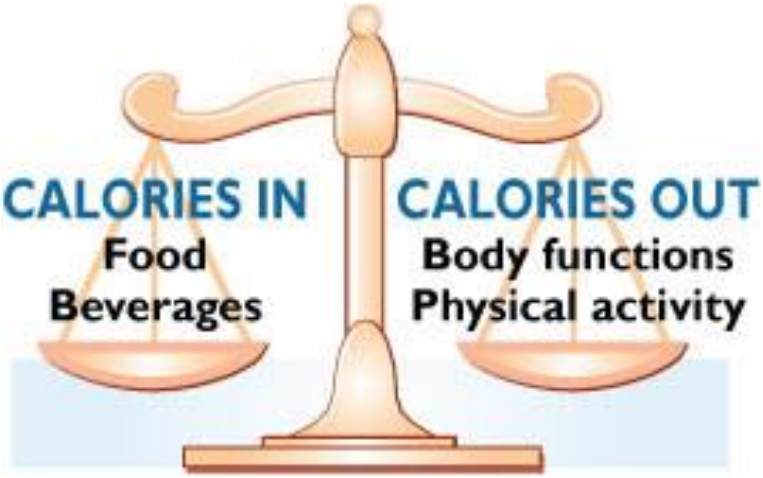


PERFORMANCE - RELATED NUTRITION AND ENERGY BALANCE

Understanding the relationship between caloric intake & caloric expenditure

Co-curricular Module—Middle School (6-8th grades)

Part 1—Nutrition Education

Adapted June 2012, Revised May 2013
Adapted by: Deidre Monarres, M.A., & Alise Echele, R.D.N.
Healthy Eating, Active Living, Health Services
Healthy School Project, Food & Nutrition Services
Ventura Unified School District

HEAL VUSD

Healthy Eating, Active Living

Ventura Unified School District

805-641-5000 ext. 1137

CHAMPIONS for CHANGE
Network for a Healthy California

VUSD
Food and Nutrition Services

Adapted 5/2012 from *Tools For Learning Fuel for Moving PRNIM* (Draft February 2010) developed by California Department of Education

Introduction

California's State Board of Education adopted content standards for Science Education, Health Education, and Physical Education to provide clear descriptions of what students should know and be able to do in each content areas and grade level. All subject areas are either already connected or can synergistically connect to nutrition standards, which provide an opportunity to meet multiple objectives across many disciplines. Nutrition Education does not replace exciting standards in other disciplines, but builds a stronger context for application. California students need a content-rich, K-12 physical education program and a skills-based health education program at all grade levels. This curriculum entitled, *Performance-related Nutrition and Energy Balance*, creates a wonderful opportunity for middle school educators to teach about healthy eating and active living, which research has shown to be critical for student success and achievement.

With the Californian adoption of the National Common Core Standards for English Language Arts and Mathematics, public school educators in all disciplines are implementing learning experiences that support the new standards and address 21st Century skills. The materials and activities presented in this blended instructional unit support the Common Core standards and 21st Century skills, while maintaining the integrity and objectives of the individual disciplines of Science, Health, and Physical Education.

Families, community partners, and other key stakeholder groups can make significant contributions to our collective health by supporting and encouraging high quality instruction, assessment of student learning, and seizing any and every opportunity to encourage and support the learning of this vital content—healthy eating and active living.

These instructional materials were designed to provide teachers with specific lessons for a sample of the content standards but do not provide lessons for all of the content standards. The HEAL VUSD (Healthy Eating, Active Living) project in collaboration with the VUSD Food and Nutrition Services' Healthy Schools Project (HSP) designed this curricular module using materials from the California Department of Health's Network for a Healthy California, USDA My Plate, *SPARK* (Sports, Play and Active Recreation for Kids), and *Tools for Learning Fuel for Moving PRNIM* draft 2012 developed by the California Department of Education. This is a "working" document; it is the HEAL/HSP Projects' intention that the teachers build on these lessons using their own professional knowledge and expertise.

