

## S.T.E.M. Unit: Nature Recycles

### MSC Unit Objectives:

3.0 Life Science

E. Flow of Matter and Energy

1. Recognize that materials continue to exist even though they change from one form to another
  - a. Identify and compile a list of materials that can be recycled
  - b. Identify what happens to materials when they are recycled
  - c. Observe and record the *sequence* of changes that occur to plants and animals that die and decay.
  - d. Ask and develop possible answers to questions about what happens to the materials that living things are made of when they die

### Common Core Unit Objectives:

SL 1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly

SL 4: Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

3.MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot where the horizontal scale is marked off in appropriate units—whole numbers, halves, quarters.

RI 4: Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 3 topic or subject area*.

RI 7: Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

W 7: Conduct short research projects that build knowledge about a topic.

### Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

|                        | Day 1   | Day 2  | Day 3   |
|------------------------|---|--|---|
| MSC Science Objectives | 3.E.1. Recognize that materials continue to exist even though they change from one form to another<br>3.E.1.d. Ask and develop possible answers to questions about what happens to the materials that living things are made of when they die | 3.E.1.a: Identify and compile a list of materials that can be recycled<br>3.E.1.b: Identify what happens to materials when they are recycled<br>3.E.1.c: Observe and record the <i>sequence</i> of changes that occur to plants and animals that die and decay | 3.E.1.b: Identify what happens to materials when they are recycled<br>3.E.1.c: Observe and record the <i>sequence</i> of changes that occur to plants and animals that die and decay.                 |
| Common Core Objectives | SL 1: collaborative discussion<br>SL 2: gather information from diverse media   | SL 1: collaborative discussion   | SL 2: gather information from diverse media   |
| Lesson Objective(s)    | SWBAT collaborate with a partner to share prior knowledge<br>SWBAT gather information from multimedia sources   | SWBAT identify items that can and cannot be composted<br>SWBAT identify at least one use for compost   | SWBAT identify several organisms that participate in and benefit from decomposition processes   |
| Materials              | Clipboards<br>Notebook paper  | Materials to be composted<br>Plastic jar with lid  | <i>MSB Meets the Rot Squad</i><br>White paper, art supplies, clipboards   |
| Warm-Up                | What would happen if...?<br>Postulate a few situations, ask students what they think would happen (e.g., if you left a PB & J on the pavement)  | Distribute questions from yesterday to partner pairs (not students who created them) to discuss. Share as whole group  | Trip to school compost ball—what can we see in there? Use what we know about compost to discuss what we see.  |
| Lesson                 | Introduction to unit<br>What decomposes? What doesn't?<br>In partners first, compile list, then share out in whole group<br>Introduction to compost—time lapse videos of compost  | Creation of classroom compost jar<br>Predictions about compost<br>FBI—read and track with a partner  | <i>Magic School Bus Meets the Rot Squad</i> read and discuss while students draw and label all of the players in the decomposition of a log<br>Which of those players might show up in a compost bin? |
| Closure                | In partners, come up with 2 questions about how nature recycles/ how things decompose using knowledge gained from videos  | 3-2-1 exit slip<br>(3 things that can be composted, 2 things that can't be composted, 1 use for compost)   | What other things might help with decomposition?<br>What role might humans play in decomposition?   |
| Assessment             | Informal observation of group collaboration as students work<br>Student-created questions showing information gathered from videos  | Exit slip<br>Informal observation of partner conversation  | MSB drawing   |
| Notes                  |   |  |   |

|                        | Day 4  | Day 5  | Day 6   |
|------------------------|--|--|---|
| MSC Objectives         | 3.E.1.a: Identify and compile a list of materials that can be recycled<br>3.E.1.b: Identify what happens to materials when they are recycled | 3.E.1.a: Identify and compile a list of materials that can be recycled<br>3.E.1.b: Identify what happens to materials when they are recycled<br>3.E.1.c: Observe and record the <i>sequence</i> of changes that occur to plants and animals that die and decay | 3.E.1.b: Identify what happens to materials when they are recycled<br>3.E.1.c: Observe and record the sequence of changes that occur to plants and animals that die and decay   |
| Common Core Objectives | SL 1: Collaborative discussion   | RI 1: Ask and answer questions to demonstrate understanding of a text<br>RI 7: Use information gained from illustrations and words in text to demonstrate understanding  | SL 1: Collaborative discussions<br>SL 2: Information from diverse sources   |
| Lesson Objective(s)    | SWBAT sort trash by whether nature, people, or nothing can recycle it.   | SWBAT gather information from a non-fiction text.<br>SWBAT make and record observations.   | SWBAT make predictions based on information learned in the unit.<br>SWBAT describe why plastic is harmful to the environment  |
| Materials              | Selection of materials—decomposable, recyclable, non-recyclable.   | Clipboards, notebook paper, magnifying glasses (1 per student)   | Assorted materials to bury, cloth, popsicle sticks  |
| Warm-Up                | Introduction to trashed room—imagine it is a forest. Was the walk enjoyable? Why or why not?   | Classroom compost jar observations made by illustrating, labeling, writing changes, and making predictions.  | Set up banana peel experiment<br>Students fill in illustration, adjectives, weight for Monday   |
| Lesson                 | Trash room<br>Sort trash—what can nature recycle, what can people recycle, what can't be recycled?<br>Make bulletin board                    | Nature Recycles—read and track in partners<br>Class walk, looking for evidence of nature recycling<br>Students will take notes, make diagrams  | Prepare and bury items (to be dug up in about a month); record predictions.<br>Watch informational video on the Pacific Plastic Island. Why is plastic harmful? What is happening? What if the problem gets worse? What can we do? (groups) |
| Closure                | Exit slip—4 things nature can recycle, 4 things people can recycle, and 2 things that can't be recycled                                      | What about the things on our walk that won't decompose? What will happen to them? What can we do?  | Allow groups to share ideas for what we as the students and staff of HES can do about the Pacific Plastic Island.   |
| Assessment             | Exit slip<br>Placement of item on bulletin board   | Student notes from walk—demonstrating attention and knowledge of decomposition   | Student predictions—in science journals and shared with class<br>Group plans—demonstrate understanding of the central problem to be solved  |
| Notes                  |  |  |   |

|                        | Day 7   | Day 8   | Day 9   |
|------------------------|---|---|---|
| MSC Objectives         | <p>3.E.1.b: Identify what happens to materials when they are recycled</p> <p>3.E.1.c: Observe and record the sequence of changes that occur to plants and animals that die and decay</p> <p>3.E.1.d: Ask and develop possible answers to questions about what happens to the materials that living things are made of when they die</p> | <p>3.E.1: Recognize that materials continue to exist even though they change from one form to another.</p> <p>3.E.1.a, b, c, d.</p> <p>MTTLSS 4: Use technology to communicate information and express ideas using various media formats</p> <p>Standards for Mathematical Practice</p> | <p>3.E.1: Recognize that materials continue to exist even though they change from one form to another.</p> <p>3.E.1.a, b, c, d.</p> <p>MTTLSS 4: Use technology to communicate information and express ideas using various media formats</p> <p>Standards for Mathematical Practice</p> |
| Common Core Objectives | <p>SL 1: Collaborative discussions</p> <p>3.MD.4: Measurement in inches, <math>\frac{1}{2}</math> inches, <math>\frac{1}{4}</math> inches; graphing measurement</p>   | <p>SL 1: collaborative discussions</p> <p>W 2: Write informative/explanatory texts</p> <p>W 7: Conduct short research projects</p>  | <p>SL 1: collaborative discussions</p> <p>W 2: Write informative/explanatory texts</p> <p>W 7: Conduct short research projects</p>  |
| Lesson Objectives      | <p>SWBAT make predictions based on information learned in the unit.</p> <p>SWBAT, over the course of the next month, measure and graph plant growth.</p>  | <p>SWBAT collaborative efficiently and effectively with a group.</p> <p>SWBAT use knowledge to design the best possible decomposable planter.</p> <p>SWBAT describe how their design addresses environmental concerns.</p>  | <p>SWBAT collaborative efficiently and effectively with a group.</p> <p>SWBAT use knowledge to design the best possible decomposable planter.</p> <p>SWBAT describe how their design addresses environmental concerns.</p>  |
| Materials              | Toilet paper rolls, soil, compost, seeds, water, trays  | <p>Plethora of materials for students to use</p> <p>Classroom computers</p> <p>Resource material on decomposition</p>   | <p>Plethora of materials for students to use</p> <p>Classroom computers</p> <p>Resource material on decomposition</p>   |
| Warm-Up                | Banana peel observations day 2  | Banana peel observations day 3  | Banana peel observations day 4  |
| Lesson                 | Compost versus non-compost planter experiment set-up—students will each plant a seed in soil and a seed in a mixture of compost and soil (students will track and compare growth over the next month)   | <p>Introduce STEM project</p> <p>Group work time—planters and presentations</p> <p>Today's focus: select materials, begin designing planter</p>   | <p>Group work time—planters and presentations</p> <p>Today's focus: design planters, list how planter addresses environmental concerns, shows knowledge of decomposition</p>  |
| Closure                | Allow students to share predictions. Ask students to back up their predictions with information from the unit so far and/or prior knowledge.  | How might students use knowledge of nature and people recycling in their lives outside of HES?  | What other things might you use these materials for? What could you do with things that can't be recycled?  |
| Assessment             | Student predictions—in science journals and shared with class   | <p>Informal—group work effectiveness</p> <p>Formal assessment of work on day 12</p>   | <p>Informal—group work effectiveness</p> <p>Formal assessment of work on day 12</p>   |
| Notes                  |   |   |   |

|                        | Day 10  | Day 11   | Day 12   |
|------------------------|---|--|--|
| MSC Objectives         | 3.E.1: Recognize that materials continue to exist even though they change from one form to another.<br>3.E.1.a, b, c, d.<br>MTTLSS 4: Use technology to communicate information and express ideas using various media formats<br>Standards for Mathematical Practice            | 3.E.1: Recognize that materials continue to exist even though they change from one form to another.<br>3.E.1.a, b, c, d.<br>MTTLSS 4: Use technology to communicate information and express ideas using various media formats<br>Standards for Mathematical Practice | 3.E.1: Recognize that materials continue to exist even though they change from one form to another.<br>3.E.1.a, b, c, d.<br>MTTLSS 4: Use technology to communicate information and express ideas using various media formats<br>Standards for Mathematical Practice |
| Common Core Objectives | SL 1: collaborative discussions<br>W 2: Write informative/explanatory texts<br>W 7: Conduct short research projects   | SL 1: collaborative discussions<br>W 2: Write informative/explanatory texts<br>W 7: Conduct short research projects  | SL 1: collaborative discussions<br>SL 4: report with understandable speech<br>SL 6: speaking in complete sentences<br>W 2: Write informative/explanatory texts<br>W 7: Conduct short research projects   |
| Lesson Objective(s)    | SWBAT collaborative efficiently and effectively with a group.<br>SWBAT use knowledge to design the best possible decomposable planter.<br>SWBAT describe how their design addresses environmental concerns.   | SWBAT collaborative efficiently and effectively with a group.<br>SWBAT use knowledge to design the best possible decomposable planter.<br>SWBAT describe how their design addresses environmental concerns.  | SWBAT present designs and information in an easy-to-understand manner using PowerPoint.  |
| Materials              | Plethora of materials for students to use<br>Classroom computers<br>Resource material on decomposition  | Plethora of materials for students to use<br>Classroom computers<br>Resource material on decomposition   | Student-created PPTs describing project  |
| Warm-Up                | Banana peel observations day 5<br>Classroom compost jar observations  | If we put cardboard in a baggie, what would happen? Why?   | Give groups 5 minutes to prepare to present  |
| Lesson                 | Discussion—what happened to the banana peel over the week? What do you think will happen next?<br>Group work time—planters/ presentations<br>Today's goals—create PPTs, take pictures of planter to put on PPTs (half the class)<br>--consider cost and feasibility of planters | Group work time—planters and presentations<br>Today's goals—create PPTs, take pictures of planters to put on PPTs (half the class)<br>--consider cost and feasibility of planters (other half of the class, switched from yesterday)                                 | Group presentation of planters and Power Points<br>Plant flowers in student-created planters   |
| Closure                | Consumer choices based on packaging   | Why is this project important?   | What we learned from the unit organizer  |
| Assessment             | Informal—group work effectiveness<br>Formal assessment of work on day 12  | Informal—group work effectiveness<br>Formal assessment of work on day 12   | Formal, summative assessment of group projects, considering S.T.E.M. aspects   |
| Notes                  |   |  |  |

