Unit Learning Objectives:
- Students will explore the components of soil as well as different growing mediums through sensory activities and simulations, featuring a cooking demonstration.
- Students will explore soil and compost as a habitat for living organisms and the ways in which humans can impact them through composting behaviours.
- Students will review the different types of organisms that inhabit a healthy compost pile through dramatic play and movement.

Workshop Materials:

Introduction:
- A book (or two) about soil or worms

Introduction to Soil:
- Examples of different growing mediums - page 3
- Growing Medium Observation sheet - Supporting Documents
- Magnifying glasses (optional)

Components of Soil:
- Soil Components Cards (4) - Supporting Documents
- Soil Particle Size Diagram - Supporting Documents

Dirt Dip
- Dirt Dip Ingredients - page 6
- Dirt Dip Utensils - page 6
- Dirt Dip Visuals (optional) - page 5

Soil As A Habitat/Introduction to Worms:
- Vermicompost Bin
- Tarp or plastic sheet to catch spilled soil and worms
- Habitat Observation Sheet - Supporting Documents

Compost Café Restaurant:
- Compost Café Restaurant Menus - Supporting Documents
- Compost Café “Specials” - Supporting Documents
- Compost Café Worksheets - Supporting Documents

Rotten Apple Party:
- Dance music - any will do
- Wrung out sponge
- Organism costumes - suggestions page 13

Workshop updated March 2017
If you require this information in an accessible format, please contact brooke@foodshare.net.
Equity, Diversity & Social Justice Notes:
The book suggested below, “Worm Loves Worm” isn’t about composting or worm biology but is a sweet story of worm love and has good messaging that can lead discussions about gender, equity and relationships. The fun worm anthropomorphizing connects well to the worm restaurant task.

Introduction: (10-15 mins)
Begin by reading story book (or two). You could try any of these or maybe you have a favourite on your book shelf already!

Yucky Worms: Who would want to be friends with a wiggly, slimy worm? You can’t even tell which end is which! But there’s more to these lowly creatures than meets the eye. Kids are invited to find out where worms live, see how they move, and understand why gardeners consider them friends with the help of this humorous and informative look at an unappreciated — and fascinating — creature. (from amazon.ca)

Soil: Books in this series introduce children to the exciting world of materials. Each book uses simple, repetitive text to teach basic vocabulary, and includes stunning photographs that illustrate the properties of each material. In Soil, readers learn what soil is, where it is found, and the different things it is made of. Readers also learn about the uses for soil, and the role it plays in nature. (from the book back

Worm Loves Worm: When a worm meets a special worm and they fall in love, you know what happens next. They get married! But their friends want to know—who will wear the dress? And who will wear the tux? The answer is: it doesn’t matter. Because Worm loves Worm. This irresistible picture book is a celebration of love in all its splendid forms. (from www.mikecurato.com)
Introduction to Soil: (45 mins)

As a group, create a chart to display What We Already Know about soil and What We Want To Know about soil - for example:

<table>
<thead>
<tr>
<th>What We Already Know About SOIL</th>
<th>What We Want To Know About SOIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.g. It’s brown</td>
<td>E.g. What animals live in it?</td>
</tr>
<tr>
<td>It’s full of different things</td>
<td>Where did it come from?</td>
</tr>
<tr>
<td>You grow plants in it</td>
<td>Why is there so much of it?</td>
</tr>
<tr>
<td>It feeds plants</td>
<td></td>
</tr>
</tbody>
</table>

You may need to ask some prompting questions to get your chart filled in, such as:

- What is soil?
- Where do you find soil?
- What is soil made of?
- What might you find living in soil?
- Is soil the same as “dirt”?
- What does soil look like?
- What does soil feel like?
- What does soil smell like?
- What does soil sound like?
- What does soil taste like? (haha)

“Growing Medium” Sensory Exploration:

Set up stations with samples of different growing mediums for the students to explore.

1. You can choose to either label each jar as above, or keep them a mystery (e.g. Sample #1).
2. Have students travel around to each and investigate how the samples are the same or different to each other, for example, describe or write down the colour, texture, consistency, feeling in your hands, moisture, smell, origin and presence of living organisms.
3. What is the definition of soil?
   - A substance made up of organic (plant and animal) material, mineral material (from rocks, like calcium or iron), water and air.
4. So, which of these growing mediums could be called “soil”? Why or why not?

