THE GREAT RHYME TRAVEL MACHINE PRESENTS:
SAVING PLANET EARTH

Supplemental Activity Packet

This packet contains classroom activity suggestions and worksheets to reinforce concepts from the Playbook® story and to go beyond the story into the content areas of Language Arts, Math, Science, Social Studies, Art, Health, etc., as well as Character Development.

Activities range in age appropriateness and skill level so that teachers can choose activities that best suit their particular students. An Answer Key is provided on the last page.

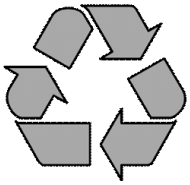
REDUCE, REUSE, RECYCLE!

One of the ways of "going green" that Marcus, Melinda, and Kelly wrote about in their song is by recycling. **Recycling means to re-use products which would otherwise be thrown away or to make new products from old materials.** This means recycling can be as simple as passing on old clothes to family members, or also refers to using materials from old products to make new products. The phrase, "reduce, reuse, recycle" refers to three goals of recycling. We need to *reduce* the amount of the earth's natural resources we use, *reuse* items by giving them to someone else instead of throwing them away, and *recycle* products that can be made into something new.

Why should we recycle? There are many reasons that recycling helps planet earth and people like you! Some of the most important ways are outlined below.

- **Conservation:** Man-made products use the earth's natural materials such as wood and metal. If we recycle these materials from old products, less new materials will need to be harvested. For example, less trees will need to be cut down if we recycle paper.
- **Energy Saving:** It uses a lot of energy to make new products, and it takes less energy to make products from recycled materials. Saving energy is good for the environment because it fights against global climate change.
- **Pollution Reduction:** By cutting down on manufacturing processes, recycling also reduced the amount of harmful gases factories release into the atmosphere. This is not only helpful in fighting against climate change, but is also beneficial to our health and the health of other living things.
- **Landfill Reduction:** When we recycle we send materials to be used again rather than thrown away to fill up our room for storing trash. Landfills harm the surrounding environment so we want to keep these places as few as possible.

What should we recycle? An easily recognizable recycling symbol (shown on the right) was created to help us identify which products are *recyclable* and which products are *recycled.* When a recycling symbol has a number percentage inside, it usually means the product is recycled and not necessarily recyclable. The following items are common recyclables:



- **Paper & Cardboard:** Paper based materials are easiest to recycle.
- **Plastic:** Some plastics are difficult to recycle, but ones that are easily recycled are often indicated with a recycling symbol with a number 1 inside. These include soda and water bottles, etc.
- **Glass:** Bottles and jars, etc. can be melted down and re-used.
- **Metal:** Metal of many types, including aluminum cans, can be recycled.
- **Electronics:** Today, many of these may be returned to the manufacturer for recycling.

Directions: At home, take a look at the trash items in your kitchen or other parts of your house. Which ones are recyclable? Does your family normally recycle these items? Fill out the chart below over several days, listing the items you found in your home that could be recycled. If possible, make sure the items go into your recycling bin or are taken to a recycling center! You can start helping to save planet earth right away!

Name_____ **Bring this form back to your teacher!**

Paper & Cardboard	
Plastic	
Glass	
Metal	
Electronics	

Name_____

I'LL BE THE BEST ECOLOGIST

In ***The Great Rhyme Travel Machine Presents: Saving Planet Earth***, Marcus, Melinda, and Kelly are looking for things they can do to help the environment. One way people can do this is by choosing ecology as a career! **Ecology is a science which studies the relationships between living things, including people, and their surroundings.** The word, "ecology" comes from a Greek word meaning "household," because it is the study of the "household" of all living things! Ecologists also explore how we can use Earth's resources in ways that will leave our planet healthy in the future.

One example of how ecologists have helped improve our environment is in discovering laundry detergents and fertilizers as a major cause of pollution in lakes. With this information, residents were able to restore the cleanliness of their nearby lakes and streams. Now these once polluted lakes can again be enjoyed with swimming and fishing!

Another way ecologists have helped the environment is by developing less toxic methods of reducing populations of non-native species. Sometimes, if people bring organisms (such as plants, animals, or fungi) to a part of the world they are not normally found, they can do great damage to the animals and plants that normally live there. The gypsy moth, for example, destroys forests by eating too many of the leaves on trees. Originally, only poisons which could also hurt other animals were available for getting rid of these pests, but now they can be controlled more safely because ecologists identified the most vulnerable stages of the moth's life cycle.

