

The World of Coca-Cola High School Green Guide Green Has Its Own Language!

Pre-visit Activity

Objectives:

1. Students will research green technologies as well as the requirements for LEED (Leadership in Energy & Environmental Design) certification.
2. Students will define unknown vocabulary and then refine their definitions.

Materials:

- ❖ Access to the Internet

Time: 1 class period of 45 minutes each



Procedure:

1. Discuss with students that the field trip to the World of Coca-Cola is coming soon. It is important to understand the concepts and technologies that have driven the company's efforts toward building and operating a more environmentally sustainable building in order to better understand what they will be seeing.
2. Write the following words on the board: LEED Certification, heat island effect, greenhouse gas, VOC pollution, low-flow, carbon footprint and chlorofluorocarbon pollution.
3. Ask students to explain what they think each of these terms mean. Explain to students that knowing the definition of these words will help them understand what they will be learning at the World of Coca-Cola.
4. Give students a class period to research the terms and write a definition and explanation of each. Discuss the definitions written by students with the class and ask students to add to or delete sections of their own written definition to make it the best it can be.

Closing:

Tell students to pay close attention to the innovations led by The Coca-Cola Company and how these innovations can impact their own lives in the future. The post visit activity will integrate these observations after the field trip is concluded.

Assessment:

Teachers may choose to use the notes taken by students during the trip for a quick assessment.

How Green is Your House?

Post-visit Activity

Objectives:

1. Students will use concepts and terms they have learned in the pre-visit activity and their field trip to the World of Coca-Cola to produce a project which will heighten their understanding of green technologies learned about during the field trip as well as through Internet research.
2. Students will produce a house plan.
3. Students will show how the integration of green technologies can be used in a simple house plan.
4. A document will accompany the house plan that explains the technologies and how their use impacts the student's carbon footprint.
5. Students will use a Web site to learn about their current carbon footprint in order to help them use these concepts to design a more environmentally friendly home.
6. Students will write a report on how their integration of green technologies in their house plan could help reduce their carbon footprint and why this is important.

Materials:

- ❖ Graph paper, rulers
- ❖ Notes and self guided tour document from the field trip
- ❖ Notebook paper
- ❖ Access to the Internet

Time : 2-3 class periods of 45 minutes each



Procedure:

1. Discuss with students the measures taken by The Coca-Cola Company that have helped to reduce greenhouse emissions and improve the environment. List these on the board.
2. Tell students that protecting the environment is quickly becoming an opportunity for business success in the future. One important business opportunity of the future will be in the area of building more sustainable buildings. This will lead to more efficient energy usage, leading to lower costs for consumers.
3. Tell students that they are going to design a home of between 1500 and 2000 square feet that is as environmentally friendly as possible. Homes must be livable with at least two bedrooms, living area, kitchen and bathroom. Technologies used at the World of Coca-Cola may be employed, as well as other technologies researched on the Internet. A pencil drawing of the front of the home will accompany the plan. The goal is to have a plan that reduces their carbon footprint.
4. To learn more about what their current carbon footprint is and how to reduce it, ask students to go to: www.mec.ca/Apps/ecoCalc/ecoCalc.jsp and take the carbon footprint test. This activity will give students information they will need as they design their homes.
5. A description of any technology used must be included in a document accompanying the house plan, as well as the energy reduction it is projected to produce.
6. Students *may* design and use one green technology they project may be important in the future and explain how this will work. This projected technology should be based on technology that would be possible in the near future but it not currently available.
7. When the house plan and accompanying document are finished, students will write a one-page report on how these innovations help reduce their carbon footprint and why this is important.
8. If desired and time permits, teachers may choose to have students put their reports on Power Point and present their designs to the class.

Closing:

Discuss with students any projected technology used by students in their designs. Discuss future job opportunities they may be presented with that could lead to promising careers. Discuss why this is important to not only their own futures, but the

future of the earth as well.

Assessment:

Teachers may use the house plan, document, and written report for assessment.

The World of Coca-Cola Self-Guided Tour for Teachers High School Green Guide

Note to Teachers:

The Green Tour may be added to either the Social Studies or Language Arts links & lesson plans with ease. Students will learn how The Coca-Cola Company has worked to make the World of Coca-Cola attraction as environmentally compatible as possible. High School Students can use the following information for a self-guided tour through the attraction, or the tour may be conducted with the class. Teachers may choose to copy the following document for groups of students to use as they proceed individually through the attraction as well as the attached document for students to use for written work.

The Green World of Coca-Cola



Location-Pemberton Place, just outside the World of Coca-Cola

Connections

As you look at the building from the outside, you will notice an area of plants and landscaping at the Baker Street entrance to Pemberton Place. Also note the colors used on the building and paving materials.