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Components of Soil: (20mins +/- 12hrs)

As mentioned in the soil definition, all soils have four different things in common: organic material, mineral material, water and air.

Show the different Soil Components Cards and discuss. Each of the four components of soil affect the final “product”, in terms of drainage, nutrient content, texture, colour etc. Therefore, there are lots of different soil “recipes” that different plants are best adapted to.

The different particle sizes found in soil can also determine the “recipe”. Show the Soil Particle Size Diagram demonstrating the size of clay vs. silt vs. sand.

Match up these different plants with their preferred soil “recipe” and description with your students - mix them up when you write them on the board and draw arrows to make the matches. You could add photos to help students visualize each kind of soil.

<table>
<thead>
<tr>
<th>Clay Soil</th>
<th>Small particles means not much air space, holds more water and nutrients, easily compacted, sticky, heavy and easily moulded into a ball</th>
<th>Shallow-rooted vegetables like broccoli, brussels sprouts and cabbage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silty Soil</td>
<td>Medium sized particles, moderate water drainage, holds nutrients well, feels smooth and soft</td>
<td>Most vegetable and fruit crops</td>
</tr>
<tr>
<td>Sandy Soil</td>
<td>Large particles, very good water drainage, feels light and gritty, cannot be moulded into a ball, can lose nutrients easily with water, easily cultivated</td>
<td>Crops that require digging in, like carrots, parsnips and other roots</td>
</tr>
</tbody>
</table>

If time permits, put this to the test and conduct an experiment by planting several of the same plant variety in different kinds of soils to see which suits

Extension Idea: The Settle Test

Add some mystery soil to a glass jar, add water and shake well. Leave to settle for 12hrs.

- Clay and silty soil with leave cloudy water with a layer of particles at the bottom
- Sandy soil will leave the water mostly clear with most of the particles at the bottom
- Peaty soil will have floating particles on the surface with cloudy water and a thin layer at the bottom
- Chalky soil will leave a whitish, gritty layer at the bottom and pale grey water
- Loamy soil will have water that is quite clear with layered particles on the bottom and the finest particles floating on top. (from www.eartheasy.com)
**Dirt Dip: (45mins)**

Sample Dialogue: “Who here likes eating dirt? Let’s make a soil snack! YUM”

In this recipe, the different ingredients added together will become Dirt Dip - just like when organic material, mineral material, water and air are added together to become soil! We’re going to use these edible ingredients to learn more about soil components.

**Visual Recipe:**

This optional part of the cooking activity is useful to prep students for what to expect, or if needed, can be used in place of cooking all together (i.e. if cooking is not an option in your classroom). Photocopy to enlarge and have students cut and colour these pictures to create a paper-based Dirt Dip (display/ worksheet/ recipe card…)

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Dirt Dip Recipe Method:

Add MINERAL materials to the bowl or jar.
Show the mineral material card again as a reminder. Mineral materials come from rocks that have been broken into small pieces. These pieces can be many different sizes. Some of the biggest pieces are sand. To represent the sand, we are going to be using some corn kernels, either from a can or cut straight from the cob.

1. Layer the corn kernels into the jar or bowl.
Using the Particle Size Diagram, show how there are different sizes of mineral material.

Silt particles are much smaller than sand, but are made out of similar materials. In our soil snack, we are going to represent these silt particles with salt, pepper and cumin. See how the spices are smaller “particles” than the corn? This is just like how silt is smaller than sand.

2. Add ½ Tablespoon of cumin and ½ teaspoon each of salt and pepper on top of the corn in the bowl or jar.
Some mineral materials are extra tiny! These particles are called clay – they are even smaller than silt and are WAY smaller than sand. We are going to use refried beans, to represent these really, really tiny clay particles.

3. Add the can of refried beans on top of the corn and spices.
Have students look at the difference in size. Refer to the Soil Particle Diagram again.

Add ORGANIC materials to the bowl or jar.
Show the organic materials card. Organic materials are things that come from plants, like rotten leaves, decomposed roots, twigs, branches, grass clippings, etc. The organic material has lots of nutrients that when broken down get added into the soil. In this recipe, we are going to use some fresh cilantro, it even looks just like leaves from a plant! You could also use some dried herbs here too.

