

## DCM Exhibitions – Staff Training Materials

### Eco City (PART B)

#### Exhibition Particulars:

- Visitors are able to choose **jobs** in the various *Eco City* businesses and deposit their **paychecks** in the Eco City Bank. At the bank, they can also withdraw money to use elsewhere in *Eco City*.
- Throughout *Eco City*, children have the opportunity to role play some of the same green choices that they, or their caregivers, can make in the real world.

#### Component Descriptions:

##### A. Bank

At the *Bank*, visitors make decisions about earning, saving and spending money. Using the ATM machine, they can deposit their paychecks and/or withdraw cash to use at the other businesses in *Eco City*. Visitors can also work with a “teller” to fill out deposit and withdrawal slips.

##### Job

Visitors work as bank tellers to add up customer deposits, sort and count out the money that customers deposit and withdraw, and sort checks, slips and cash. Tellers signal for the next customer, exchange cash for paychecks, or make change. Once children have worked a shift as tellers, they can pick up a paycheck at the *Earn Your Pay Station*.

##### ATM

At the ATM, visitors can create an account, check their account balance, and deposit and withdraw paychecks or money earned in *Eco City*. Visitors have the ability to make transactions using their ATM account throughout the day.

##### Budget or Bust

In the “Budget or Bust!” game, children learn about financial responsibility and the importance of financial planning. They are challenged to create a personalized Budget Plan and then test it to see the overall effect of their individual choices. Children create their Budget Plan by choosing from an assortment of “SPEND” and “EARN” tokens. On each of the tokens is a statement representing a different choice.

Above, three buckets are attached to the cross beam of a balance. Two of the buckets – marked “SPEND” and “EARN” – are located on opposite ends of the balance, and children can see that placing pressure on these buckets affects the position of a meter above the balance. The third bucket – marked “SAVINGS” – is located in the center and has no effect on the meter. Once a visitor has created a Budget Plan, he or she can test it on the Budget or Bust! Balance by placing tokens in the corresponding “SPEND” or “EARN” bucket.

If an equal number of “EARN” and SPEND” tokens were selected, the beam will be balanced and the arrow will point to the center (“Great job balancing your budget!”) If too many “SPEND” tokens were selected, the scale will tip towards the “danger zone” (far left), indicating to the visitor that he or she

has gone over budget. Conversely, if more “EARN” tokens were selected, the scale will tip towards the “surplus zone” (far right). Children with a surplus of earnings can transfer tokens into the “SAVE” bucket. Associated signage explains both the importance of maintaining a balanced budget and accumulating savings.

### Green Connection

Banks are eco-friendly when they encourage their customers to switch over to “paperless” billing. Using less paper means fewer trees and less energy are needed to create paper.

#### **Green Banking:**

Today’s consumers have a number of options to make their banking “greener,” including signing up for direct deposit (having pay checks automatically deposited at the bank), paying bills online, viewing bank statements electronically, and using debit or credit cards rather than writing paper checks. These practices save paper, energy used in printing, postage, and waste – not to mention trips to the bank and post office. Experts estimate that if all U.S. adults received and paid their bills online, the equivalent of 18.5 million trees would be saved a year!

[Source: <https://www.northwest.bank/business/plan/plan/bank/budget-for-today/go-green-energy-saving-tips-for-your-business> ]

Financial institutions increasingly are offering consumers ways to put their money to work in environmentally-conscious investment options, such as “sustainable CDs,” which invest money only in solar projects and fair trade, for example. Some banks and credit unions provide rate discounts on loans for hybrid or electric cars, or for mortgages or home-equity loans when energy-efficient features are added.

[Source: <http://www.bankrate.com/finance/savings/5-green-banking-tips-to-save-the-planet-1.aspx>]

### Engagement Tools and Tips

- Use Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Eco City experience.
- Use bank deposit slips to help visitors learn how to deposit money into a bank account.
- At the “Budget or Bust!” game, encourage visitors to plan how to use the money in their “SAVE” bucket (donate to charity, invest for interest, or save for a long-term purchase.)
- While assisting visitors with the ATM, use vocabulary terms that correlate with the experience (withdraw, deposit, overdraft fees, and insufficient funds).
- Engage in money management discussions with visitors at the ATM (i.e. if you have \$40.00 in your bank account, you cannot withdraw \$60.00).

