna; **ISBN 13**- 978-0740777462

Materials Needed:
- Media such as a dictionary, library books &/or web access (optional)

Procedure:
1. Students may work individually or in small groups for this activity. Place the words, "Reduce, Reuse, and Recycle" on the board.
2. Ask the students to explain what these three words mean to them by using each word in an action sentence. Examples: "I will bring cloth bags to the grocery store to reduce the amount of paper or plastic going to the landfill."; "I can reuse 2 liter plastic bottles to make bird feeders." ; and "I can recycle all the aluminum cans that my family uses."
3. At the conclusion of the discussion, instruct students to think of additional words that begin with the letter "R" that can be used to help the environment. These "R" words are to be used in a sentence to explain how they can help. Students may find it helpful to use various media for ideas. Examples include: "Renewable Resources" such as corn and soybeans can be used to make fuels for our cars and trucks. OR I will "repair" items when possible, rather than just throwing them away.
4. As students think of new words, place the words on the board to encourage discussion.

Explore More: Students may draw posters to depict how the "R" words can help the planet. Students may target their research to show how agriculture is helping the environment. This activity complements Top 40 Hits Lesson #9 Lend a Hand for the Heart of the Earth.

Give credit where credit is due…adapted from Utah Ag in the Classroom.

Hit #12

Web of Life

Objective: Students will demonstrate how plants, animals, and the sun interconnect.

Illinois State Goals: 12. B.

Top Book Hits:
Food Chains and Webs a Delta Science Reader; **ISBN-13:** 978-1592422579
This is Your Life Cycle by Heather Lynn Miller; **ISBN-13:** 978-0618724857
The Web at Dragonfly Pond by Brian "Fox" Ellis; **ISBN-13**: 978-1584690795

Materials Needed:
- Ball of yarn
- 3 x 5 index card for each student
- Large area of classroom or outside area

Procedure:
1. Share the following quote with the students: "When you try to remove one single thing, you find it's hitched to everything else in the universe." – John Muir.
2. Tell the students that after this activity you are going to ask the students what John Muir might have meant by this statement.
3. Ask students for names of living and nonliving components of an urban ecosystem. As each student names a component, have them print the name in large letters on an index card. Help direct the students to mention plants and animals. Collect all the cards. (*You can find already made up cards on line at: www.agclassroom.org.)
4. Divide into groups of 8 – 10 students. Each group is now an "urban ecosystem" Hand out one index card to each group member, but try to keep cards as diverse as possible in each group. Instruct students to lay their card in front of them face up so that they can easily be read by other group members.
5. Give a ball of yarn to one student and ask how they are related to another card within their ecosystem (group of students).
6. As each student chooses a connection, he/she should wrap a piece of yarn around their wrist a couple of times and hand the yarn to the next connection. The process continues till all the components are spoken for.
7. To demonstrate the connections, ask the students to be completely still. Make sure the yarn is tight and ask the first student to gently tug on the yarn. As each student feels a tug, they should gently tug in response. Eventually the whole web will be shaking, demonstrating the total connection.
8. At this point, you could ask one of the students to let go of the yarn to show how their leaving the web would affect it. Discuss different scenarios that would have affects upon the web, i.e. drought, disease, etc.
9. Disassemble the web and have students exchange cards in preparation to do the activity again. This time the teacher will represent the sun. Wrap the yarn around your wrist and pass the yarn to a connection. Continue to build a web like before.
10. After the web is woven, ask students what will happen if the sun were to be taken out of the web. Discuss these impacts. To demonstrate this, as students prepare to tug on yarn, the sun will let go of the original piece. Once students tug on their yarn, they will see all animals and plants are impacted and the web will collapse. Discuss how the sun is the source of energy and the base for all ecosystems.
11. Ask the students what John Muir meant by his statement, "When you try to remove one single thing, you find it's hitched to everything else in the universe"?

Give credit where credit is due…adapted from Project LEAP, Cornell University, Ithaca, NY.

Hit #13

Renew-A-Bead

Objective: Students will understand how, over several years, nonrenewable resources will be depleted.

Illinois State Goals: 11.A., 12.E.

Top Book Hits:
Michael Recycle by Ellie Bethel; **ISBN-13:** 978-1600102240
Energy Essentials: Renewable Energy by Nigel Saunders & Steven Chapman; **ISBN-13:** 978-1410931856

Materials Needed:
- One open clear container
- Pony beads: 92 of one color, 8 of another color
- One blindfold

Procedure:
1. Explain to students that 92% of our energy consumption is from non-renewable resources and that only 8% comes from renewable resources.
2. Have students count out 92 pony beads of one color and 8 pony beads of another color to represent these percentages. Place these beads in a clear container.
3. Inform students that this demonstration simulates energy consumption in the United States.
4. Blindfold six students. Tell the students that any beads representing renewable resources can be returned to the container, while any beads representing nonrenewable resource cannot.
5. Ask the first student to pick out 15 beads and place any renewable resource beads back in the container. The nonrenewable energy beads can be placed in another container.
6. Have the remaining students pick out more beads in the following amounts: 25, 35, 45, 55, and 65.
7. Ask students to predict what will happen if the activity continues. What does this mean for our energy supply? Have students list ways to extend both renewable and non-renewable energy resources.

Explore More: Illinois Renewable Energy Ag Mag www.agintheclassroom.org or through local agricultural literacy coordinator. Illinois Agriculture in the Classroom Renew-A-Bead lesson from Go Green booklet goes into more depth and provides charts www.agintheclassroom.org.

Give credit where credit is due…adapted from R.E.A.C.T & Illinois Ag In the Classroom.

Hit #14

Wind Energy

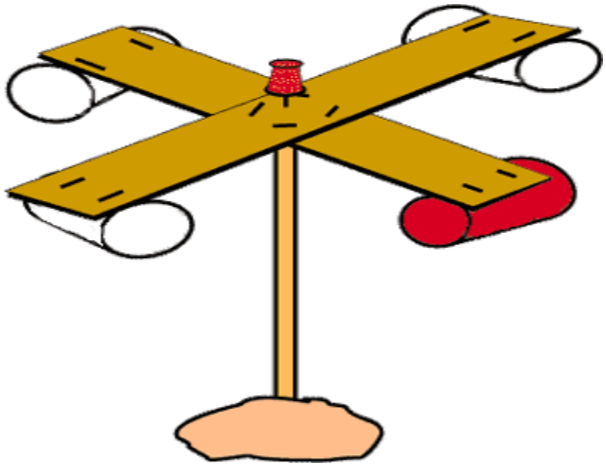
Objective: Students will demonstrate that wind energy can be turned into electricity with a windmill.

Illinois State Goals: 11.B., 12.C., 12.D., 13.A.

Top Book Hits:
Feel the Wind by Arthur Dorros; **ISBN-13:** 978-0064450959
When the Wind Stops by Charlette Zolotow; **ISBN-13:** 978-0064434720

Materials Needed:

- Scissors
- 4 small paper cups
- Marking pen
- Push pin
- Sharpened pencil with eraser
- Modeling clay
- Stop watch
- 2 strips of stiff, corrugated cardboard
- Ruler
- Stapler



Procedure:

1. Cut off the rolled edges of the paper cups to make them lighter.
2. Color the outside of one cup with the marking pen.
3. Cross the cardboard strips so they make a plus (+) sign. Staple them together.
4. Take the ruler and pencil and draw lines from the outside corners of where the cardboard strips come together to the opposite corners. Where the pencil lines cross will be the exact middle of the plus sign.
5. Staple the cups to the ends of the cardboard strips; make sure the cups all face the same direction.
6. Push the pin through the center of the cardboard (where the pencil lines cross) and attach the cardboard plus sign with the cups on it to the eraser point of the pencil. Blow on the cups to make sure the cardboard spins around freely on the pin.
7. Place the modeling clay on a surface outside. Stick the sharpened end on the pencil into the clay so it stands up straight.
8. Using your watch, count the number of times the colored cup spins around in one minute. You are measuring the wind speed in revolutions (turns) per minute.
9. Measure the wind speed in several spots around the school to determine which location has the highest wind speed. Record your data in a chart.

Grow Further: Illinois Renewable Energy Ag Mag www.agintheclassroom.org or through local agricultural literacy coordinator.

Give credit where credit is due…Lake Land College Alternative Energy Kit.

Wind Energy

Direction of wind _____

LOCATION	HEIGHT	SPEED

1. How do buildings and other structures and objects impact wind speed?

2. What impact does height have on wind speed?

3. How would the answers to the above questions impact the placement of wind turbines?

CLEAN UP OUR EARTH ACTIVITY

Objective: Students will clean up the school grounds and learn what is recyclable.

Illinois State Goals: 17.C.

Top Book Hits:
Garbage and Recycling (Young Discoverers: Environmental Facts and Experiments) by Rosie Harlow and Sally Morgan; **ISBN-13**: 978-0753455036
The Three R's: Reuse, Reduce, Recycle by Nuria Roca; **ISBN-13:** 978-0764135811

Materials Needed:
- Gloves for each student
- Garbage bags
- Containers for recycling

Procedure:
1. Set boundaries and a time limit for the clean up.
2. Give one bag for recyclable objects and one for trash to each group (you might want to have an area for aluminum cans so they could be recycled for money, if available in your area.)
3. Hand out gloves for each student to wear.
4. Go over safety issues, like no picking up of broken glass.
5. Let students go around the area picking up the litter.
6. Regroup and discuss the activity with the students.
7. Dispose of recycling and trash in the proper receptacles.

Explore More: Contact your community Environmental Protection Agency to find out what can be recycled. http://www.epa.gov

Give credit where credit is due…originally came from the Environmental Protection Agency.

Hit #16

Closed Loop Recycling of Aluminum Cans

Objective: Students will demonstrate the closed loop recycling of aluminum cans.

Illinois State Goals: 12.E., 13.B., 15.B.

Top Book Hits:
Recycle! by Gail Gibbons; **ISBN-13:** 978-0316309431
The Adventures of an Aluminum Can: A Story About Recycling by Alison Inches**; ISBN-13:** 978-1416972211

Materials Needed:
- Aluminum can pattern
- Closed loop worksheet
- Scotch tape/glue
- Scissors

Procedure:
1. Discuss with the students natural resources and the fact that they are limited.