There are jobs available in the ecology field for everyone from young students to those with advanced university degrees! However, the more education you pursue, the more flexibility you will have in your choice of career. There are many types of work in ecology, including recording the effects of conservation and development, managing natural resources for organizations, studying and restoring ecosystems and doing research, and teaching the public about ecological issues and nature.

There are even less scientific jobs related to ecology, such as being an environmental lawyer who helps find compromises between people who want to build on land and those who want to protect it. Science writers may also report on ecological discoveries and issues, for those who are more creative yet still interested in science and the environment!

Key Words

Ecosystem: an area of the earth that includes all of the organisms living there and non-living parts of their physical environment

Environment: the surroundings of an organism including non-living features and other organisms.

Natural Resources: living and non-living materials in the environment which are used by people.

Population: group of individuals belonging to a single species (or a specific set of people)

Community: groups of different species that interact with one another

Directions: Use the Internet to research the ecology careers described above and others you may find. The following website provides information about various types of ecology positions: http://kids.nceas.ucsb.edu/ecology/careers.html. Use the career names listed on the website to search for more information about the ones that sound most interesting. Write a short essay on a separate sheet of paper explaining what kind of job in the field of ecology sounds most interesting, and why? Use some of the key words above in your essay when appropriate.

Name_____

GOING GREEN IN EVERY WAY

A previous activity in this work book discussed the importance of recycling, but that's not the only thing you can do to help planet Earth! You learned many of these things in the song, "I'm Going Green" in ***The Great Rhyme Travel Machine Presents: Saving Planet Earth***. Why is it helpful to do these easy things? The reasons are explained below!

Beyond Recycling: ***Precycling*** means to *buy* recycled products and prevent the need for recycling. Like recycling, this reduces the use of fresh natural resources, saves energy needed for product manufacturing, and cuts down on trash. Some ways of precycling include buying products or products with packaging made from recycled materials. For example, some school materials like writing paper are made from paper factory scraps. Also avoid using disposable products when possible. For example, use your own cups when away from home instead of using Styrofoam ones.

Water Conservation: Even though the earth is covered in water, ocean water is salty and not suitable for drinking. It takes time and resources to clean "used" water or rainwater for human use. A typical 8 minute shower uses 17 gallons of water, while a 4 minute shower uses only 7.5 gallons of water. See how much water you can save by cutting just a few minutes of running water?

Turn off the faucet when brushing your teeth. When doing dishes, instead of running the faucet the whole time, fill one side of the sink with cleaning water and the other side with rinsing water. The website, http://www.wateruseitwisely.com shares over 100 ways of saving water!

Preserving the Climate and Energy Saving: A measure of the effect human activity has on the environment is called the ***carbon footprint***. This means the amount of carbon dioxide, a harmful gas which contributes to global warming, that we release into the air by burning fossil fuels like oil or coal. We leave carbon footprints by driving cars, using heaters in our homes, and cooking with ovens or barbeque grills! In addition, there is a limited supply in the world of fuels like oil which we use most commonly, so it is important to use energy wisely. Walk or ride your bike to school instead of riding in the car. If that is not possible, then carpool with friends. This is not only good for the environment, but will also save money for your parents because they will not need to buy as much gas! Also remember to turn off lights and electronics when you are not using them.

Nature Protection: The plants and animals with whom we share the earth both provide beauty for us to enjoy, and help keep the environment balanced and healthy. Trees supply the air with oxygen we need to breathe, so plant some! Pick up and throw away trash when you see it around your neighborhood, at the beach, at the park, or in other natural or community areas.

Individual people, school classrooms, or other groups can also "adopt" an animal of an endangered species that is being kept in a wildlife rehabilitation organization. The person or group who wishes to "adopt" the animal donates an amount of money that will go towards caring for the animal, and the organizations usually sends back a photo of the animal. This is a fun form of "pitching in" to see how you are helping nature in a small, yet important and specific way!

Directions: Pretend you are a member of an Ecology Club at your school, and you are helping to plan a "Save Water Week." For this event, classrooms will compete to see who can conserve the most water by using the most water-saving methods at home and recording what they do each day. On a separate, white sheet of paper, make a poster to be displayed at your "pretend school" for advertising the event and getting students excited about taking part. Use both words and drawings, making sure to include the dates the event will take place. Mention some important reasons for saving water and also methods of conserving water. You can even include your own slogan for "Save Water Week" and offer prizes to the classroom that wins the competition!