### **B. Cafe**

The *Eco City Cafe* serves the dining needs of *Eco City* with healthy food options. Visitors can be customers or take on various roles as *Eco City Cafe* “team members” at this restaurant that features a menu of (pretend) healthy foods based on the *Eco City Cafe* menu.

Customers can take a seat at the “sidewalk” tables or at the counter, place an order, and pay for their meal. Food preparers will find all they need to fill the orders behind the counter: a prep area, blenders, a refrigerator, cups, plates and utensils.

Job

At *Eco City Cafe*, children can become “team members” by taking orders from customers, serving food and smoothies, restocking items and clearing tables. Behind the scenes, visitors fill orders and cook food items for customers.

Servers wear aprons and greet customers. They set up counter seats and tables with placemats, dishes, and utensils, and take orders. Dishwashers remove tubs of dirty dishes, decide if the food is to be recycled, composted, or taken to the landfill, and restock the food.

Green Connection

“Team members” and customers have choices to make after they’ve finished “eating.” How do they dispose of their garbage? Three different containers are provided: one is for compost, one is for recycling and one is for garbage (the landfill).

**Composting:**

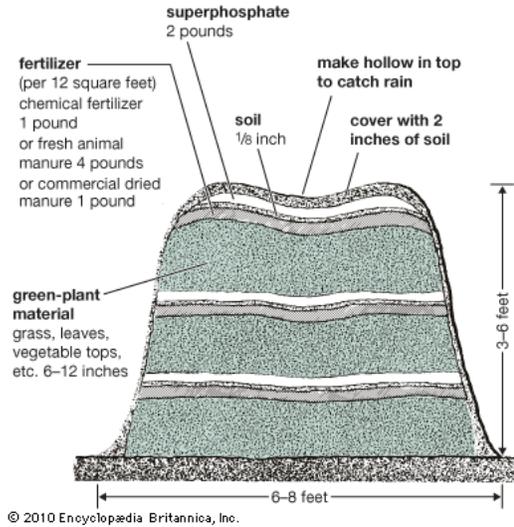
On a larger, community or city-wide scale: Waste with 75 percent or more organic material can be converted by aerobic digestion, or **composting**. After the inorganic materials have been removed from the shredded waste, it is fed into large tanks mixed with sewage sludge and held from four to six days. During this period aerobic, or air-consuming, bacteria convert the waste-sludge mixture into an inert material that can be used as soil conditioner, as fertilizer, or in the construction of wallboard. Often, however, the sludge is hauled by train or truck to remote dump sites and deposited.

**Composting** is popular in Europe, where it has reduced the volume of several nations' trash by 20 percent. It has not gained wide acceptance in the United States. Yet some U.S. households convert their yard wastes into usable fertilizer and conditioner by maintaining **compost** piles in their backyards.

[Source: <http://kids.britannica.com/comptons/article-201349/garbage-and-refuse-disposal>]

On a smaller, residential scale: Most gardens thrive with the help of a **compost** pile. This rotted, homemade mixture of organic matter is often called synthetic manure. **Compost** supplies plants with food and improves soil structure. If mixed with the soil, it helps retain rainfall and plant food. It allows air to enter, prevents soil from crusting, and reduces erosion. If used on the top of the soil, it controls soil temperature, lessens evaporation, and discourages weeds.

There are various ways to make **compost**. A bin may be built of lumber, cement blocks, or wire. Layers of plant material (which includes vegetable or fruit peels and other organic waste), fertilizer, and soil are piled in a heap. The fertilizer layers hasten the process of decay. The diagram shows types commonly used. Layers of soil absorb products of decomposition. The superphosphate layers add lime and phosphorus. A layer of soil over the entire pile retains moisture and odors. A hollow made in the top catches rain. The pile must be kept moist but not soggy. Turning occasionally speeds decay. **Compost** is ready to use in three months to a year.