2. Talk about aluminum being made from bauxite ore, a nonrenewable resource.

3. Discuss recycling.

4. Explain that aluminum made from recycled cans saves about 95% of the energy needed to make a new can out of the bauxite ore.

5. Talk about the steps in the aluminum can closed loop of recycling. (It takes about 6 weeks for the can that you recycle to be made into a new can and ready on the store shelves for you to purchase.)

6. Have students make the loop by gluing/taping the steps together with words facing outward.

7. Cut out the cans; insert the loop between the two cans and glue top and bottom of can together.

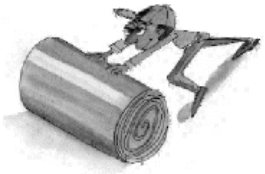
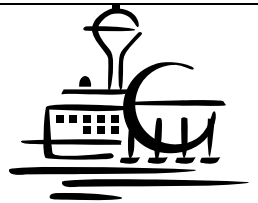
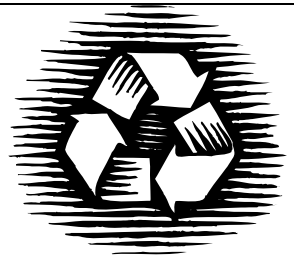
8. The loop can be moved through the can, showing the closed loop cycle of the aluminum can.

9. The loop can go on and on, never breaking unless someone doesn't recycle their can.

Give credit where credit is due…this is an extension of EPA lessons on closed loop recycling.

Give credit where credit is due…this is an extension of EPA lessons on closed loop recycling.

Closed Loop Recycling

 1. Aluminum cans are collected and sent to a recycling center.	 2. At the recycling center, the cans are cleaned, crushed and baled.	 3. The used cans go to the aluminum manufacturing plant.
 4. It is rolled into long, thin sheets, coiled and sent to the can manufacturing plant.	 5. The cans are made at the manufacturing plant.	 6. The cans are filled at the beverage factory.
 7. The cans are sold at the stores.	 8. The cans are recycled to start the whole process again.	 9. The cans go back to the recycling center

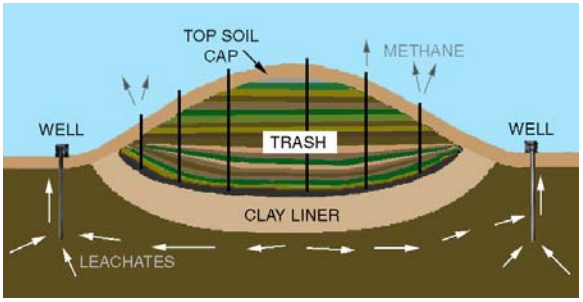
Give credit where credit is due…this is an extension of EPA lessons on closed loop recycling.

Hit #17

INCREDIBLE EDIBLE LANDFILL

Objective: Students will discover the amount of engineering that goes into the creation of a landfill and the byproducts of throwing things 'away'.

Illinois State Goals: 11.B., 17.C.



Top Book Hits:
Where Does the Garbage Go? by Paul Showers;
ISBN-13: 978-0064451147
Why Should I Recycle by Jen Green;
ISBN-13: 978-0764131554

Materials Needed:
- Graham cracker pie crust — Clay liner
- 8-10 fruit roll-ups — synthetic geomembrane liner
- Graham crackers (crushed) — gravel
- 8 pieces of licorice — leachate collection & gas collection
- 2 boxes Instant vanilla pudding — trash
- Chocolate chips — trash
- Oreos (crushed) — daily soil cover
- Coconut colored green w/ food coloring — grass cover

Procedure:
1. First you must create the landfill.
2. The pie pan is the hole in the ground and the graham cracker crust is the 2 foot clay liner.
3. Line the crust with the fruit roll-ups.
4. Sprinkle crushed graham crackers for gravel.
5. Lay 2 pieces of licorice down horizontal for leachate collection.
6. Now you may fill the landfill
7. Cover the graham crackers with pudding and chocolate chips.
8. Discuss different types of trash that go into the landfill and their different consistencies. The average person creates 4.7 lbs. of trash a day!
9. Poke licorice into the mixture to allow methane to escape. Some methane can be recaptured for energy, but only a small percentage. The rest is flared off and sent into the atmosphere.
10. Cover the trash with daily soil cover (crushed Oreos) to keep birds away and the odor at bay.
11. Continue layering until the pan is full.
12. Now the landfill must close - cover the landfill with coconut.
13. While the landfill sets up discuss the amount of waste generated from the activity.
    - *How much was recyclable?*
    - *How could this waste be reduced?*
    - *What are the byproducts of disposing of trash?*
    - *How is this an accurate model?*
    - *Are their any inaccuracies?*
14. Enjoy your landfill by slicing into it after a few minutes!

Give credit where credit is due…inspired by a project from Resourcefulschools.org.

Hit #18

Recycled Paper

Objective: Students will create paper, a forest product.

Illinois State Goals: 12.E.

Top Book Hits:
A Log's Life by Wendy Pfeffer; **ISBN-13:** 978-1416934837
Trees to Paper by Inez Snyder; **ISBN-13**: 978-0516243566

Materials Needed:
- Large square pan, about 3 inches deep
- Large bowl
- 3 cups of water
- Large section of newspaper
- Rolling pin, plastic pipe or tube to roll out paper

Procedure:
1. Tear one or two pages of newspaper into small pieces of one inch or less.
2. Put the paper chips into a large bowl and add three cups water to it. Keep adding paper, tearing it and squeezing it until the paper mixture looks like thick oatmeal.
3. With the pan turned upside down, place about 1 cup of the blended pulp over the bottom of the pan. Spread it with your fingers evenly across the entire area.
4. Lay several sheets of newspaper over the pulp, then carefully turn the pan over. Remove the pan. Your pulp "square" is now sitting on the newspaper.
5. Close the newspaper over the pulp. Using the rolling pin, roll over the newspaper to blot out the extra water.
6. Uncover and let the new "paper" dry completely. When it is thoroughly dry, peel your new "recycled paper" away from the newspaper. It can now be cut to any size and used to make a variety of things.

Explore More: As the paper is drying, students could add seeds to make a "plant a card" or an ornament. From Tree to Table DVD by Chris Fesko.
Show & Tell Series: Bats & Balls, Milk & Cookies, News & Comics DVD by Library Video Company available from your local agricultural literacy coordinator.
Illinois Tree Ag Mag www.agintheclassroom.org or through local agricultural literacy coordinator.

Give credit where credit is due…California Foundation for Agriculture in the Classroom.

Hit #19

RECYCLING PLEDGE BRACELET

Objective: Students will discover the importance of recycling and make a commitment to our environment by building one of these bracelets.

Illinois State Goals: 13.A., 13.B.

Top Book Hits:
The Three R's: Reduce, Reuse, Recycle by Nuria Roca; **ISBN-13:** 978-0764135811
Recycle!: A Handbook for Kids by Gail Gibbons; **ISBN-13:** 978-0316309431

Materials Needed:
- Pipe cleaner – 1 per student
- Green beads – 3 per student
- Yellow beads – 1 per student
- Clear beads – 1 per student
- White beads – 1 per student
- Grey beads – 1 per student
- Multicolored beads– 1 per student
- Blue Beads – 1 per student
- Brown Beads – 1 per student
- Red Beads – 1 per student

Procedure:
Each bead represents one of the many items we can recycle, reduce our use of, or reuse in other ways. The ideas are limitless. Feel free to add bead ideas.

1. Place the following beads onto a pipe cleaner:
   - **Green Bead:** Each child takes 3 – one each for Reduce, Reuse, Recycle.
   - **Yellow Bead:** Represents the sun and energy saved by recycling.
   - **Clear Bead:** All the glass products that can be recycled or reused**.**
   - **White Bead:** Represents paper saved by using both sides of a sheet at school and home; then recycling.
   - **Grey Bead:** Metal objects that are recycled and reused.
   - **Multicolored Bead:** Plastic items can be recycled or reused.
   - **Blue Bead:** Represents water pollution prevented by recycling motor oil (which should never be dumped).
   - **Brown Bead:** Worms love to make compost – new soil enriching material from many items.
   - **Red Bead:** Vegetables and fruit that worms turn into compost.

Explore More: This lesson works well with Top 40 Hits Lesson #20 Build a Mini Worm Bin. The Case for Investigating the 4 R's available from IL Dept. of Commerce & Economic Opportunity. Illinois Earth Week Ag Mag www.agintheclassroom.org

Give credit where credit is due… adapted from IL Dept. of Commerce & Economic Opportunity.

Hit #20

BUILD A MINI WORM BIN

Objective: Students will make a worm bin and use it for observing the worm behaviors and life cycle.

Illinois State Goals: 12.A., 12. E., 17.B.

Top Book Hits:
Worms Eat Our Garbage by Applehof, Fenton, Harris; **ISBN-13:** 978-0977804504
Diary of a Worm by Doreen Cronin; **ISBN-13:** 978-0060001506

Materials Needed:
- Clear quart sized container for each student (like a deli container) OR a quart wide mouthed jar (canning, mayo, or parmesan cheese)
- T- Bar pin to make holes if using plastic, or hammer and nail if using glass jar for holes in lid
- Shredded newspaper
- Water
- Topsoil
- Sand
- 5 red worms for each student
- Chopped vegetable peelings
- Black paper to wrap around the container

Procedure:
1. Make holes in top, bottom and sides of plastic container, or simply in lid of glass jar.
2. Place moist, shredded newspaper bedding in bottom of the container.
3. Add 2 scoops of topsoil.
4. Add 1 tablespoon of sand.
5. Add 5 red worms.
6. Add a couple of tablespoons of chopped vegetable peelings.
7. Place more bedding on top of the peelings.
8. Wrap black paper around the container.
9. Fluff the bedding once or twice a week.
10. Feed the worms lunch scraps, crushed egg shells, coffee grounds, and chopped peelings. Do not feed milk, meat, or bones.

Digging Deeper: Herman the Worm www.urbanext.illinois.edu/worms/
NRCS Claude Got the Scoop www.urbanext.illinois.edu/soil/

Credit where credit is due…adapted from Environmental Protection Agency lessons.

