

## Composting with Grade 2

Patrick Nau, PS 369

**Project is for 2<sup>nd</sup> grade-lasting 8 approximately 8 weeks-2x per week**

**Name of Project:** Students are going to start a composting program in the school in partnership with a local community garden. Students will also create a presentation to share with the school to raise awareness on the issues of waste.

### Essential Questions:

1. What is composting?
2. How are various systems of composting different?
3. What do we need to do to implement the program with students and staff?
4. How does composting help us to 'protect the earth'?

### Big ideas:

1. Composting reduces waste.
2. Composting is the use of bacteria or worms to convert plant matter into nutrients and soil amendment.
3. Composting is a way to decrease waste in landfills.
4. Composting provides nutrition for plants.
5. There are multiple systems for composting.

### Project Objective-When students complete the project they will be able to:

1. Understand what can be composted
2. analyze and describe different forms of composting by comparing and contrasting developing designs for a homemade compost bin
3. observe and recording what happens during the composting process
4. discuss and evaluate the process of composting
5. explain the importance of composting
6. be able to use digital media to present information

### Vocabulary:

- composting
- waste
- environment
- responsibility
- problem solving

- present
- teamwork
- nitrogen
- carbon
- aerate
- earth
- biodegradable
- decompose

**Integration of Other Functional/Academic Skills:**

- Math: using math to measure the amount of waste being composted and to compare the rate of material being composted using different kinds of composting bins.
- Reading---reading directions on creating composting bins, researching how composting bins work and what composting actually is, reading research for presentation
- Writing/Technology-creating the presentation via digital media
- Science---it is science, experiment and observe what happens to the organic material in the compost bin

**CCLS:**

**NYS: Math, Science and Technology, NYS: Elementary , Core Curr: Standard 1 Analysis, Inquiry & Design**

Key Idea 3: Critical thinking skills are used in the solution of mathematical problems.

- Performance Indicator M3.1, Explore and solve problems generated from school, home, and community situations, using concrete objects or manipulative materials when possible.

Scientific Inquiry Key Idea 1: The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process.

- Performance Indicator S1.1, Ask "why" questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.
- Major Understanding S1.1a, Observe and discuss objects and events and record observations
- Major Understanding S1.1b, Articulate appropriate questions based on observations

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- Performance Indicator S1.2, Question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.
- Performance Indicator S1.3, Develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.

Key Idea 3: The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena.

- Performance Indicator S3.3, Share their findings with others and actively seek their interpretations and ideas.
- Major Understanding S3.3a, Explain their findings to others, and actively listen to suggestions for possible interpretations and ideas
- Performance Indicator S3.4, Adjust their explanations and understandings of objects and events based on their findings and new ideas.

Engineering Design Key Idea 1: Engineering design is an iterative process involving modeling and optimization (finding the best solution within given constraints); this process is used to develop technological solutions to problems within given constraints.

- Major Understanding T1.1a, Identify a simple/common object which might be improved and state the purpose of the improvement
- Major Understanding T1.1b, Identify features of an object that help or hinder the performance of the object
- Major Understanding T1.1c. Suggest ways the object can be made differently, fixed, or improved within given constraints

**NYS: Math, Science and Technology, NYS: Elementary , Core Curr: Standard 2 Info Systems**  
STANDARD 2—Information Systems Students will access, generate, process, and transfer information using appropriate technologies. Information Systems Key Idea 1: Information technology is used to retrieve, process, and communicate information and as a tool to enhance learning.

- Process Skill: use computer technology, traditional paper--based resources, and interpersonal discussions to learn, do, and share science in the classroom

Key Idea 2: Knowledge of the impacts and limitations of information systems is essential to its effective and ethical use.

- Process Skill: use a variety of media to access scientific information
- Process Skill: consult several sources of information and points of view before drawing conclusions
- Process Skill: identify and report sources in oral and written communications

Key Idea 3: Information technology can have positive and negative impacts on society, depending upon how it is used.

- Process Skill: distinguish fact from fiction (presenting opinion as fact is contrary to the scientific process)

**NYS: Math, Science and Technology, NYS: Elementary , Core Curr: Standard 7 Interdisciplinary STANDARD 7**—Interdisciplinary Problem Solving Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning. Connections Key Idea 1: The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/technology/society, consumer decision-making, design, and inquiry into phenomena.

- Process Skill: analyze science/technology/society problems and issues that affect their home, school, or community, and carry out a remedial course of action
- Process Skill: make informed consumer decisions by applying knowledge about the attributes of particular products and making cost/benefit trade-offs to arrive at an optimal choice
- Process Skill: design solutions to problems involving a familiar and real context, investigate related science concepts to determine the solution, and use mathematics to model, quantify, measure, and compute
- Process Skill: observe phenomena and evaluate them scientifically and mathematically by conducting a fair test of the effect of variables and using mathematical knowledge and technological tools to collect, analyze, and present data and conclusions

Strategies Key Idea 2: Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits; gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results.