[Source: <http://kids.britannica.com/comptons/article-9273761/compost>]

### Recycling:

Because of rapidly dwindling landfill space and rapidly rising incineration costs, recycling has become increasingly widespread in Japan and most parts of Europe and North America. Recycling is the recovery and reuse of materials that would otherwise be wasted. First, salvageable items such as metals, paper, and glass are separated from other wastes. The reclaimed materials are then re-processed and used instead of raw materials in the creation of new products. Recycling is practiced both by industries and by private citizens, who may separate yard wastes; glass, plastic, and aluminum containers; and newsprint for recycling or municipal composting.

[Source: <http://kids.britannica.com/comptons/article-201349/garbage-and-refuse-disposal>]

### Landfill:

At the beginning of the 20th century most solid waste was disposed of by dumping it onto vacant land near where it was generated. These dumps were then periodically set on fire to reduce the organic content. Not only did the smoke become a nuisance and a health hazard, but also the low, uncontrolled burning temperatures did not get rid of enough organic materials. Disease-carrying animals also inhabited most dumps.

Concern over these health hazards led to the development of sanitary landfills. In these landfills the refuse is shredded or otherwise compacted to about one tenth of its original volume to provide a more uniform mixture. It is then disinfected, compacted, and dumped into cells that are covered daily with earth. The cells are usually lined with plastic liners and layers of compacted clay to reduce the leakage of rainwater containing toxic chemicals into the soil and water beneath the landfill. There is evidence, however, that biodegradable materials dumped in landfills do not significantly decompose even after several decades.

[Source: <http://kids.britannica.com/comptons/article-201349/garbage-and-refuse-disposal>]

## Engagement Tools and Tips

- Use Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Eco City experience.
- Distribute the menu template and pencils to encourage visitors to design their own healthy menu selections.
- Role play different Cafe jobs with guests: busboy, cook, server, cashier, dishwasher, management, custodial, etc.
- Direct the visitor's attention to the trash, compost and landfill bins and practice sorting the items in the Cafe into the appropriate bins.

### **C. Children's Hospital**

In the Children's Hospital, visitors can be patients, medical professionals or parents. Children can wear lab jackets, use various medical tools and select a life-like patient (baby doll) to care for. Children can use an x-ray machine, a physician's scale, and an eye chart to assess their own health.

#### **Job**

As a doctor, registered nurse, medical lab technician, pharmacist, child life specialist, or physical therapist, a child chooses a life-like patient (baby doll) from an isolette and retrieves the corresponding medical chart. The patients have common medical ailments: fever, colic, jaundice, cradle cap, etc. The medical charts contain instructions about how to care for the patients. Children are challenged to use the charts to analyze the problem and determine the best treatment. They read the patient history and current symptoms, and examine the patient before administering treatment using stethoscopes, thermometers, blood pressure cuffs, medicine spoons, bulb syringes, biliblankets and other tools. They may also use the illuminator to view radiographs showing a broken bone, a swallowed object, etc.

Children may also provide general care for the patients, including changing their diapers and clothing, feeding them, weighing them using an infant scale, bathing them in a non-working sink or infant bath, swaddling them, brushing their hair, placing them in a bouncer seat or on an infant pillow, and rocking them to sleep.

Charts and equipment are spread throughout the space to provide a medical atmosphere. A set of locked cabinets display real medical supplies used in hospitals. Children can play the role of a patient and assess their health. Using the full scale x-ray machine, children can scan their bodies. Children can also measure their weight using the physician's scale, check their eyesight on the eye chart, and measure their height using the height chart.

#### **Green Connection**

##### **Green Practices at the Children's Hospital:**

Some of the ways in which hospitals have instituted green practices include:

- Converting from traditional x-rays to digital radiography, eliminating the hazards associated with chemicals used in developing traditional films.
- Using digital, rather than mercury, thermometers. If a mercury thermometer breaks, the spilled mercury can pose an environmental hazard.
- Choosing reusable, rather than disposable, equipment when possible.
- Turning off hospital equipment when not in use.

- Reducing waste, and choosing environmentally-responsible methods of waste disposal.
- Being mindful of green practices when designing new facilities or replacing heating/cooling/water systems.

