COMPOSTING AT SCHOOL



COMPOST GUIDE

Douglas County School District
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DCSD SCHOOL Composting Guide was developed to help establish an effective composting program for schools in the Douglas County School District in Colorado. Composting is a wonderful teaching tool to introduce, learn and grow from. It explains concepts such as the life cycle, decomposition, dirt vs soil, food waste management, landfills, trash, biodegradable and non-biodegradable items. In addition, students enhance their knowledge with environmental science, chemistry, economics, art, math and communication.



Students from Sedalia Elementary are locating worms in the finished compost, getting ready to spread it into the garden soil.

- Students learn to become responsible consumers. They evaluate how human activities affect the environment and understand the implications of their actions.
- Composting provides an on-site tool for food production and waste disposal. Students gain an understanding of where their trash ends up and what they can do to prevent excess waste.
- Students learn how important it is to be a part of their community and environment and can build a relationship with both.
- Compost education engages students to use their senses and identify with natural processes.
- Students can utilize the design process to enhance critical thinking and problem solving skills.
- The rot cycle provides a foundation of understanding that can lead to an interdisciplinary approach to natural resources.

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What is in your school trash? One of the first steps in thinking about starting a compost program is to analyze the current status of your school's waste. Here are some examples of audits that were performed at other schools:

Cafeteria Trash school #1	Cafeteria Trash school #2
Leftover Food and Napkins 46% Liquid 31% Trash 21% Bottles and Cans 2% Household Trash Clothing 5% Napkins and Paper Plates 9% Bottles and Cans 7% Paper 17% Food Waste 21% Trash 41%	paper 17% food waste 21% trash 41% bottles & cans 7% clothing 2% napkins & paper plates 9% liquid 31% leftover food & napkins 45% bottles & cans 2% trash 21%

Data collected was based on weight, not volume.

Creating a new program is best to start at the beginning of the year to establish a routine. It is important to give the students ownership of the program. They are the core of a successful composting program and can educate other students in your school throughout the year. Having students perform a pre-audit will help you get started. If you have established your team, this is a great exercise to help understand the school's waste and create diversion ideas. After your audit is complete, enter the information in our DCSD Pre Audit form or Post Audit Form.

Build your team of Compost Commanders!

Step 1 - Create a leadership team - Get permission from your principal first and work with your custodial team on where the bins will be placed. See who would be interested in starting a compost team within the school. Collaborate and discuss new ideas and ways to maintain your compost with your team, custodial and kitchen staff. Click here for kitchen operation policies and guidelines. Create a long-term compost plan and goal. Utilize an action plan for your compost, template of Compost Action Plan. Decide on what compost system works best for your situation.

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Step 2 - Recruit your committee of teachers and students - there are many jobs to create to ensure your compost works and is maintained. Here are a few suggestions:

- **Job 1** - Educate students and staff of what can go in your school compost and help manage the Composting Program / Plan. It is a good idea to assign compost collectors for each lunch. A suggestion would be to rotate 2 students each lunch to help make sure the correct items are added to the compost.
- **Job 2** - Carbon collector. There are many items that will go into your compost that will be high in nitrogen so this team would help collect carbon-rich items in your school to help balance the compost ingredients (paper towels, pencil shavings, shredded paper, raked leaves...)
- **Job 3** - Marketing manager. This team would work with kitchen staff, custodial staff, student body and administration. This team would help promote compost throughout the year. Newsletters, news reports and/or morning announcements.
- **Job 4** - Teacher Leadership- teachers are essential to new programs and ideas within the student community. They are a key element in introducing the program to students and integrating related concepts into their curriculum. There are many resources at the IDC to check out to help educate.
- **Job 5** - Data digger. This team would be responsible for collecting the data (weight) for the outgoing compost. They would weigh the compost every day and keep a record. They would also weigh the finished compost before it is spread onto the gardens. This group could create a form so the data could be easily tracked.

Steph 3 - Launching the program - Involve your entire school, make it fun and exciting. Make sure you have all of your equipment before the launch, so you can get started and quickly and the ideas are fresh in your student's brain. DCSD Office of Sustainability would love to help with your launch of the composting program by helping with assemblies or presentations to students and staff, show videos in classrooms, read books on compost, and host in-class presentations for different age groups. Some schools have students create reports about compost. Make composting the new, fun and cool thing to do.