Hit #21

EDIBLE SOIL PROFILE

Objective: Students will recognize that soil is made up of different layers and identify the components of a soil profile.

Illinois State Goals: 12.E.

Top Book Hits:
A Handful of Dirt by Raymond Bial; **ISBN-13:** 978-0802786982
Soil! Get the Inside Scoop by David L. Lindbo and others; **ISBN-13:** 978-0891188483

Materials Needed:

- 44 oz. ready-to-eat chocolate pudding
- 2 (16 oz.) packages of chocolate sandwich cookies, crushed
- 30 gummy worms
- 12 oz. package chocolate chips
- ½ cup multi-colored sprinkles
- ½ cup coconut
- Green food coloring
- 6 clear bowls
- Quart-sized Ziploc bag
- Paper towels
- 36 plastic spoons
- 30 clear plastic cups

Procedure:

1. Explain to the students that they will be building an edible soil profile from the ground up, but first they have to identify the ingredients they represent.
2. Pour the chocolate chips into the first of the six containers, asking students for suggestions on what component they represent (parent material/bedrock). Explain to the class what parent material is and its purpose in the soil profile.
3. Pour the pudding into the next container. Again, ask the class for suggestions (subsoil). Explain what you might find in the subsoil.
4. Place the crushed cookies into the third container. Do the students know what this represents? (topsoil) Explain the difference between topsoil and subsoil. This might be a good time to discuss erosion.
5. Next, pour the multi-colored sprinkles (organisms) into a container, asking for student suggestions and offering explanations.
6. Put the coconut into the quart-sized Ziploc bag and add a few drops of green food coloring. Shake the bag until the coconut has turned green. Spread the coconut on paper towels for about 30 minutes to dry. (Note: you many want to do this before class as a time saving device.)
7. Place the green-tinted coconut into a container. Do the students know what this represents? (grass) How can grass, or the lack thereof, affect erosion?
8. Place the gummy worms in the last container. Can the students guess these represent earthworms? What role does an earthworm have in the soil profile?

Give credit where credit is due…this activity came from Soil mAGic Kit.

Hit #22

Planet Toss

Objective: Students will discover the ratio of water versus soil on planet Earth.

Illinois State Goals: 10. C., 12. E., 12. F.

Top Book Hits:
I Love Our Earth by Bill Martin Jr.;
ISBN-13: 978-1580891073
Life in a Bucket of Soil by Alvin Silverstein and Virginia Silverstein; **ISBN-13:** 978-0486410579

Materials Needed:
- Inflatable Globe

Procedure:
Planet Toss – using an inflatable globe.

1. Have students stand up and form a circle.

2. Students will then play catch with the inflated globe. Whoever catches the globe then announces where their left thumb landed: water or land. A chart to tally the results is recommended.

3. Students will continue to play until everyone has had a chance to catch the globe or until enough passes have been made for the students to appreciate the amount of water on the earth's surface relative to land.

4. Call the students attention to the statistics that between 2/3 and 3/4 of the earth's surface is covered with water. Discuss the amount of salt water (97%) versus fresh water (3%) that covers the earth.

More Hits: This is great to use with Top 40 Hits Lesson #32 Don't Use It All Up and #24 Slice of Planet Earth.

Give credit where credit is due... the Illinois Department of Natural Resources.

Hit #23

Say It With Soil

Objective: Students will demonstrate, through writing, how soil interconnects with all living things.

Illinois State Goals: 3.C.

Top Book Hits:
Diary of a Worm by Doreen Cronin; **ISBN-13:** 978-0060001506
A Handful of Dirt by Raymond Bial; **ISBN-13:** 978-0802786982
Soil! Get the Inside Scoop by David L. Lindbo and others; **ISBN-13:** 978-0891188483

Materials Needed:
- List of quotes on the following pages

Procedure:
1. Using provided quotes on the following pages and also found in Soil mAGic kit Social Studies Lesson 2 - Soil Quotes Handout - Say It With Soil.

2. Cut quotes into strips and distribute to students or display quotes on an overhead projector, allowing students to choose one.

3. Students will read the soil quote and write a paragraph about the quote. Some/all of the following questions should be addressed:

    a. What does the quote mean to me?
    b. What did this quote mean to the author?
    c. Under what circumstances did the author write this quote?
    d. Has this quote withstood the passage of time? Why?
    e. Is this quote appropriate in today's world? Why?

4. Students should be allowed to share their writing with their class. Students may need to be guided to realize that learning about soil is important.

Dig Deeper: Soil mAGic Kit available through local agricultural literacy coordinator. Illinois Soil Ag Mag www.agintheclassroom.org or through local agricultural literacy coordinator. Surviving the Dust Bowl DVD by American Experience available through local agricultural literacy coordinator. Natural Resources Conservation Service http://www.nrcs.usda.gov/feature/education

Give credit where credit is due…developed by the mAGic writing team for the Soil mAGic kit.

Soil Quotes Handout - Say It With Soil

- Soil, like faith, is the substance of things hoped for, the evidence of things not seen. It is the starting point for all living things that inhabit the earth.-Firman E. Bear; 1986

- I know of no pursuit in which more real and important services can be rendered to any country than by improving its agriculture.-George Washington July 20, 1794

- The soil is the source of life, creativity, culture and real independence.-David Ben Gurion, Hazon VeDerek; 1950's

- There are two spiritual dangers in not owning a farm. One is the danger of supposing that breakfast comes from the grocery, and the other that heat comes from the furnace.-Aldo Leopold; 1949

- A conservationist is one who is humbly aware that with each stroke he is writing his signature on the face of the land.-Aldo Leopold; 1949

- When tillage begins, other arts follow. The farmers therefore are the founders of human civilization.-Daniel Webster; 1840

- If in the human economy, a squash in the field is worth more that a bushel of soil, that does not mean that food is more valuable than soil; it means simply that we do not know how to value the soil. In its complexity and its potential longevity, the soil exceeds our comprehension; we do not know how to place a just market value on it, and we will never learn how. Its value is inestimable; we must value it, beyond whatever price we put on it, by respecting it.-Wendell Berry; 1995

- We know more about the movement of celestial bodies than about the soil underfoot.-Leonardo daVinci; 1500's

- Essentially, all life depends upon the soil...There can be no life without soil and no soil without life: they have evolved together.-Charles E. Kellogg; 1938

- ...the Latin name for man, homo, derived from humus, the stuff of life in the soil.-Dr. Daniel Hillel; late 1900's

- I saw all the people hustling early in the morning to go into the factories and the stores and the office buildings, to do their job, to get their check. But ultimately it's not office buildings or jobs that give us our checks. It's the soil. The soil is what gives us the real income that supports us all.-Ed Begley; late 1900's

- Soil erosion is as old as agriculture. It began when the first heavy rain struck the first furrow turned by a crude implement of tillage in the hands of prehistoric man. It has been going on ever since, wherever man's culture of the earth has bared the soil to rain and wind.-Hugh H. Bennett and W.C. Lowdermilk; 1930's

Give credit where credit is due…developed by the mAGic writing team for the Soil mAGic kit.

Soil Quotes Handout - Say It With Soil

- We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.-Aldo Leopold; 1949

- I bequeath myself to the dirt, to grow from the grass I love; If you want me again, look for me under your boot-soles.-Walt Whitman; 1855

- We are part of the earth and it is part of us...What befalls the earth befalls all the sons of the earth.-Chief Seattle; 1854

- Each soil has had its own history. Like a river, a mountain, a forest, or any natural thing, its present condition is due to the influences of many things and events of the past.-Charles Kellogg; 1956

- Nature has endowed the earth with glorious wonders and vast resources that man may use for his own ends. Regardless of our tastes or our way of living, there are none that present more variations to tax our imagination than the soil, and certainly none so important to our ancestors, to ourselves, and to our children.-Charles Kellogg; 1956

- Man and man's earth are unexhausted and undiscovered. Wake and listen! Verily, the earth shall yet be a source of recovery. Remain faithful to the earth, with the power of your virtue. Let your gift-giving love and your knowledge serve the meaning of the earth.-Friedrich Nietzche; 1870's – 1880's

- A cloak of loose, soft material, held to the earth's hard surface by gravity, is all that lies between life and lifelessness.-Wallace H. Fuller; 1975

- I cannot conceive of the time when knowledge of soils will be complete. Our expectation is that our successors will build on what has been done, as we are building on the work of our predecessors.-R.S. Smith; 1928

- Soils are developed; they are not merely an accumulation of debris resulting from decay of rock and organic materials...In other words, a soil is an entity – an object in nature which has characteristics that distinguish it from all other objects in nature.-C.E. Millar & L.M. Turk; 1943

- We spend our lives hurrying away from the real, as though it were deadly to us. "It must be somewhere up there on the horizon," we think. And all the time it is in the soil, right beneath our feet.-William Bryant Logan; 1996

- Plowed ground smells of earthworms and empires.-Justin Isherwood; 1990

- A nation that destroys its soil, destroys itself.-Franklin D. Roosevelt; 1937

- The wealth of Illinois is in her soil and her strength lies in its intelligent development.-Draper; 1899

Give credit where credit is due…developed by the mAGic writing team for the Soil mAGic kit.

Hit #24

SLICE OF PLANET EARTH

Objective: Students will discover our available soil resources through this apple graphic.

Illinois State Goals: 6.B., 8.A., 10.C.

Top Book Hits:
Diary of a Worm by Doreen Cronin; **ISBN-13:** 978-0060001506
A Handful of Dirt by Raymond Bial; **ISBN-13:** 978-0802786982

Materials Needed:
- Large apple
- Cutting board
- Knife to cut the apple

Procedure:
Tell your students to imagine the apple is planet Earth.

1. Cut the apple in quarters.
    - Oceans occupy three quarters of our Earth. Put these 3 quarters aside.
    - One quarter of our Earth is our land area.

2. Take this quarter and cut it in half, now you have two 1/8th sections of land.
    - One-eighth of our land is not suitable for producing food.
    - This represents the deserts, swamps, mountains, and the Arctic and Antarctic regions.
    - The other 1/8th represents land where man can live.

