Gardening and Food Composting 5E Lesson Plan

2. Subject area/ course / grade level: Science, Middle or High School

3. Materials List: dead dried plant parts (leaves and pine needles), grass clippings, vegetable scraps, weeds, soil, mesh wire fencing OR plastic bin with holes, water

4. Overarching TEKS, ELPS, CCRS, and Global Graduate/other district standards (chart or list).

TEK	*CCRS*	*ELPS*
6th, 7th, 8th grade: Practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials	Human Practices and their impacts	Listening, writing
Earth and Space Science: explore careers that involve the exploration, extraction, production, use, and disposal of Earth's resources.	Human Practices and their impacts	Listening, writing
Environmental Science research the advantages and disadvantages of "going green" such as organic gardening and farming	Human Practices and their impacts	Listening, writing

5. Lesson Objective/Summary:
Students construct and maintain a compost bin using lunchroom scraps. They create posters, spread awareness for the compost bin, and research/implement best practices for composting and future gardening. Students connect sustainability of and impacts of human practices on the environment through each of the TEKS.

6. Differentiation Opportunities:
Students maintain the compost bin together as well as research/implement best practice. They can be formatively assessed in different ways based on their assigned job in their team. Differentiation can also be present in teamwork as well as individual work based on student needs.

7. Community-Based Resources:

A. Utilize Guest Speakers from local organizations such as Jeremy Peaches from Fresh Life Organics, have a representative from an organic pest control company (Natran Green Pest Control), conduct a class phone call with Master Gardeners in Harris County, take a trip to a Finca Tres Robles to learn and volunteer at an urban farm.

B. Compare City of Houston composting resources information with other local resources.

5E Model Lesson Plans Resources (used below): Different Es, Origins of the Model, Videos with Dr. Nancy Moreno. Please describe each component of the lesson, and link applicable materials.

8. Engage:
Students watch a video of John from GrowYourGreens completing a field trip to Dr. Bob Randall's Permaculture Food Forest. Then they brainstorm compost bin ideas.

9. Explore:
After splitting into teams in each class period, every team of students will construct/research ideas for a compost bin. Each group will present their idea to their peers describing the possible pros/cons of their compost bin structure. For each class period, students will select the best team idea. Class periods will be given materials to build their compost bin and once finished, will advertise their compost bin in the lunchroom to spread awareness. Each class period will have their own separate container for students to choose to place their scraps from lunch which will then be placed in their compost bin. After the compost has formed, students will grow a plant (options given by the teacher and voted on by students) using their class period's compost.

10. Explanation:
Students will check on compost bins weekly and monitor progress over 3 months. During those weekly checks, students will record observations and hypothesize which materials decompose the quickest. Later, when students are ready to plant using their own compost, students will collect data on the progress of their plants. Each class will compete for having the best compost bin and most plant growth (height and quantity).

11. Elaboration:
A speaker from an organic pesticide company will discuss pesticides that are environmental-friendly. Students will receive information on how the pesticides are made, what they contain, and different options to use at home. Students may also take a field trip to Finca Tres Robles to complete volunteer work and receive a tour of the urban garden. Jeremy Peaches may also come in as a guest to present Fresh Life Organics.

Students will discuss and compare different organic pesticides as well as those used on the urban farm with specific speakers. Each class will have the chance to show the speaker their compost bin and receive feedback and possible tips. For each compost bin, students will decide on an organic pesticide and hypothesize why their pesticide is the most effective based on information provided by the speakers.

12. Evaluation:
After 4 months, students submit a self-reflection explaining which compost bin was the most effective and possible errors with their class period's compost bin, identifying organic pesticides and why they were used, and which compost bin rendered the most growth.