

# Activities

## UNIT 2 THEME 1: COMPOSTING, DECOMPOSITION AND RESOURCE CONSERVATION

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Ask any experienced organic gardener, and they'll tell you that compost is the best thing going. Compost is an ideal soil amendment that provides essential plant nutrients safely while improving the soil's ability to hold water. Better still, it can be made from materials that are readily available and can be obtained for free.

Compost is the end result of the natural process of decomposition. Any plant materials, if left long enough, will decompose into compost with the help of worms, fungi, bacteria and other soil microorganisms. In the schoolyard, the challenge is to select an appropriate composting system that suits the needs and constraints of the participating classes and that makes the best use of available compostable materials. At most schools, a significant portion of the leftover food thrown into the garbage has the potential to be turned into compost. Other possible materials available to schools include fallen leaves, grass clippings and plants and weeds pulled from the school garden. As part of these composting activities, students will gain valuable insights into conserving natural resources, decomposition and soil stewardship.

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**Note:** Some activities in this section were adapted with permission from *The Growing Classroom* by Life Lab science program.

### SUGGESTED ACTIVITIES

#### 1. Compost in a Bag

K-3

Use this demonstration to introduce students to the natural process of decomposition. Begin this activity about one month before beginning composting in the garden or in the classroom.

##### Materials

- Large clear plastic bag and twist tie
- Compostable food scraps: pieces of fruit, bread, grass clippings, paper
- Non-compostable items: plastic, scraps of metal (make sure these are blunt so they won't puncture the plastic bag)
- Moist soil from the garden

##### Procedure

- a) Tell the students that you know the ingredients for a secret recipe. Have them guess what the results of the recipe might be as you put the ingredients together.
- b) Put a generous helping of moist soil into the bag.



## Unit 1 Fall

### 2. Four Senses

K-3

For this tasting activity, ask students to close their eyes and tell them that they are going to study food using all their senses except sight. If you are doing this activity with an entire class, select a few students to distribute food samples to their classmates. Without revealing the food's identity, have them feel, smell, listen to and taste some samples from their garden. Let students guess what they are sensing.

### 3. Stone Soup

K-3

For this activity you will need to find a copy of *Stone Soup*, an old folk tale which has been written down and published by many authors. Following the story, students work together to prepare a stone soup of their own using vegetables harvested from the school garden. If you have a very minimal harvest from the school garden, asking students to bring ingredients from home will only make the class' soup more like the soup in the story. Of course if you can't find a copy of *Stone Soup*, it's still a great idea to use the vegetables harvested from the garden to make soup. For this activity to be a success, you'll need the help of some adults or perhaps some reliable older students.

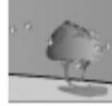
#### Materials

- Vegetables harvested from the school garden and/or vegetables that students have brought from home
- Crock pot or large pot and stove
- Sharp knives
- Cutting boards
- Spoons
- Bowls or mugs
- Stock and/or bouillon cubes
- Spices
- Water
- Washed stone (could be from the garden)
- A copy of the story *Stone Soup* (many versions of this folk tale are available, including versions by Marcia Brown, Jon J. Muth, Heather Forest and Ann McGovern)

Preparation: If the school garden hasn't produced enough vegetables to make a large pot of soup, ask the students to bring some vegetables from home that could be added to a soup.

#### Procedure

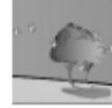
- a) Ask the students to share examples of times when they worked together with other people to do something they couldn't do by themselves.
- b) Read the story of *Stone Soup*, a folk tale that tells the story of travellers with nothing to eat who stop for a night at a town. The people in the town have little food themselves and are unwilling to share, until the travellers begin brewing a pot of soup using a magic stone. Soon, the townspeople have all contributed something to the pot and there is enough soup for everyone to share.



- c) What did the travellers in the story accomplish that they couldn't have done by themselves?  
What lesson did the townspeople learn from the travellers?
- d) Have some of your students or some older student helpers wash and dice the vegetables to add to the soup, making sure students are supervised while using knives.
- e) Have one of the students find a stone, scrub it clean, and add it to the crock pot along with water and/or stock. Bring the liquid to a simmer.
- f) Add vegetables to the liquid and simmer for at least 30 minutes. Tender vegetables, such as tomatoes and greens, can be added later. Add some salt to bring the flavour out and add spices as you see fit.
- g) Serve the soup and enjoy!

