Making a Difference

Prepared by

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August 29, 2014

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<thead>
<tr>
<th><strong>Title</strong></th>
<th>Making a Difference</th>
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<tbody>
<tr>
<td><strong>Prepared By</strong></td>
<td>UNT Sustainability</td>
</tr>
<tr>
<td><strong>Original Creation Date</strong></td>
<td>August 29, 2014</td>
</tr>
<tr>
<td><strong>Version</strong></td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Date of Current Version</strong></td>
<td>August 29, 2014</td>
</tr>
<tr>
<td><strong>Revised By</strong></td>
<td>Heather Treadway</td>
</tr>
<tr>
<td><strong>Edited By</strong></td>
<td>Heather Treadway</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>A collection of activities and resources regarding ways in which students can make a difference that meet state education standards and national sustainability standards for the fourth grade level.</td>
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## Revision History

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<th><strong>Previous Version</strong></th>
<th>none</th>
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Excellence in Curricula and Experiential Learning

Introduction

Grade Level

These activities are intended for a fourth grade classroom.

Discipline

These activities have a science and social studies focus.

TEKS

Content:
In Grade 4, investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world. Within the natural environment, students know that earth materials have properties that are constantly changing due to Earth's forces. The students learn that the natural world consists of resources, including renewable and nonrenewable, and their responsibility to conserve our natural resources for future generations. They will also explore Sun, Earth, and Moon relationships. The students will recognize that our major source of energy is the Sun. TEKS §112.15. Science, Grade 4. (a)(4)(A)

The eight strands of the essential knowledge and skills for social studies are intended to be integrated for instructional purposes. Skills listed in the social studies skills strand in subsection (b) of this section should be incorporated into the teaching of all essential knowledge and skills for social studies. A greater depth of understanding of complex content material can be attained when integrated social studies content from the various disciplines and critical-thinking skills are taught together. Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples. TEKS §113.15 (a)(3)

Skills:

Scientific investigation and reasoning. The student conducts classroom and outdoor investigations, following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to make informed choices in the use and conservation of natural resources and reusing and recycling of materials such as paper, aluminum, glass, cans, and plastic. TEKS §112.15 (b)(1)(b)

Social studies skills. The student applies critical-thinking skills to organize and use information acquired from a variety of valid sources, including electronic technology. The student is expected to differentiate between, locate, and use valid primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual material; documents; and artifacts to acquire information about the United States and Texas; analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main

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idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions; organize and interpret information in outlines, reports, databases, and visuals, including graphs, charts, timelines, and maps; identify different points of view about an issue, topic, historical event, or current event; and use appropriate mathematical skills to interpret social studies information such as maps and graphs.


National Education for Sustainability K-12 Student Learning Standards

3.1 ~ Personal Action ~ Setting Goals, Communicating Ideas, and Making a Difference
Objective

Students will learn about preserving the environment through personal and group actions.

Key Words

Reduce
Reuse
Recycle
Compost
Worms
Carbon
Nitrogen
Greenhouse gas
Stewardship
Energy
Climate change

Description of Activities

The following activities have been compiled to address the topic of “Making a Difference” in fourth grade classrooms. The activities meet the state and national education standards for the fourth grade, and are intended to supplement pre-existing curricula, with a focus on integrating sustainability topics. The activities can be used in conjunction or alone.
Activities

Activity 1: Composting

Introduction

The students will learn about composting through creating and observing a compost bin.

Materials

Two see-through plastic containers of the same size, with lids, optimal size is 18” deep with small holes in the lids and sides
Earthworms of the “red worm” or “red wiggler” variety
Compostable items, such as carrots, leftover vegetables, newspapers, and coffee grounds (avoid meat and dairy products)
Student journals
Water, preferably heated
Garden soil

Product

Compost
Student Observations and Journals

Process

1. Set up the two bins, with the holes in the sides and lids. Line them with a bit of garden soil.

2. Place the compostable items on the soil. Keep it balanced by having a layer of “green” materials that are high in nitrogen, such as grass clippings, coffee grounds, and vegetable scraps, on top of “brown” materials that are high in fiber, such as dead leaves, newspapers, and dead plants. After making a layer of each, add a bit more garden soil.

3. Make alternate layers of the two materials, and then add some water. It is best if the water is heated (such as microwaving it for half a minute), but not so hot that it poses a burn risk. The materials should be as damp as a sponge that has been wrung out.

4. After filling the bin, top it with about two inches of garden soil. Now add the worms to one of the bins. (A few dozen per bin should suffice.)