SPARK

Table of Contents

Content Standards.....4

Problem Statement & Essential Question 6

Objectives & Learning Outcomes.....7

Academic Vocabulary.....8

Resources.....10

Sample Pacing Guides.....13

Lesson 1 Agenda.....14

Lesson 2 Agenda 24

Lesson 3 Agenda 32

Lesson 4 Agenda 41

Lesson 5 Agenda 46

Lesson 6 Agenda 54

Lesson 7 Agenda 67

Lesson 8 Agenda 69

Lesson 9 Agenda 72

Appendix.....81

Performance Related Nutrition & Energy Balance
Middle School (6-8th grades)

Content Standards

Common Core Standards:

CCSS.ELA-Literacy.RST.6-8.2	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
CCSS.ELA-Literacy.RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6–8 texts and topics*.
CCSS.ELA-Literacy.RI.6.7	Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.
CCSS.ELA-Literacy.W.6.1	Write arguments to support claims with clear reasons and relevant evidence.
CCSS.ELA-Literacy.W.6.1a	Introduce claim(s) and organize the reasons and evidence clearly.
CCSS.ELA-Literacy.W.6.1b	Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.
CCSS.ELA-Literacy.W.6.1e	Provide a concluding statement or section that follows from the argument presented
CCSS.ELA-Literacy.RST.6-8.8	Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
CCSS.ELA-Literacy.RST.6-8.9	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Math I

Creating Equations

- Create equations that describe numbers or relationships.

Reasoning with Equations and Inequalities

- Understand solving equations as a process of reasoning and explain the reasoning.

CA Science Standards:

6th Grade-

3b: Students know that when fuel is consumed, most of the energy released becomes heat energy.
6: Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation.
6a: Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

CA Physical Education Standards:

6th Grade-

3.4: Participate in Moderate to Vigorous physical activity a minimum of 4 days per week.
3.6: Monitor heart rate during physical activity.
4.2 Develop a one-day personal physical fitness plan specifying the intensity, time, and types of physical activities for each component of health-related physical fitness.
4.7: Compile and analyze a log noting the food intake/calories consumed and energy expended through physical activity.
5.1 Participate productively in group physical activities.
5.2 Evaluate individual responsibility in group efforts.

7th Grade-

3.1 Assess one's own muscle strength, muscle endurance, aerobic capacity, flexibility, and body composition by using a scientifically based health-related fitness assessment.
3.3 Develop individual goals, from research-based standards, for each of the five components of health-related physical fitness.
3.5 Participate in moderate to vigorous physical activity a minimum of four days each week.
4.5 Describe the role of physical activity and nutrition in achieving physical fitness.

5.2 Accept responsibility for individual improvement.
5.3 Demonstrate an acceptance of differences in physical development and personal preferences as they affect participation in physical activity.

8th Grade-

3.1 Assess the components of health-related physical fitness (muscle strength, muscle endurance, aerobic capacity, flexibility, and body composition) by using a scientifically based health-related physical fitness assessment.
3.2 Refine individual personal physical fitness goals for each of the five components of health-related physical fitness, using research-based criteria.
3.4 Participate in moderate to vigorous physical activity a minimum of four days each week.
3.5 Assess periodically the attainment of, or progress toward, personal physical fitness goals and make necessary adjustments to a personal physical fitness program.
4.5 Explain the effects of nutrition and participation in physical activity on weight control, self-concept, and physical performance.
5.2 Organize and work cooperatively with a group to achieve the goals of the group