[Source: <https://news.aamc.org/patient-care/article/teaching-hospitals-go-green/> ]

### Engagement Tools and Tips

- Use Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Eco City experience.
- Demonstrate how medical tools are used.
- Show visitors techniques for swaddling infants. Explain that the practice of swaddling mimics the environment of the womb by gently restricting movement, and comforting the infant.
- Role play with the guests as a nurse, doctor or concerned parent.
- Reference the medical tools in the locked cabinets to further enhance the guest experience.

### **D. Construction Build Zone**

Here, visitors put on hard hats and construction vests to join the work crew at the *Construction Build Zone*. They can operate a crane, use tools to “rivet” beams into place or build an arch. A *Build It Green Studio* engages visitors in the design of a model house using green building materials.

#### Job

Throughout the *Construction Build Zone*, children take on the roles of construction workers, architects or designers. They can engage in a number of role-play activities, including:

- Operating the crane and rivet gun.
- Using hoses to connect and route air through a series of motorless fan boxes to watch the flow of air.
- Walk across a construction beam and get the sensation of being high above the site.
- Use foam blocks and a keystone to engineer and test an arch.

#### Green Connection

In the *Build it Green Model Home*, children construct a table-top model of a green home using a variety of building pieces made from real or realistic simulations of green construction materials that are either renewable (a natural source that can be replaced without harming the environment) or recycled (a substance made from materials that might otherwise end up in a landfill). Visitors can choose materials for insulation, roofing or flooring, and position them in the model house.

- Renewable: Bamboo flooring, Wool insulation, Wheatboard (building material, alternative to wood)
- Recycled: Plastic carpet, Denim insulation, Crumb rubber (ground cover), Rubber roofing, Metal roofing, Recycled glass tiles.

In another part of the *Construction Build Zone* visitors use mix-and-match “spinners” to choose Green Certified Building methods for a commercial building or a residence. Options include: wind turbines, greywater storage, geothermal cooling, solar panels, green landscaping or community roof gardens.

### Engagement Tools and Tips

- Use conversation cards to facilitate an inquiry based approach to learning.
- Use products from the retail store that correlate with the Eco City experience.
- Use renewable and recyclable building samples to illustrate eco-friendly options for construction materials.
- Build a house or other structure using building materials with visitors while talking about the benefits of using different materials.

### **E. Market**

Inside the *Market*, visitors find:

- Open produce bins for fruits and vegetables and a hanging scale.
- Open “refrigerated” shelves for dairy (milk, cheese, butter, yogurt, etc.).
- Open “freezer” shelves for frozen goods (vegetables, dinners, fish, ice cream, etc.).
- A packaged food shelf with grains (rice, etc.), baking ingredients (flour, sugar), pasta, cereals, snacks, jams, jellies, peanut butter, etc.
- A shelf with canned fruits and vegetables, soups, sauces, juices, water, etc.
- A deli/meat & fish counter with sliced meats and cheese displayed on platters in a clear-fronted case. A pretend meat slicer and scale are on the counter.
- A bakery with cakes, pastries, donuts, breads and cupcakes displayed in a clear-fronted case. Cookie sheets, trays and baskets are available for creating inviting arrangements of baked goods.
- A checkout area with two cash registers and a grocery belt.
- Throughout the *Market*, activities and information heighten awareness of environmentally friendly practices.

### Job

At the *Market*, children can either be employees (stocking the shelves, running the deli or bakery department, or cash registers) or patrons (shopping for food, checking out). Two checkout counters with cash registers are located at the front of the *Market*. When children move an object over a motion sensor embedded in the counter, they will hear an audible beep that imitates a product scanner.

### Green Connection

Near the checkout area is an acrylic-covered display of plastic, paper or fabric bags. Only fabric bags are offered to visitors, to emphasize the ‘eco-friendly’ decision. Nearby is a small monitor showing a brief slideshow about the choices and consequences attached to using these different kinds of bags. A “multiplier” effect is illustrated when multiple plastic bags are used by one family every week at the grocery store and that number is multiplied by the number of families in the community, city, state, etc.