Step 4 - Involve your parents - Parents find that composting programs are a great way to get involved in the school. They can serve on the composting committee or help supervise student workers one day a week to help get the program off the ground. Parents who already compost can be particularly helpful. A presentation at the PTO meeting should outline program goals and give specific examples of how they can help. A parent group may take the program on as a project, help fund (or fundraise to cover) needed materials, or provide incentives for student volunteers. An informational article in the PTO newsletter will help spread the word.

Items you may need:

- **Establish a compost area and type of system you would like to utilize**

[3 Bin compost](#)



[Compost Tumbler](#)



- **Create a cafeteria plan** - decide on what kind of reciprocal would work for your compost collection. Make sure that your bin is different than the trash bins. This will help students decipher what is what. The bin needs to be light enough for students to carry it out to the compost pile every day. Here are some ideas:
  - 5-gallon buckets
  - Green trash can
  - Totes

- **Utensils for the food waste monitor** - Students volunteer to be the compost helper each lunch. These tools help them scrape the food in the proper bin to help the line move faster while educating students of the proper compost items.
  - Tongs
  - Scraper
  - Gloves

- **Keep your bins together** - Your diversion line should be set up so students can walk down the line and sort out the proper items into each bin. Engaged students gain ownership of the program, so let them sort out if you can. It will take some time for students to get the hang of what goes where, but be patient, they will learn. Positive encouragement is recommended.



The picture above shows where some students sort their trays. They start with liquids, trash, recycle, compost, chickens, recycle again and then finally plastic bag recycling. This school has had a waste reduction of 67%.

- **Monitoring** can quickly become a hassle, so maintaining student interest with fun rewards is a must. Here are some ideas other schools put into play.
    - Compost Awareness Week: Students who compost correctly are given a ticket at each lunch and a drawing is held each day for a prize (gift certificate for ice cream, a book, etc., a sticker, a compost-themed item such as a plant, package of seeds, etc.).
    - Outdoor time - kickball with teachers, extra recess, capture the flag are free ideas that younger students enjoy.

- Connect programs with existing celebrations: There are many local and nationally recognized celebrations that you can connect to your program, such as Earth Day, America Recycles Day, Green Up Day.....
- High School students need volunteer hours. Make this initiative part of their benefit by helping them get their hours in by maintaining the compost.

Remember why you decided to compost! Remind your school frequently with positive rewards and communication!

- ★ Composting will reduce the amount of food you put in the landfill
- ★ Create your own **Humus** (finished compost) for your garden soil
- ★ Teaches us that food is a natural resource and should not be wasted
- ★ Composting helps climate change
- ★ Composting saves money
- ★ Water conservation -because compost helps with soil water retention
- ★ Humus helps keep unwanted pests off of your plants
- ★ Reduces the impact of chemical fertilizers

There are benefits and drawbacks to on-site composting. The benefits are clear: Students see what is happening to their food scraps; they learn to tend the pile; and they can do research on the pile by conducting experiments. Students also reap what they sow. At the end of the year, there is a usable mass of rich soil for them to dig their hands into and use in a school garden or sell for a fundraiser.

The drawbacks can be minimized with careful planning. An uncared for pile will attract rodents and smell. Decomposition will happen faster with a consistent balance of food scraps and carbon matter such as leaves or sawdust, and will minimize rodents and odors. Most problems associated with compost piles can be avoided by burying and layering food waste with an adequate amount of yard waste. Students will need to separate their food scraps (excluding meat and dairy products to help prevent scavengers and odors). A small compost project will not generate enough heat to easily break down meat and dairy waste, so these items are not accepted.