3. Slice this 1/8th section lengthwise into four equal parts, now you have four 1/32nd pieces.
    - The first section represents the areas of the world with rocky soil that are too poor for any type of food production.
    - The next section represents land too wet for food production.
    - The third section represents areas that are too hot for food production. The last section represents the area of the world developed by man.

4. Carefully peel the last 1/32nd section.
    - This small bit of peeling represents all the soil of our Earth which humans depend upon for food production.
    - Save our soil; one of Earth's most valuable resources.

Dig Deeper: Video demonstration of this activity http://aginclassroom.org/movie/soil.html
Soil mAGic Kit - Math Lesson 4 - A Slice of Planet Earth available through local Ag Literacy Coordinator.

Give credit where credit is due…this activity originally came from the USDA.

Hit #25

Soil Recipe

Objective: Students will learn that soil is composed of many things, including living organisms, and will understand that time is important in the formation of soil.

Illinois State Goals: 12.E.

Top Book Hits:
Soil! Get the Inside Scoop by David L. Lindbo and others; **ISBN-13:** 978-0891188483
A Handful of Dirt by Raymond Bial; **ISBN-13:** 978-0802786982

Materials Needed:
- Small paper bags (one per pair)
- Chef's hat or apron
- Mixing bowl
- Wooden spoon
- Large index card
- Napkin large enough to cover the bowl
- Wristwatch
- Grocery bag containing a bottle of the herb thyme (real or pretend)
- Props or index cards to indicate water, nutrients, earthworms, sunshine, and bacteria

Procedure:
1. Invite the students into your garden "test kitchen" to make a special batch of soil. Explain that you have forgotten your recipe and you hope they can create a special class recipe for soil. Stress that you need soil and not dirt and ask if they know the difference. (Dirt is what is under your fingernails and gets washed off before meals. Soil is a living entity that grows the food we eat.)
2. Ask the students to raise their hands if they have ever cooked before using a recipe. Compare making soil to baking a batch of cookies. Explain that they are both a mixture of different ingredients in certain proportions. The final product is made by combining these ingredients according to a recipe.
3. Explain that a well organized cook has all the necessary ingredients on hand, so they simply add them as they are called for in the recipe. Tell the students that their first job is to gather the necessary soil ingredients to have on hand. Go outdoors and divide the class into pairs. Assign each pair the task of finding some soil ingredients (such as leaves, pinecones, grasses, small sticks, etc.). Give each pair a small paper bag in which to collect the materials and remind them to collect mostly non-living things.
4. At the end of the collecting time, gather the students together in a comfortable outdoor spot or back in the classroom. Ask for a volunteer who enjoys cooking to be the soil chef. Ask them about their favorite recipe while they are donning an apron or chef's hat. Give them the bowl and magic cooking spoon. Ask him or her to gather soil ingredients from the other students and mix them thoroughly. Record these ingredients on a giant recipe card.

Give credit where credit is due…Shelburne Farms, Project Seasons by Debra Parrella.

5. After all the items have been placed in the bowl, explain that there is a bit of magic in the science of making soil. Ask the soil chef to cover the bowl with the napkin and tap the bowl three times with the magic spoon. In unison, have the class whisper magic words (such as abracadabra, hocus-pocus or any other class favorites). Have the students give a drum roll by slapping their thighs, while the soil chef removes the cloth with a flourish. Since nothing has happened, exclaim to the soil chef that you thought he or she was a good cook. Ask the students what went wrong. Suggest that perhaps some ingredients were missing. Again compare making soil to baking, and make the analogy of baking chocolate chip cookies and leaving out the chips.
6. Pull out the shopping bag and tell the students you might have some of the missing ingredients inside. Give the students clues to the missing ingredients (sunlight, water, nutrients, earthworms, bacteria) and as they guess them, add the cards or props to the mixing bowl. Discuss the role of each item in the life of the soil.
7. Give additional clues so the students can guess the final, important missing soil ingredient - time. Pull out a bottle of the herb thyme as a joke when they guess. When the students protest, add a little more thyme and ask if that isn't enough. Point to your watch and ask the students if they mean that kind of time. Take off your watch and add it into the bowl. Is that enough time? Ask the students how much time they think is needed.
8. Compare their guesses to the actual figures. Explain that it takes an average of 500 years to make an inch of topsoil. Using their grandparent's age, give them a sense of the time span involved. Finish by stressing the importance of soil in our lives and brainstorm ways to care for and save our soil.

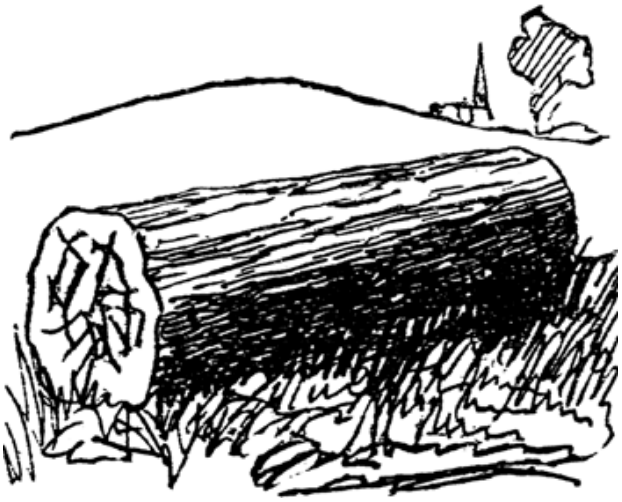
Dig Deeper: Soil mAGic Kit - Science Lesson 3 – Edible Soil Profile available through local agricultural literacy coordinator.
Illinois Soil Ag Mag www.agintheclassroom.org or through local agricultural literacy coordinator.
Natural Resources Conservation Service http://www.nrcs.usda.gov/feature/education

Hit #26

A Log's Life

Objective: Students will describe the process of decomposition and identify some of the organisms that live in, on and under fallen logs and explain how those organisms depend on the dead wood for survival.

Illinois State Goals: 12.A., 12.B., 12.E.



Top Book Hits:
A Log's Life by Wendy Pfeffer;
ISBN-13: 978-1416934837
What's Under the Log? (Hidden Life) by Anne Hunter; **ISBN-13:** 978-0395754962

Materials Needed:
- Containers with lids for collection of bugs and/or plant matter
- Paper and pencil
- Field guides on insects and fungi
- Magnifying glasses
- Log's Life Chart

Procedure:
1. Ask the students why forests aren't piled high with fallen trees, branches, and leaves. What happens to trees after they die? Tell the students that they are going to examine dead logs to find out the answers.

2. Divide the group into teams of three or four and explain that each examine a rotting log. Each group will fill out the "A Log's Life Chart".

3. Take the students outside and have each group pick a log to study.

4. Once the students have finished the activity, be sure they put the log back in place so the habitat is not totally disturbed.

Give credit where credit is due…adapted from Project Learning Tree - The Fallen Log Lesson.

A Log's Life

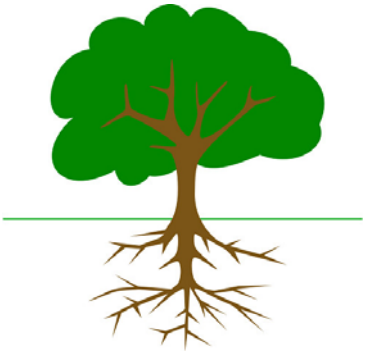
Is there bark on the log? What does it look like?	
What kinds of plants are growing on the log?	
What kinds of insects or animals do you see? (Be sure to look inside and under the log)	
What are the insects or animals doing?	
What do you think the insects or animals eat?	
Do you see any insect holes, spider webs, or other evidence that an animal has been there?	
Why do you think the tree died? (Look for other parts of the tree nearby to help you answer this question.)	
Has the tree been dead a long or short time? What makes you think that?	
Draw two of the insects or animals that you see.	
Draw something you find interesting on your log.	
Draw two plants that you see on your log.	

Give credit where credit is due…adapted from Project Learning Tree - The Fallen Log Lesson.

Hit #27

BUILD-A-TREE

Objective: Students will demonstrate the parts of a tree and their function.



Illinois State Goals: 12.A.

Top Book Hits:
Tell Me Tree, All About Trees for Kids by Gail Gibbons;
ISBN-13: 978-0316309035
Around the Oak by Gerda Muller**;**
ISBN-13: 978-0382336614

Materials Needed:
- None are essential, but laminated cards of tree parts: heartwood, taproot, lateral root, sapwood, cambium, phloem, bark) would be helpful
- Group Size – Parts of Tree Chart

Procedure:

Warm-up: Have everyone stand in a large circle. Place yourself in the center. Ask: "What is a tree? How does a tree work? Has anybody ever seen the inside of a tree? What does it look like?" Explain that the children will be building a tree.

Activity: Choose tall or strong-looking children for the **heartwood**. (Refer to the chart for number of assignments.) Place them in the middle of the circle. Tell them: "Your job is to hold the tree tall and strong. The rest of the tree hangs on you. The branches, the growing wood, the bark and the leaves all depend on you to hold them up. You are the heartwood. You used to be alive, bringing water and food up and down thousands of tiny tubes, but now you are dead, clogged with resin and pitch. You keep the tree upright during windstorms, snowstorms and all sorts of awful weather. You are the heartwood. Let's practice your line: When I say, 'The wind's a blowing and a hollering.' You say, 'I've got heart!!!'"

Next, choose other strong-looking children to be the **taproot**. Have them kneel at the base of the heartwood. Tell them: "Try to imagine sinking down into the ground 30 feet. You are the taproot. You anchor the tree firmly to the ground, sinking deep into the soil, through clay and rock. You hold tightly onto the earth. When the fiercest storms come, you keep the tree from being blown over by the raging winds. You are the taproot. Let's practice your line: When I say, 'The wind's a blowing and a hollering.' You say, 'Anchors Away!'"

Give credit where credit is due…this activity adapted from Project Learning Tree.