An “Eco IQ” game is also located in the *Market*. This light-hearted quiz game invites families or small groups to test their knowledge of eco-friendly choices and behaviors by answering multiple-choice questions about everyday scenarios.

Posters inside the *Market* highlight necessary or unnecessary packaging, green cleaning products, using/distributing extra food, and buying locally (i.e. where and how your produce is grown makes a difference).

### Engagement Tools and Tips

- Use Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Eco City experience.
- Distribute the market promotional cards (free cookie/apple cards) to reward visitors for restocking the shelves.
- Distribute the weekly market advertisement to visitors playing the role of patrons.
- Offer the calculator to visitors so that they may calculate their purchases before the check-out process.
- Role play different jobs in the market with guests, i.e. “Clean up on aisle four!” to encourage guests to restock the shelves.
- Explain the importance of keeping items in grocery shelves, neatly displayed in rows with labels facing forward (this provides ease of shopping and encourages consumers to purchase new products).
- Demonstrate how to use the different tools in the space such as the scale, meat slicer, meat scale, etc.
- Talk about the choice between paper, plastic, and cloth shopping bags.

### F. Car Care Center

In the *Car Care Center*, visitors can pretend to be mechanics or the owner of the hybrid car in the center of the space. Children explore the model hybrid car and learn more about what makes cars environmentally friendly.

#### **Hybrid Cars:**

In biology, a **hybrid** is the offspring of two different types of animal or two different types of plant. In the automotive world, a hybrid is a vehicle with two motors: one that runs on electricity and one that runs on gasoline. Hybrids are good for the environment because less fuel is used and fewer harmful emissions are produced than by standard gasoline-powered vehicles. At low speeds and in stop-and-go traffic, the hybrid vehicle is powered by the electric motor – using no energy during idles and also generating no exhaust. At speeds above 40 miles per hour (such as highway driving), the gasoline-powered motor kicks in. During these times – or when the vehicle’s battery is low – the gasoline-powered motor charges the electric battery. Hybrid vehicles are very fuel-efficient, getting about 48-60 miles per gallon of gasoline.

[Sources: <http://phys.org/news10031.html> and <http://kids.britannica.com/comptons/article-197067/automobile-industry>]

In the Auto Inspection activity, children can practice inspecting a car by checking the “emissions” level, hooking up a cable to the battery, and testing the lights (they turn on and off) and the horn (it beeps). Children can reference an eco-friendly car care checklist, and view real tools under protective Plexiglass to further enhance their experience.

Using the Fan Belt Gear Wall, children create a wall of moving gears by adding, removing or adjusting their placement. Two fan belts connect two disks at the bottom and a gear above. By turning the crank on one of the disks along the bottom, visitors can set a series of gears into motion.

**JOB**

When children are working in the *Car Care Center*, they can put on a mechanic's shirt, reference an eco-friendly car care checklist and scoot under the hybrid car on a "creeper." There, they can check out the muffler and tailpipe. Under the hood of the hybrid, visitors can check and refill the fluids, and change the air filter. Visitors can check to see if a tire needs to be changed, rotated or balanced, "change the oil," and put used oil in the oil-disposal unit so it can be "disposed" of properly.

**Green Connection**

In the *Car Care Center*, children use a checklist to determine whether the vehicle in the shop will pass its annual inspection.

As children and their caregivers go through the Annual Inspection Checklist, they also learn the importance of keeping one's car running energy-efficiently. They check the tailpipe for "CO<sub>2</sub> emissions" (too high a reading contributes to more polluted air); learn how tires that aren't correctly inflated or balanced wear out faster (ending up in landfills) or affect gas mileage; and learn how a hybrid car uses less non-renewable fuel. There is also an oil-disposal unit so that children can properly dispose of "oil" and other "fluids."

**Tire Maintenance:**

Over time, tires tend to lose air, which makes it important for vehicle owners to have their tire pressure checked regularly. When tires are under-inflated, they have more "rolling resistance," which increases the amount of fuel needed to power the vehicle. In addition, when a vehicle's tires are out of balance with each other, the amount of tire-to-road traction (the drawing or pulling of the vehicle over the road surface) is reduced – causing a loss of fuel economy.