Impact

This area demonstrates what The Coca-Cola Company has done to address the cyclical Georgia drought issue as well as decrease the heat island effect that contributes to smog and ozone in Atlanta.



All areas of the new World of Coca-Cola construction and operation have been planned to reflect the company's commitment to the environment. The building was constructed in accordance with the United States Green Building Council's (USGBC) Leadership in Energy and Environment Design (LEED) standards. This group encourages thoughtful building design with an emphasis on recycling, reuse of resources and waste reduction. The World of Coca-Cola building minimizes negative environmental impact, conserves energy, and minimizes water use. This reflects The Coca-Cola Company's worldwide efforts to protect our natural resources. At this time, less than 400 projects have achieved some level of LEED Certification in the United States. Nine of these projects are located in Atlanta, Georgia. Each year, nearly one million people have the opportunity to learn more about the environmentally friendly aspects of the World of Coca-Cola while enjoying their visit to the attraction.

A. When the World of Coca-Cola opened on May 24, 2007, Pemberton Place was filled with streams, waterfalls and ponds. It was beautiful, but as Georgia went deeper into another cyclical drought, The Coca-Cola Company became concerned about the 34,000 gallons needed to keep the stream and waterfall flowing each day. To be more environmentally conscious regarding the drought, the company decided that the water features had to be removed. The water features were filled in with 640 cubic yards of dirt. The area was then planted with 2000 drought tolerant plants such as lirioppe, cleyera, and knock out roses. Other areas that were changed from outdoor water features into areas that were more drought-friendly will be noted later in the tour. When the World of Coca-Cola opened, many water features such as the pond above were found throughout the grounds. To conserve water during Georgia's cyclical droughts, the water features were replaced with drought resistant plants and other elements.



B. Pemberton Place adds 5 acres of green space to downtown Atlanta. Urban green space is important because it provides habitat for birds, insects, and other organisms and prevents soil erosion. Trees absorb pollutants in the air. Just 20 trees can replace the pollution from a car driven 60 miles a day. Since there are so many cars in the city, trees are especially important. Plants reduce the urban heat island effect that happens when buildings, asphalt, and concrete absorb radiation from the sun and cause air temperatures to rise. Plants reduce this effect because they shade heat-absorbing surfaces. Green spaces also reduce noise pollution. But that's not all. Urban green spaces give people a place to play, gather and rest. In fact, you may enjoy eating your lunch in Pemberton Place today!



C. Notice the color of the paving, building, and the roof. All of these areas are finished in light colors in what is called “cool landscaping”. When cool landscaping is used, the sun is reflected off of the surface rather than being absorbed. Why is this important? Lighter colored surfaces absorb less heat than dark surfaces, causing less energy to be needed for cooling the building. The walls, both inside and outside of the attraction, are covered with a material called Archistone, which is stucco-like, but is environmentally friendly.



D. Notice the bike rack outside the parking garage. The Coca-Cola Company encourages alternative transportation options such as riding a bike to work. The company also has showers and locker rooms for employee use and is located close to public transportation.

E. Water is essential to the production of Coca-Cola products. Therefore, water stewardship is an important issue for the company worldwide. The Coca-Cola Company has implemented measures to support access to clean water and sanitation and protect watersheds in water-stressed regions. The company provides awareness programs that promote water conservation within communities and in area industries. This effort led the company's dedication to change the landscaping around the attraction into something that is more sustainable as well as more in line with the values of the company.

Location – Lobby

On March 5th, 2008 The Coca-Cola Company announced that the World of Coca-Cola had achieved the official “green” status as an environmentally friendly building. This means that Coca-Cola has followed the U.S. Green Building Council's standards for Leadership in Energy and Environmental Design.





Location- The area just outside of the Hub

Connections

Bring your students' attention to the area outside the windows located on the left side of the Hub.

Impact

The Coca-Cola Company has used plants plus light colored paving materials to help reduce the heat island effect around the World of Coca-Cola.

A. Ask your students to look around the Hub at the walls. All paint used at the World of Coca-Cola is low Volatile Organic Compounds paint. Why is low VOC paint important? Let's look at regular paint first. Regular paint has almost 10,000 chemicals in it, 300 of them are toxic! This means that some people can have breathing problems, allergies, and other health problems caused from the fumes that come from regular paint. In fact, paint is considered to be one of the worst environmental pollutants. Low VOC paint reduces the toxins from paint, doesn't pollute groundwater, and is easily cleaned up with soap and water. Using low VOC paint results in a very low odor when used, and no odor once it is dried. This improves indoor air quality. The World of Coca-Cola has also used low-emitting adhesives, sealants, and carpet which is made from recycled carpet, called "cradle to cradle" carpet within the building. So go ahead, take a deep breath. The air at the World of Coca-Cola is squeaky clean!



