

Worm Diner

Grades K-4

Meets Grades K-4 Standards


Lesson Summary

Students learn what to feed red worms in a compost bin.

Overview

In this lesson, students will:

- Distinguish plant-based foods from animal-based foods.
- Create a chart that serves as a menu of foods red worms can eat.

Time 

30-45 minutes for lesson

Background

Compost is nutrient rich soil created from the breakdown of food and plant scraps. By turning leftover food waste into compost we can continue nature's cycle of returning nutrients back to the earth. Compost helps plants grow strong and healthy without the use of chemical fertilizers and reduces the amount of waste sent to landfills.

Compost can be made at school or home using a worm bin. A worm bin is easy to make and creates a perfect place for red worms to eat **plant-based food** scraps and excrete them into *castings* or compost. Castings is just a fancy word for worm poop! If you're feeding worms in a worm bin, only give them plant-based foods like fruits, vegetables and dry bread. Although worms can eat meat and dairy products, it takes them a long time to do so, and these lingering animal foods will make a smelly mess in your worm bin! For this reason, we treat red worms in a bin like they are *vegans*. A **vegan** is someone or something that only eats plant-based foods. A vegan is also an *herbivore*. Red worms cannot eat metal, glass or plastic, so it's important to keep these items out of a worm bin. Too many foreign objects in a worm bin, including trash like Styrofoam, are harmful and may cause worms to stop producing compost.

Unlike worm compost bins, the green bins that the City of San Francisco has provided to residents for curbside pick up, can accommodate all food scraps including animal-based foods. In fact, the green bins can accept anything that came from a plant or an animal. This includes items like meat, bones, milk cartons, dirty pizza boxes, used paper napkins and eggshells. While worm compost bins are a great way to learn about the natural cycle of decomposition, and create nutrient rich castings for use on houseplants or in gardens, San Francisco's green bin system is an effective way to divert thousands of tons of organic matter from the landfill. Compost created from the green bin system is used at local wineries and farms and helps rebuild the topsoil in a natural manner free of synthetic chemical fertilizers.



Vocabulary

- Plant-based food
- Animal-based food
- Compost
- Vegan

Materials

- Examples of food scraps such as apple cores, carrot tops, half eaten toast, beans, pasta, meat, cheese, etc. Use actual samples of food or the drawings included in this lesson plan.
- *Worm Diner Take-Out Menu* worksheet: One copy for each student. (Gr. K-1)
- Crayons or markers
- *The Dirt on Composting* Student Fact Sheet (Gr. 3-4) and Reading Comprehension Questions
- Gram Scale
- Tape





Preparation

- Read background information.
- Prepare examples of the different food scraps listed above.
- Locate a place to sort the food items with students. A desk or floor will work if you are using actual food samples. You can also use a two-column chart to tape on the food scrap drawings. *See sample at the end of the lesson plan.*
- Have students read the Student Fact Sheet, *The Dirt on Composting*, and have them answer the reading comprehension questions.

Pre-Activity Questions

Tell students they are going to learn how to feed their leftover food to worms in a worm bin. But first explain that they need to learn where food comes from.

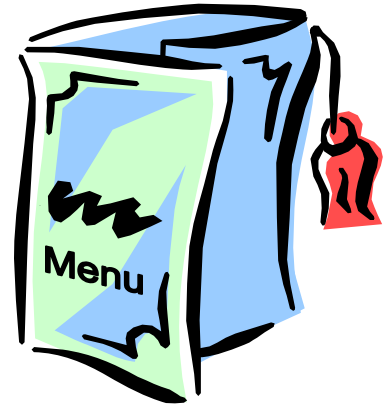
1. What kinds of foods do you like to eat? (*Take all answers*)
2. What is this food made from? (*Take all answers, but the main answers are animals and/or plants. Explain that cheese and milk come from cows and that fruits and vegetables come from plants.*)
3. What fruits or vegetables are in your snack or lunch today?
4. Do they come from plants? (*Yes*)
5. Are there any foods in your snack or lunch like meat, bologna, cheese or milk?
6. Where do these foods come from? (*Animals like cows and chickens*)
7. Do these animal-based foods come from plants? (*No*)



