



The Green Economy & You

EPISODE #209

ACTIVITIES & LESSONS

LESSON LEVEL

Grades 6-8

KEY TOPICS

- Economy
- Environment
- Sustainability

TIME NEEDED

Preview & Screening:
45 minutes

Activity #1:
45-90 minutes

Activity #2:
60-90 minutes

EPISODE SYNOPSIS

Join the Biz Kids on a green mission and discover your impact on the environment. Explore different ways to become part of the green economy and learn how there's green to be made in thinking green. Take a ride on "The Big Green Bus" and find out how to turn poop into profits with "Zoo Doo."

LEARNING OBJECTIVES

1. Understand people's impact on the environment.
2. Learn about environmental responsibility of businesses.
3. See how there's green (\$) to be made in thinking green.
4. Learn how to conduct a "going green" cost benefit analysis.

EPISODE ENTREPRENEURS

- *Project Kool*: Designing, selling reusable bags
- *The Big Green Bus*: Bus powered by sun, waste vegetable oil
- *Live Green, Learn Green*: Home energy conservation kits
- *Green Job Hunters*: Eco-friendly careers
- *Ecovative Designs*: Creating natural polystyrene
- *Zoo Doo*: Animal waste composting

CONTENTS

- Lesson Prep & Supplies
- Preview/Screening Notes
- Activity # 1
- Activity #2
- Biz Terms Vocabulary
- Resources



LESSON PREP & SUPPLIES

Getting Started

1. Familiarize yourself with *Biz Kid\$* Episode #209 by watching it ahead of time. The episode will serve as a springboard for student learning, discussions, vocabulary exploration, and related hands-on activities.
2. Determine what equipment is required to show the episode in the classroom and request it if needed.
3. Choose an activity and gather supplies. Have fun exploring “The Green Economy & You!”

Equipment & Supplies for Preview/Screening

Time Needed:
45 minutes

Arrange to borrow a TV/DVD player if one is not readily available. Or, if you have a computer, Internet access, and a projection system, the episode can be streamed online at www.bizkids.com/ey. You will need to enter the password of “ey.”

Items needed for class:

- TV/DVD Player or Computer/Internet Set-Up
- DVD of Episode #209
- Plastic Grocery Bag
- Paper Grocery Bag
- Re-useable Grocery Bag

Supplies for Activity #1: Making Solar Ovens

Time Needed:
45-90 minutes

Items needed for class (optional):

- Bag of Marshmallows
- Box of Graham Crackers
- Several Chocolate Bars
- Napkins/Plates

Items for each group of four students:

- Photocopies of instructions (pages 5 and 6 in this packet)
- Scissors
- Ruler
- Pencil
- Large, clean pizza box
- One piece black construction paper (8.5 x 11 or larger)
- Sheets of clean newspaper
- Tape (clear or masking tape)
- Roll of clear plastic wrap
- Roll of aluminum foil
- Bamboo skewers

Supplies for Activity #2: Biz Kid\$ CSI

(Classroom Sustainability Investigation)

Time Needed:
60-90 minutes

Items needed for class:

- White board
- Dry erase markers
- Computer
- Printer
- Computer paper
- Bulletin board display area
- Washable markers
- Scotch or masking tape

Items for each group of four students:

- Digital camera with connection cable or smart phone with camera
- Computer with online access



PREVIEW & SCREENING

Introduction

Welcome the students and introduce yourself. Briefly explain what Ernst & Young does and describe your job. Explain that *Biz Kid\$* is a public television series that teaches kids about money and business. Mention that the bizkids.com website has many video clips, games, a blog, and other resources to help kids start businesses and learn about money.

Episode Preview Discussion

Before you show *Biz Kid\$* episode #209, “The Green Economy & You,” lead your students in a discussion with these questions using the three visual props (different grocery bags).

- How are these three grocery bags different?
- Do you know how are plastic bags made?
(Generally, plastic bags are made from polyethylene plastic – a material made from petroleum.)
- How are paper bags made?
(Trees are cut down, ground into pulp, and used to make the paper used in paper bags.)
- If you only had paper or plastic bags to choose from at the grocery store, which bag would you choose & why?
- What are some of the pros/cons of using plastic bags?
How about paper bags?
- How many of your families carry and use re-usable shopping bags?
- What are some of the pros/cons of using re-usable bags?