Name_____

"I'M GOING GREEN" SONG PRACTICE

INTRO (*spoken or sung*):

We know that we're just kids, but we want to save the earth!
We're here to spread the message, telling people what it's worth.
So listen to our song, as we spell it out for you,
We hope you'll want to be a greener person, too!

(Chorus)
I'm going **GREEN.**
I'm going **GREEN.**
I'll be the best ecologist that you've ever seen.
The world will shine.
It's yours and mine.
We're saving Planet Earth … one letter at a time!

G means thinking **G**lobally at every open door,
Like taking your own shopping bag into the grocery store.
Adopt a sturdy canvas sack you won't have to dispose,
Instead of plastic bags that take so long to decompose.

R is for **R**ecycling the paper people toss.
Imagine all the oxygen from forests never lost.
When jotting in your journal, be sure to use both sides,
And pick precycled products as you shop for school supplies.

(Repeat Chorus)

E is for the **E**nergy your body has inside.
Tap into your own supply and walk instead of ride.
Reduce your carbon footprint by strolling here to there.
Real footprints in the sand can cut pollution in the air.

E should be for **E**very drop of water you conserve.
Shortening your showers will help balance our reserve.
Don't leave the water running when you rinse a dirty dish.
Brush your teeth without the waterfall is my wish.

(Repeat Chorus)

N is for your **N**eighbors living all around the world.
You've got to pass this global dream to every boy and girl.
Be Pen Pals for the planet; share your vision to survive.
Pass on this song of **GREEN** to keep our planet Earth alive.

(Repeat Chorus Twice)

Name_____

WRITE YOUR OWN SONG

Directions: In ***The Great Rhyme Travel Machine Presents: Saving Planet Earth***, Marcus, Melinda, and Kelly write their own song about "going green," to teach others this important message. What is an issue that is interesting and important to you? Maybe you care about being kind and making lots of friends, doing your best in school, adopting homeless pets, or donating toys to poor children. Pick a topic and write *your* own song about it! "I'm going GREEN" has verses that each start with a different letter in the word, "green." In your song, try to think of a word you can use to form the first letters in each of your verses! Write your completed song on the lines below, but use a separate sheet of paper to plan and practice your writing.

Name_____

SUPER SCIENTISTS

If ecology isn't quite the area you are interested in, consider these other earth or environment-related science careers. While working in any career in these areas of science you can consider ways of helping the planet and cutting down on harmful effects to the environment! As you learned in the story, Rachel Carson was a marine biologist!

There are many types of **geologists**, scientists who study the physical properties and activities of the earth and its place in our solar system. Geologists explore our planet's past and can use this information to help discover what might happen to the earth in the future.

- *Paleontologists* study fossils of once living things and layers of earth that show a record of earth's history. Dinosaurs are studied by paleontologists!
- *Seismologists* study earthquakes, their causes, and how to predict earthquakes so people living in the area can be prepared.
- *Geomorphologists* study landforms, how they developed, and how they might change in the future. They use what they learn to predict the effects of climate change, be aware of possible natural hazards such as landslides, and restore and control rivers.
- *Volcanologists* study volcanoes, lava, and geographical features related to them. They observe currently active volcanoes and learn about volcano eruptions in the past and their causes. They are working to discover an accurate way to predict future eruptions, which could save many lives.

Biology is the study of all forms of life (including humans) and how these organisms function, grow, reproduce, and evolve.

- *Zoologists* study animals, classify them according to their similarity with other animals, and may work with endangered species.
- *Marine biologists* study ocean life and work to protect the ocean from pollution and other damage.

Chemistry has earned a bad reputation among those concerned with the environment, because artificial pesticides and other chemicals have caused great damage to living things. However, a new scientific movement known as **"green chemistry"** is on the rise. Chemists must now consider the cost of using the synthetic process or product in question instead of just focusing on the desired effect. This means that harmful impact on the environment will be noticed and avoided. The goals of **"green chemists"** include creating safer chemical products, preventing chemical waste, and using energy-efficient scientific methods.

Directions: Pick one of the types of scientists described above, and on the lines below, explain how you think this type of scientist could help planet Earth and/or protect the environment. Use specific examples of things you think your type of scientist would be concerned with.