5. When finished, keep the bin in a dark place, like a closet, if possible. (Worms prefer dark environments.)

6. Throughout the next few weeks, ask students to bring compostable materials. Every other day, ask students to check out the box and record their observations.
7. Have students help you maintain the compost by turning the materials (use a hand shovel to re-blend the material), and check on the decomposition process. Good compost smells earthy and has a damp feel to it. If it smells bad, add more “brown” materials. It should be warm or hot to the touch, and if it isn’t, add more “green” materials.

8. After a few weeks, you should have a pile of compost. Give it to someone who needs it, such as the farmers’ market, your city’s parks department, or a local farmer or gardener. You can make a trip out of it by delivering the compost with the class. If this is not possible, tell the class that the compost’s receiver deeply appreciates it.

9. Wrap up the project by discussing the importance and benefits of composting. Ask students how they think the composting process works. After the discussion, ask them to turn in their journals.
Activity 2: A Journey to Recycle City

Introduction

Students will visit a site and learn about different ways to protect the environment and how they are all interconnected. They will also learn what they can do to encourage good environmental policies.

Materials

Computers/Internet Access
Word processing program
Large blank sheet of paper

Product

Completed Group Letter

Process

1. Gather the students and tell them that you are all taking a trip to Recycle City. Direct them to: http://www.epa.gov/recyclecity/mainmap.htm.

2. Give them ample time to explore the city. Ask them to click around and read about what interests them the most.

3. After some time has passed, ask the students to group together. Tape the paper to the whiteboard and ask the students “What did you like most about Recycle City? What was cool about it?”

4. Listen to their responses and write them down on the paper. Ask the class to pick their favorite topics.

5. After picking a topic, ask how their school (or city, county, etc.) can be more like Recycle City. Pick a topic that can be realistically addressed.

6. Have each student write an open letter to someone who can address the issue, such as the school principal or the city’s environmental protection department. Ask the students how the letter should be written. When you finish writing it, print it and ask the students to sign it.

7. If possible, deliver the letter as a class. If not, mail it to the right person.

8. Wait for a response, and share it with the class. Emphasize positive changes that will be made, so the students can see their impact.

Activity 3: Greenhouse Gas Tag

Introduction

Students will learn how the greenhouse effect works and how it affects climate change. They will also learn how they can reduce the amount of greenhouse gases they contribute to the atmosphere.

Materials

Index cards, preferably of two different colors, labeled “heat” and “greenhouse gas”
Hole-punch
Yarn, preferably of two different colors
Two poster boards

Product

Student observations and contributions

Process

1. Write either “heat” or “greenhouse gas” on the index cards. There should be double the number of “greenhouse gas” cards as there are “heat” cards. (Example: if you have fifteen students, make ten “greenhouse gas” cards and five “heat” cards.)

2. Use the hole-punch and make a hole in each card. Thread enough yarn through each card to make a lanyard.

3. Gather the students into a common area. Bigger areas are best, and the playground can also be used.

4. Label one poster board “Sun” and the other “Earth”. Put them on opposite sides of each other.

5. Ask some of the “heat” students to stand towards the “Sun” poster board, and the “greenhouse gas” students stand close to the “Earth” poster board.

6. Ask the “heat” students to run back and forth to the “Earth” without getting tagged. Ask them to stop once one student is tagged. The tagged student stays on the Earth side, while the others return to the Sun side.

7. Explain that this is how the greenhouse gas effect works and that it is important, as it keeps the Earth warm enough to keep the planet suitable for life.

8. Now, have the students on the sidelines join in as “greenhouse gases”. Ask the heat students to run back towards the Earth, and to avoid being tagged. Ask them to stop once one “heat” student remains. The tagged students remain on the Earth side, with the remaining “heat” student goes back to the Sun.
9. Explain that now the Earth has too much heat from the Sun because there are more greenhouse gases. Ask them what greenhouse gases are, and where they come from. Ask students what they can do to reduce the amount of greenhouse gases they contribute to the planet.

10. As an extension, ask students to go home and ask them to work with their families to make a more environmentally friendly home.

Additional Resources

Online Resources

Primary Resources

http://www.educationworld.com/a_lesson/03/lp308-03.shtml

http://www.epa.gov/recyclecity/mainmap.htm

http://climatekids.nasa.gov/greenhouse-effect/

Secondary Resources

http://www.wikihow.com/Compost

http://www2.epa.gov/recycle/composting-home

http://www.onearth.org/blog/how-to-teach-your-children-about-climate-change-without-scaring-them

http://www.epa.gov/climatestudents/

http://www.explainthatstuff.com/globalwarmingforkids.html

http://www.pik-potsdam.de/~stefan/warmingfacts.pdf

http://www.planetnatural.com/composting-101/

Educational Literature

“15 Children's Books About Recycling”
SCI
UNT Sustainability

EXCEL is a division of the Sustainable Communities Initiative