Classroom Activity

1. Tell students that today they are going to learn how to feed their pet worms that live in the class worm bin. Just like all living things, red worms need air, water, and food to live.
2. Tell students they are going to pretend to open up a Worm Diner or restaurant. They will need to make a menu that lists foods that worms can eat. This is what will be fed to the worms living in the worm bin.
3. Explain to students, that worms do not have teeth. Instead, they scoop up their food with their mouth and swallow it whole. Explain that although worms can eat any thing that came from a plant or animal, that the worms eating at the Worm Diner are *vegans*. A vegan is someone or something that only eats foods from plants. That means that these worms should only eat plant-based food like fruits, vegetables, beans, nuts, and grains like rice and wheat that get turned into pasta, bread, cookies and crackers.
4. Explain that if you feed animal foods at the Worm Diner, that the food in the worm bin will get very smelly and stinky before the worms can eat it. The worms that will eat at the Worm Diner need students to make sure the food on the menu is only made from plants.

5. Begin sorting the foods into two piles by holding up one of the food samples. Ask students if the food comes from an animal or a plant and then ask them if it should be served at the Worm Diner.
6. Place foods that worms can eat in a pile labeled “Worm Diner—Yes,” and the foods that worms cannot eat in a “Worm Diner—No” pile. Encourage active student participation by giving individual students a food item and asking them to place it into the correct pile
7. Ask students to make a chart with pictures and words that shows what to feed and what not to feed the red worms.
 - Brainstorm a list of items that are common in students’ snacks and lunches; write each item on a separate scrap piece of paper; place all the scrap papers in a hat/container and let students each take one.
 - Ask students to draw their item and write its name underneath the drawing.
 - Use the sample chart at the end of the lesson plan or create your own large chart on butcher paper that includes two columns and the headings “Okay to Feed Worms” and “Not Okay to Feed Worms.”
 - Have students glue their drawings in the appropriate column.
 - Hang the chart by your worm bin.



Discussion Questions

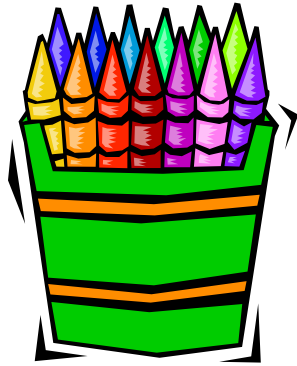
1. What happens to the food after the worms eat it?
(They poop it out! Just like all living things, red worms take in nutrients when they eat food, and they excrete or give off “waste.”)
2. Explain that worm poop is called *compost* and it is full of nutrients. Compost is very good for our earth and helps plants grow big and strong. Compost from a worm bin can be collected and placed in a garden or flowerpots.
3. How can red worms help our class reduce what we throw in the garbage? *(They can eat our leftover food that comes from plants.)*
4. Before snack or lunch, divide the class into four teams. Ask each team to bring back one scrap of food about the size of an apple core. These food scraps will be fed to the worms.



Follow-up Activity

1. Write numbers 1 to 6 on note cards or 3”x5” scrap papers and tape them on the top of the worm bin lid, so they create a six-section diagram that students can use as a guide for feeding worms and tracking where the food was placed.
2. Gather food scraps collected by each team; weigh out a half-pound of scraps and bury them in section 1 of the worm bin.
3. Emphasize with students that it is important not to overfeed the worms.



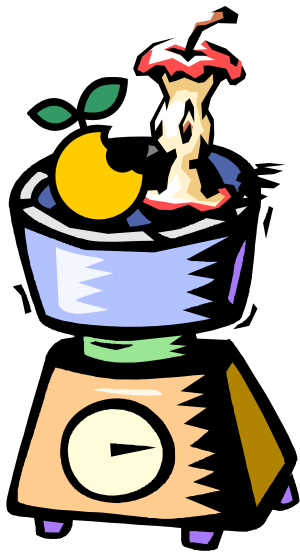


For younger students:

1. Tell students that you need their help a Take Out Menu for the worms.
2. Remind students that worms will only eat food from plants.
3. Give each student a *Worm Food To Go* worksheet and tell him or her to color only the plant-based foods. Ask students to count and write down the number of plant-based food that can be fed to worms.

