|  |  |  |
| --- | --- | --- |
| Modified 5 E Unit Plan | | |
| TOPIC: Resource Conservation-Composting  Last revision 10/13/2013 | | DATE(S): |
| SCIENCE STANDARDS: (possibly)  MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.  [Clarification Statement: Examples of the design process include examining human environmental impacts, assessing the kinds of solutions that are feasible, and designing and evaluating solutions that could reduce that impact. Examples of human impacts can include water usage (such as the withdrawal of water from streams and aquifers or the construction of dams and levees), land usage (such as urban development, agriculture, or the removal of wetlands), and pollution (such as of the air, water, or land).]  Disciplinary Core Idea  ESS3.C: Human Impacts on Earth Systems  Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth’s environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)  Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS- ESS3-3),(MS-ESS3-4) | | |
| COMMON CORE STANDARDS:  **CCSS Anchor Standards for Reading**  1 – Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.  2 – Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.  4 – Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific work choices shape the meaning or tone.  7 – Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.  9 – Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.  **CCSS Anchor Standards for Writing**  2 – Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.  4 – Produce clear and coherent writing in which the development, organization and style are appropriate to task, purpose, and audience.  5 – Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.  6 – Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.  7 – Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.  8 – Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.  9 – Draw evidence from literary or informational texts to support analysis, reflection, and research.  10 – Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audience.  **Grades 6-8 Literacy in Science and Technical Subjects**   * [CCSS.ELA-Literacy.RST.6-8.1](http://www.corestandards.org/ELA-Literacy/RST/6-8/1/) Cite specific textual evidence to support analysis of science and technical texts. * [CCSS.ELA-Literacy.RST.6-8.2](http://www.corestandards.org/ELA-Literacy/RST/6-8/2/) Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.   **Craft and Structure**   * [CCSS.ELA-Literacy.RST.6-8.4](http://www.corestandards.org/ELA-Literacy/RST/6-8/4/) Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6–8 texts and topics*.   **Integration of Knowledge and Ideas**   * [CCSS.ELA-Literacy.RST.6-8.7](http://www.corestandards.org/ELA-Literacy/RST/6-8/7/) Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). * [CCSS.ELA-Literacy.RST.6-8.9](http://www.corestandards.org/ELA-Literacy/RST/6-8/9/) Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. | | |
| **ENGAGE:** Use a question, discrete event, piece of text, video, cartoon, picture, symbol or demonstration that exemplifies the question but not the answer. | | |
| Before the engage, randomly place students into groups of 2-3 to work through the project. One student is materials handler, one is recorder, and one is reporter. In a group of 2, delete materials handler.  Option 1: Show the video clip-Meet the Greens/Rotting Cabbage and discuss it as a class. Ask questions such as “What questions do you have about the video?”, “What is she doing?”, “What is composting?”, “What was smelling?”, “Should compost smell?”(Answer is NO), or other clarifying questions.  Option 2: Show students a piece of fruit or vegetable. As a group, have them “hot dog” fold a sheet of paper and use the headings “2 days” on one side and “2 weeks”(use 2 months if desired) on the other side. Have them discuss in their groups what would happen in 2 days and 2 weeks if left outside and write it on the appropriate column of the paper, then discuss with the class. Turn the paper over and ask the students to list any possible way to make it decompose faster and discuss.  Option 3- Do both of the above beginning with option 2. | | |
| **EXPLORE:** Identify and investigative technique or text and product to be used/created it the exploration. Describe what the students will do. | | |