**Extensions**

- Invite other students or adults that helped with the garden in the spring to share the soup.
- Have students write their version of the stone soup recipe.
- To continue in the spirit of sharing, donate extra harvest from the garden to a local food bank or soup kitchen.



## Activities

### UNIT 1 THEME 1: CELEBRATING THE FALL HARVEST

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Harvesting and using vegetables that have been grown in the school garden is a great way to make connections to the garden work that has been done in the spring and to build excitement for the coming year. Even if you have just a small garden, it's still important to celebrate the students' accomplishments and to take time to enjoy the food that students have grown. Remember to check that students are not allergic to any of the produce that is being harvested, and allow the students to eat only the plants that you are absolutely certain are edible.

#### SUGGESTED ACTIVITIES

##### 1. Harvesting

**K-7**

Bring the students to the garden to observe what makes fall different from all the other seasons in the garden and to harvest any remaining crops.

**Materials**

- Bags for collecting harvested vegetables
- Sturdy pair of scissors or sharp knife

**Procedure**

- a) What do you notice about the garden? What do you remember about the work that was done in the garden in the spring? How has the garden changed since then?
- b) Discuss some of the students' observations. You may want to touch upon ideas such as: different stages of the plant life cycle that can be observed
  - effects of weed competition
  - plants that have gone to seed, seed dispersal mechanisms
  - evidence of insect and animal activity
  - interactions between the weather, soil and plants
- c) Demonstrate how to harvest plants gently, without damaging the edible parts (spots on a vegetable that have been bruised or cut will be the first to rot). Harvest any edible plants, looking, touching, smelling and discussing along the way. Put food in a bag for subsequent use. Set aside plants that have gone to seed in a dry, protected area for use in seed saving activities.
- d) Wash food that has been harvested and ask students to wash their hands.
- e) Share the harvest among the students for taste testing. Sample each item as connoisseurs, discussing flavours or rating tastes. You may want to put some of the harvest aside for use in one of the following activities.

## Adopt-A-Beach

# Waivers and Safety

### Liability Waivers

All volunteers must sign a liability waiver BEFORE participating in a beach cleanup.

**A WAIVER MUST BE SIGNED FOR EACH BEACH CLEANUP.**

People who do not turn in a completed waiver may NOT participate.

**IMPORTANT:** Please note that children **under the age of 18** must have the waiver signed by a **parent or legal guardian**. A child's waiver may **NOT** be signed by a friend's parent, babysitter, aunt, teacher, etc. The waiver can be obtained in advance from our website at [www.healthebay.org](http://www.healthebay.org).

### Use Caution

Please advise volunteers to wear sun block, closed-toe shoes, and a jacket and to bring a snack and beverage. Children should be supervised by an adult at all times.

### Accidents and Emergencies

Before you start your cleanup, please take some time to look around for the nearest attended lifeguard tower or station. Should any accident or emergency arise, please contact a lifeguard immediately. If a lifeguard is not available and there is an emergency, call 911.

## Cleanup Supply Checklist

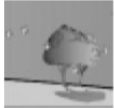
Please check this list to make sure you have all of the supplies you will need for your beach cleanup.

- Trash Bags** (Supplied by Heal the Bay)
- Recycle Bags** (Supplied by Heal the Bay)
- Liability Waiver Forms** (Supplied by Heal the Bay)
- Pencils** (Supplied by Heal the Bay)
- Data Cards** (Supplied by Heal the Bay)
- Gloves** (Supplied by Heal the Bay)
- Water**
- Snacks**
- Sunscreen**
- Closed Toe Shoes**



**IMPORTANT: PLEASE BE SURE TO RETURN THE WAIVERS AND DATA CARDS IN THE PRE-ADDRESSED ENVELOPE TO HEAL THE BAY AFTER YOU HAVE COMPLETED YOUR CLEANUP.**





## Unit 1 Fall

*Three quarters of this apple represent all the oceans on earth. The remaining quarter represents all the land on earth.*

Cut the remaining quarter in half and set one piece aside.

*One half of the land is unfit for humans; it is either too hot, like a desert, or too cold, like the north and south poles.*

Cut the remaining piece into quarters and set three of them aside.

*Of the land that humans can live on, only this small piece is land that we can grow food on. The rest is too rocky, or there isn't enough sun for plants to grow.*

Peel the remaining piece.

*This thin peel represents the thickness of the soil in which we grow our food. It is only about one metre deep. This tiny portion is the only area out of the whole earth where all the right conditions exist to grow food. Enough food has to be produced on this small bit of land to feed all of the people on earth.*

- c) With so little soil in the world, what should people be doing to take care of it?

## 2. Erosion

**K-5**

It takes over 500 years to produce just 2.5 cm of soil, and in many parts of the world existing soil is lost as much as 18 times faster than new soil is formed.<sup>7</sup> This activity will demonstrate to students how this important resource can be lost through erosion by rain and wind when the garden is left bare for the winter.

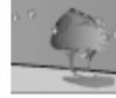
### Materials

- Four waterproof trays (could be seeding trays, cookie sheets, old baking pans)
- Sod to fit snugly in one of the trays
- Soil
- Watering can
- Preparation: Dig up a piece of sod to fit snugly into one of the trays, and fill a second tray with soil. Set the two empty trays out on the ground against a wall. Fill the watering can with water.

### Procedure

- a) In the winter, there is usually plenty of rain and wind. What do you think the rain and wind will do to the soil? When soil or rocks are moved from one place to another by rain or wind, we call this erosion.
- b) Ask the students to make predictions about what will happen when the wind blows across the tray filled with sod and the tray filled with soil.
- c) One at a time, hold the trays filled with sod and soil over one of the empty trays. Invite a few students to blow across each tray to simulate wind. Notice how much soil collects in the empty tray.

<sup>7</sup> Ecology Action. *Worldwide Loss of Soil and a Possible Solution*. <http://www.growbiointensive.org/biointensive/soil.html#soil>.



In this activity students create criteria for an appealing seed packet and design their own seed packets for seeds collected from the garden. These decorated seed packets can be sold as part of a garden fundraiser, used as gifts or saved for planting in the spring.

**Materials**

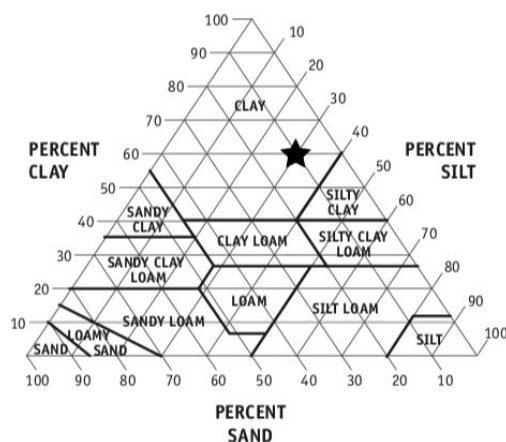
- Seeds collected and dried from the garden
- Copies of the seed packet template for each student (*see Appendix B, page 83*)
- A variety of seed packets leftover from the spring
- Scissors
- Glue
- Pencil crayons

**Procedure**

- a) There are many farmers and seed companies that earn their living by selling seeds. Imagine that you own one of these small seed companies and you want to sell some of your seeds. When you go to the garden stores you see that there are many other companies trying to sell their seeds as well, so you want to design a seed package that will stand out from all the others and convince people to buy your seeds.
- b) Show the students the seed packages and have them point out some of the features that stand out on each package, such as colour pictures, detailed planting information, the name and address of the seed company, etc. Ask students to rate the seed packets from most appealing to least appealing.
- c) Create a list of criteria for an appealing seed packet on the board.
- d) Have students design seed packets for the seeds the class has saved, based on the list of criteria.
- e) Cut and fold the seed packets, then fill them with seeds. Make sure that the packages are cut and sealed carefully so that seeds won't fall out.
- f) Have students look at each others' seed packets. Did we meet the criteria we established? What other techniques do you think seed companies might use to sell their seeds? Are the seeds in the nicest packets always the best seeds?

**Extensions**

Student-designed seed packets serve as an excellent symbol of the work and learning that takes place in a school garden. Use the seed packets to help raise awareness about the benefit of a school gardening programme by selling them at a fundraiser or giving them as gifts to administrators who have supported the school garden.



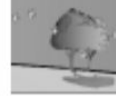
**Example:** A soil that is 60% clay, 10% silt and 30% sand would be a clay soil, according to the soil texture grid at left. (see Appendix B, page 96)

- Trowels for collecting soil (optional)

#### Procedure

- Have students make predictions about what soils are made of. Do you think all soils are the same? How might they be different from each other?
- Divide the class into groups
- Have each group collect a soil sample from a different area of the schoolyard, including the garden. Alternatively, students could bring soil samples from home.
- Put each soil sample into a different glass jar so that each jar is filled halfway with soil.
- Label each jar using masking tape, indicating the students in the group and where the sample was collected.
- Add water to the jars until they are full.
- Screw the lids tightly onto the jars and shake vigorously for up to one minute.
- Allow the jars to sit undisturbed for as long as possible. It can take up to 24 hours for the soil layers to settle completely, even longer for heavy clay soils. Students can make an initial observation after a few minutes, then confirm their observation the following day.
- Ask students to draw and describe what they see. The minerals in the soil will be layered with the heaviest particles at the bottom of the jar. In order from bottom to top, the mineral layers will be sand, silt then clay. Decomposed humus will sit in a thin, dark layer on top of the clay (only after the soil has settled completely) and humus that has not yet decomposed will float to the surface of the water. Air in the soil may be visible as bubbles when water is first added to the soil.
- Ask the students to determine which layer is the thickest. This will determine what kind of soil you have.
- Ask students to predict what might be the best kind of soil for the garden. What kind of soil would be easiest to dig? What kind of soil would hold water the best? (The ideal soil texture is





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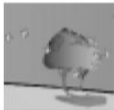
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## Unit 1 Fall

Our food travels great distances to reach our plates. In Canada, on average, each meal ingredient travels close to 2000km to reach us.<sup>8</sup> Transporting food such long distances requires burning large amounts of fossil fuel, resulting in increased emissions of CO<sup>2</sup> and other greenhouse gases. As a consequence of this globalized food system, the eating habits of a typical family of four can result in nearly the same volume of greenhouse gas emissions as heating a home and using a car combined.<sup>9</sup>

On grocery shelves in British Columbia, we often find apples that are grown locally or elsewhere in the province, in Washington State, or grown in New Zealand. An apple grown in New Zealand travels approximately 12,000 more kilometres to reach us than an apple grown locally, resulting in more than 50 times the amount of CO<sup>2</sup> emissions through transport alone.<sup>10</sup> In this series of activities, students will examine how growing their own food and eating food grown closer to home can help slow climate change.

### SUGGESTED ACTIVITIES

#### 1. Greenhouse in a Jar

2-7

Through a simple experiment, students will discover how the greenhouse effect causes climate change. This activity can be completed in small groups or as a whole class experiment.

##### Materials

- Two thermometers
- Glass jar
- Clock or watch
- Sun lamp or access to sunny area
- Greenhouse in a Jar worksheet (*see Appendix B, page 84*)

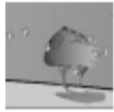
##### Procedure

- a) Describe how living on earth is a bit like living inside a jar; carbon dioxide (CO<sup>2</sup>) and other greenhouse gases create a layer of insulation that helps to keep the atmosphere warm enough to allow life on earth. Ask student to make predictions about what the temperature inside the jar will be like compared to the temperature outside the jar.
- b) Place the two thermometers close to each other in direct sunlight or under the sun lamp.
- c) Wait about three minutes so that the thermometers are both giving the same reading. On the first row of the worksheet, record the time and the temperature readings on both thermometers.

<sup>8</sup> Ten Days for Global Justice. *What's All the Hot Air About?* <http://www.web.net/~tendays/hotair>.

<sup>9</sup> Jones, Andy. Summary of *Eating Oil: Food Supply in a Changing Climate*.  
[http://www.sustainweb.org/pdf/eatoil\\_summary.PDF](http://www.sustainweb.org/pdf/eatoil_summary.PDF)

<sup>10</sup> Calculations of the author, based on CO<sub>2</sub> emission statistics cited in Kaymar Enshayan et al. *Food, Fuel and Freeways*.  
<http://www.leopold.iastate.edu/pubinfo/paperspeeches/ppp/foodmiles.html>



### SCIENTISTS AT NATURAL RESOURCES CANADA PREDICT THAT SOME OF THE EFFECTS OF CLIMATE CHANGE IN B.C. MAY INCLUDE: <sup>11</sup>

- a rise in sea levels by up to 30 cm on the northern coast of the province
- increased flood dangers in some areas of the coast and in the interior drought in some areas
- fishes that prefer cold water may move farther north, while warmer water fish such as tuna and mackerel may move into the area off our coast
- some tree species will extend their ranges northward and to higher elevations
- grasslands may replace some Douglas fir forests in places where there is less rain
- changes in tree growth, fire frequency, and insect infestation that may cause difficulties for forest companies

*Appendix B, page 85)*

#### Procedure

- Ask students what they think some of the effects of climate change might be in British Columbia and how we might be able to reduce the effects of climate change. Discuss some of the predictions made by scientists.
- Look at the sample graphs using an overhead projector, or distribute copies to the students. Explain that these graphs are clues about how students can help slow climate change. Each graph shows the number of apples eaten on the same day by two different classes located in Victoria. The four locations on the graph are the most common places where the apples we find in stores are grown.
- Ask some questions about the graphs to check for understanding: Which class ate more apples from BC? Which class ate more apples from New Zealand?
- Ask students to guess how many kilometres an apple would have to travel from each of these growing regions to reach Victoria (you may want to modify these distances if you live somewhere else). Write the actual distances on the graphs for reference:
  - Apple grown locally (in Victoria): 0-50 km
  - Apple grown in Okanagan Valley, BC: 450 km
  - Apple grown in Washington State, USA: 500 km
  - Apple grown in New Zealand: 12,000 km
- Apples and other foods are brought to us using big trucks, ships, trains and airplanes. All of these vehicles use fuel and emit greenhouse gases like carbon dioxide. The further the food has to travel, the more fuel is needed and the more greenhouse gases are released. Which kind of apple would take the most amount of fuel to bring to us? Which kind of apple would take the least amount of fuel? What kind of apples could you choose to help slow climate change? Write

<sup>11</sup> Natural Resources Canada website. [http://adaptation.nrcan.gc.ca/posters/teachers/bc\\_e.asp](http://adaptation.nrcan.gc.ca/posters/teachers/bc_e.asp)



#### 4. The Worm Squirm

K-3

There are many materials that can be successfully made into compost in either a worm bin or outdoor compost bin, but some materials should not be added to the compost either because they won't decompose or because they pose a health hazard to students. This quick game will help young students remember what to put into the compost and give them a preview of what their composting efforts will produce.

##### Materials

- Examples of compostable and non-compostable materials, or the names of these items written on cards
- Small container of compost or worm castings

##### Procedure

- Review materials that should and should not go into the worm bin or compost.
- Ask the class to hold hands to form a giant worm.
- Hold up items that can and can't go into the compost. Ask the 'worm' whether it would like the item.
- If the answer is yes, everyone says "WORM SQUIRM!" and the worm wiggles by sending a wave down the line. If the answer is no, ask where the item should go (e.g. in the garbage, in the recycling box, etc.).
- After a few rounds, ask the class to sit down. Look through the items or cards that were used and ask why they were or were not used for the compost.
- Bring out a small container of compost and show the 'worm' what it has just made. Pass it around for the children to see, touch and smell.

DO ADD TO THE COMPOST	DON'T ADD TO THE COMPOST
fruit and vegetable scraps	metal, plastic, glass
eggshells	stones
grass clippings	meat, fish or poultry
leaves	large sticks
seaweed	cooked foods
shredded newspaper or cardboard	dairy products
weeds that haven't gone to seed	diseased plants
manure from farm animals	perennial and invasive weeds (morning glory, ivy, buttercup, blackberry)