



# VICTORY GARDENS

Lesson and Activity Suggestions for Grades 3rd - 5th

## How to Make Humus Compost

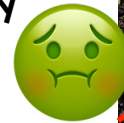
### Humus versus Hummus

In a previous lesson we learned about the layers of soil. The first layer is humus and should *not* to be confused with hummus, which is the yummy dip made out of chickpeas. You do not want to eat humus! Humus is the layer of soil that is made of decaying plants and animals as well as many worms and bacteria that could make you very sick. Decay and bacteria sound gross, right? Well, maybe. But humus is necessary for several reasons. First, if nothing ever decomposed then all that dead material would be here forever. Now THAT is gross. Secondly, the organic matter that decays is full of nutrients to help new plants grow, which is similar to humans eating nutritious food and taking vitamins to grow strong and healthy.

**Eat hummus.  
It is yummy!**

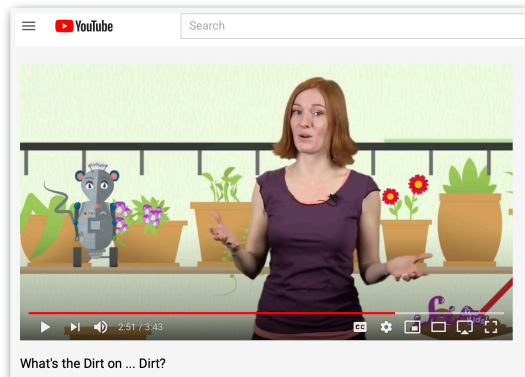


**Do not eat  
humus.  
You may  
pukus!**



So how does that plant and animal stuff decay? Nature provides a bunch of different microorganisms to do the work. They break the food particles down enough that it eventually becomes part of the soil. According to the Soil Science Society of America, a handful of soil has more living organisms than there are people on planet Earth. Soils are the “stomach of the earth, consuming, digesting, and cycling nutrients and organisms.” I suggest you watch “What’s the Dirt on . . . Dirt?” By SciShow Kids on You Tube for a brief review of last week’s lesson and a good look at humus. <https://www.youtube.com/watch?v=if29mjcd5bc>.

After you watch, answer the following questions:



What are the four main things that make up soil?

- 1.
- 2.
- 3.
- 4.

Where is humus found?

## Give Back to your Garden

Gardeners like you can create “DIY humus” through the process of composting. Compost is “human-made” decomposed organic matter. Humus is decomposed by organisms like worms, insects, bacteria, and fungi.

Compost give important nutrients back to the soil to provide for growing plants. Composting also helps the environment because it decreases the amount of waste we send out through our trash to landfills everyday, which is bad for the earth. Instead of taking away from your planet, composting is giving back to your planet. Who doesn't want to do that?

## How to Make Compost


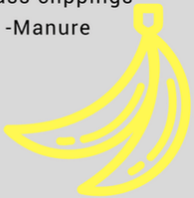
To make a compost pile, you simply need to collect organic materials, such as leaves, grass clippings, and food scraps and then introduce the right conditions that will encourage all those microorganisms to do their job. If you do it all at once, and the right amount of organic matter, moisture and air is in your pile, it will actually get hot as the millions of microbes work to decompose it! That is called “hot composting” and can produce finished compost in just one to three months.

However, if you are adding in your organic materials as you come across them, rather than all at once, you will get a “cool” compost pile. The microorganisms are still doing their job, but more slowly. It may take six months to a year to fully decompose. Either way is still a great way to help your garden specifically and our planet in the big picture.

An ideal compost pile should be;

- in full sun or partial shade
- at least three feet tall, wide, and deep
- multiple layers of carbon-rich “browns” and nitrogen-rich “greens.” See the chart for examples.
- kept moist with water
- sprinkled with soil to introduce microbes
- turned over regularly to add oxygen

If your compost pile smells, your balance of materials is off. You should NOT include any meat or animal by-products. That will create problems with rodents, flies, and harmful bacteria.