| Students will practice close reading with the following pieces of text in the order listed below. They are available in the handouts.   1. Composting with Willie the Worm:   <http://www.michigan.gov/kids/0,1607,7-247-49067-62499--,00.html#print>   1. Definition of Composting: [http://www.benefits-of-recycling.com/definition of composting/](http://www.benefits-of-recycling.com/definition%20of%20composting/) 2. Backyard Composting: Local brochure 3. Backyard Composting: EPA Brochure   <http://www.epa.gov/wastes/conserve/tools/greenscapes/pubs/compost-guide.pdf>   1. Food Waste Chart: <http://www.epa.gov/epawaste/conserve/foodwaste/> 2. Composting Techniques: <http://www.benefits-of-recycling.com/compostingtechniques/>   After reading the text and group/class discussions, students **must** be able to answer the following questions:  1. **What is composting?** A natural way to recycle some food waste (or equivalent statement).  2**. Is composting a good thing to do? Why or why not? State information from text.**  3. **What are two common ways to compost?** (with worms in a bin, or without worms in a pile outside.)  4. **What are the 2 important materials in all composting?** Browns-Carbon and Greens-Nitrogen-see text  Students will write a 5-paragraph informational/explanatory paper using the text and include a works cited page. Questions 1-4 are the subject for the introduction paragraph and the next 3 paragraphs. Students should then write a conclusion paragraph that will close the paper.  Students (individually or in groups of 2 or more as needed) will then make an **oral presentation** using  1. appropriate composting materials for visual aids or  2. a poster, a video, or a 6-panel brochure of their own creation as their visual aid.  Lesson 1: Model close reading with the Close Reading Worksheet found in the handouts using the article “Willie the Worm”. Print out 3-4 copies of this worksheet for each student, front and back copies are preferable.  Lesson 2: Have students use the Close Reading Worksheet to finish reading the other articles. Discuss each article and define problem vocabulary in groups and then with the whole class. This will take more than one class period (you may choose to break up the reading and model the MLA worksheet, go over what the final products of the unit will be, and go over the rubric, so they don’t get too bored!).  Lesson 3: Model the MLA worksheet with the first article, then students will complete the rest of the articles as a group. Print 3 of the MLA worksheet per student, front and back copies are preferable.  Lesson 4: Students are then ready to begin organizing, writing, and revising as a group of 2-3. Students should finish the paper in class. Students may type or handwrite the paper.  Lesson 5: Students will exchange papers with another group for editing purposes; the final draft may be prepared in or out of class as necessary. Students will then be prepared to create their visual aid  (poster, brochure, collect appropriate materials, etc.) in or out of class as necessary and be prepared to present to the class. The teacher may use the rubric with the papers before the final is turned in. The same rubric is used for the project.  Lesson 6: Students present their work, this is the explain phase. | | |
| **EXPLAIN:** **Students** will summarize the results of the EXPLORE phase in oral or written form. This may be a class discussion, reports, or a product. | | |
| Students will complete an oral presentation with their visual aid, and answer questions posed by the audience. | | |
| **ELABORATE:** Teachers challenge and extend students’ conceptual understanding and skills. Through new experiences, the students develop deeper and broader understanding, more information, and adequate skills. Students apply their understanding of the concept by conducting additional activities. This may be done before, during, or after any other E. | | |
| As a class, build a composting pile outside or build a vermicomposting bin inside, or investigate how to do it. Investigate composting in the community. <http://compost.css.cornell.edu/CIC.html> to download pdf of *Composting in the Classroom*.  Searcy AR has a large scale composting operation. For more information contact Searcy Mulch Center, 1840 N. Main, Searcy, AR 72143 501-279-1076  Batesville AR picks up yard waste upon request, chip/shreds it and places it in a pile at the city yard. Residents may have this material free of charge. For more information contact City of Batesville, City Hall, Batesville, AR 72501 870-698-2400 | | |
| **EVALUATE:** Use frequent formative evaluations to make instructional decisions about clarifying, re-teaching, or moving on. Use Summative evaluations to assign grades. | | |
| Formative: | Summative: | |
| Circulate while students are working to help with problems and keep students on track.  Examine the student papers and make edits if necessary before the final paper is turned in, grading with rubric if desired. A rubric is included in handouts, an each student should have a copy of the rubric. | Use rubric to evaluate the final project and paper. In 6th grade, this **may** be a group project and paper, in 8th grade this **may** be an individual project depending on the needs of the students. | |

For More Information:

Reasons for the 5E Lesson Plan: <http://science.education.nih.gov/houseofreps.nsf/b82d55fa138783c2852572c9004f5566/$FILE/Appendix%20D.pdf>

CCSS for Literacy:

<http://www.corestandards.org/ELA-Literacy>

Next Generation Science Standards:

<http://www.nextgenscience.org/next-generation-science-standards>