About the Episode

In the episode “The Green Economy & You,” you’ll learn about different ways that young adults are helping the environment AND making money at the same time.

Next Steps

Summarize the discussion and play the *Biz Kid\$* episode.



Activity #1:

MAKING SOLAR OVENS

Activity Learning Objectives

- Construct a solar oven to learn how the sun's radiation can be utilized as an affordable alternative energy source.
- Determine how to maximize profit when planning an eco-friendly bake sale.

Supplies

Items needed for class (optional):

- Bag of Marshmallows
- Box of Graham Crackers
- Several Chocolate Bars
- Napkins/Plates

Items for each group of four students:

- Photocopies of instructions
- Scissors
- Ruler
- Pencil
- Large, clean pizza box
- Piece black construction paper
- Sheets of clean newspaper
- Tape (clear or masking tape)
- Roll of clear plastic wrap
- Roll of aluminum foil
- Bamboo skewers

About the Segment: The Big Green Bus

Four Dartmouth College students provide viewers with an on-screen tour of The Big Green Bus, a project that showcases environmental sustainability. Instead of using diesel fuel, The Big Green Bus is powered by waste vegetable oil from local restaurants, which is environmentally friendly. Solar panels on the roof of the bus harness energy from the sun, which is then converted into electricity and used to run electrical items inside of the bus.

Biz Terms

- Diesel fuel
- Environmentally friendly
- Solar panel
- Sustainability
- Waste vegetable oil

Biz Terms & Segment Review

1. How is The Big Green Bus different than the “average school bus?”
2. What is “diesel fuel” and where does it come from?
3. What is “waste vegetable oil” and where does it come from?
4. How is using waste vegetable oil more “environmentally friendly” than using diesel fuel?
5. How does the bus “pay for itself over time”?
6. The students were traveling around the country in The Big Green Bus to teach Americans about “sustainability.” What does the term “sustainability” mean?
7. Why should people living today worry about sustainability for the future?
8. “Solar panels” were attached to the roof of the bus. What kinds of things inside the bus did the solar panels help power?

MAKING SOLAR OVENS

INSTRUCTIONS FOR STUDENTS

Introduction

Solar panels were attached to the roof of The Big Green Bus in order to convert energy from the sun into electrical energy. Using a few simple items, you're about to work in groups of four to build something that will help you better understand how energy from the sun can be harnessed and used.

Steps to a Solar Oven

1. To start, take the pizza box and close the lid tightly.
2. Using a ruler and pencil, measure and draw a 1.5-inch or 2-inch border around all four sides of the top lid.
3. Use scissors to cut carefully along the three lines at the front and sides of the box. (Do not cut the pencil line running along the back of the lid closest to the spine.)
4. Create a cardboard flap by gently folding the top section of the lid backwards, forming a crease along the uncut pencil line.
5. Wrap the underside of the flap with aluminum foil. (The aluminum foil will serve as a reflective surface for the sun's rays. The smoother the aluminum foil is, the more light it will reflect, so try not to make lots of creases or wrinkles as you attach it to the flap. Tape the aluminum foil to the back side of the flap so that the tape doesn't show on the reflective surface.)
6. Open the lid so that the interior portion of the pizza box is accessible. Using a small amount of tape, attach a black piece of construction paper to the bottom portion of the box. The black paper will absorb light. Absorbed light turns into heat.
7. Center the black paper so that when the top flap is opened, the black paper is clearly visible.