Then choose children to be **lateral roots**. You might want to choose children with long hair so you can demonstrate the root hairs extending down into the soil. Have them lie down on their backs with their feet up against the heartwood and their bodies extending away from the tree. Tell them: “There are hundreds of you that stretch out from the trunk in all directions for long distances, sometimes hundreds of feet. You are the lateral roots. Like the heartwood and the taproot, you help hold the tree up. Some trees, like redwoods, depend only on you. They don’t have taproots. Extended from you are tiny little roots called root hairs. (At this point, kneel down and spread out the hair of the lateral roots.) Your root hairs suck up water trapped by the soil. You are the lateral roots. You supply the tree with water, so when I say, ‘Slurp,’ you make slurping sounds.”

The **sapwood** children are next. Have them encircle the heartwood, facing inward, and being careful not to step on the root hair or lateral roots. Tell them: “You draw water up from the roots and lift hundreds of gallons of water a day high into the air. In your tiny tubes, water sometimes surges upwards at 200 miles per hour. After the roots bring up the water from the ground, your job is to bring the water up the tree. You move water up the tree, so when I say ‘Bring the water up!’, you say ‘Whoooooo!’” (ascending note).

Have the tree practice its parts, then choose children to be the **cambium/phloem** layer of the tree. Have them form a circle around the sapwood, facing inward, and stretching their arms upwards and outwards so they intersect each other at the wrists, leaving their hands free to flutter like leaves. Tell the children: “You are the most vital, alive part of the tree. You are the cambium/phloem layer. When I say ‘Make food!’, you rustle your leaves in the sun. And when I say ‘Bring the food down!’, you say ”Whoooooo!’ (long descending note), bend at the knees and drop your arms and body to the ground.”

Review the sounds and motions of the tree parts. Then have the remaining children be **bark** and circle around the tree. They face outward because they protect the tree. Tell them: “Your job is to protect the tree. You are the bark. You work day and night putting up with all kinds of abuse. If some critter gnaws on your bark you soon grow a new layer. You are the bark. Because you are so protective, let’s practice your line: When I say ‘Chomp! Chomp!’, you say ‘Roff! Roff!’, like a dog, and snarl.”

Wrap-up: Walk around the tree and have the group make their sounds when you call out the part of the tree.

Give credit where credit is due…this activity adapted from Project Learning Tree.

	GROUP SIZE				
PARTS OF TREE	**15**	**20**	**25**	**30**	**40**
Heartwood	**1**	**1**	**2**	**3**	**4**
Taproot	**1**	**1**	**1**	**1**	**1**
Lateral Roots	**2**	**2**	**3**	**4**	**5**
Sapwood	**3**	**3**	**4**	**5**	**7**
Cambium/Phloem	**3**	**5**	**6**	**7**	**10**
Bark	**5**	**8**	**9**	**10**	**13**

Grow Further: Take a walk to see trees. Do some bark rubbings. Use booklets to try to identify trees. Secret Life of Trees – http://urbanext.illinois.edu/tree2/

Give credit where credit is due…this activity adapted from Project Learning Tree.

Hit #28

Leaf It!

Objective: Students will learn the parts of a tree and ways trees help the environment by answering tree trivia questions.

Illinois State Goals: 12.A., 12. B.,12.E.

Top Book Hits:
A Tree Is Nice by Janice May Udry; **ISBN-13:** 978-0064431477
Red Leaf, Yellow Leaf by Lois Ehlert; **ISBN-13:** 978-0152661977
Why Do Leaves Change Color? by Betsy Maestro; **ISBN-13:** 978-0064451260
The Giving Tree by Shel Silverstein; **ISBN-13:** 978-0060586751

Materials Needed:
- Tree bulletin board kit or art supplies to make a tree trunk with branches and leaves
- Scissors
- Tape and/or velcro
- "Leaf It" questions
- Rock, pine cone, pine needles, piece of bark, orange, acorn
- Recorded music with player (optional)
- Beanbag (optional)

Activity Preparation:
- Fashion a tree trunk with branches to stand approximately 4 foot from the floor using a bulletin board kit or brown construction/craft paper. If needed, use green construction paper to cut out leaves. There should be enough leaves for each student to have at least one or two. ***NOTE:*** You may wish to laminate all the pieces for long term use.
- Tape or hang the tree on the wall at a height that students can reach. Place a circle of tape or Velcro dot on various spots on the branches. If using Velcro, place the other part of the Velcro on the back of each leaf. Place the leaves in a pile near the tree.
- Select the "Leaf It" questions that are provided or develop some of your own to complement your tree study unit. Cut the questions into strips and place in a container for each student to draw out of.

Procedure:
Have students sit in a semicircle around the tree. Explain that everyone will have the opportunity to re-leaf the tree***.*** Before a student can put a leaf on the tree, he or she must answer a tree question.

1. Place the questions in a bag. Instruct each student to select a question. Read the question to them. Offer hints if the student is having difficulty.
2. After the student answers the question correctly, he or she can take one of the leaves from the leaf pile and stick it on one of the velcro or tape spots.
3. Continue playing until all the leaves are on the tree.

Option: Music may be used with this activity. Set up the music so it can be stopped and started easily. Start the music, and direct students to pass a bean bag around the circle. When the music stops, the student with bean bag gets to answer a tree question.

Give credit where credit is due…adapted from NatureScope: Trees are Terrific!

Leaf It Questions

Hold up a “non-tree” object such as a rock and ask, “Is this part of a tree?”

What happens to some tree leaves in the fall?
On some trees (most deciduous trees), the leaves turn different colors and fall off in one season. On most pines and other evergreens, they don’t change colors and they don’t fall off during one season.

Can you think of a way a bird might use a tree?
Many birds perch in trees, build nests in trees, and/or roost (sleep) in trees.
Also, some birds eat a tree’s fruit or nuts or eat insects that live in or on trees.

Can you think of a way a tree’s bark can help the tree?
Bark protects a tree from certain insects, cold weather, animals, and other things that could harm it.

Hold up a pine cone and ask, “What is this?”

Can you name a kind of food that people get from trees?
Apples, oranges, cherries and other fruits; also walnuts, pecans, and many other nuts.

Is a tree a living thing?
YES

Hold up some pine needles and ask, “What are these?”

Can you name a kind of animal that lives in trees?
Many bats, birds, insects, spiders, squirrels; and other animals live in trees.

Is a tree a plant or an animal?
Plant

Can you name something made from trees that people use every day?
Paper, pencils, and wooden furniture are just a few examples

What color are most trees’ leaves most of the time.
Green

Can you name a color some leaves become in the fall?
Yellow, red, orange, purple and brown. The leaves of some trees stay green all year long.

When there are no leaves on a tree in winter, does that necessarily mean the tree is dead?
NO. Trees that lose their leaves in fall stay alive all through the winter in a kind of resting stage.

Would trees be able to grow if the earth never got any sunshine?
NO. Trees, like most plants need sunshine to grow.

Can you name a way an insect might use a tree?
Some insects eat tree leaves, bark, seeds, and other tree parts; some insects lay their eggs on or in trees; some katydids and other insects “sing” from perches in trees.

What is a big group of trees all living in the same place called?
A woods or forest

Give credit where credit is due…adapted from NatureScope: Trees are Terrific!

What do a tree's roots do?
They absorb water and minerals and help hold the tree steady in the soil.

When you grow up, will you be taller or shorter than most kinds of trees that are the same age?
Shorter

If there were tall trees all around your house, would you feel warmer or cooler in the house on a hot summer day?
Cooler

Hold up an orange and ask, "Is this part of a tree?"
An orange is the fruit of an orange tree.

Name two ways animals use trees.
For food, shelter and nesting sites

Hold up an acorn and ask, "What would this grow into if it were planted?"
An oak tree

TRUE or FALSE - Pine needles are leaves.
TRUE

Hold up a piece of bark and ask, "Is this part of a tree?" Also ask where is bark is found on a tree?
On the trunk, branches, and roots

What are deciduous trees?
Trees that lose their leaves each year.

What gives green plants their green color?
A pigment called chlorophyll

Name one function of a tree's trunk.
Support rod and transport system

You live in a place that is windy. If you plant big pine trees around your house, would as much wind blow against your house as it did before the trees were planted?
NO. Trees make good windbreaks.

A tree's outer covering or _____, protects it from injury, insect damage, and disease.
Bark

What is the seed of an oak tree called?
An Acorn

Name three products that people get from trees.
Lumber, paper, food, spices, rubber, cork, drugs, fabric and more!

The sap from the sugar maple is used to make what product?
Maple Syrup

Native Americans used bark from birch trees to make what?
The white bark of the birch tree was used to make light-weight canoes.

What is the state animal of Illinois?
The White-tailed Deer

Give credit where credit is due…adapted from NatureScope: Trees are Terrific!

TRUE or FALSE - Trees are considered to be annuals.
FALSE. Annuals are plants that sprout, reproduce, and die in one season. Trees are a type of perennial, which means they live for many seasons.

The buckeye tree got its name because it has a shiny nut that looks like the eye of what animal?
The buckeye has a seed that looks like the eye of a deer.

What is a compound leaf?
A leaf made up of many leaflets.

The shagbark hickory is named for its shaggy what?
The bark on a mature shagbark tree separates from the trunk in narrow strips, which gives it a shaggy look.

The sapwood carries _____ and _____ from the roots to the leaves.
Nutrients, Water

What do people traditionally plant on Arbor Day?
Trees

What is the state tree of Illinois?
The White Oak

When is Earth Day?
Earth Day is celebrated on April 22nd of each year. The first celebration was held in 1970.

What is one way that scientists can tell how old a tree might be?
Count the annual growth rings

What is the state bird of Illinois?
The Northern Cardinal

What is name for the single layer of living cells called that produces the sapwood and the inner bark?
Cambium

Name one way trees help the environment.
Roots help hold soil in place to prevent erosion and trees help clean the air.

What is the name for the part of the tree that is located in the center of the trunk and contains very strong, dead tissue that supports the tree?
Heartwood

These tiny holes in leaves of a tree, take carbon dioxide gas from the air. They turn this gas into oxygen and release it. What are they called?
Stomata

What is the food making process called where the leaves of the tree use the energy in sunlight, chlorophyll (the green substance in leaves), water and nutrients from the soil?
Photosynthesis

TRUE or FALSE – After a tree dies it has no value to the environment.
FALSE – Even after a tree dies it can be a home for insects, animals, and birds. As the tree begins to decompose, it enriches the soil.

