School-wide Composting & Curricular Tie-ins

Wednesday, December 18, 2019
But first, a bit of housekeeping:

- Webinar is being recorded – will be available on the Mass. Farm to School website
- New to Zoom! Please excuse any tech glitches throughout (and feel free to chat me about persistent issues)
- Q&A will be available through the chat function only. You can submit questions at any time throughout the webinar. I’ll read them off during Q&A after all three presenters have finished.
- Please do not turn on your microphone or video!
What Mass. Farm to School Does

- Professional Learning Opportunities for Schools
- Networking
- Communications
- Policy/Advocacy
- Research
Learn more at

www.MassFarmToSchool.org
By the end of this hour participants will learn:

• The basics of composting in school classroom environments including infrastructure needs, associated potential costs and savings, & the difference between on-site & haul away composting options.

• Strategies for collaboration between cafeteria & classroom environments, teaching compost concepts through classroom activities & standards-aligned lessons, & reinforcing positive habits in the cafeteria.

• Real-world models for composting in schools & through school gardens programs.
Introducing our Presenters

- Morgan Laner, Program Specialist for RecyclingWorks in MA
- Mary Stucklen, Program Manager for Berkshire Zero-Waste Initiative
- Janice McPhillips, Farm Educator and Outreach Coordinator for Holly Hill Farm
COMPOSTING IN SCHOOLS 101
FREE ASSISTANCE FOR BUSINESSES & INSTITUTIONS

RecyclingWorks MA is funded by MassDEP, delivered under contract by the Center for EcoTechnology

recyclingworksma.com
FIND-A-RECYCLER TOOL

Recycling Assistance for Businesses & Institutions

RecyclingWorks in Massachusetts is a recycling assistance program that helps businesses and institutions maximize recycling, reuse, and food waste diversion opportunities.

LIST YOUR BUSINESS  ABOUT RECYCLINGWORKS  ABOUT THE FIND-A-RECYCLER TOOL
FOOD WASTE ESTIMATION GUIDE

Elementary and Secondary Schools

Click here for a printable, fill-in version of this Commercial Food Waste Disposal Ban threshold estimation guide for elementary and secondary schools.

<table>
<thead>
<tr>
<th>Students</th>
<th>Average Measurement</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Elementary School]</td>
<td>1.13 lbs/student/week</td>
<td>Food waste</td>
</tr>
<tr>
<td>[Middle School]</td>
<td>0.73 lbs/student/week</td>
<td>Food waste</td>
</tr>
<tr>
<td>[High School]</td>
<td>0.35 lbs/student/week</td>
<td>Food waste</td>
</tr>
<tr>
<td>Disposed Waste</td>
<td>45% % of disposed waste by weight</td>
<td>Food waste</td>
</tr>
</tbody>
</table>

THE GREEN TEAM

• K-12 schools in Massachusetts
• Lesson plans & curriculum resources
• Free recycling & composting equipment available

The GREEN TEAM is funded by the Massachusetts Department of Environmental Protection and administered by CET.
FOOD WASTE RESOURCES

FOOD WASTE RESOURCES

- Build support for the program
- Evaluate current waste operations & options
- Plan the program
- Implement the program
- Analyze and maintain the program
- Promote the program

FOOD WASTE ACROSS THE HIERARCHY
WHY COMPOST?

• 40% of food is wasted
• Environmental benefits
• Social benefits
• Educational benefits
THE FINANCIAL CASE

GUIDANCE FOR BUSINESSES CONTRACTING FOR TRASH, RECYCLING, AND FOOD WASTE SERVICES

www.recyclingworksma.com/hauler-contracting-bmp/
Food Scraps

COMPOST
All Food Scraps
Napkins & Paper Towels
Fruits, vegetables,
dairy, bread, grains,
meat & fish, bones
& shells, eggs

NO
No gloves, plastic, wrappers
Stryrofoam, or any
other trash
QUESTIONS?

Morgan Laner
Program Specialist
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413-586-7350 x389
www.recyclingworksma.com
Proud to be a program of BERKSHIRE ZERO-WASTE INITIATIVE
HOW DO YOU CONNECT COMPOST TO THE CLASSROOM AND TO THE SCHOOL CULTURE?

Teaching Compost & Associated STEAM Curriculum

Classroom Lessons

Transitioning to the Cafeteria

Engaging Faculty & Staff

Ensuring Success in your Composting Program

Going Further
TEACHING ABOUT COMPOST & ASSOCIATED STEM CURRICULUM

- Engages students in concepts around waste, climate change, and natural life processes
- Satisfies multiple STEAM curriculum standards
- Nurtures a school culture around healthy & sustainable living
- Hands-on and highly adaptable to any school size and demographic
K-ESS3-3. Communicate solutions to reduce the amount of natural resources an individual uses.