MAKING SOLAR OVENS

8. Create rolls of newspaper, using one sheet at a time. (Each roll of newspaper should be about 1-inch to 1½-inches thick.)
9. Fit the newspaper rolls along the four sides of the pizza box to cover any areas not covered by the black construction paper. The newspaper will help absorb some of the heat.
10. Unroll and cut two pieces of plastic wrap so that they are 1-inch longer and wider than the flap opening on the top of the box.
11. Open the lid of the pizza box and tape one side of the plastic wrap to the underside of the box top. (After taping one side down, have another person help you by pulling the plastic wrap tightly before taping the remaining three sides so that the edges are completely sealed.)
12. Close the lid of the pizza box and follow the same steps to attach the second piece of plastic wrap to the top of the lid. (The double layer of plastic wrap will help provide a layer of air insulation that will help keep the sun's heat inside the pizza box.)
13. Use a bamboo skewer to prop the lid's flap up so that the shiny surface can be adjusted and used to direct sunlight into the dark interior of the solar oven.
14. Place the oven in direct sunlight, so the sun hits the foil flap.
15. If you have time, let the oven pre-heat for a half hour and then use your ovens to make s'mores treats! Note that cooking time will be about twice as long as when using a conventional oven.



Temperatures inside the solar oven can reach between 200 – 250 degrees depending on the sun's intensity!



MAKING SOLAR OVENS

Optional Activity — *Biz Kid\$ Solar Bake Sale*

Once the solar ovens are ready to go, it is the perfect time to bring out aspects of entrepreneurship! Challenge the students to use their newly constructed solar ovens to make money with a Solar Bake Sale.

- Explain to the students that the challenge is to hold an eco-friendly bake sale.
- Solar ovens are perfect for baking s'mores. The students can research current pricing for a box of graham crackers, a bag of marshmallows, and chocolate bars.
- By adding up the cost of the raw ingredients, the students can determine how much each s'more will need to be sold for in order to make a profit.

Activity Wrap-Up

Ask the students to explain how different parts of the solar oven worked together to harness the sun's energy. (i.e. the role of the aluminum foil, black paper, double plastic wrap, etc.) Point out that the use of solar energy can help businesses go green and save money.

Thank the students for their participation, and remind them that each student can take small steps to create a healthier planet.



Activity #2:

CSI (CLASSROOM SUSTAINABILITY INVESTIGATION)

Activity Learning Objectives

- Conduct a Classroom Sustainability Investigation (CSI) to identify positive steps already taken in the school environment that help promote sustainability.
- Identify areas where eco-friendly improvements can be made at school.
- Realize that decisions made by consumers every day have a lasting effect.

Supplies

Items needed for class (optional):

- White board
- Dry erase markers
- Computer
- Printer
- Computer paper
- Bulletin board display area
- Washable markers
- Scotch or masking tape

Items for each group of four students:

- Digital camera with connection cable or smart phone with camera
- Computer with online access

About the Segment: Project Kool

Hunter learned about global warming in his science class when his teacher explained how it would impact people's daily lives. When he learned that plastic and paper usage was directly tied to global warming, Hunter decided to encourage his classmates to reduce paper and plastic waste. With his family's help, Hunter designed a line of reusable, recyclable, eco-friendly lunch bags, book bags, tote bags, and pencil cases. By going green with reusable lunch bags, Hunter and his classmates produced less plastic and paper waste.

Biz Terms

- Eco-friendly
- Global Warming
- Going Green
- Recyclable
- Reusable

Biz Terms & Segment Review

1. Hunter learned about global warming in science class. Who can explain what global warming is?
2. Before watching the episode, we talked about the pros and cons of using a "reusable" grocery bag. If something is "reusable," what does it mean?
3. Hunter's bags are made from "recyclable" materials. Who can provide an example of a material that can be "recycled?"
4. If Hunter's bags are "eco-friendly," what does this mean?
5. Hunter has encouraged kids his own age to "go green." How can a person "go green?"
6. Hunter says the following statement, "Being green makes you green." What does he mean?



CSI (CLASSROOM SUSTAINABILITY INVESTIGATION)

Introduction

Hunter made observations about student behavior and waste generation in his own school. Now it's your turn to find evidence of sustainable practices. Get ready for CSI – a “Classroom Sustainability Investigation.”

Start Your CSI

1. Divide the class in half.
2. Assign one half of the students the task of finding “positive evidence” of sustainable practices. Assign the second half of the students the task of identifying areas “needing improvements.”
3. Break both groups further down into small groups of four students. If possible, have each group of four students work with one Ernst & Young volunteer.