4. Sprinkle ½ a handful of chopped cilantro into the bowl or jar.

Ingredients:
✓ Sand: Corn Kernels
✓ Silt: S&P, Cumin
✓ Clay: Refried Beans
✓ Organic Material: Cilantro
✓ Water: Lime Juice
✓ Tortilla chips

Utensils:
› Bowl or Jar
› Mixing spoon
› Teaspoon
› Tablespoon
› Knife
› Cutting board
› Citrus juicer (optional)

Materials:
➡ Soil Component Cards
➡ Particle Size Diagram
Dirt Dip Recipe Method (continued):

The organic material and water work together. The organic material works like a sponge, absorbing water and keeping it available for roots to drink up!

Review that you have organic materials and mineral materials, but is it soil yet? Nope, something’s missing! We need some **liquids**! In soil, there is always some water.

**Add WATER to the bowl or jar.**

Show the water card. This provides liquids for all of the plants and microorganisms in the soils to drink. In our snack, we are going to use **lime juice** as the water.

5. **Squeeze ½-1 lime into the bowl or jar, depending on how juicy it is.**

Watch as the lime trickles down past all of our “soil” components, or ingredients.

There is one more component of soil – it’s hard to see, it’s even already there! Does anyone know? **Air!**

**Add AIR to the bowl or jar.**

Show the air card. To add air, we’re going to mix our dip with a **spoon**. Watch as these snack ingredients mix together to form something new – a dip! This is what happens when air, water, organic material and mineral material mix together to become soil.

6. **Mix all ingredients together well, using a spoon.**

7. **Taste your Dirt Dip.**

Hand out tortillas and spoon some of the dirt dip onto each chip for the students to taste and discuss. You could also use fresh vegetables, crackers or breads to taste.

**Educator Notes on Canned Foods:**

- We recommend emptying beans and corn from their cans before the activity - so not to promote certain brands, but also to make the food look more attractive. We use glass jars.
- Try to purchase BPA-free and low-sodium canned foods whenever possible.
- **Why used canned foods at all?** We often get asked this question. We understand that many students may only have canned, boxed or packaged foods in their cupboards at home so we feel this is a good way to keep things familiar and equitable. We aim to keep our food programming relevant to all budgets.
- Using canned goods shouldn’t stop you adding in other fresh ingredients as well, especially if you have a school garden to harvest from! Try adding in some chopped tomatoes, peppers, tomatillos or other herbs like chives to your dirt dip!
Soil As A Habitat/Introduction to Worms: (20 mins)

Have the group sit in a circle on or around a tarp or plastic sheet, with the vermicompost bin in front of you.

Sample Dialogue: “Today’s workshop is about “habitats”. Can anyone share what a habitat might be? Can you describe your own habitat?”
- A home for plants and animals
- It is the natural environment that provides the necessities of life such as food, water and shelter for a plant or animal species
- My habitat is a house/ condo/ apartment!

“I actually have a habitat for worms right here in this vermicompost bin!”
- “Vermicompost” is the use of worms, usually Red Wigglers, to break down our food scraps into nutrient-rich soil.

Before Getting Started, Highlight These Worm Rules:

1. Worms are very delicate and will break if you are rough with them. A broken worm DOES NOT make two worms (it usually makes two halves of a dead worm.)

2. Worms prefer no loud noises, because they breathe through their skin and “hear” vibrations (so yelling is like giving them a sharp shake.) Please be quiet.

3. Worms prefer dark environments. So if possible, create a little shelter using both hands if handling worms, to provide some shade.

4. If handling worms, be sure to ask the person beside you if they would like to hold a worm before passing it to them. If they don’t want to, skip to the next person.

5. If possible, have a (non-squeamish) adult supervise the handling of worms so they don’t get dropped or thrown.

6. We don’t want to touch worms if we have sunscreen, bug spray or soap on our hands – so give your hands a dirt bath! Rub your hand on some grass or dirt or wash well with plain water so you don’t get chemicals on the worms.

7. Worms might release some orange-yellow liquid called coelomic fluid when handled. It is not pee, but something that happens when the worms are stressed and getting too dry. Take notice and put them back in the bin carefully to recover.