_____

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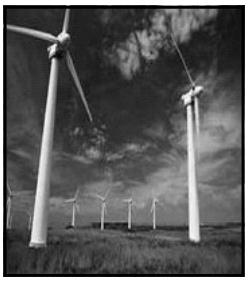
Name_____

ALTERNATIVE ENERGY

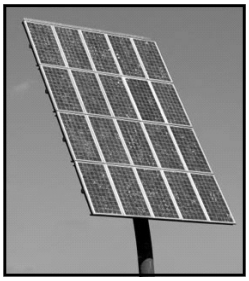
Today, our society's main source of energy is from **fossil fuels,** material found in the earth that contains carbon. They got their name because scientists think they formed from the fossil remains of plants and animals over millions of years. The world faces a challenge because these fuels are being used up much faster than new sources are developing.

In addition, burning fossil fuels release carbon dioxide into the air, which causes the earth's temperature to permanently rise. A climate change like this would cause major changes in the way our continents look and would harm many species. Polar bear populations in the north are already in danger of extinction in the next century, because ice covering the ocean is melting, and polar bears cannot make the long swim from one solid place to another. Because of these problems, we must develop new sources of energy that will not run out, and will be safer for the environment.

Three existing types of energy sources that are only minimally used but could be better developed are **wind power**, **solar power**, and **hydropower.** None of these power sources release the harmful gases that fossil fuels do. **Electricity from these sources** could be put to use more commonly in cars and in other ways it is not usually used.



Wind power has been used for thousands of years for water travel with sails, pumping water, and grinding grain. Wind mills were developed in some places before the year 500 AD, and people have continued to improve its design and use to this day. The blades have been upgraded over time from heavy wood to thinner and faster metal. The first wind mill to produce electricity was in the United States in 1888. Today's wind machines convert energy produced by the spinning blades on a wind machine into electricity that can power homes just the same as electricity produced by traditional power plants! In recent years, the production of wind-based power has increased quickly. Electricity generated from wind more than doubled between 2002 and 2006!



Solar power comes from the sun and can be used to make electricity with large panels that collect sunlight and create an electric charge with silicon. We can use solar power to heat water and air for our homes with shiny solar panels on the roof of the house. Currently, more than 10,000 American households use 100% solar power as their electricity source. Solar power works very efficiently. The silicon in *one ton* of sand used in solar panels can produce the same amount of electricity as burning *500,000 tons* of fossil fuel! However, solar power can be very expensive to generate and usually a lot of space is needed to set up solar panels. More development is needed to make solar power an affordable choice for a main source of energy.

Hydropower is energy produced by the flow of water, using either a river or a storage area that collects water and then releases it when needed. Water is channeled into pipes, where it turns a blade in a generator to make electricity. Hydropower made up 71% of renewable electricity generation (non-fossil fuels that can not be used up) in 2007, making it the most widely used renewable energy source. Like other sources of renewable energy, hydropower does not pollute the environment. It does, however, affect animal habitats. For instance, it can prevent fish from being able to swim up the river to get to their breeding grounds. One solution to this problem has been building "fish ladders" to help the fish swim up a series of steps to pass the dam.

Design and Draw an Energy Efficient House

Directions: Currently, most renewable energy sources are usually used to produce electricity in large plants. These plants either sell to energy companies or directly to households. These sources of energy are usually quite expensive to produce or to use. Imagine one day the methods of producing electricity from these sources becomes so advanced that each house, or each neighborhood, could afford it's own system for producing electricity. Think about what a house or neighborhood with it's own wind power, solar power, or hydropower source might look like.

On a separate sheet of paper, draw an illustration or diagram showing how a house or neighborhood with one of those three power sources would be set up. How would energy from the wind, sun, or water be captured and sent to household electrical lines? Where would the electricity generators be located? Be creative and have fun with your ideas!

Source: http://www.eia.doe.gov/kids/energyfacts/sources/renewable/wind.html, http://www.eia.doe.gov/kids/energyfacts/sources/renewable/water.html

Name_____

LEARN ABOUT TABLES AND GRAPHS AT THE BEACH

Part A: In ***The Great Rhyme Travel Machine Presents: Saving Planet Earth***, Miss Chalk's class picks up trash off the beach. Pretend that the class makes 4 more trips to the ocean to clean up the beaches and the rest of the school joins them to help. Miss Chalk keeps a record of how many pieces of each type of trash were found. Use the data shown in the **table** below to answer the questions.

Trip	Plastic	Glass	Styrofoam	Cigarettes
1	43	11	38	139
2	108	5	59	314
3	55	5	24	122
4	69	7	52	167
5	174	3	100	504

Rows are lines on the table that go from left to right.

Columns are lines on the table that go from top to bottom.