Give credit where credit is due…adapted from NatureScope: Trees are Terrific!

Hit #29

LIFE OF A TREE ENACTMENT

Objective: Students will act out the life cycle of a tree.

Illinois State Goals: 12. E.

Top Book Hits:
The Life Cycle of a Tree by Bobbie Kalman; **ISBN-13:** 978-0778706892
The Tree Farmer by Chuck Leavell and Nicholas Cravotta **ISBN-13:** 978-1893622166

Materials Needed: Teacher instructions
- Large area for student activity

Procedure:
Ask students to imitate your movements as you enact the life of a tree. (Elaborate/add to these actions as you wish.)

1. Curl up in a tight ball – you are a seed.
2. Uncurl and kneel—you've sprouted.
3. Stick up one arm (fist clenched) – you've grown a branch.
4. Stick up the other arm—you've grown another branch.
5. Wiggle your fingers – you've grown a lot of leaves to make your food.
6. Stand up (feet together)—you grow tall.
7. Spread your feet apart – you've grown a lot of roots to bring you water and minerals.
8. Wiggle your toes—you grow lots of little roots.
9. Start scratching all over—you're attacked by insects and fungi.
10. Sway slowly then more and more—a storm goes by.
11. Make a loud noise (kchhhh!) – you get hit by lightning and loose a limb.
12. Smile and sigh (ahhhh!)—you become a home for wildlife in your old age.
13. Make a hammering noise (knock, knock, knock) and vibrate—woodpeckers peck into your dead wood.
14. Make a creaking sound and fall down—you blow down in a storm.
15. Stick up one arm—a new seed sprouts from your rotting wood.

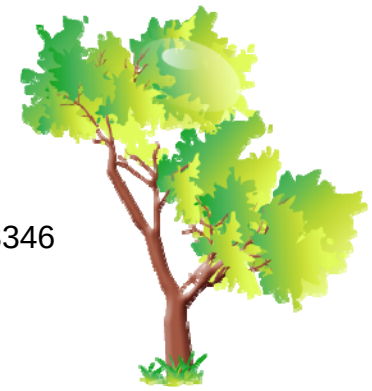
Grow Further: An extension would be to take the students on a walk and try to find trees at various stages of their lives. Dr. Arbor Talks Trees http://urbanext.illinois.edu/tree3/01.html

Credit where credit is due…adapted from Project Learning Tree.

Hit #30

The Giving Tree

Objective: Students will learn all of the parts of a tree and explore how each of these parts are used to make a wide variety of common products.



Illinois State Goals: 12.A., 12.B.

Top Book Hits:
The Tree Farmer by Chuck Leveau & Nicholas Cravotta;
ISBN-13: 978-1893622166
A Grand Old Tree by Mary Newell DePalma; **ISBN-13:** 978-0439623346
The Giving Tree by Shel Silverstein; **ISBN-13:** 978-0060586751

Materials Needed:
- Leaves – an umbrella with paper leaves attached
- Wood – a small piece of wood with a long string attached to wear as a necklace
- Bark – a vest made from a paper grocery bag, decorated with squiggly line to resemble patterned bark
- Roots – rope tied together at different lengths with knots in it tied at the students feet
- Flowers – a headband decorated with small yellow, green, or white flowers made from pipe cleaners
- Fruits – fruit shapes cut out of construction paper and hung on loops of string to hang over the students outstretched arms
- Seeds – gloves with paper cut outs of seeds attached to each finger
- Sap – two jugs of water to shake

Procedure:
1. Assemble the pretend parts of a tree as directed in the materials needed.

2. Ask the students to brainstorm a list of all the things that trees give us and write down a list.

3. Have the students list the eight different parts of the tree: leaves, wood, bark, roots, flowers, fruits, seeds, sap.

4. As each part is mentioned, have one student come to the front of the class to "wear" that part of the tree.

5. Once each part is represented in front of the class, start matching items from their lists to the different parts of the tree.

Grow Further: Ask students to compare the parts of a tree to the parts of a flower. Ask students to discuss different types of trees and where they can be found around the world. Have students conduct a tree inventory in their homes by surveying each room for products made from trees. Try some unusual edible tree treats such as mangos, pomegranates, dried figs, whole coconuts, kiwi fruit or papaya.

Give credit where credit is due…this came from Shelburne, Project Seasons by Debra Parrella.

Hit #31

Tree Rings

Objective: Students will learn about the parts of a tree and note significant life events.

Illinois State Goals: 12.A.

Top Book Hits:
I Can Name 50 Trees Today! by Bonnie Worth; **ISBN-13:** 978-0375822773
My Little Corner of the World by Beth Burch Smith; **ISBN-13:** 978-1878096364

Materials Needed:
- White paper plates
- Crayons
- Blank sticky labels
- Pens/pencils

Procedure:
1. Discuss these parts of a tree with the students: outer bark (protects tree), inner bark/phloem (pipeline for the food to be passed to the rest of the tree), cambium (the growing part of the tree that produces new bark and wood), xylem (pipeline for moving water up to the leaves), and heartwood (supports tree on the inside).

2. Give each student a paper plate. Ask them to use crayons and draw the outer bark, inner bark, cambium, xylem, and heartwood on the plate so it looks like a cross-section. Each section should be a different color and the sections should be labeled.

3. Ask the students to draw rings on the tree to show the age of the tree.

4. Ask the students to pretend their life is on the tree cross-section. Give each student blank sticky labels. They can write events of their life on the labels and attach them to different years on the tree cross-section.

Grow Further: Forests are for Kids http://www.idahoforests.org/kids1.htm
Anatomy of a Tree http://www.arborday.org/trees/RingsTreeNatomy.cfm

Give credit where credit is due…this activity came from Illinois Agriculture in the Classroom.

Hit #32

Don't Use It All Up

Objective: Students will state one demand he or she places on a natural resource. Then, students provide an example and explain the importance of conserving that resource.

Illinois State Goals: 12.E., 13.B.

Top Book Hits:
We Use Water by Robin Nelson; **ISBN-13:** 978-0822545958
Water by Ian Graham; **ISBN-13:** 978-1403456281

Materials Needed:
- Clear container with 4 cups of tinted water
- Marker or masking tape
- Small pieces of sponges (at least one per student)
- Second container for sponges

Procedure:
1. Measure about 4 cups of tinted water into the container. The container represents Earth and the water represents all the available freshwater.

2. Students can brainstorm ways in which we use water (drinking; cleaning, cooking, bathing, irrigation, recreation, etc.).

3. Using a marker or the masking tape, mark the water level on the outside of the container. Each student should drop a sponge into the container as they state one demand that they made on water today. Leave the sponges in the container. Ask if anyone notices a change in the water level.

4. After the students have dropped all the sponges in the container, remove them without squeezing. Set the sponges in the other container. Look at the first container and note the dramatic change in the water level. Mark the new water level on the outside of the container.

5. Help students understand that the demands on natural resources (such as water) of a large population have more effect than the demands of a small one. Students can answer the following questions:
   - What happens to the water level as we remove all the sponges?
   - What will happen if we keep using water at this rate?
   - What can we do about this situation?
   - How can we conserve or give water back to the environment?

6. Squeeze sponges back into the original container, one at a time, while each student names a way to reduce the amount of water. Notice the slight change in water level. Watch the water level rise as more students add water to the container.

Give credit where credit is due…this activity adapted from Project Food, Land and People.

7. When everyone has put the water from their sponge back into the container, note the water level. It will be lower than when the lesson began. Ask:
   - Why doesn't the water level return to the original mark even after all the sponges are squeezed out?
   - What are some resources that are renewable?
   - Describe one thing you have learned from this demonstration.

Explore More: This lesson complements Top 40 Hits Lesson #33 Drop in a Bucket. Illinois Water Ag Mag www.agintheclassroom.org or through local agricultural literacy coordinator. H_20 University http://www.h2ouniversity.org/html/3-5_index.html Ways to save water, activities, games http://www.wateruseitwisely.com/

Give credit where credit is due…this activity adapted from Project Food, Land and People.

Hit #33

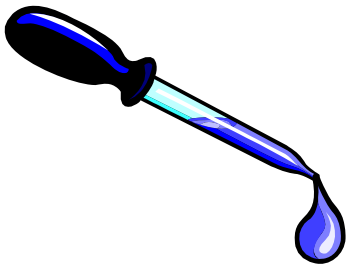
DROP IN THE BUCKET

Objective: Students will learn about how much fresh water is available for human use.

Illinois State Goals: 12.E.

Top Book Hits:
Water by Susan Canizares & Pamela Chanko; **ISBN-13:** 978-0590107273
Drip! Drop! How Water Gets to Your Tap by Barbara Seuling; **ISBN-13:** 978-0823414598

Materials Needed:
- 1 gallon of water
- Eye dropper
- Measuring spoons
- 6 clear containers with labels



Procedure:
1. Measure and take out 5 tablespoons of water from the gallon of water and place in one clear container. Label this 2% polar ice caps or glaciers.

2. Measure and take out 2 tablespoons of water from the gallon of water and place in another clear container. Label this container 0.62% ground water.

3. From the gallon of water take 1/8 teaspoon and place in a container labeled 0.008% inland seas/salt lakes.

4. Take out another 1/8 teaspoon of water and place in a container labeled 0.009% fresh water lakes.

5. In the two remaining containers place one drop of water in each. Label one 0.001% atmosphere and one 0.0001% rivers/streams.

6. The water remaining (97.2%) in the original gallon represents the oceans. What is available as fresh water for human use? The combination of groundwater, fresh water lakes, and rivers and streams (2 tablespoons + 1/8 teaspoon + 1 drop).

Explore More: Frank the Fish water usage short video:
http://www.youtube.com/watch?gl=CA&hl=en&v=a_r4jRm-T50
Illinois Water Ag Mag www.agintheclassroom.org or through local agricultural literacy coordinator.