Educator Note:
Search YouTube for videos like: “Vermicomposting: How worms can reduce our waste” - Matthew Ross (https://youtu.be/)
Habitat Exploration:
In pairs, provide students with a small sample (handful) of “habitat” to explore on their own. Be sure to include at least one worm in each sample. This is where the magnifying glasses can be useful. Discuss some of the habitat’s elements they may be observing and fill out the Habitat Observation Sheet:

- Moisture
- Darkness
- Bits of scrap paper to hide under
- Food scraps to eat
- Water to drink
- Air to breathe
- Other organisms
- Microorganisms
- A soft bed of vermicompost to live in
- Protection from predators (e.g. birds)
- Protection from other dangers (e.g. humans stomping around)

Fun Worm Facts:
Try this fun True or False quiz with your students...

1. Worms have 1 heart. **FALSE** - they have 5!
2. Worms are both male and female at the same time. **TRUE** - they are hermaphrodites!
3. Red Wiggler worms can eat up to half their body weight in food each day. **TRUE**
4. Red Wigglers have lungs. **FALSE** - they breathe through their skin.
5. Worms prefer dry environments. **FALSE** - they need the moisture in order to breathe.
6. Worms can swim. **FALSE** - when it rains or their bin gets too moist, worms will come to the surface so they can breathe.

“Today I learned that soil is too precious to treat like DIRT!”
- Grade 4 Can You Dig It? student
Compost Café Restaurant: (60mins)

Read the “Compost Café” restaurant menu together (or have students take turns reading out loud). Choose from the two different menus, according to the group of students you’re working with.

Sample Dialogue: “This is a menu for worms! Do you think you’d like to eat at this restaurant?”

Note the different sections of the menu and discuss the following points as a group or broken up into segments for small groups/pairs:

- **Green Items**: Nitrogen-rich for a quick breakdown. E.g. food scraps and green leaves.
- **Brown Items**: Carbon-rich to balance out the fast decomposition of the Green items and make the final compost really nutritious. E.g. straw, hay and dry grasses.
- **Moisture**: the compost pile needs to remain nice and moist, but not wet in order to break down properly and provide the best habitat for the creatures within – it should feel like a wrung out sponge.
- **Oxygen**: The compost pile needs to be “aerated” which basically means mixed up to make sure that oxygen is spread throughout. Take note: This also helps to reduce bad smells!
- **“Policy”**: the Compost Café’s “policy” is for foods that should NOT be composted. High protein foods such as meat and dairy are very smelly when they break down. Excessive liquids will make the compost pile too wet and diseased plants like weeds might infest the pile and spread unwanted pests.
- **“Worm Castings”**: another word for worm poop = nutrient-rich compost!

Define any new words on the menu as you go, for example:

- “Exquisite” – beautiful and special
- “Repelling” – keeping away
- “Free-Range” – refers to chickens that are able roam free and aren’t caged
- “Indigestion” – not digesting your food properly (can cause stomach aches, gas etc.)
- “Aerated” – mixing in air or oxygen
Menu Du Jour:

You’ll need access to colouring pencils, crayons, pens or anything you would usually use to create works of art for this activity.

1. After reviewing the menu, hand out the blank “specials” boards. Many restaurants like to have daily specials, something that isn’t usually on the regular menu.

2. Ask students to create their own worm restaurant specials board.
   - They should list and/or illustrate some enticing menu items
   - Remember to add some “browns” and “greens”!
   - Students should focus on using their best creative skills and adjectives (“describing words”) to make the menu items sound appetizing.
   - It’s up to them how many special items they want to promote.

3. Have students share their worm specials either with the whole class or in small groups.

4. Now that your student’s specials board are done, try the Compost Cafe Worksheets!

Connecting Idea:

Remember the book, “Worm Loves Worm” from the introduction?

This activity could be replicated to create the catering menu for that worm wedding! Yum!
Welcome to the Party:

Ask students what it takes to make a good party – the right space, the right food, the right drinks, and the right people, or in this case... organisms. If our ‘Rotten Apple Party’ has all the right elements…. we’ll have healthy compost, generating a good amount of heat and helping to quickly breakdown our garden waste and food scraps.

Location:
The first thing we need to consider when composting, or when having a party is where to host it.

What type of bin will you use? Will it be a garbage bin? A recycling bin? A green bin? Or perhaps a corner of your backyard at home?

Rotten Apple Dance Party: (60mins)

This activity uses throwing a party as a metaphor for a healthy compost pile. The dance party demonstrates how the compost is a habitat for lots of different organisms.... and students have a blast at the same time!