B. Look overhead at the few lights used at the ceiling level in the Hub. Very little energy is needed to light the Hub because the building was not only constructed with large windows, but it is facing in a northwestern/southeast exposure to the sun. This cuts down on electrical usage because the sun does all the work! The building was designed to optimize energy efficiency and is 30% more energy efficient than a conventionally constructed building. This is important because buildings use 1/3 of all the energy and 2/3 of all electricity produced in the United States.



Location-Restrooms and water fountains throughout the building

Connections

Ask students to note the small plaques discussing the conservation of water throughout the building.

Impact

Thanks to the low-flow faucets, waterless urinals, and other fixtures used in the attraction, the World of Coca-Cola uses 30% less water than other buildings of its size constructed in a conventional fashion.

A. In 2005, The Coca-Cola Company conserved enough water through its facilities around the world to flush toilets in their headquarters for over 300 years.

B. It is estimated that the water supply in Atlanta will only last another 20-30 years. It is imperative that Atlanta businesses and citizens do all they can is possible to conserve water.

C. The Coca-Cola Company is participating in The Global Water Challenge, which is a growing public-private partnership designed to help bring safe drinking water and sanitation to people all over the world who need it. The company has set a goal of returning to communities and to nature an amount of water equivalent to what is used in all of the company's beverages and their production. The Company calls this "water neutrality".

D. In 2007, it was announced that The Coca-Cola Company and the World Wildlife Fund (WWF) would be working together to help conserve and protect freshwater resources throughout the world. They will do this by conserving key watersheds, improving the efficiency of the Coca-Cola system's water use, supporting efficient water use in the company's agricultural supply chain, decreasing Coca-Cola's carbon dioxide emissions and energy use, and inspiring a global movement to conserve and protect freshwater resources around the world.



Location - Gallery 7; Within Arms Reach of Desire

Look around this room at the variety of dispensers used in Coca-Cola's history. Recent research has shown that the coolants used in older vending machines were damaging to the environment. The company owns more than nine million coolers and vending machines. They produce three times the emissions of manufacturing facilities and more than five times the emission from the Company's fleet of vehicles. Because of this, the sustainable refrigeration program is the cornerstone of Coca-Cola's energy and climate protection efforts. The Coca-Cola Company has taken a number of measures to correct this situation, as well as reduce their carbon footprint worldwide.



Reducing the Carbon Footprint

This photo depicts an example of a new dispenser using CO2 coolant.

A carbon footprint is the amount of greenhouse gases caused directly or indirectly by a person or organization in a given time. The following list represents a few of the efforts The Coca-Cola Company has put into place to lower their carbon footprint.

- In 1969, The Company commissioned the first study to examine the environmental impact of a package which laid the framework for the life cycle assessment methods used today.
- The company has reduced the amount of polyethylene terephthalate (PET) plastic used in bottles by up to 35% (the 500 m. Dasani bottle), while continuing to use recycled content when possible.
- The use of smaller caps for plastic bottles has eliminated 40 million pounds of plastic used annually in the United States alone.
- Investment in technologies and recovery systems has enabled the company to use more recycled materials.
- The Coca-Cola Company will grow its company without expanding its carbon output. This will be done by making investments in energy efficiency at all of the 1,000 plants and with bottlers around the world.
- Efforts to improve the efficiency of coolant systems (a large contributor of greenhouse gasses) include a number of initiatives:



1. Improve the efficiency of vending machines. By using an energy system called EMS-55 which can use up to 35% less energy than machines without the technology.
2. Make insulated foam for vending machines environmentally friendly by removing materials that cause greenhouse gasses from the insulation of all new coolers. This action alone eliminates 75% of the direct emissions from the coolers.
3. CFC's (chlorofluorocarbon, which has been implicated in depleting the ozone layer) had been used in vending machine coolant mechanisms but was removed from all new coolers in 1994. At first, the CFCs were replaced with HFCs, but it was found that these gases also contribute to greenhouse gasses. The company then spent almost \$40 million to identify and test another alternative refrigerant- CO2. CO2 is more efficient and is much safer for the environment than CFCs or HFCs.

The company has made the commitment to deploy 100,000 CO2 coolers by the end of 2010.