K-LS1-1. Observe and communicate that animals (including humans) and plants need food, water, and air to survive.

2-LS2-3(MA). Develop and use models to compare how plants and animals depend on their surroundings and other living things to meet their needs in the places they live.

3.3-5-ETS1-1. Define a simple design problem that reflects a need or a want. Include criteria for success and constraints on materials, time, or cost that a potential solution must meet.

4.3-5-ETS1-3. Plan and carry out tests of one or more design features of a given model or prototype in which variables are controlled and failure points are considered to identify which features need to be improved. Apply the results of tests to redesign a model or prototype.
5-LS2-1. Develop a model to describe the movement of matter among producers, consumers, decomposers, and the air, water, and soil in the environment

5 - LS2-2(MA). Compare at least two designs for a composter to determine which is most likely to encourage decomposition of materials

7.MS-LS2-3. Cycling of matter should include the role of photosynthesis, cellular respiration, and decomposition, as well as transfer among producers, consumers (primary, secondary, and tertiary), and decomposers

HS-LS2-5. Use a model that illustrates the roles of photosynthesis, cellular respiration, decomposition, and combustion to explain the cycling of carbon in its various forms among the biosphere, atmosphere, hydrosphere, and geosphere.
thegreenteam.org

www.lifelab.org

www.educationworld.com

http://www.siddals.com/compost-stew.html

https://www.teachengineering.org
STUDENTS CAN DESIGN THE SOLUTION
OPTIONS FOR CAFETERIA SET-UP

BZWI - COMPOST IN THE CLASSROOM & BEYOND | 2019
OPTIONS FOR CAFETERIA SET-UP
TRANSITIONING TO THE CAFETERIA

- Prepare & Pre-teach in the classroom
- Assign students to be "Compost Monitors"
- Engage staff and faculty
- Engage students in the entire process
- "It's a bump in the road, not the road."
GETTING YOUR FOOD WASTE TO THE COMPOST BIN
GETTING YOUR FOOD WASTE TO THE COMPOST BIN

New Age Composter
Available through GreenTeam

DIY Your Own!

EarthCube
By Green Mountain Technologies
ENGAGING FACULTY & STAFF

INCLUDE EVERYONE

KEEP INFORMED & AWARE

REFLECT & IMPROVE
APPROACHES THAT ENSURE SUCCESS

ADOPT A POSITIVE & FLEXIBLE ATTITUDE

MAKE MISTAKES & COLLABORATE TO OVERCOME THEM

THE END GOAL IS NOT PERFECTION
APPROACHES THAT ENSURE SUCCESS

REDUCE SINGLE-USE PLASTIC

KEEP THE BINS IN THE SAME PLACE, WITH DIFFERENT COLORS

STAFF SUPPORT IS ESSENTIAL
1. Sharing Table
2. Offer vs. Serve
3. Food Donations
4. Table to Farm
5. Reusables - As much as possible!
Thank you!

Mary Stucklen
(413) - 684 - 8144
Mary@BerkshireZeroWaste.org

Find Berkshire Zero-Waste Initiative on:
Hingham High School
Cafeteria Food Waste Diversion Program

• 1,200 students
• Green Committee started by Assistant Principal, 2007
• Mass Recycle “Best High School Recycler” 2013
• Department of Education “Green Ribbon School”
• Dedicated administrators, teachers, custodians, student involvement, Student Council, sports teams & clubs, supportive community, donations, partnership with Friends of Holly Hill Farm
• “Slash the Trash” Fridays – about 50 lbs compost
• “Teach In” – America Recycles Day, Green Week
• Prizes for “Random Acts of Greenness”
• The “Friday Show”
Hingham High School
Cafeteria Food Waste Diversion Program

America Recycles Day - November 15th
Dedicated Custodian – Matt Conway
Hingham High School
Cafeteria Food Waste Diversion Program

Active Asst. Principal, prizes, sports teams & clubs involved, FUN!
Hingham High School
Cafeteria Food Waste Diversion Program

“Slash the Trash” Friday
Hingham High School
Cafeteria Food Waste Diversion Program
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America Recycles Day, November 15th
Composting, Recycling and Healthy Eating Can Galvanize the Entire School Community
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Hingham High School
Cafeteria Food Waste Diversion Program