Best Practices, Problems and solutions -

- After being collected, take the compost out right away to the bin every day after all lunches are complete.
- Use a clean tote every day, work with the custodial department to ask if it could be cleaned every day.
- Do some students continue to throw trash in the bin? Make it fun for the monitors to pick it out by providing easy-to-use long handled tongs.
- Do teachers need to lead by example? Once teachers are a part of the effort, their behavior may change. Ask the teacher to monitor the bin one day to help out.
- Contamination - if your compost gets contaminated with proteins and dairy, you will need to throw the entire contents in the trash. The last thing you want is unwanted pests and smelly compost.

RECIPE FOR COMPOST

Greens (Nitrogen Rich)	Browns (Carbon Rich)	Avoid including these materials in a backyard compost...
Vegetable / fruit peels & scraps	Dried leaves & brown grass clippings	Meat, fish and bones attract animals
Coffee grounds, tea bags	Pine and spruce needles	Dairy products in large quantities make the compost smell bad
Green grass clippings	Paper, cardboard and newspaper	Fat, oil and grease in large quantities slow down the process
Green garden waste	House plants	Feces (kitty litter, dog doo, humanure) contain pathogens
Flowers	Prunings & cuttings (these help create air pockets)	Weed with seeds or persistent roots
Other (Add Minerals)	Sawdust from untreated wood	Diseased plants
Egg shells	Straw	Ash or sawdust from chemically treated or painted wood
Wood & wood pellet ash (sparingly)		

Troubleshooting Your Compost

TOO WET	Add carbon (ash, pine shavings, paper towels, shredded paper, leaves)
TOO DRY	Add more nitrogen (fruits and veggies)
TOO SMELLY	Add carbon (ash, pine shavings, paper towels, shredded paper, leaves)

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Too Cold (not up to temp)	Add nitrogen and turn

outreach - The DCSD Office of Sustainability is available year-round to help with questions for waste and consumption, composting, recycling, give presentations, and help implement school-wide composting and recycling initiatives. DCSD Sustainability Coordinator and Learning Specialist can provide educational resources that align with the new standards (located at the end of the document) and facilitate compost bin design and operation. The coordinator can meet with you and your compost committee to share ideas and knowledge of what has worked at other schools in the area. The Office of Sustainability helps by providing brainstorming meetings, support, PD hours and conferences. In addition, the Office of Sustainability can also provide you with an in-class worm compost bin that can be checked out from IDC along with microscopes, PH tester, scales and much more.



Good Tips on Keeping A Healthy Compost:

- Layer equal parts of Carbon (browns) and Nitrogen (Greens) - Do not add manure to school compost.
- Turn your compost regularly (3 times a week minimum). This adds Air into the compost and keeps rodents from finding it.
- Do not add extra water (nitrogen-rich ingredients add water) Adding water may increase the smell and decrease the air.
- Smaller items are better (easier for decomposers to break down).
- Keep a compost thermometer in your compost to regulate temp. The Optimum temperature is 120°. If your compost is not over 100, ask yourselves these questions:

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- Are we stirring it enough?
- Do we need to add more nitrogen?

Resources



ANYONE CAN MAKE A DIFFERENCE

COMPOSTING AT SCHOOL

WHAT YOU CAN COMPOST:

- APPLE CORES - BANANA PEELS - WATERMELON RINES
- FRUITS AND VEGGIES
- CRUSHED EGG SHELLS
- SHREDDED PAPER
- PAPER TOWELS
- DRIED LEAVES AND DEAD PLANTS (WITHOUT SEEDS)
- PENCIL SHAVINGS
- FIRE PLACE ASH OR UN TREATED WOOD SHAVINGS

DOUGLAS COUNTY SCHOOL DISTRICT SUSTAINABILITY IT'S A LIFESTYLE

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MAKE A DIFFERENCE IN YOUR SCHOOL WASTE!

BE THE SOLUTION!