For older students:

1. Keep a class worm journal next to the bin for students to record data and copy into their own journals.
2. As a class, decide what type of data you will record. Students could record the weight of food added each week, what section of the bin the food was added, and type of food added.
3. After a month, students should use the data to answer questions like: *What plant-based foods do red worms seem to prefer? How much food did the red worms eat in one week? In one month?*



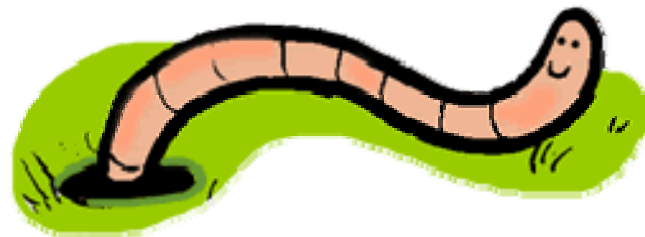
Extensions

- Discuss the differences between feeding worms in a bin in class, which only eat plant-based foods, and using San Francisco's green bin system that accepts all food from plants or animals. Explain that the difference is the green bin takes all things that once came from a plant or an animal. The green bin system uses a different method to break down the food into compost, which is why it can take animal-based foods too.
- Obtain a copy of the poem "Sarah Cynthia Sylvia Stout" by Shel Silverstein from the Internet or library. Read the poem to the class and ask students to identify which items described in the poem could have been composted in a worm bin.

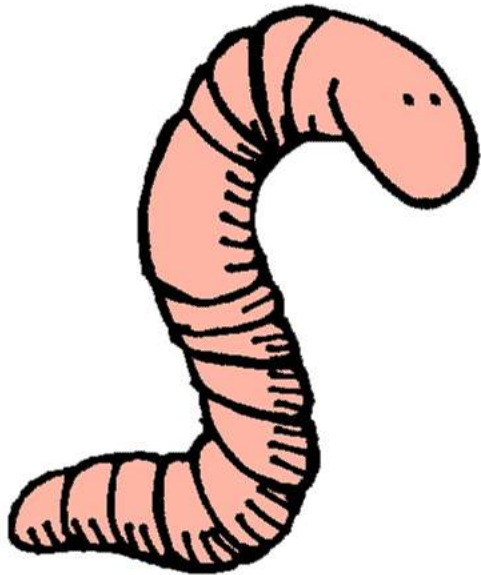


CA State Standards

- Gr. K** Science 1a • Math A1.1
Gr. 1 Science 1c • Math S1.1
Gr. 2 Science 3e • Math S1.1
Gr. 3 Language Arts R2.3 • Math N2.8, MG1.1
Gr. 4 Science 2c • Language Arts R2.2 • Math N3.0



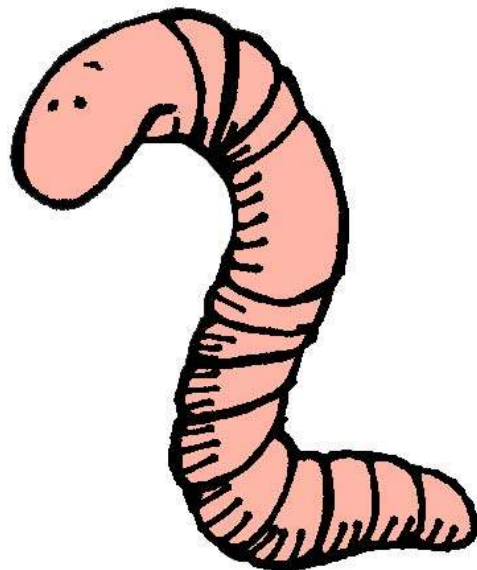
WORM DINER



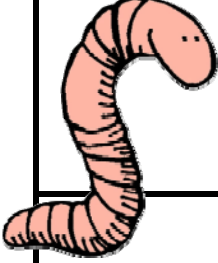
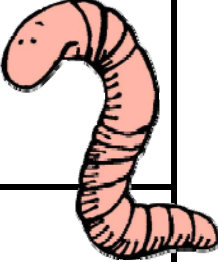
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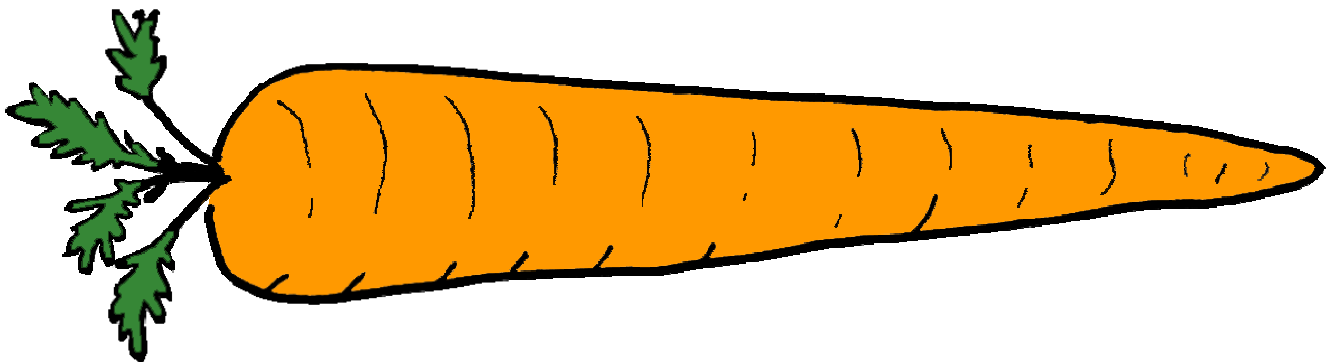
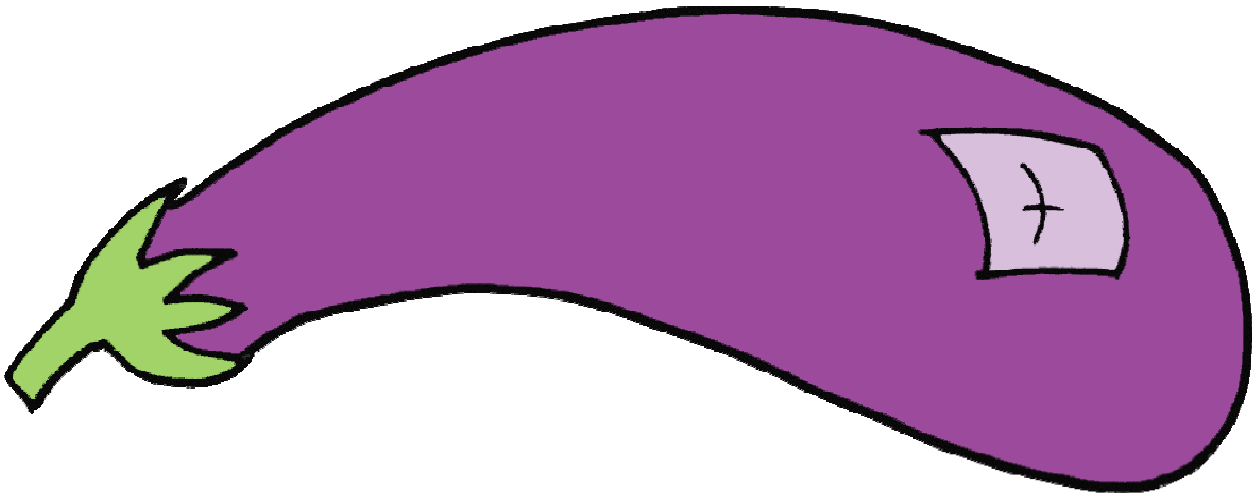
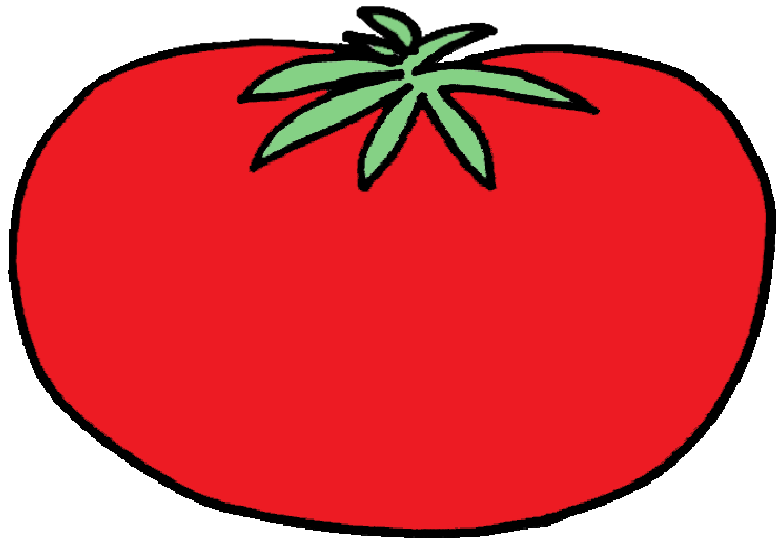
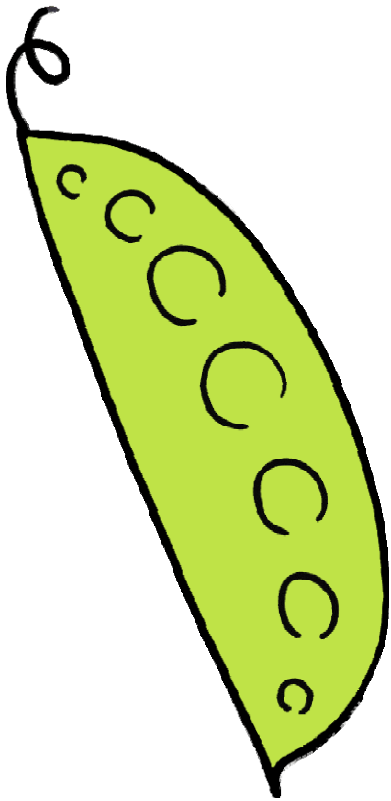
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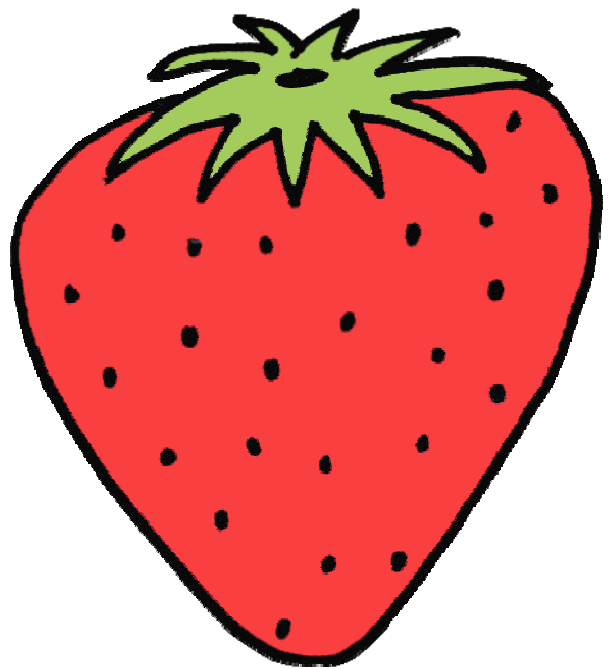
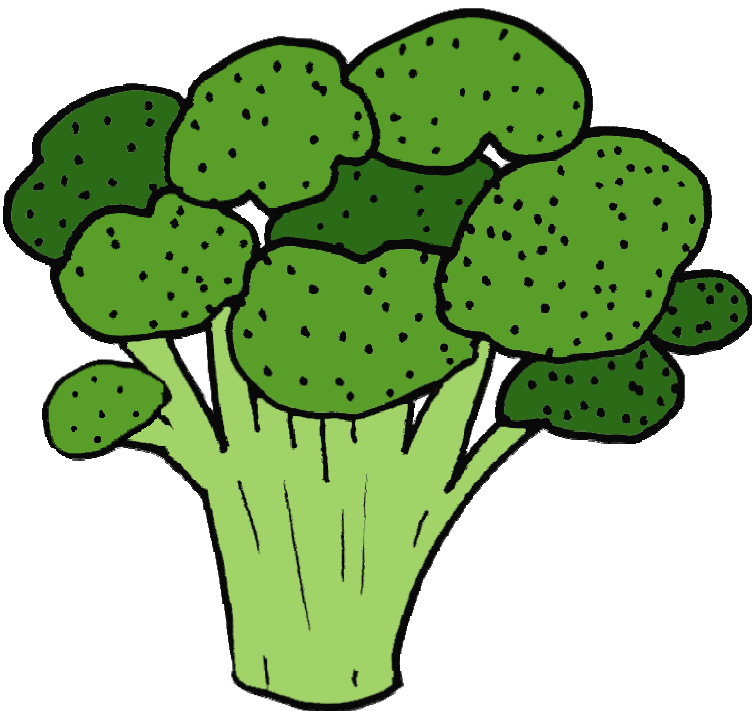
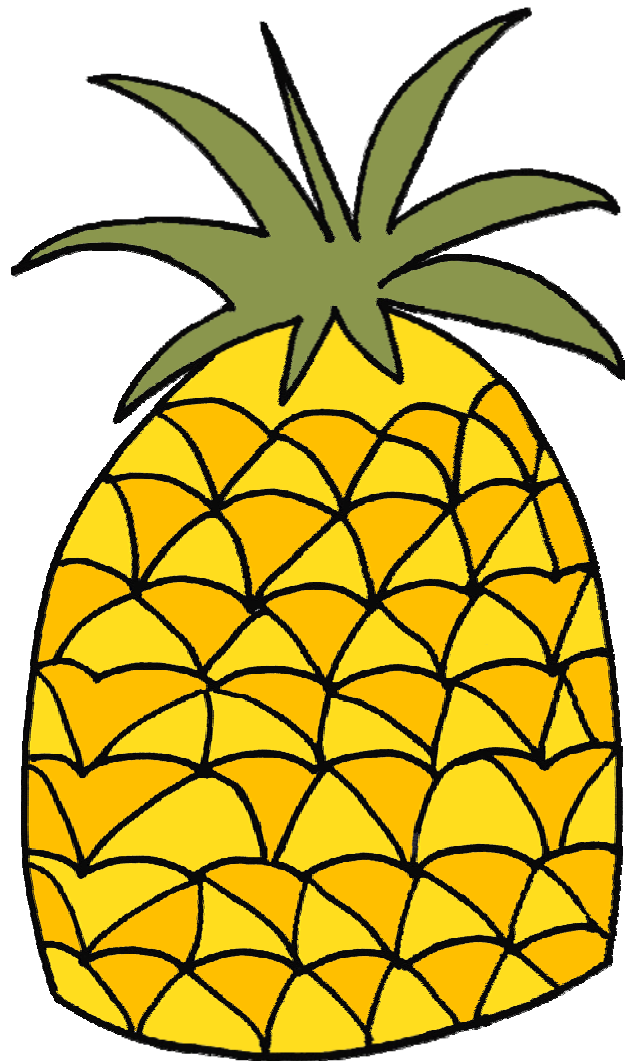
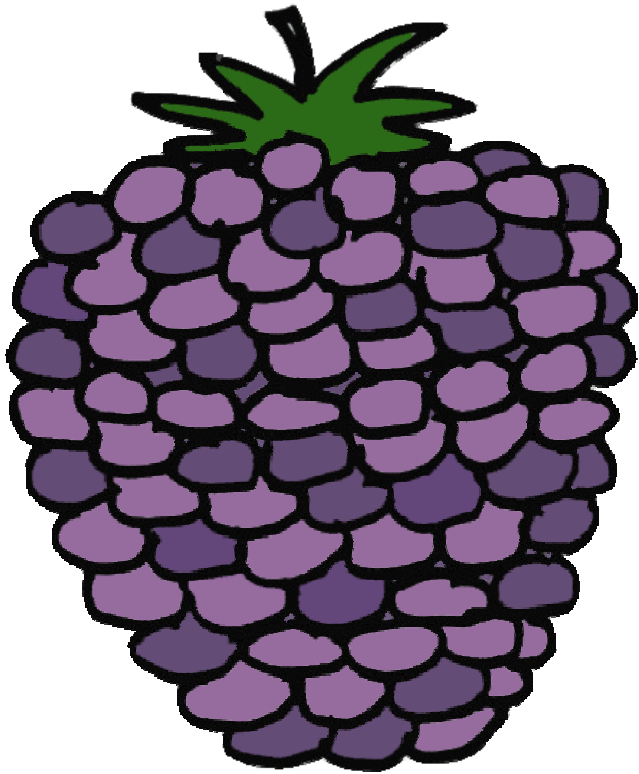
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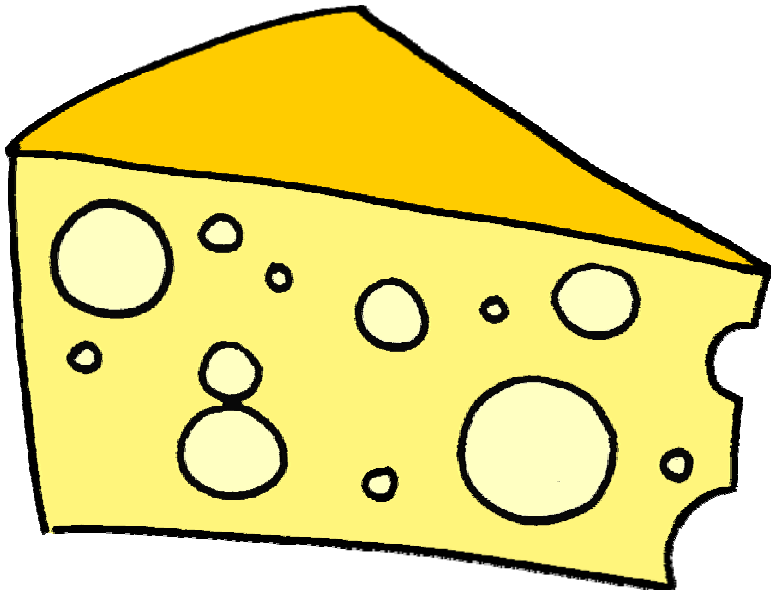
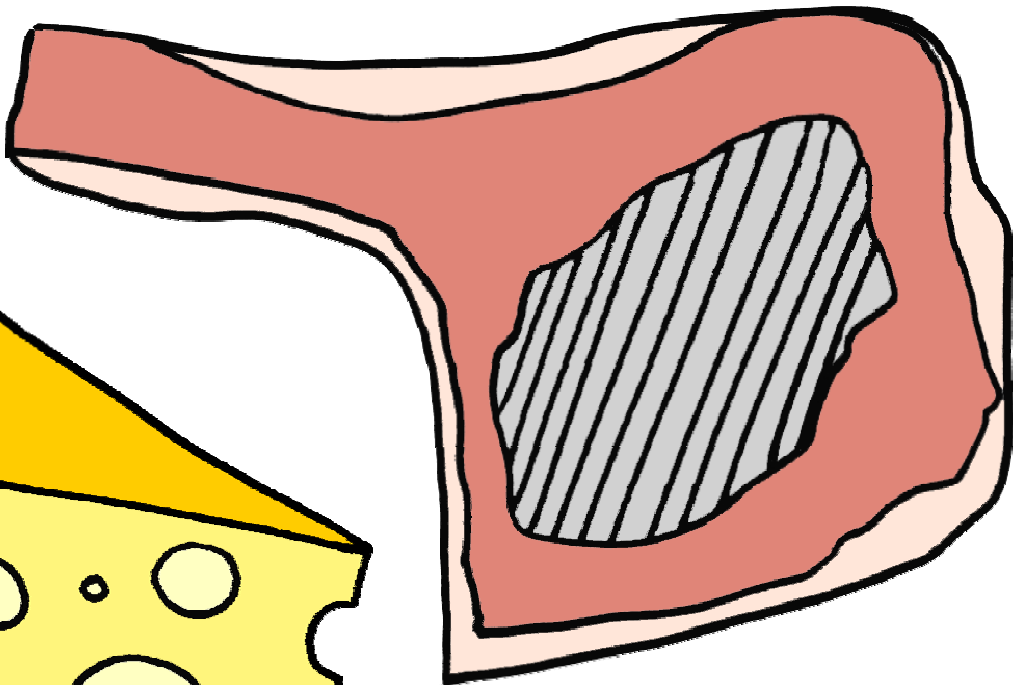
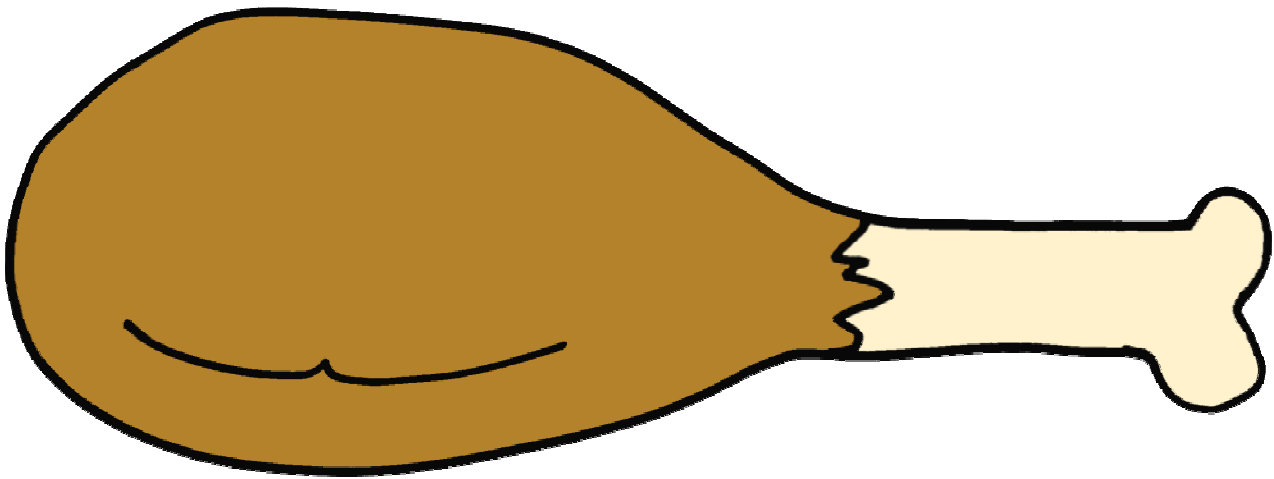
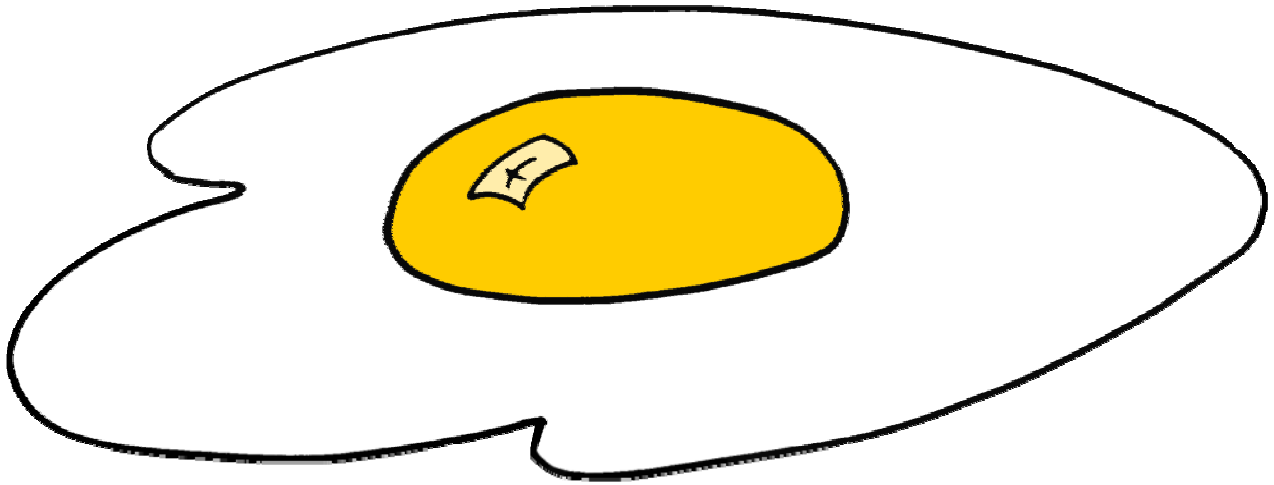


WORM DINER MENU

 YES!	NO! 







Worm Diner Take-Out Menu

Name _____ Date _____

Herm the Worm is hungry! Help him choose food by coloring ONLY the foods that come from plants. Then count the number of plant-based foods Herm the Worm can eat. Write this number in the star below.