<h3>Brown</h3> <ul style="list-style-type: none"><li>-Leaves</li><li>-Hay/straw</li><li>-Sawdust</li><li>-Shredded newspaper</li><li>-Wool</li><li>-Brown paper bags</li></ul> 	<h3>Green</h3> <ul style="list-style-type: none"><li>-Food scraps</li><li>-Coffee grounds</li><li>-Tea bags/leaves</li><li>-Grass clippings</li><li>-Manure</li></ul> 
<h3>NO</h3> <ul style="list-style-type: none"><li>-Meat</li><li>-Dairy</li><li>-Fish</li><li>-Bones</li><li>-Oil/fats</li><li>-Diseased plants</li><li>-Chemicals</li><li>-Glossy paper</li></ul>	<h3>Help</h3> <ul style="list-style-type: none"><li>• Ideal ratio is 2/3 brown to 1/3 green</li><li>• Too much green= Stinky compost</li><li>• Too much brown= won't break down</li><li>• Turn compost once a week</li><li>• Add water so contents stay moist</li></ul>

## Compost Bin

If you are wondering how to keep your compost pile contained and in nice vertical layers, the answer is a compost bin. While there are many commercially constructed bins available, but DIY designs are readily available. Bins can be made from a wide range of materials such as wire, wood, concrete blocks and even old trashcans. Just Google "DIY compost bin" to learn how to make your own or purchase one. This will require the help of an adult to make.

Bins can also help with sorting the materials during the collection process, and once the piles are created, they can keep the materials together and provide a neat and tidy appearance. Some bins are even designed to ease the turning of the materials to increase the rate of decomposition. Below are just a few ideas made from wire, a trash can, a cardboard box, and pallets.



## Patience

If you follow those instructions, in six - 12 months, your mixture should have a warm brown color, crumbly texture, and a pleasant, earthy odor and be ready to use in your garden. Six months?! That's so long! Yes, it is a long process, but once you get it started, you can continuously have ready-to-go compost. In the meantime, try this experiment to see the compost process at work in just a few weeks.

## Compost in a Bag

### Materials Needed:

Ziplock bag  
Straw or dried grass  
Organic food waste  
Paper  
Water  
Straw  
T of soil



### Directions:

1. Start by filling your bag just over half-way full of chopped up organic food waste. These are the nitrogen-rich "greens" we discussed earlier: leftover vegetables, fruits, coffee grounds, and eggshells are examples. NO MEAT, DAIRY OR PROCESSED FOODS.
2. Next, tear up some uncolored paper or cardboard to almost fill the bag. This is the layer of carbon-rich "browns."
3. Your organics should have some water content in them, but add a few drops of water.
4. Now throw in a tablespoon or small handful of soil. Any soil. This will introduce microbes.
5. Place the straw in the corner of the bag and seal the bag around it. This will let air get in, and keep too many smells from getting out.
6. Gently mix your compost by squishing the bag and set it in a sunny spot. Squish it again once or twice a day. If it seems really dry, add a few more drops of water.
7. In a few days, you should have some rich, dark compost that you can give to a plant!

Keep experimenting! What happens if you add in different types or amounts of organic food waste? What happens if you keep the compost in a dark place versus a sunny spot? What if you add a worm?

# Garden Composting Vocabulary

Find and circle the vocabulary associated with this compost lesson.

I Z Q D M U L C H R U F S D A  
U J Z Y T S O P M O C U E O A  
Z F E R T I L I Z E M G S E Z  
E U W C A R C X L U N S O C G  
S J I W A R E P H Z D P P Z C  
E P V L O R U C D K R K M O M  
T O X B N I B W Y E R I O G D  
S N E T J M J O Y C V N C A G  
A S E K N W T G N O L S E R X  
W Z K G R P O Y X K C E D D F  
S Z A O O B N R U V U C Y E V  
U E N V I R O N M E N T A N P  
C J U A M N T O Z S E S C D D  
H B N U B R C I N B Q I E D C  
Q H W S B Y U V N V O X D S U

CARBON  
COMPOST  
DECAY  
DECOMPOSE  
ENVIRONMENT  
FERTILIZE  
GARDEN  
HUMUS  
INSECTS  
MICROBES  
MULCH  
NITROGEN  
RECYCLE  
WASTES  
WORMS