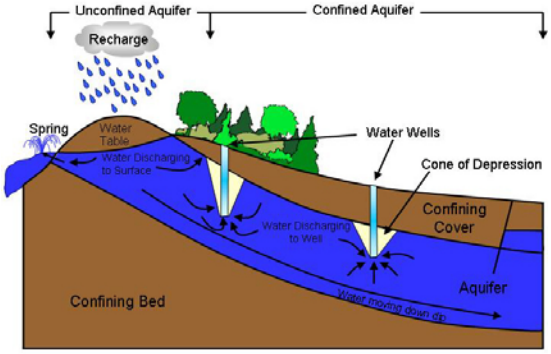
Give credit where credit is due…this activity came from Project Wild Aquatic.

Hit #34

Edible Aquifer

Objective: Students will illustrate the geologic formation of an aquifer, how pollution can get into groundwater, and how this pollution can end up in drinking water wells. Students will come to understand how our actions can affect groundwater and drinking water.

Illinois State Goals: 11.B.



Top Book Hits:
Water Dance by Thomas Locker;
ISBN-13: 978-0152163969
A Drop Around the World by Barbara McKinney;
ISBN-13: 978-1883220723

Materials Needed:
- Chocolate chips (4, 12 oz bags)
- Chocolate sprinkles (2, 3 oz containers)
- Clear plastic cups (12 or 16 oz) (25 - 30)
- Clear soda (e.g., lemon-lime) (4 liters)
- Crushed ice (the smaller the better)
- Gummy bears or worms (small) (2 lbs)
- Red Kool-Aid® (dry) (4 small packages)
- Spoons (25 - 30)
- Straws (clear work best) (25 - 30)
- Vanilla ice cream (½ gallon or 25 - 30 single serving cups)

Procedure:
1. Fill a clear plastic cup 1/3 full (total) with a combination of gummy bears, chocolate chips, and/or crushed ice. *These represent gravels and soils that make up the aquifer.*

2. Add enough soda to just cover the candy/ice. *The soda represents ground water. Notice that the soda fills all of the spaces among the gummy bears, chocolate chips, and ice. The aquifer is now saturated with soda; it is a "saturated zone." In an unconfined aquifer (see Step 3), the top of the saturated zone is called the "water table."*

3. Add a layer of ice cream. (Optional) *This layer, called a "confining layer" or an "aquitard," is impermeable or significantly less permeable than the aquifer below it (it is difficult for water to soak through). It helps protect the aquifer from contamination and is usually made of rock and/or clay. An aquifer under a confining layer is called a "confined aquifer." An aquifer without a confining layer is called an "unconfined aquifer." If your local aquifer does not (or even if it does), consider omitting the ice cream or having half the class use ice cream and half not to compare the results.*

Give credit where credit is due…Idaho Department of Environmental Quality.

4. Add crushed ice on top of the confining layer/water table. *This represents the unsaturated zone, the area where air fills most of the pores (spaces) in the soil and rock.*

5. Scatter chocolate sprinkles over the top. *The sprinkles represent the soil, which is very porous.*

6. **The aquifer is now complete. Your aquifers will probably be messy and not look like the picture on this page. That's OK! Real aquifers aren't neatly layered either.**

7. Sprinkle Kool-Aid® over the top. *The Kool-Aid® represents contaminants on the ground (e.g., fertilizers, oils, fuels,). Does anything happen to the Kool-Aid® right away? (Usually nothing will happen.)*

8. Using a drinking straw, "drill" a "well" into the center of the aquifer. *Observe the aquifer and Kool-Aid®. What, if anything, happens when the well is drilled?*

9. Begin to "pump" the well by slowly sucking on the straw. *Watch the decline in the level of the soda and observe what happens to the contaminants. Do contaminants (Kool-Aid®) leak through the confining area (ice cream) and get sucked into the well? If so, do more contaminants get into wells in confined or unconfined aquifers? (If your class made both; see Step 3)*

10. Pour a small amount of soda over the top. *The soda represents precipitation. It recharges the aquifer (adds new water). Watch how the Kool-Aid® dissolves and moves into the aquifer. The same thing happens when contaminants are spilled on the ground. Do you think you could get the Kool-Aid® back out of the soda?*

More Hits: Aquifer Virtual Field trip www.spokaneaquifer.org/kids/vfte/
Illinois Water Ag Mag www.agintheclassroom.org or through local agricultural literacy coordinator.

Give credit where credit is due…Idaho Department of Environmental Quality.

Hit #35

ENVIROSNACK

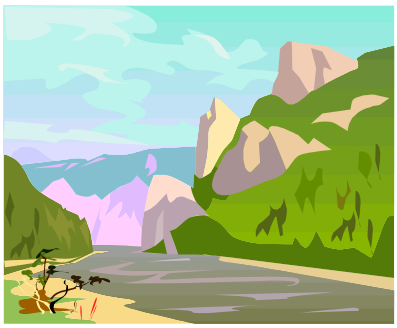
Objective: Students will demonstrate the basic geography of a watershed, how water flows through the system, and how people can impact the quality of our water.

Illinois State Goals: 13.B., 17.A., 17.B., 22.C.

Top Book Hits:
Everything Kids' Environment Book by Sheri Amsel; **ISBN-13:** 9781598696707
Spring Waters Gathering Places by Sandra Chisholm DeYonge;
ISBN-13: 978-1888631050

Materials Needed:

- Chocolate graham crackers - soil
- Spreadable white cake frosting - adhesive
- Chocolate kisses (2 or 3 per students) – mountains
- Chocolate chips – hills
- Green sprinkles – grassland
- Tree shaped sprinkles
- Tube of blue cake icing (no gel) – lakes and streams
- Miniature marshmallows – clouds/precipitation



Procedure:

1. Assemble the envirosnack by spreading white frosting (adhesive) on a full size cracker.

2. Add hill and mountains as desired.

3. Sprinkle with green grassland sugar crystals.

4. Place the tree shaped sprinkles to create a forest area.

5. Add blue icing to form mountain waterfalls, rivers, and lakes.

6. Add clouds according to personal preference – perhaps surrounding the mountains creating precipitation that ends up as a lovely mountain stream.

7. Enjoy eating your edible watershed.

Explore More: This activity complements Top 40 Hits Lesson #39 Wad-A-Watershed. EnviroScape demonstration model may be available through local NRCS/SWCD or agricultural literacy coordinator.

Give credit where credit is due…this activity came from Florida Agriculture in the Classroom.

Hit #36

INCREBIBLE JOURNEY

Objective: Students will describe the movement of water within the water cycle and identify the states of water as it moves through the water cycle.

Illinois State Goals: 12. E.

Top Book Hits:
Water Dance by Thomas Locker**; ISBN-13:** 978-0152163969
Water Cycle by Delta Science Readers; **ISBN-13:** 978-1592423477

Materials Needed:
- Colored pencils
- Dice
- Water Cycle Data Table sheet (one per group)
- Water Cycle Diagram sheet (one per group) – the tables that are used to complete this activity are included on the following 2 pages.

Procedure:
1. Have individual students or small groups roll two dice. This will determine where the water molecule will begin its journey through the cycle. Find the sum of the roll on the chart below and then record the starting place of the molecule on the Water Cycle Data Table that is found on the next page.

2 – animal	5,6 – clouds	10 – glacier
3 – ground water	7,8 – ocean	11 – soil
4 - lake	9 – river	12 - plant

2. To begin the journey of the water molecule, roll one of the dice. Looking at the Water Cycle Table, determine where the water molecule will move next. Record where the water molecule moves in the Water Cycle Data Table under roll # 1.

3. On the Water Cycle Diagram, use the colored pencil to draw a line that shows where the molecule moves.
   Example: On your first roll of the 2 dice, you got a 10, so you begin your journey as a glacier. On your second roll, you roll a 2. Look at the Water Cycle Table by the glacier. A roll of 2 has you move to the clouds. Before rolling again, document the movement of your molecule on the Water Cycle Diagram and the Data Table.

4. Repeat steps 2 and 3 nineteen (19) more times.

5. After all groups have finished their water molecule journeys, discuss and compare their results.

Explore More: Have students make a water bracelet after completing the activity by using a different colored bead for each of the places their water droplet went during the activity. If the activity is done in small groups, each student could roll and document their individual water molecule journey on the same water cycle diagram. This will show the possible variances in molecule journeys. As an evaluation, instruct students to use water cycle terminology to explain their water molecule journey. (Terms may include condensation, evaporation, precipitation, run–off, transpiration, and infiltration.)

Give credit where credit is due…adapted from Project WET.

Water Cycle Diagram

CLOUDS **OCEAN**

RIVERS

LAKES **PLANTS**

SOIL

ANIMALS **GLACIERS**

GROUNDWATER

Water Cycle Data Table

Starting area: _____

Roll #	Move to:	Roll #	Move to:
1		11	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		20	

Give credit where credit is due…adapted from Project WET.

Water Cycle Table

Molecule is in:	***Die #***	***Move to….***	***Molecule is in:***	***Die #***	***Move to…***
SOIL	1	Plants	**CLOUDS**	1	Soil
	2	River		2	Glacier
	3	Ground water		3	Lake
	4,5	Clouds		4,5	Ocean
	6	Stay in soil		6	Stay in Cloud
PLANT	1,2,3	Clouds	**LAKE**	1	Ground Water
	4	Animal		2	Animal
	5.6	Stay in plant		3	River
				4	Clouds
RIVER	1	Lake		5,6	Stay in lake
	2	Ground water			
	3	Ocean	**GLACIER**	1	Ground Water
	4	Animal		2	Clouds
	5	Clouds		3	River
	6	Stay in River		4,5,6	Stay in Glacier
OCEAN	1,2	Clouds			
	3,4,5,6	Stay in Ocean			
ANIMAL	1,2	Soil	**GROUND WATER**	1	River
	3,4,5	Clouds		2,3	Lake
	6	Stay in animal		4,5,6	Stay in ground water

Give credit where credit is due…adapted from Project WET.

Hit #37

Making Rain

Objective: Students will follow directions, working within a group to make the sounds of a rainstorm.

Illinois State Goals: 12.E., 19.A., 21.A.

Top Book Hits:
Thunder Cake by Patricia Polacco**; ISBN-13:** 978-0698115811
Water Dance by Thomas Locker**; ISBN-13:** 978-0152163969

Materials Needed:
- None

Procedure:
Arrange children so they are all facing you. Tell them to imitate what you are doing whenever you walk in front of them and have them keep doing it until you come by again doing something else. Each time you begin making a different sound, you will start on one side and then return to the starting point to start the next sound. Tell the children that they will first hear the wind, then drizzle, hard rain, thunder and then the storm as it gradually blows away.