How to Read the Table

Example: To find out how many pieces of glass were found on the third trip, look at the number in the box in the number 3 row and in the glass column.

1. How many pieces of Styrofoam did Miss Chalk's class pick up on their second trip? _____
2. How many pieces of plastic did they collect *total*, including all five trips? _____
3. How many pieces of trash did they collect on the first trip? _____

Part B: The table below shows the total amount of each type of trash that was found on beaches over an extended period of time.

	Plastic	Glass	Metal	Wood	Paper	Styro-foam	Rubber	Cloth	Cigar-ettes	Other	Total
Total	5324	603	663	1080	4876	6278	257	278	13546	359	33264

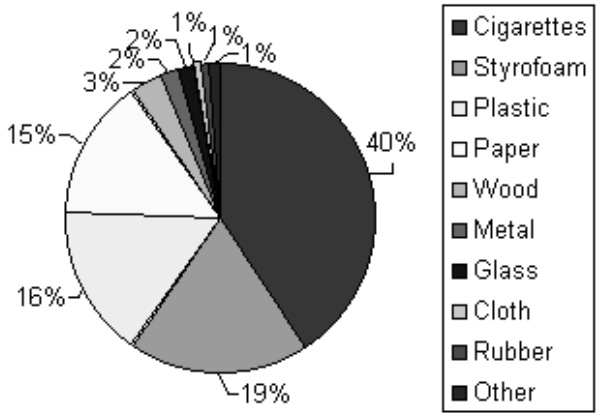
The magnitude of these numbers can be easier to understand if you put them in a **graph**. The "pie graph" below shows what portion each type of trash makes up of the total trash found. The colors next to each type of trash on the right indicate each section of the "pie." For example, the most pieces of trash picked up were cigarettes, as shown by the red section, labeled 40%.

1. Which three types of trash makes up the smallest portion of the total trash found? _____
2. Graphs have limits to what they can tell us. What is one thing this graph cannot tell us about the types of trash the Summersville Elementary School students collected?

   _____

   _____

   _____
3. From this graph, can you tell which type of trash would be the heaviest if all the pieces were weighed together? _____



Source: http://kids.nceas.ucsb.edu/DataandScience/tables.html

VOCABULARY TO SAVE THE WORLD

Directions: Match the vocabulary words relating to ***The Great Rhyme Travel Machine Presents: Saving Planet Earth*** in the word bank to their correct definitions. Write the letter of the correct word next to each definition. You may not know the exact meaning of some of the words, but by doing this exercise, you will learn them!

1. _____ following smart ways of reducing your waste and buying products made from old materials
2. _____ the trend of the earth's average temperature increasing
3. _____ to influence or to cause excitement about a particular subject
4. _____ the process of preventing waste, protecting, or saving
5. _____ to break down or dissolve
6. _____ chemicals used to kill insects that destroy crops
7. _____ a person who believes in the importance of protecting nature and encourages others to help and do the same
8. _____ a scientist who studies and works with the relationships between organisms and their environments
9. _____ a type of energy source including coal, oil, and natural gas, which all cause pollution when burned.
10. _____ having a limit to size, time, or use
11. _____ energy sources that do not run out, including water, wind, and solar power
12. _____ to give reason for someone to take action
13. _____ a nickname for the carbon dioxide each person adds to the air by using fossil fuel as an energy source
14. _____ to refill or replace

Word Bank

A. environmentalist	B. ecologist
C. carbon footprint	D. fossil fuels
E. renewable energy sources	F. precycling
G. conservation	H. finite
I. global warming	J. pesticides
K. inspire	L. motivate
M. replenish	N. decompose

THE GREAT RHYME TRAVEL MACHINE PRESENTS:
SAVING PLANET EARTH
ANSWER KEY
FOR TEACHER USE ONLY

Learn About Tables and Graphs at the Beach

Part A:

1. 59 pieces of Styrofoam
2. 449 pieces of plastic
3. 231 pieces of trash

Part B:

1. cloth, rubber, and other
2. *(Sample Answer)* This graph cannot tell us whether littering has increased over time.
3. No. Some of the types of trash, like metal, are heavier than cigarettes but make up a much smaller portion of the pie graph. We cannot tell exactly how heavy each of the types of trash collected would be if weighed together.

Vocabulary to Save the World

1. F	8. B
2. I	9. D
3. K	10. H
4. G	11. E
5. N	12. L
6. J	13. C
7. A	14. M

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