Sample Dialogue: “Who likes going to parties? What about a compost party?!” “What do you think that party would be like?”

Before we party, what is composting?

- Composting is just like recycling – using our food scraps to make something new!
- Compare how composting is also kind of like a party for teeny tiny microorganisms (animals that are so small, we can’t event see them!) in the soil – but really it’s a habitat, where they all live together happily.
- The end result of composting is beautiful worm “castings” or, worm poop! This stuff looks like dirt, but really is a super-duper soil to make healthy plants.
- Here’s how it happens, worms wait for our food scraps to start breaking down after we’ve tossed them into the green bin or compost pile, before feeding on them. Just like us, worms poop. But worm poop is special stuff that helps our garden to grow big and strong. Kind of like what fruits and vegetables do for us!
Food:
When we have a party, we usually want to offer a delicious spread of foods. For this party, the organisms (guests) in our compost bin need a balance of different types of foods too. They like food scraps, dried leaves, grass clippings, and plant matter – mmm delicious! (See Compost Cafe for more on this…)

Beverages:
Beyond having the right food, these organisms also require a certain amount of moisture, and the ideal bin will have the consistency of a wrung out sponge, moist to the touch, but without pooling liquids. (*Pass the sponge around to feel the moisture level)

Guests:
The compost bin is a swarming mass of many different microorganisms. Let’s find out exactly who is at the party… and when!

<table>
<thead>
<tr>
<th>Name</th>
<th>ETA to the Rotten Apple Party</th>
<th>Phase Description</th>
<th>Costume Ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychrophiles (“sike-ro-files”)</td>
<td>Present in lower temperatures, like a cool spring day (e.g. &lt; 20°C), and are the first bacteria to arrive on the composting scene/at the party!</td>
<td>The Psychophilic phase is where these bacteria invade the compost pile and begin to burn carbon, releasing heat and nutrients. As the temperature begins to rise, the next gang of bacteria arrives…</td>
<td>scarf, winter hat</td>
</tr>
<tr>
<td>Mesophiles (“miso-files”)</td>
<td>Arrive for mid-temperature parties, like a hot summers day (20-30°C). Most decomposition is ‘mesophilic’ and so they’re considered to be the hardest workers at the party.</td>
<td>The Mesophilic phase lasts for a couple of days. Mesophiles love food scraps, especially inside your compost bin. Mesophiles work really hard to consume just about everything in site, generating enough heat to raise the temperature even higher…</td>
<td>sunglasses, constructio n tools</td>
</tr>
<tr>
<td>Thermophiles (“therm-o-files”)</td>
<td>Arrive for hot temperatures (40-70°C) – strong enough to fry an egg, destroy weed seeds and diseases too.</td>
<td>The Thermophilic phase, can last from a few days to several months. Thermophiles arrive on site when the compost bin is super hot!</td>
<td>egg flip, fan, large sun hat</td>
</tr>
<tr>
<td>Worms and Fungi</td>
<td>Work along side Mesophiles (who come back) when things cool back down a little.</td>
<td>The cooling phase may take several months. You won’t see worms and Thermophiles side by side – because the worms will cook in such hot temperatures!</td>
<td>shower caps, nylons</td>
</tr>
</tbody>
</table>
The time it takes for your Rotten Apple Party to reach the hottest temperatures really depends on:

- the type of scraps you use,
- the amount of moisture (water) in the bin,
- the size of the compost heap, and
- the amount it was aerated to allow oxygen to get inside.

Let’s Dance!

Turn up the music and have a dance party!

Imagine if this was really the middle of a compost bin! Turn the lights out to make it nice and dark.

You could have groups of microorganisms dancing at different times (or phases), just like in a real compost situation with temperature changes…. An organism dance-off!

- This is a great way to test knowledge too, for example, you could “turn the dial up” on the thermometer to prompt different groups to dance in the middle of the circle.

A Rotten Apple Disco Ball!
Conclusion & Consolidation Ideas:

Growing Medium Re-Test
Once you’ve closely investigated the different kinds of growing mediums (and completed the observation sheets), try showing the different jars or containers again - with the names hidden if they were showing the first time around. Can students use their newfound knowledge to identify each one successfully?

It’s Getting Hot In Here!
During your Rotten Apple dance party, try testing the students’ knowledge by turning the heat up or down. Depending on the temperature, different organisms will be present (and dancing) at the “party”.