Your sequence of sound-making activities should go like this:

1. Rub your hands together gently.
2. Snap your fingers (for little children clucking with their tongue works also).
3. Slap your hands on your thighs.
4. Keep slapping your hands on thighs and stamp feet.
5. Return to just slapping hands on thighs.
6. Snap fingers.
7. Rub hands.
8. Stop all movements.

Explore More: Watch an adult choir making rain at www.youtube.com/watch?v=LKDGCgXtETc

Give credit where credit is due…adapted from Project WET.

Hit #38

RAINSTICK

Objective: Students will develop an appreciation and knowledge of other cultures and learn about agriculture and natural resources while having fun creating the sound of rain.

Illinois State Goals: 12.E.

Top Book Hits:
The Rainstick, A Fable by Sandra Chisholm Robinson; **ISBN-13:** 978-1560442844
Thunder Cake by Patricia Polacco; **ISBN-13:** 978-0698115811

Materials Needed:
- Cardboard mailing tubes with end pieces (or empty paper towel rolls, using packing tape on the ends)
- Chicken wire (cut into pieces the length of the tube and three times wider that the tubes width), rolled into a cylinder.
- Materials for filling the tube such as seeds, beans, pebbles, rice, beads, shells, etc.
- Decorating material such as markers, stickers, yarn, etc.

Procedure:
1. Attach one end piece to the mailing tube (or tape one end of the paper towel roll).
2. Insert rolled wire into the tube.
3. Fill tube with a mixture of seeds, beans, etc. Use more or less to create the sound you like.
4. Attach other end piece to mailing tube.
5. Decorate rainsticks by using items from the students' culture, or use natural objects from your own part of the world. Be creative.

Explore More: Students explore how people have tried to make rain throughout history. This lesson complements Top 40 Hits Lesson #37 Making Rain.

Give credit where credit is due…activity came from Oklahoma Cooperative Extension Service.

Wad-A-Watershed

Objective: Students will be able to understand the basic geography of a watershed, how water flows through the system, and how people can impact the quality of our water.

Illinois State Goals: 10.B., 13.B., 17.A., 17.B., 22.C.

Top Book Hits:
The Disappearing Earth by Doug Peterson; **ISBN-13:** 978-1883097271
Spring Waters Gathering Places by Sandra Chisholm DeYonge; **ISBN-13:** 978-1888631050

Materials Needed:
- 8 ½ x 11 paper (one sheet for each student)
- 3 different colors of water soluble markers
- Several spray bottles of water

Procedure:
A watershed is a geographic area in which water, sediments and dissolved minerals all drain into a common body of water like a stream, creek, reservoir, or bay. A watershed includes all the plants, animals, and people who live in it, as well as the non-living components like rocks and soil. We are all part of a watershed, and everything we do can affect the surface and ground water that runs through this system. When you create your miniature watershed, be sure to use water-soluble markers. As the markers "bleed," they demonstrate how rain moving through the watershed affects soil erosion and urban runoff.

1. To create the watershed, crumple a piece of paper up into a tight ball. Gently open up the paper, but don't flatten it out completely. The highest points on the paper now represent mountaintops, and the lowest wrinkles represent valleys.

2. Choose one color of water-soluble marker and use it to mark the highest points on the map. These points are the mountain ridgelines.

3. Choose a second color and mark the places where different bodies of water might be: creeks, rivers, lakes, etc.

4. With a third color, mark four to five spaces to represent human settlement: housing tracts, factories, shopping centers, office buildings, schools, etc.

5. Use the spray bottles to lightly spray the finished maps. This spray represents rain falling into the watershed. Discuss students' observation about how water travels through the system.

   - What changes did you observe in the maps?
   - Where does most of the rain fall? What path does the water follow?
   - Where does erosion occur? What happen to the human settlement – are any buildings in the way of a raging river or crumbling hillsides? How does the flow of water through the watershed affect our choice of building sites?
   - How does this map demonstrate the idea of a watershed?

Explore More: EnviroScape demonstration model may be available through local NRCS/SWCD or agricultural literacy coordinator.
U.S. Geological Survey (USGS) Science in Your Watershed http://water.usgs.gov/wsc/
USGS Water Science for Schools http://ga.water.usgs.gov/edu/watershed.html
Watershed game http://www.bellmuseum.org/distancelearning/watershed/watershed2.html

Hit #40

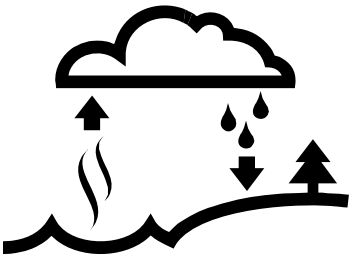
Water Cycle Bag

Objective: Students will learn about the water cycle through observation.

Illinois State Goals: 12.C., 12.E.

Top Book Hits:
The Magic School Bus Wet All Over by Pat Relf; **ISBN-13:** 978-0590508339
Down Comes the Rain by Franklyn M. Branley; **ISBN-13:** 978-0064451666

Materials Needed:
- Sandwich-sized zipper seal bags
- Permanent markers
- Aquarium rock
- Tablespoon
- ¼ cup measuring cup
- Water
- Packing tape
- Water cycle illustration



Procedure:
1. Place the copy of the water cycle illustration inside the bag and close the bag.
2. Using permanent markers, trace over all the black lines, including the numbers.
3. After completely tracing everything, remove the copy from the bag.
4. Add 2 tablespoons of aquarium rock to the bottom of the bag.
5. Add ¼ cup water to the bag.
6. Using wide clear packing tap, affix the bag to a window in direct sunlight and watch the water cycle work.

Explore More:

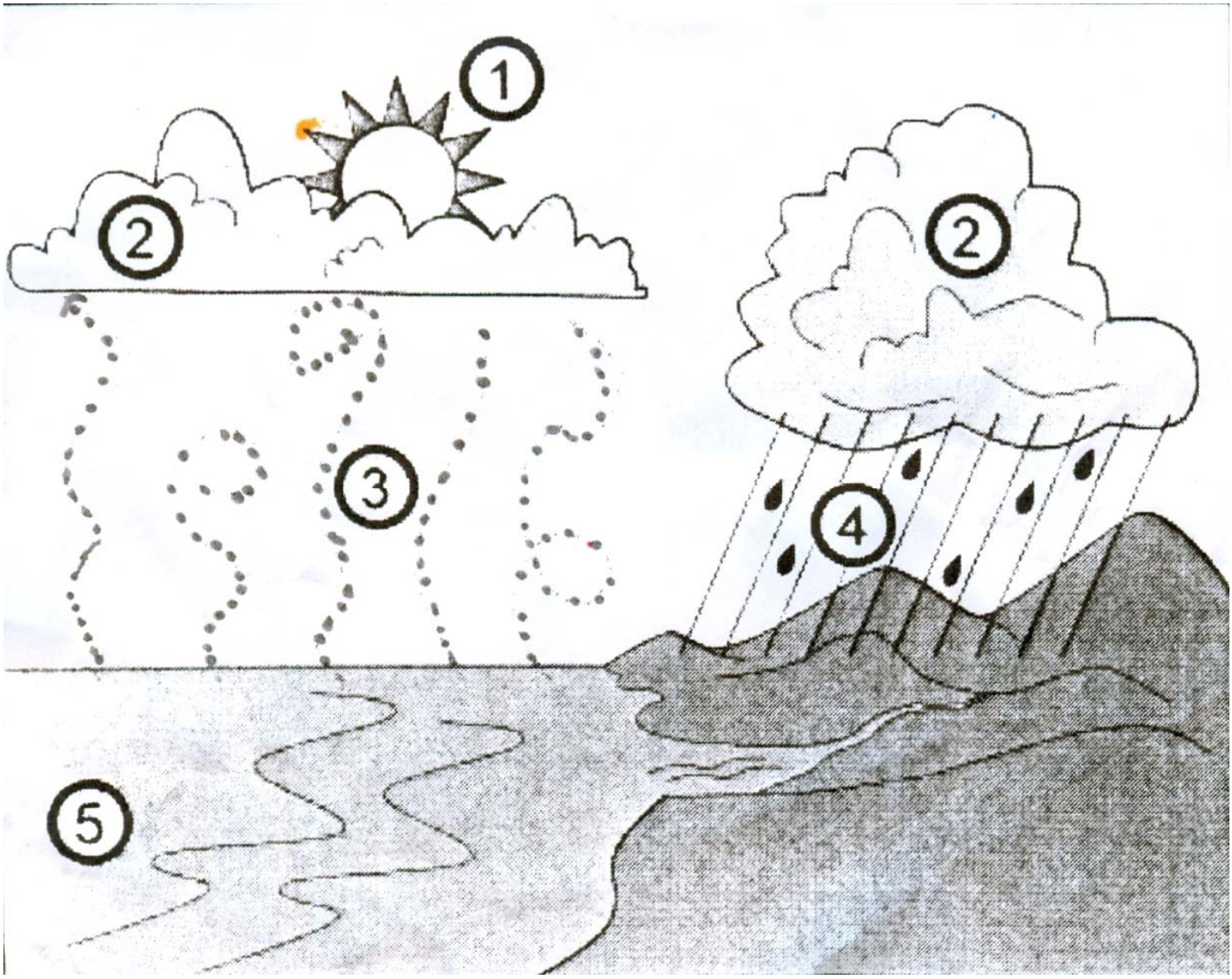
Water Cycle Song

(to the tune of "Oh, My Darlin")

- Evaporation, (Push both palms up, palms parallel to the floor.)
- Condensation, (Push with arms straight out to the side.)
- Precipitation on my head. (Pretend to "rain" on head.)
- Accumulation, (Make arms sweep back and forth in front.)
- Water Cycle, (Arms rotate in circle in front.)
- And we start all over again. (Turn around in place in a circle.)

Give credit where credit is due… 2009 National Agriculture in the Classroom conference.

Water Cycle Illustration



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Notes:

Give credit where credit is due…this booklet was compiled by the mAGic kit writing team:

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