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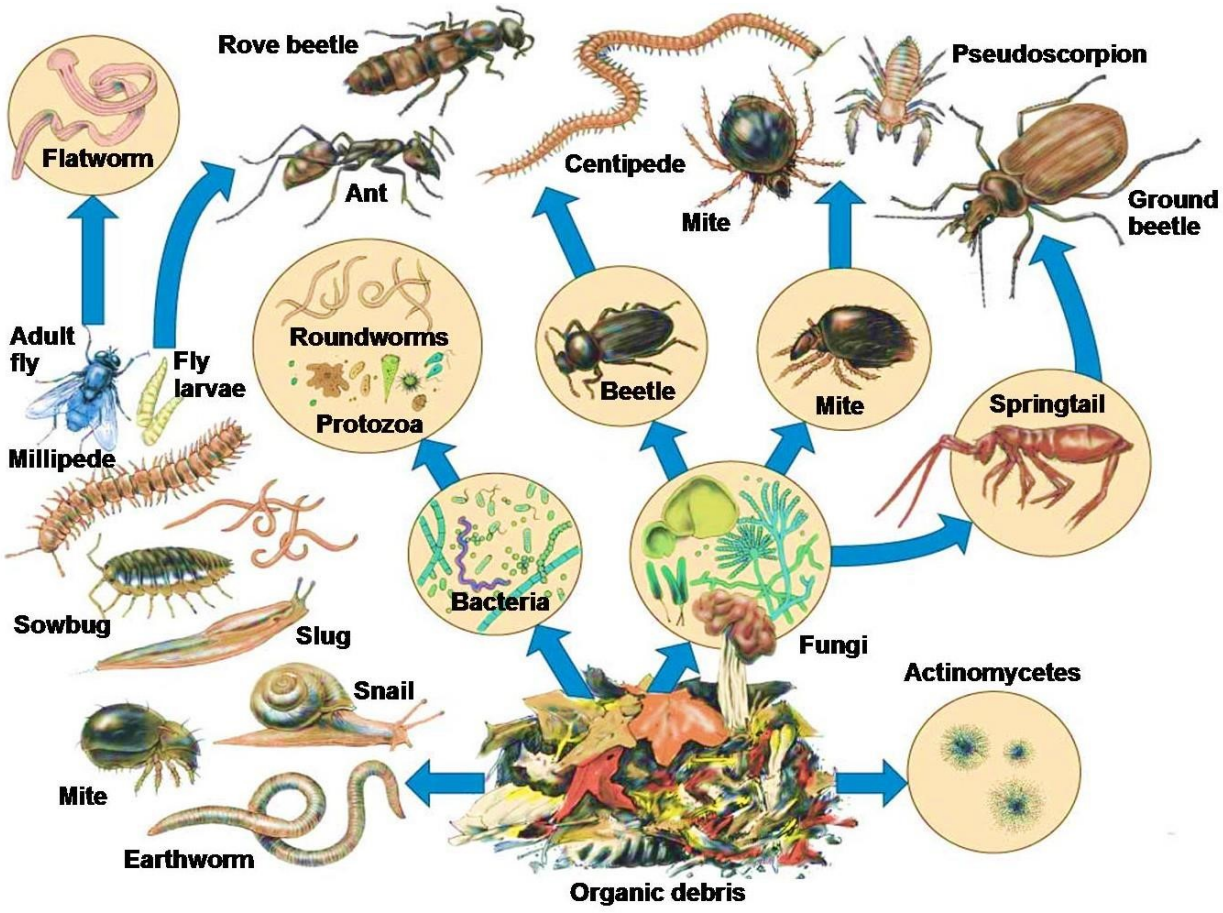
WHAT IS WRONG WITH MY COMPOST?
Tricks and Tips for troubleshooting your compost:

Symptom	Problem	Solution
Pile has a rotten odor	Not enough air	Turn compost pile to add oxygen
Pile has an ammonia odor	Too much nitrogen (greens)	Add carbon (browns) fireplace ash or pine shavings work well
Pile is dry	Not enough greens, too many browns	Turn compost and add fresh greens
Low temperature **temp should be 110°- 150° **	The pile is too small Not enough nitrogen The pile is hard to turn Cold weather	Add new material Mix in more greens Needs added oxygen, carbon and mix Insulate with straw, newspaper or cover with a tarp
Pests are getting into the compost pile	Meat (proteins), oils, or dairy may be present	Remove from pile and turn compost daily to prevent rodents establishing homes