Browns vs. Greens
A healthy compost pile needs about twice as many “green” as “brown” materials… but do you students remember what greens vs. browns are? Have students create some simple picture cards to sort or play games with (e.g. “snap”) to get more familiar.

Compost Cafe:
After exploring the Cafe’s menu, complete the worksheet included in the Supporting Documents. There’s one for younger students and one for older.

Worked your way through the whole “Can You Dig It?” unit?
Wow! Way to go! Now that your group are soil professionals, hand out the Soil Scientist Certificates on page 17 of the Supporting Documents.

The Take Home Messages:
• Good, healthy soil is essential for the growth of good, healthy food.
• Soil is an important habitat for micro and macro organisms.
• Soil is alive and should be looked after: “Soil is too important to treat like dirt!”
Follow On Activities, Suggested Workshops and Additional Resources:

Soil Science Society of America: Dig Deeper
Learn about soil, play fun soil games, experiment with soil and download soil lesson plans if you’re an educator.
Available: www.soil4kids.org

Scientific literacy is an evolving combination of the science-related attitudes, skills, and knowledge students need to develop inquiry, problem-solving, and decision-making abilities; to become lifelong learners; and to maintain a sense of wonder about the world around them. Available: http://www.ednet.ns.ca/files/curriculum/LetsExplorePlantsandSoils.pdf

FoodShare’s Three Cell Compost Bin-Building Guide:


With funding support from:
## Ontario Curriculum Connections:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Subject Area</th>
<th>Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Science &amp; Technology</td>
<td><strong>Understanding Life Systems:</strong> Demonstrate an understanding that animals grow and change and have distinct characteristics (O) 3.3 Identify ways in which animals are helpful to, and ways in which they meet the needs of, living things, including humans, to explain why humans should protect animals and the places where they live (S)</td>
</tr>
<tr>
<td>3</td>
<td>Science &amp; Technology</td>
<td><strong>Understanding Life Systems</strong> Investigate similarities and differences in the characteristics of various plants, and ways in which the characteristics of plants relate to the environment in which they grow (i.e. the nutrient density of the soil). (O) 2.4 Investigate ways in which a variety of plants adapt and/or react to their environment, including changes in their environment, using a variety of methods. (S) 2.5 Use scientific inquiry/experimentation skills and knowledge acquired from previous investigations, to investigate a variety of ways in which plants meet their basic needs. (S)</td>
</tr>
<tr>
<td></td>
<td>Understanding Earth and Space Systems: Investigate the composition and characteristics of different soils. (O) 2.2 Investigate the components of soil, the condition of soil and additives found in soil using a variety of soil samples from different local environments, and explain how the different amounts of these components in a soil sample determine how the soil can be used. (S) Demonstrate an understanding of the composition of soils, the types of soils, and the relationship between soils and other living things. (O) 3.1 Identify and describe the different types of soils. (S) 3.2 Identify additives that might be in soil but cannot be seen. (S) 3.3 Describe the interdependence between living and non-living things that make up soil. (S) 3.4 Describe ways in which the components of various soils enable the soil to provide shelter/homes and/or nutrients for different kinds of living things. (S)</td>
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<tr>
<td></td>
<td>Health &amp; Physical Education</td>
<td><strong>Healthy Living</strong> Demonstrate an understanding of factors that contribute to healthy development. (O) C1.1 Demonstrate an understanding of how the origins of food (e.g., where the food is grown, how it is made) affect its nutritional value and environmental impact. (S)</td>
</tr>
<tr>
<td>4</td>
<td>Science &amp; Technology</td>
<td><strong>Understanding Life Systems – Habitats &amp; Communities</strong> Demonstrate an understanding of habitats and communities and the relationships among the plants and animals that live in them. (O) 3.1 Demonstrate an understanding of habitats as areas that provide plants and animals with the necessities of life. (S) 3.3 Identify factors that affect the ability of plants and animals to survive in a specific habitat. (S)</td>
</tr>
<tr>
<td></td>
<td>The Arts</td>
<td><strong>Visual Arts</strong> D1. Creating and Presenting: apply the creative process to produce a variety of two and three dimensional artworks, using elements, principles, and techniques of visual arts to communicate feelings, ideas and understandings. (O) D1.3 Use elements of design in works to communicate ideas, messages, and understandings. (S)</td>
</tr>
</tbody>
</table>