- The Coca-Cola Company has issued a Call to Action to encourage other companies to lower their carbon footprint by replacing commercial refrigeration equipment with CO2 systems.
- In May of 2009, the Atlanta Journal-Constitution reported on a new bottle made of sugarcane and molasses that is being developed by The Coca-Cola Company that will recycle easily, cheaply and will decompose more quickly called “Plantbottles”. The bottle will be tested with the Dasani product first. Later in 2009, carbonated beverages will be added. Chief Executive Officer of The Coca-Cola Company, Muhtar Kent has said, “Over the next 10 years, that simple initiative will transform the whole concept of recycling.” This type of bottle would be an improvement over the PET bottles, which are still primarily a petroleum-based product. PET bottles are recyclable but take years to decompose. The Plantbottle uses a blend of petroleum-based materials and about 30% of plant based materials, which causes decomposition to happen much more quickly. About one billion plastic PET bottles are currently used every week and only 18-23% are recycled.



Location- Window between Pop Culture and the 4-D theater (Second Floor)

Connections

As you look out this window, you will notice green glass as well as many plants that were used to replace a water feature.

Impact

The area outside this window demonstrates how the World of Coca-Cola has attempted to maintain the look of a water feature while doing it in an environmentally friendly manner. This area was altered in response to the cyclical drought our state experienced.



- A. Coca-Cola has used recycled, tumbled green glass to represent the waterfall that was removed due to the drought. It is meant to represent the look and reflective properties of a waterfall. Drought tolerant plants have been added at the bottom of this area. Once again, this helps to reduce the heat island effect.



Location-Taste It (Second Floor)

Connections

In the Taste-It room, bring your students’ attention to the poster called “Packaging from Nature”.

Impact

This poster is a flow chart about how corn becomes a cup. It demonstrates how the World of Coca-Cola has replaced plastic with 100% compostable cornstarch cups throughout the Taste It room.



- A. Read the poster “Packaging from Nature” with your class. Discuss the flow chart and ask students why cups and products that decompose easily are important to their lives. Explain to students that The Coca-Cola Company has put thought into not only providing a biodegradable cup in the Taste-It room, but they are also working on a biodegradable bottle that will soon hold Coca-Cola products they purchase in the future.



Location-The Coca-Cola Store

Connections

In this room, students will notice the two types of floors used in the store and discuss the materials they are made from. They will also view products made from recycled materials which are for sale in the store.

Impact

The Coca-Cola Company has encouraged the use of recycled materials and supports artists who produce products made in this way. Written descriptions located on each product give consumers a short education in how the product uses recycled materials as well as the people who produce the product.



A. Bring your students' attention to the floor in The Coca-Cola Store. The wood floor is actually made of bamboo like the flooring in Pop Culture. The Bamboo plant grows more quickly and is more sustainable than wood and is just as strong. For example, the bamboo in The Coca-Cola Store and Pop Culture room has endured the feet of over one million visitors each year.



B. Bring your students' attention to the black rubber section of the floor in The Coca-Cola Store. This floor is made from recycled tires. First, the tires are shredded and turned into crumbs for many products, including flooring. Americans dispose of over 245,000,000 tires every year, adding more and more waste to our environment. Using recycled tires not only reduces waste, but also reduces the need for new materials for new products. Recycled tires can be used for flooring, fuel to power furnaces, cushioning material in playgrounds, as well as other uses.

C. Go to the wall to your right as you entered The Coca-Cola Store. Located on this wall are a number of recycled/repurposed Coca-Cola products. Be sure to read a few of the tags on some of the products as they give information on how the product is made. For example, there are T-shirts that tell how many plastic bottles went into making the shirt and jewelry by Kathleen Plate that is made out of recycled/repurposed Coca-Cola bottles. Bring your students' attention to the pop-top handbags by *Escama*. This company is run by two women's co-operatives in Brazil and the tag is signed by the woman who made the bag. To learn more about this company go to: www.escamastudio.com. Another company whose products are displayed in this area is *Ecoist* which is a company from Peru. This company uses discontinued or imperfect Coca-Cola labels to make products for sale in the retail store. A company called *Remarkable.co.uk* makes notebooks with recycled tire covers and even recycled plastic. Bottom line...Everything has a use!



Concluding Your Tour

To end your tour, review what your students have seen at the World of Coca-Cola that demonstrates their efforts to be environmentally friendly.

Written Response

World of Coca-Cola Attraction Self-Guided Tour

Name _____

Use the back of this page for notes

1. Use this space to take notes on stories from the Hub wall as well as to take notes when you discuss with other members of your group.
2. Why are the efforts of The Coca-Cola Company as well as other companies to recycle and find products that are easily decomposable important to your life?
3. What types of innovations that you have seen today do you think you could use to improve your life in the future?