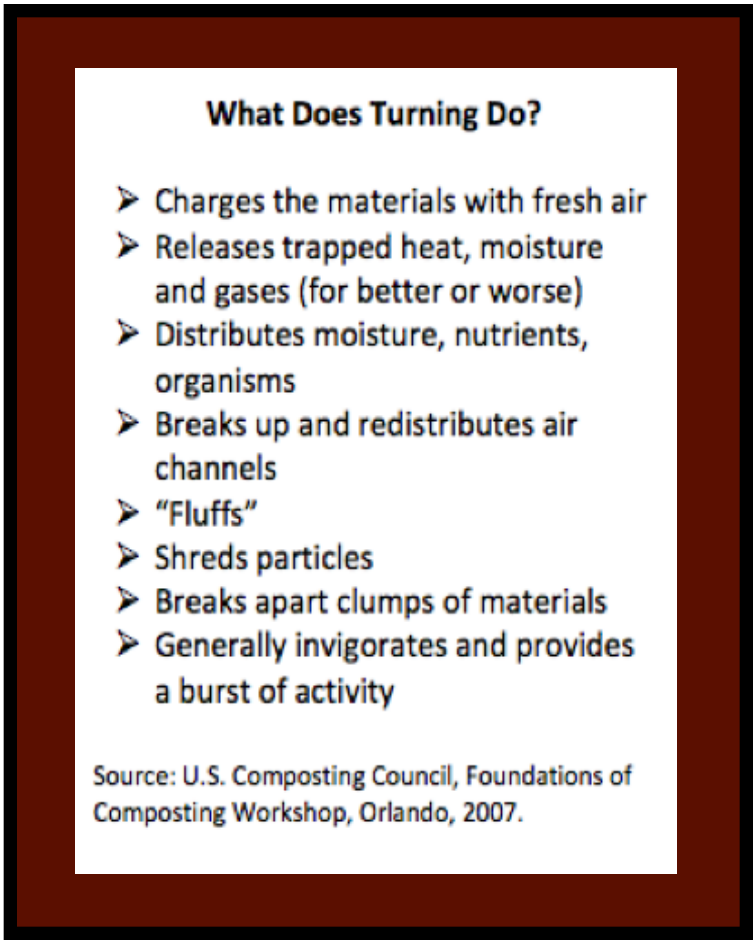
Greens	Browns
Vegetable peelings	Straw
Fruit waste (and other food waste, depending on your composter)	Wood shavings / wood pellets (depending on your composter)
Old flowers and weeds	Cardboard / scrunched up paper
Grass cuttings / hedge clippings	Small twigs
Fresh leaves	Dead leaves

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WHO IS DOING ALL OF THIS WORK?
Microorganisms and Macroorganisms working in compost



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GET COMPOST CRAZY! If you need additional help please contact:

Beth Church
DCSD Sustainability Coordinator
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Curriculum:

Waste Diversion PPT
https://ngss.nsta.org/Resource.aspx?ResourceID=1049
https://www.lifelab.org/composting/composting-curriculum/
https://www.mesdoutdoorschool.org/ngss-alignment-soil.html
https://www.teachengineering.org/lessons/view/cub_environ_lesson05
Green team lesson plan

Audits, Forms and Plans:

Compost Action Plan
Pre audit template
Post audit template
DCSD Pre Audit form
DCSD Post Audit Form.

Thank you to all who helped put our guide together by sharing all of your knowledge and ideas. This wealth of knowledge will help our school district become compost crazy!

References:

Industrial Compost Video
Strawberry Commercial
https://www.epa.gov/recycle/composting-home#basics
https://extension.colostate.edu/topic-areas/yard-garden/?target=publications
Backyard composting, it's only natural
http://www.oaklyngreen.org/composting.html
www.uvm.edu/mastergardener/mastercomposter
https://cswd.net/
https://helpmecompost.com/compost-ph-the-role-of-ph-levels-in-composting/
https://www.compostfoundation.org/ICAW/ICAW-Home
https://www.google.com/search?q=microorganisms+in+compost&safe=strict&rlz=1C1GGRV_enUS813US813&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjwn8XzxrzjAhVRVs0KHXpIA9YQ_AUIECgB&biw=1280&bih=832#imgrc=n25WsY2b29qenM:

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