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| **Week** | **Lesson Descriptions** | **Goals**  | **Lesson strategies & resources** |
| Flexible timing(75 minute program) | Science Center Program: *Vermicomposters** Students collect leaves and plants and use them to create a vermicompost column (with worms)
* Students observe and make predictions about what will happen to the composters
 | * Students reflect on what happens to leaves after they fall
* Students observe and predict what will happen to vermicomposters
 | * Consider requesting this program early in the unit so you have time to observe changes in decomposition over time
* You can also run this activity without science center help and request the materials instead
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| 1 | Learning Experience 1: *Soil Observation** Students collect soil outside (optional)
* Students observe soil and record their observations

Learning Experience 2: *Is Soil Dirt?** Students share observations from lesson 1
* Teacher charts observations into categories- nonliving, once living and living
* Class sings song “I love dirt”
* Teacher explains that soil and dirt are different
* Homework- songs and stories about dirt (optional)
 | -Introduce the properties of soil by observation-Students hone observation skills-Students document and communicate observations of soil- Build awareness that soil and dirt are different | * This lesson can involve taking students outside to collect soil. Consider doing some prep work about expected behavior outdoors. (alternatively you can also use soil from the Science Center)
* It can be helpful to have an anchor chart to track students questions about soil and to refer to in later lessons
* Consider having students tell you what they think dirt is before you define it for them
* Consider having additional resources to explain the different between soil and dirt (e.g. *Dirt* by Steve Tomecek)
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| 2 | Learning Experience 3: *Rocks in the Soil** Students observe sand, silt and clay and record their properties
* Teacher records observations on class chart
* Teacher explains difference of sand, silt and clay

Learning Experience 4: *Getting to know soil: properties of dry soil** Student observe clay, sand and humus and record their observations using various senses
 | - Students observe, describe the properties of soil- Students record observations of soil- Introduce “Humus” | * Some of the concepts and vocabulary presented in Learning Experiences 6 (particles, parent materials) are not in the Massachusetts standards for elementary and can be omitted or adapted to save time
* Consider using books (e.g Kids Discover Soil). graphic displays, or videos(Brainpop) to help explain difference of sand, silt and clay
* Class chart from lesson 3 will be used again in later lessons
* You can order microscopes for lesson 4 separately from the Science Center, but should do so a few days before you plan to teach so you have them in time
* Lesson 4 materials are used again in Lesson 5
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| 3 | Learning Experience 5: *Getting to know soil: properties of wet soil** Class discussion about properties of soil (use chart from lesson 3)
* Student test and observe clay sand and humus with water and record their observations
 | -Students observe and record properties of sand, silt and clay- Students compare and contrast sand, silt and clay- Students predict, observe and describe results of a test | * You can order microscopes for lesson 5 separately from the Science Center, but should do so a few days before you plan to teach so you have them in time
* Use class chart from Lesson 3
* Lesson 5 materials are used again in Lesson 4
* Students may need some practice using the pipette before starting the experiment
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| 4 | Learning Experience 6: *Getting to know soil: Interpreting Data** Students complete notebook page “What have you learned about wet and dry soil?”
* Students discuss results in a science talk

Learning Experience 7:  *Does Soil or sand hold water better?** Students add water to humus, soil and clay to test absorption
* Students test compaction to see the effect it has on humus, soil and clay
* Students share results from experiment
 | -Students participate in a science talk- Students compare and contrast dry and wet soils and its properties- Students investigate how different types of soil can absorb water (predict, observe and infer)  | * Use class chart from Lesson 3 & 5
* Lesson 6 and 7 are nice opportunities for a science talk and having students explore scientific experimentation
* Some of the concepts and vocabulary presented in Learning Experiences 6 (particles, absorption, pores, etc) are not in the Massachusetts standards for elementary and can be omitted or adapted to save time
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| 5 | Learning Experience 8:  *Getting to know soil: Soil shake** Teacher demonstrates the soil shake
* Students complete soil shake tests
* Teacher reads big book: *Looking at Soil*
* Students observe and record results

Learning Experience 9: *The Scoop on Soils** Teacher reads “The Scoop on Soils”
* Students observe settling jars from lesson 8 and make model sample jars from paper (optional)
 | - Students predict, observe and record the results of soil settling tests- Reinforce the components of soil (rock particles, air, water and humus)-Students practice scientific inquiry (predicting, investigating, drawing conclusions)-Build awareness that soil composition differs by location and that soil can be found in layers | * Lesson 8 can involve taking students outside to collect soil. Consider doing some prep work about expected behavior outdoors (alternatively you can also use soil from the Science Center)
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|  | **Lesson Description** | **Goals**  | **Lesson strategies & resources** |
| 6 | Learning Experience 10: *Earthworm investigation** Teacher reads “*Wiggling Worms at Work”*
* Students observe live earthworms

Learning Experience 11: *Soil critters** Teacher Reads aloud: *Nature’s Recyclers*
* Students read compost critter booklet
* Students observe compost or vermicomposters
 | -Build awareness that soil is a habitat for living things- Build awareness that earthworm’s and other living creatures have a role in healthy soil-Students practice scientific inquiry (asking questions, investigating, drawing conclusions)  | * Lesson 10 requires live earthworms that you can request from the science Center. Make sure you order worms a few days before you plan to teach so you have them in time
* It works well to run these lessons in connection to the vermicomposters (either before making the composters or after they have had time to make observations of decomposition)
* If you are not using the vermicomposters, you will need to have access to a compost pile or collected material from a compost
* Consider running lesson 11 outside since compost critters might scurry away!
* There are some wonderful resources in this lesson. Consider spending more than one lesson on compost
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| 7 | Learning Experience 12: *Layers in the soil** Teacher reads poem: *Under the Ground*
* Teacher charts student ideas about what is underground
* Students create paper models of layers of soil

Learning Experience 13: *What’s in the bedrock** Teacher reviews chart from lesson 12
* Teacher reads selections from *Underground*
* Students discuss ideas in science talk
 | -Build awareness that soil has layers-Build awareness that the ocean is largest and most vital of Earth’s ecosystems | * Some of the concepts and vocabulary presented in Learning Experiences 12 and 13 (topsoil, subsoil and bedrock) are not in the Massachusetts standards for elementary and can be omitted or adapted to save time
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| 8-9 | Learning Experience 14-17 *Plant and Soils*- Students experiment with planting in a variety of ways (teacher chooses between sunflowers, nasturtiums and/or vegetables in root vue) | - Build awareness that plants depend on soils- Students observe seeds- students plant seeds and observe change over time-Students practice scientific inquiry (predicting, investigating, drawing conclusions) | * Consider starting these lessons earlier in the unit so you have time to observe plant growth
* These lessons provide a nice connection to the trees unit and to what students learned about life cycles in grade 1
* These lessons offer many opportunities for students to explore scientific experimentation
* Consider using your school garden for planting sunflowers and nasturtiums
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