[Sources: <http://cars.about.com/od/adviceforowners/a/tiretips.htm> and <http://dnr.louisiana.gov/assets/TAD/education/ECEP/auto/d/d.htm>]

**Carbon Dioxide Emissions:**

Carbon dioxide, or CO<sub>2</sub>, is produced naturally when animals breathe, but also by burning fossil fuels to power automobiles and to generate electricity. CO<sub>2</sub>, methane, nitrous oxide and halocarbons are known as "greenhouse gases." In nature, the output of greenhouse gases is balanced by processes that remove them from the atmosphere (such as photosynthesis, the use of CO<sub>2</sub> by green plants to make food). However, the natural processes can't keep up with the increased human activity, and the concentration of greenhouse gases has caused an environmentally dangerous phenomenon known as "global warming."

[Source: <http://kids.britannica.com/comptons/article-276215/global-warming>]

**Green Practices at the Mechanic's Shop:**

Just as auto manufacturers are becoming more conscious of the effects of their products and practices on the environment, so are auto mechanics. The following are some of their green practices:

- Proper storage and disposal of fluids such as oil and antifreeze, which can contaminate landfills and pollute local waterways.
- Collection of grease to reduce the need for absorbents.
- Recycle oil, sell to a refinery, then purchase back as re-refined oil.

- Install bioremediation devices on sinks that break down and wash away grease.

[Source: <http://www.mnn.com/green-tech/transportation/stories/organic-auto-mechanics>]

### Engagement Tools and Tips

- Use Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Eco City experience.
- Talk about the different tools displayed in the tool box and throughout the space. Name the different parts of the car.
- Talk about why is it important to recycle oil, and change and rotate tires.

### **G. International Airport**

At Eco City's *International Airport*, visitors can be airport employees or passengers. As employees, they update the Arrivals/Departures board, scan the luggage and direct air traffic. As customers, wheel their luggage to the checkpoint, and check their flight departure time.

#### JOB

Large domestic and international maps help everyone locate where they are and where they'd like to go. "Ticket agents" update the Arrivals & Departures board by sliding in names of cities, times, gates or flight status ("on time," "on the ground," "boarding," "delayed" or "cancelled"). Children can also dress up as pilots.

As passenger luggage is pushed through a "scanner," children take on the roles of TSA (Transportation Security Administration) agents using the "x-ray" equipment to check that the contents of luggage are safe. Children may also enter the air traffic tower and become air traffic controllers. Using a console station equipped with video, light and sound effects, children listen to a series of weather reports, watch fly zone radar screens, and monitor runway, gate and terminal views displayed on screens. A microphone, telephone, and series of buttons and toggle switches give children the opportunity to both receive and "send" air traffic signals. Children can also communicate with the scale airplane in the Museum's *Summit* exhibition, which is located right above the Air Traffic Control Tower.

#### Green Connection

Traveling uses fuel. The less fuel you use, the less pollution is created. Families can learn about what kind of carbon footprint is created by different methods of travel using the *How will you get there?* activity. Families plan hypothetical trips and compare the environmental impact of a hybrid car, a SUV (Sport Utility Vehicle), a bus and an airplane based on how many people can travel at once and how much fuel will be used.

#### **Carbon footprint:**

A **carbon footprint** is a measure of the impact of a person or group of people on the climate. It is usually thought of as the amount of carbon dioxide and other greenhouse gases that one's choices create each year.

[Source: <http://www.nature.org/greenliving/carboncalculator/index.htm>]

Using the large domestic map, families can choose a travel destination and then an itinerary of activities while there. A group of choices is provided for each city, some more eco-friendly than others. Families can discuss the options and make a choice.

### Engagement Tools and Tips

- Use Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Eco City experience.
- Use the aircraft flight manuals to enhance the learning experience and encourage visitors to explore safety guidelines for operating an aircraft.
- Use airline tickets to give children the experience of checking in for their flight.
- Use the voice box to communicate with the “pilot” in the airplane exhibit on the Summit, to simulate a real landing experience.
- Discuss the different panels and images on the digital screens.
- Guide guests through the use of the carbon footprint exhibit to explore the most eco-friendly travel choices.