- Process Skill: work effectively
- Process Skill: gather and process information
- Process Skill: generate and analyze ideas

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- Process Skill: observe common themes
- Process Skill: realize ideas
- Process Skill: present results

**Website to support instruction:**

- [http://unicycler.com/go\\_green/schools/how\\_to\\_start\\_a\\_compost\\_program](http://unicycler.com/go_green/schools/how_to_start_a_compost_program)
- <http://meetthegreens.pbskids.org/episode4/kitchen-composting.html>
- <http://www.michigan.gov/kids/0,4600,7-247-49067-62499--,00.html>
- <http://aggie-horticulture.tamu.edu/kindergarden/kidscompost/cover.html>
- <http://www.funkidslive.com/features/a-to-z-of-food-health-and-the-environment/c-is-for-compost/>
- <http://schools.nyc.gov/community/facilities/sustainability/Ecology/default.htm>
- <http://www.planetnatural.com/composting-101/>
- <http://www.earthrangers.com/games/compostcrunch/>
- <http://compost.css.cornell.edu/schools.html>
- <http://theselfsufficientliving.com/ho-to-make-a-diy-homemade-compost-bin/>
- <http://www.pinterest.com/lvparke/compost-ideas/>

**Pre-requisites**

- Be able to follow directions
- Be able to work in a group

**Handouts:**

- Lesson rubric
- Key Vocabulary
- Essential Questions
- Objectives: Skills and Strategies
- Big ideas/essential questions

**Necessary technology**

- Wireless network and MacBook Airs
- Imovies
- Powerpoint
- Flip Cam

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- Microphone
- Google customized search

**Activities done in the unit:**

- **Background Knowledge**
  - What are we going to do? What is composting? What can be composted and what can't be? What is the purpose of doing this project?---should take two periods and involve some website work
- **The Composting Part**
  - researching and selecting composting bins---students need to think about the pros and cons of different systems to determine what would work best for our school---website work mostly---should take two periods, one to research and one to discuss.
  - actually composting--students will collect food scraps, add to bins, turn the bin contents as necessary--daily
  - comparing the effectiveness of two different composting bins---students will observe and discuss how the composts bins are working to determine if the bins purchased work well and if they could be improved. If they can be improved, can we design a better bin as a school or do we need to see if someone else produces a better compost bin---ongoing
  - weighing food scraps each day for a week to determine how many scraps we can compost at the school---what capacity do we have as a school to compost? This will ultimately guide the rest of the unit because it will encourage the creation of a partnership with the local community garden as well as be evidence for presenting the value of the composting program to the school---daily for a 5 minutes
- **The Presenting Part**
  - creating an awareness program for why it is important to compost at the school---students will have the opportunity to create a video/Powerpoint/podcast/play to share what they are learning, why it is important and how the school community can support it. Students could also design a set of tweets: what are the key words, which should the tweet be directed towards or sent to? --- should take the majority of the 8 weeks.
- **The Extension**
  - developing a partnership with local community garden in an effort to expand composting systems---since the school will most likely produce more scraps for compost that we will have space for, who can we partner with to expand our vision/interests?---ongoing

### Assessment Rubric

Unit Element	Exceeds Expectations	Meets Expectations	Below expectations
Participation	Students participated in all activities, asked questions, took initiative.	Students participated in all activities and asked questions.	Students did not participate in all activities.
Presentation--- information accuracy	All information is accurate and helpful, the information helps students clearly understand not just how but also why composting is important.	Information is accurate and explains what composting is and why it is important.	Information is inaccurate and does not explain why composting is important and /or what composting is.
Presentation Visual Appeal	Presentation looks attractive, organized, and motivates students to support the composting program. The program gets the crowd excited about composting.	Presentation looks attractive, organized, and motivates students to support the composting program.	The presentation is disorganized or incomplete and does not motivate students to support the composting program.
Presentation Cooperation	All students worked cooperatively, sharing responsibilities and respecting each voice. Students encouraged one another to try to do things differently and take chances.	All students worked cooperatively, sharing responsibilities and respecting each voice	Students did not work cooperatively, often disagreeing and not respecting one another's opinion.

**Accommodations:** Students will be working in groups created by me, thus providing opportunities for students to support one another. There is a setting on Macs that enables students who may be struggling readers to tell the computer to read specified information to them. If students have trouble working cooperatively, we will practice thru various activities, like trust building, watch video clips, and roll play,.

The Danielson Frame guides all instruction. In this instance, the first thing I thought about

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## CEL F Professional Learning in Education for Sustainability

component 3c from Domain 3 that focuses on student engagement. By creating an interactive project that involves doing and an abundance of technology I have created a unit that will engage the students and keep them engaged. Under domain 1, I thought about designing a unit with clear expectations for students and a clear path for getting them there. It will need some tweaking along the way as challenges arise but it is a coherent plan for not only teaching the students but also one that will motivate and empower students. The students in my school are eager to learn via technology and are active kids. They will get the chance to learn by doing and discovering, instead of listening to me. For Domain 2, classroom environment, we are striving towards creating a presentation in which multiple people share responsibilities and respect one another. Students will be active learners and thus behavior issues should be minimized because engaging students is the best way to minimize behavior problems. As for Domain 4, Professionalism, I am growing professional by doing something new. I am taking this class and creating this works to improve my instruction but is also learning something new. I am going to be a S.T.E.M. teacher this upcoming year for the first time after teacher social studies/technology for the past three years and multiple years teaching 3<sup>rd</sup> and 4<sup>th</sup> prior to that.

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