Gather Your Evidence

4. Send the “Positive Evidence” groups with their adult volunteer to quietly visit areas within the school building to identify and take pictures documenting positive sustainability practices such as:
 - soda can recycling bins in the student cafeteria/eating area
 - plastic trays used for serving meals in student cafeteria
 - paper recycling bins in the classroom
 - posted page limit printing signs in the school library/computer lab
5. The “Needing Improvement” groups will also quietly visit areas with their adult volunteer, but will take pictures, documenting practices not promoting sustainability such as:
 - fluorescent lighting used in ceiling fixtures (instead of CFLs)
 - student drinking water from single use plastic water bottle (instead of reusable bottle or thermos)
 - student throwing away a paper lunch bag (instead of carrying reusable lunch bag)

Before dismissing groups to gather evidence, have all participants synchronize their watches and set their watch or phone alarms for a 10-minute period, so everyone returns at the same time.





CSI (CLASSROOM SUSTAINABILITY INVESTIGATION)

Reporting Your CSI Findings

1. **Recording Process**

Two students can be chosen to serve as group recorders. The whiteboard will be divided into two columns – “Positive Practices” and “Areas Needing Improvement.” One student will list the positive sustainability practices and the other student will list areas where improvement is needed as the groups share their findings.

2. **Reporting Process**

Starting with the positive “evidence,” have one student from each small group share the group’s findings. After that, have each of the “needing improvement” groups share their suggestions.

3. **Downloading & Printing Photos**

After two lists have been generated on the whiteboard, a different student from each group will be assigned the role of downloading and printing the photographic “evidence” from each group’s digital camera or cell phone camera.

4. **Bulletin Board Display:** “Making the Grade by Going Green”

Using the photographs taken around the school environment, the students will create a bulletin board display using photos, markers, paper, tape, and some artistic creativity. Have them split the display in half to include both successes and “changes remaining to be seen.”

Activity Wrap-Up

Thank the students for their participation, and encourage them to continue working as a team to convince the school community to expand and make improvements to its eco-friendly practices.



BIZ TERMS VOCABULARY

- ***Diesel fuel:*** a combustible form of fuel distilled from petroleum (which is a non-renewable by-product of crude oil)
- ***Environmentally friendly:*** not harmful to nature or the environment
- ***Solar panel:*** a panel exposed to radiation from the sun that can produce electricity with the help of solar cells
- ***Sustainability:*** policies, practices, and strategies designed for meeting society's present needs without compromising the ability of future generations to meet their own needs
- ***Waste vegetable oil:*** oil used in cooking that would normally be discarded; it is used as an alternative fuel for diesel engines
- ***Eco-friendly:*** not harmful to nature or the environment
- ***Global warming:*** an increase in the average temperature of the Earth's atmosphere great enough to cause changes in the global climate. (Global warming is attributed to increased levels of greenhouse gases largely due to human activities in industry and agriculture.)
- ***Going Green:*** consciously using less energy and producing less waste in order to help the environment
- ***Recyclable:*** something that is treated or processed in some way to make it usable again
- ***Reusable:*** able to be used more than once



RESOURCES

Project Kool

<http://www.projectkool.com>

The Big Green Bus – Project for Change

<http://www.thebiggreenbus.org/>

Ecovative Designs

<http://www.ecovatedesign.com/>

Youth Venture Team Spotlight: Live Green Learn Green

<http://blog.youthventure.org/2009/05/yv-team-spotlight-live-green-learn.html>

Zoo Doo at Woodland Park Zoo

<http://www.zoo.org/page.aspx?pid=270>

National Renewable Energy Laboratory

http://www.nrel.gov/education/educational_resources.html

Waste Management & Discovery Education “Think Green” Partnership

<http://www.thinkgreen.com/classroom>

Environmental Protection Agency (EPA) Teaching Center

<http://www.epa.gov/teachers/>



Produced by: *Biz Kid\$* LLP

Funded by:



Co-Produced by:



Distributed by:

