



TEACHER GUIDE SR: NUTRITION SPRING 2008

Dear Teachers,

We would greatly appreciate your feedback on this guide and any past guides. Your input directly affects our decisions of what to include in future guides, so please feel free to send feedback and suggestions to gilbersg@bc.edu. Also, you can visit www.greenscreen.org for more information and to download this teacher guide.

Educationally yours,
Sarah Gilbert
Greentimes Program Manager

Table of Contents

Background Information	page 1
Inquiry Science Activities	page 2
Language Arts & Vocabulary	page 3
Answers to Worksheet	page 3
Social Studies & Mathematics	page 4
Nutrition Worksheet	page 5
Waste Management Worksheet	page 6

Background Information

- ◆ *Carbohydrates, proteins, fats, vitamins, minerals* and *water* are found in food.
- ◆ Eat a variety of foods from the basic food groups.
- ◆ Food contains *calories*, which are measured as a unit of energy. When you hear something contains 100 calories, it's a way of describing how much energy your body could get from eating or drinking it. Calories aren't bad for you. Your body needs calories for energy. But eating too many calories - and not burning enough of them off through activity - can lead to weight gain.
- ◆ Examples: A cup of shredded lettuce has less than 10 calories V.S. A half of a cup of peanuts has 427 calories.
- ◆ Find out how many calories are in a food by looking at the *nutrition facts label*.

Maintaining a Balanced Diet

<p>Grains <u>Good:</u> whole grain bread, cereal, crackers, rice, or pasta. <u>Examples:</u> wheat, rice, oats, cornmeal, barley, bread, pasta, oatmeal, breakfast cereals, tortillas, and grits.</p> <p>Vegetables <u>Good:</u> dark green, orange, dry beans and peas. <u>Examples:</u> broccoli, carrot, black beans, spinach.</p> <p>Fruits <u>Good:</u> variety, fresh, frozen, canned, or</p>	<p>dried fruit, and 100% fruit juice. <u>Examples:</u> apple, banana, grapes. <u>Limit:</u> fruit juices.</p> <p>Milk <u>Good:</u> low-fat or fat-free. <u>Examples:</u> milk, cheese, yogurt. <u>Limit:</u> cream cheese, cream, and butter. *If you don't or can't consume milk, choose lactose-free products or other calcium sources.</p> <p>Meat & Beans <u>Good:</u> low-fat or</p>	<p>lean, poultry, bake, broil, or grill it, vary with fish, beans, peas, nuts, and seeds. <u>Examples:</u> beef, chicken, almonds, salmon, shrimp. <u>Limit:</u> frying, egg yolks, organ meat, processed meat.</p> <p>Oils <u>Good:</u> fish, olives, avocados, nuts, and vegetable oils. <u>Examples:</u> fish, olives, avocados, nuts. <u>Limit:</u> butter, stick margarine, shortening, and lard.</p>
--	---	---

MINIMIZE WASTE!

- ◆ A *biodegradable* product has the ability to break down, safely and relatively quickly.
- ◆ These products can be solids biodegrading into the soil (which we also refer to as *compostable*), or liquids biodegrading into water. A leaf is a perfect example of a biodegradable product: it is made in the spring, used by the plant for photosynthesis in the summer, drops to the ground in autumn, and assimilated into the soil to nourish the plant for the next season.
- ◆ Examples of time required to biodegrade:
paper – 2~3 mo.; orange peel – 6 mo.;
milk carton – 5 yrs;
aluminum can – 80 ~ 100 yrs;
glass bottle – 1 million yrs;
plastic bottles – forever.

Title: Planning a Healthy Menu – Students will plan a full meal that incorporates food from all the food groups.

Note: This activity accompanies worksheet 1

Objectives & Related Science MA Frameworks:

- ◆ Classify their ingredients according to the food groups.
- ◆ Gain the knowledge and skills to select a diet that supports health.

Materials:

- ◆ sample menu
- ◆ menu template
- ◆ visual of food pyramid

Additional Resources:

- ◆ Create your own pyramid plan: go to www.mypyramid.gov and click on *MyPyramid Plan*
- ◆ Learning more about kid's health <http://kidshealth.org/kid/>

Procedures

1. Review the food groups with the students.
2. Tell the students that they are going to design a menu for one meal that includes at least one serving of food from each food group.
3. The menu must include an entree, or main dish, at least one side dish, and a beverage.
4. Pass out the sample menu located on page 5, and discuss it with the class. Does it meet the requirements? How?
5. As students finish, look over the assignment with them. Have the students identify which of the food groups each of the ingredients belongs to.
6. Send this assignment home with the students. Have them write out the recipe and directions with the help of an adult.

Extension Activity

1. Making the Cookbook: When all menus and recipes are returned, proof-read them and hand them back to the students.
2. Design an interesting cover and bind the final copy pages together.
3. Keep the cookbook in your classroom for students to review. Display the cookbook for parents to see at conference time.

Assessments

- ◆ Have the students write out which food group each ingredient in their menu belongs to.
- ◆ Does each menu include at least 1 item from each of the food groups?
- ◆ Have students label food group names and food examples on a blank food pyramid.

Title: Food Chains and Webs – Students design their own food web using magazines and see how pollutants can travel through this web.

Objectives & Related Science MA Frameworks:

- ◆ Classify different organisms into their correct biological niches.
- ◆ Explain the roles and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.
- ◆ Describe how energy and pollutants can be transferred from one organism to another and magnified through the food chain.
- ◆ Predict what might happen if one organism is removed from the food web.

Materials:

- ◆ Picture cards of organisms from each trophic level (use magazines such as National Geographic)
- ◆ Scissors

Additional Resources:

- ◆ Interactive computer games http://www.harcourtschool.com/activity/food/food_menu.html
- ◆ http://www.bbc.co.uk/schools/ks2bitesize/science/living_things.shtml
- ◆ http://www.ecokids.ca/pub/eco_info/topics/frogs/chain_reaction/index.cfm

Procedures

1. Gather mags w/ animal pictures & shade or mark some pictures for Step 6.
2. Have students sort the pictures into groups according to energy sources; producers, herbivores (first order consumers), 1st level carnivores (second order consumers), 2nd level carnivore (third order consumers), scavengers and decomposers.
3. Have students color-coordinate each trophic level.
4. Students should construct 2 food chains that would occur in an ecosystem. Use arrows to show that energy is passed from one organism to another.
5. Students use the same pictures to form a food web. Use arrows to show that energy is passed from one living organism to another.
6. Have students look at their food web. If any of your organisms are shaded/ marked, they have been sprayed with an insecticide. Animals that eat organisms that have been sprayed take in the poison. The animals may not die, but the poison builds up in the organs of its body. Because larger animals eat more food that may be affected with the poison, more poison is naturally concentrated in the larger animals.
7. Students should take a dark colored pencil or crayon and mark all of the organisms in the food web that might get some of the poison into their bodies from their food.

Assessments

- ◆ Would there be more predators or prey in a particular community? Explain.
- ◆ Why are the 2nd level carnivores more likely to be affected by the insecticide than 1st level carnivores?
- ◆ Explain what may happen to the other organisms if disease were to kill off one of the 2nd level carnivores in your food web. Which organisms would increase in population? Why? Which organisms would decrease in population? Why?
- ◆ Describe how humans might change (or are currently changing) the food web.
- ◆ Why can't food chains go on forever? (8th order, 9th order and 10th order consumers?)

Title: The Facts About Fast Foods – Students will compare nutritional values of fast food through writing.

Objectives & Related Science and Language Arts MA Frameworks:

- ◆ Determine the nutritional values of fast foods (both)
- ◆ Practice research skills and expository writing. (LA)
- ◆ Write brief research reports with clear focus and supporting detail. (both)

Materials:

- ◆ menus from different fast food restaurants or print out fast food menus online
- ◆ computer with internet access
- ◆ books on fast food
- ◆ expository writing outline templates
- ◆ essay format explanation

Additional Resources:

- ◆ Websites providing nutritional facts about fast foods
<http://www.fatcalories.com/>
<http://www.foodfacts.info/>

Procedures

1. Give students menus from different fast food restaurants to stimulate discussion. Menus can be printed out from restaurant websites.
2. Discuss: What makes fast food less healthy than other food? What nutrition does one find in fast food meals? How is fast food made? How is it cooked?
3. Write on the board the title “The Facts About Fast Foods” and tell students to brainstorm all that they already know, plus what had been discussed in class, and write the ideas down in their notes.
4. Pick 3 facts from the brainstormed list and create an outline. It can be in point form, web, flowchart, any format the student prefers.
5. Students begin to do research on the three facts they chose to explore. The book Fast Food Facts: Nutrition and Exchange Values for Fast Food Restaurants by Marion J. Franz is a great resource. Other resources are the internet, library, newspaper, etc.
6. Instruct students to take notes of their findings for the outlines.
7. When outlines are completed, the teacher checks to see the facts are accurate.
8. Explain the format of the essay as well as the rubrics. Tell the students who their audience is (adults or children, people with some or no knowledge about fast food, etc.).
9. Have the students begin writing their informational essay.
10. Pair students for peer evaluation. Then conference with students before the final paper is due.

Assessments

- ◆ Expository Writing Rubrics
<http://home.wsd.wednet.edu/WSD/learn/learn/AllInterWriting.pdf>
<http://www.amityregion5.org/hsgradreq/Assets/English%20Department%20Rubric%2009-12.pdf>

Vocabulary

Biomass organic matter, especially plant matter, that can be converted to fuel
Calorie is the unit for measuring food energy
Consumer an organism that feeds on plants or other animals.
Crops cultivated plants or agricultural produce, such as grain, vegetables, or fruit
Decomposer an organism, usually a bacterium or fungus, that breaks down the cells of dead plants and animals into simpler substances
Environmental Justice means everyone in every community has access to equal benefits
Food Chain is the flow of energy from one organism to another (it shows what eats what)
Food Pyramid a diagram that represents a healthy diet by placing food groups in a pyramid according to the number of servings from

each group to be eaten every day
Food Web the links and connections of different food chains in an ecological community
Fossil Fuels any non-renewable combustible organic material – oil, coal, or natural gas
Freegan people who use alternative strategies for living based on limited participation in the conventional economy and minimal consumption of resources
Global Warming an increase in the earth's average atmospheric temperature that causes corresponding changes in climate
Greenhouse Effect the gradual heating of the atmosphere caused by air pollution which traps energy from the sun
Habitat the place where an organism's needs are met (food, water, shelter, space)

Landfill disposal site where solid waste, such as paper, glass, and metal, is buried between layers of dirt and other materials
Photosynthesis is the process of green plants and some bacteria making their own food by using the sun's energy and water
Predator any animal that lives by preying on other animals
Producer an organism that is able to make (produce) its own food
Renewable Energy any naturally occurring energy, such as biomass, solar, wind, that is not derived from fossil or nuclear fuel
Species a classification of related organisms that can reproduce with each other
Trophic Levels an organism's position in a food chain based on what they eat

Answers to Waste Management Worksheet

+	>	>	o	o	o	>	o	>	o	o	o				
---	---	---	---	---	---	---	---	---	---	---	---	--	--	--	--

1. **Best:** No packaging, natural package, returnable containers, all-aluminum cans, glass bottles with twist-off tops
Worst: PVC, aluminum foil based containers, collapsible metal tubes, metal and plastic pumps, aerosol cans
2. *Answers may vary.*
 Bring my own shopping bag; don't buy products that are excessively packaged; buy products with none or minimal packaging; choose recyclable packages.
3. Some of them are made of biodegradable materials, which means they can be broken down easily. Others are made of recyclable materials so they can be reused or renewed for multiple uses.

Title: Waste Management: Biodegradability & Pick the Best Package – Students will bring in materials from home to investigate if they are biodegradable.

Note: This activity accompanies worksheet 2

Objectives & Related Science and Social Studies MA Frameworks:

- ◆ Conduct an investigation on the biodegradability of objects. (Sci)
- ◆ Distinguish between different types of packaging and decide if it can be recycled. (Sci)
- ◆ Discuss and decide the harm various packages have on the environment. (both)
- ◆ Plan strategies for waste management. (SS)

Materials:

- ◆ soil and various substances
- ◆ metal tray or bread pan
- ◆ plant labels or ice cream stick
- ◆ survey and observation sheets

Additional Resources:

- ◆ PBS Waste Management Plan
http://www.pbs.org/americanfieldguide//teachers/landfills/landfills_sum.html
- ◆ Pollution reproducible and mind teasers
<http://hawaii.gov/dbedt/ert/activitybook/pollution.html>

Procedures

1. Ask students to bring about 4 cups (approximately one liter) of garden or other soil from an outdoor area. Ask them to bring objects and materials from home that they consider biodegradable or non-biodegradable. Substances may be small pieces of fruit, bread, meat, plastic, paper or cardboard, charcoal, etc. The soil is then placed in a metal tray or bread pan. The soil should be at least 7 cm deep (2 1/2 inches). Divide the pan into 6 areas, and bury a small piece (about 1 cc) of material in each area. Place a plant label or ice cream stick in each area, telling what material is buried there.
2. Every other day for two weeks, dig up the substance and record observations on its appearance, smell, etc. How has it changed? Why? What materials show little or no change? Why not?
3. Have students complete the survey sheet on page 6. After 10-15 minutes begin discussing their choices using the answer key given.
4. Ask students to conduct a survey of their neighborhood supermarkets. Find out if the markets provide information about packaging, biodegradability, and toxicity.

Assessments

- ◆ Look at the students' work on the survey sheet.
- ◆ Presentation of the students' finding about their neighborhood supermarket.
- ◆ Have students predict what substance is biodegradable and what is not, and check their prediction during the course of their observation.
- ◆ Have students design a one-day routine involving an effective waste management.

Mathematics Activities

Title: Energy Conversion: From Food to Fuel – Students create a data table to estimate the number of calories they burn in a day and convert this info into a pie graph.

Objectives & Related Science and Math MA Frameworks:

- ◆ Interpret data on a food label to determine the amount of energy. (both)
- ◆ Determine the amount and type of exercise needed to "burn off" specific amounts of calories. (Sci)
- ◆ Use problem-solving skills to develop strategies for interpreting data. (both)
- ◆ Use data to construct a pie graph. (both)
- ◆ Estimate and calculate percentages. (M)

Materials:

- ◆ calculator
- ◆ worksheet for recording and calculations
- ◆ physical activity table handout pie graph

Additional Resources:

- ◆ Read more about Dietary Guidelines and how to read food labels for Americans on
<http://hgic.clemson.edu/factsheets/hgic4000.htm>
<http://hgic.clemson.edu/factsheets/hgic4061.htm>

Procedures

1. Ask students: How do you get energy? Guess how many calories a person your age needs each day. Place the student predictions on the blackboard. Is the daily recommended calories the same for their entire life, or does it change with age? Do males and females have the same recommended daily calorie intake? Explain answers.
2. Have students imagine their typical day. Use the data table on <http://hgic.clemson.edu/factsheets/hgic4030.htm> to estimate the number of calories they burn off in this typical day. Prepare a data table listing the important information.
3. Once students have completed their data tables of calories expended, give each student a copy of a pie template divided into 24 sections of equal size. These represent the 24 hours of the day.
4. Ask students to use the pie chart to show the high energy, low energy, and moderate energy activities that make up their day.
5. After completing their pie graphs, ask each student to estimate the percent of their day that is devoted to high energy activities. This should be an estimate at this point. What percent of their day do they estimate is devoted to moderate energy activities? What percent do they estimate is spent doing low energy activities?
6. Once all students have made estimates, ask students to calculate the exact percentages. How do their estimates compare to the actual values?

Assessments

- ◆ Give students a pie graph and ask them to interpret the data.
- ◆ Give students data and have them construct a pie graph accordingly.
- ◆ Estimate and then calculate the percentages of each section of a pie graph.