Students do the work!
Hingham High School
Cafeteria Food Waste Diversion Program
Teaching Sustainability, Math & Science by Composting and Gardening

Finished compost is screened and used to create or amend new gardens beds.
Teaching Sustainability, Math & Science by Composting and Gardening

Close the loop:
Fill a new bed with compost & soil, plant garlic on America Recycles Day
Teaching Sustainability, Math & Science by Composting and Gardening

More garden beds added during “Green Week” in March
Teaching Sustainability, Math & Science by Composting and Gardening

Close the loop: Garden & Greenhouse meal
Teaching Sustainability, Math & Science by Composting and Gardening

HHS Green Committee
Red Wiggler Worms

Add red wiggler worms to your compost pile or use the worms to set up a vermicomposting system. For more information, check out: www.growforit.org.
HS-ESS3-3. Illustrate relationships among management of natural resources, the sustainability of human populations, and biodiversity
STEM Curriculum Connections: #2 What is compost? How do you make a compost pile?

Fool proof recipe:
- 3 parts “brown”
- 1 part “greens”
- water
- soil microbes
- stir
- wait 2 months = BLACK GOLD!

STB-3.M.3 Composting is the process of organic matter such as food scraps, paper, and yard waste decomposing. The product of this decomposition can be used as fertilizer. Drawbacks to composting include odor and rodents.
STEM Curriculum Connections:
#2 Continued - What is compost? How do you make a pile?

STB-3.M.3 Composting is the process of organic matter such as food scraps, paper, and yard waste decomposing. The product of this decomposition can be used as fertilizer. Drawbacks to composting include odor and rodents.

Free compost bins from Mass DEP - www.thegreenteam.org
ERT-1.A.2 Symbiosis is a close and long-term interaction between two species in an ecosystem. Types of symbiosis include mutualism, commensalism, and parasitism.
STEM Curriculum Connections:
#3 The Compost Pile is a Diverse Ecosystem

ERT-1.A.2 Symbiosis is a close and long-term interaction between two species in an ecosystem. Types of symbiosis include mutualism, commensalism, and parasitism.
HS-LS1-7. Use a model to illustrate the aerobic cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and new bonds form, resulting in new compounds and a net transfer of energy.
STEM Curriculum Connections:
#4 Continued ... Because Decomposition is the Reverse of Photosynthesis

Photosynthesis:

\[ 6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \]

sunlight energy

Aerobic Decomposition:

\[ \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O} + \text{Heat} \]

HS-LS1-7. Use a model to illustrate the aerobic cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and new bonds form, resulting in new compounds and a net transfer of energy.
STEM Curriculum Connections:
#5 Soil is Made of Minerals and Decomposed Living Material (humus)

HS-LS2-1. Analyze data sets to support explanations that biotic and abiotic factors affect ecosystem carrying capacity.
HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, aesthetics, and maintenance, as well as social, cultural, and environmental impacts.
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STEM Curriculum Connections:
#8 Growing & Eating Local Food = Low Carbon Footprint

HS-ESS2-6. Use a model to describe cycling of carbon through the ocean, atmosphere, soil and biosphere and how increases in carbon dioxide concentrations due to human activity have resulted in atmospheric and climate changes.
STEM Curriculum Connections: 
#9 Study Plant Life Cycles ... Get Food to Eat!

HS-LS1-5. Use a model to illustrate how photosynthesis uses light energy to transform water and carbon dioxide into oxygen and chemical energy stored in the bonds of sugars and other carbohydrates.
ERT-4.C.1 Water holding capacity—the total amount of water soil can hold—varies with different soil types. Water retention contributes to land productivity and fertility of soils.
HS.LS2-5. Use a model that illustrates the roles of photosynthesis, cellular respiration, decomposition, and combustion to explain the cycling of carbon in its various forms among the biosphere, atmosphere, hydrosphere, and geosphere.
STEM Curriculum Connections:
#11 Farmers & Gardeners Need to Calculate Volume, Area, etc.

3.OA.3. Represent and solve problems involving multiplication and division.
HS-LS1-6. Construct an explanation based on evidence that organic molecules are primarily composed of six elements, where carbon, hydrogen, and oxygen atoms may combine with nitrogen, sulfur, and phosphorous to form monomers that can further combine to form large carbon-based macromolecules.
Don’t Expect Perfection! Problems include contamination, rodents, smells, limited capacity, snow, poorly mixed piles, etc.
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Hingham High School
Cafeteria Food Waste Diversion Program
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