CA 7th & 8th Health
Essential Concepts

1.1.N Describe the short- and long-term impact of nutritional choices on health.
1.2.N Identify nutrients and their relationships to health.
1.3.N Examine the health risks caused by food contaminants.
1.4.N Describe how to keep food safe through proper food purchasing, preparation, and storage practices.
1.5.N Differentiate between diets that are health-promoting and diets linked to disease.
1.6.N Analyze the caloric and nutritional value of foods and beverages.
1.7.N Describe the benefits of eating a variety of foods high in iron, calcium, and fiber.
1.8.N Identify ways to prepare food that are consistent with current research-based guidelines for a nutritionally balanced diet.
1.9.N Analyze the harmful effects of engaging in unscientific diet practices to lose or gain weight.
1.10.N Identify the impact of nutrition on chronic disease.
1.11.N Analyze the cognitive and physical benefits of eating breakfast daily.
1.12.N Examine the role of lifelong fitness activities in maintaining personal fitness, blood pressure, weight, and percentage of body fat.
1.13.N Explain how to use a Body Mass Index (BMI) score as a tool for measuring general health.
1.14.N Identify ways to increase daily physical activity.
1.15.N Explain that incorporating daily moderate or vigorous physical activity into one's life does not require a structured exercise plan or special equipment.
1.16.N Differentiate between physical activity and exercise and health-related and skill-related fitness.
2.2.N Evaluate internal and external influences on food choices.
3.1.N Distinguish between valid and invalid sources of nutrition information
4.2.N Practice effective communication skills with parents, guardians, or trusted adults regarding healthy nutrition and physical activity choices.
8.1.N Encourage nutrient-dense food choices in school.
8.2.N Support increased opportunities for physical activity at school and in the community.
8.3.N Encourage peers to eat healthy foods and to be physically active.

Performance Related Nutrition & Energy Balance
Problem Statement and Essential Questions
(Teacher copy)

The Problem : Approximately 38 percent of children in California are overweight or obese. In Ventura County, city ranges begin as low as at 25.7 percent (Thousand Oaks) and climb to 52.6 percent in the country's poorest performing city (Port Hueneme). In Ventura, about 33 percent of children are overweight or obese. The health problems and chronic diseases associated with being overweight or obese are detrimental to our society as a whole. Obesity-related illness, such as diabetes and heart disease, is estimated to carry an annual cost of $190.2 billion. According to the Public Health Institute, if every Californian who was overweight or obese lost five pounds, it would save the state $82 billion and prevent 800,000 cases of diabetes.

Chronic disease, such as diabetes and heart disease, are the most preventable diseases prevalent in the United States, and heart disease is the number one preventable death. This disease can be prevented if Americans are physically active and eat healthfully daily. The habits youth form now will either support a healthy life or support an unhealthy life, which puts youth at risk for early on-set of chronic diseases and early death. Scientists have found that many youth are physically inactive and eat unhealthy foods—a trend that is seen all over America. In order to live a healthy life, all youth must care for their bodies by moving more and eating well.

Our Task as Educators: Experts have shown that fit, healthy students are more likely to succeed. Schools have the opportunity to model healthy environments and support student success—to teach young people how to live healthfully. **In order to model health, schools must support policy, system, and environmental changes that make the healthy choices the easy choice.** The purpose of this curriculum is to equip youth to be advocates for and focus on healthy eating and active living individually and as a community. Teaching students about nutrition and physical activity as it relates to energy balance while connecting these topics to core curriculum is one way to engage this important topic during the school day.

It is important, however, to present "energy balance" as it relates to the childhood obesity epidemic with compassion and care for each individual student. Every child is unique which a different shape and size. Stigmatizing youth for their size and shape is counterproductive and results in low self-esteem and apathy. Each educator should engage youth with the following key question: How can you best care for your body?

It is important to note that this curriculum is not designed to teach children that they must be thin in order to be healthy. Experts have shown that the best way to improve health and reduce the risk for chronic disease is to focus on increasing daily activity levels to at least 60 minutes per day and forming healthful eating habits—the goal of this curriculum. These are the two most important lifestyle changes that will help prevent obesity-related chronic diseases.

Essential Question(s):

How are you going to reverse the trend of physical inactivity and unhealthful eating at home, school, and in the community? How can you best care for your body? What important information can you share and how will you share it? What will you do to help create a healthy community?

Objectives & Learning Outcomes

1. Students will define the term "energy," explain where energy comes from, and how energy from food is used in the human body.

2. Students will explain the relationship between energy in and energy out (i.e. Energy Balance; Caloric Intake and Expenditure)

3. Students will define the term "calories" and determine individual daily caloric needs based on age, gender, body composition, and physical activity levels.

4. Students will be able to identify specific foods within each MyPlate category (i.e. fruit, vegetable, whole grains, protein, dairy product and empty calories).

5. Students will be able to explain the role of vitamins and minerals in food.

6. Students will analyze food logs to determine if they are: 1) eating a balanced diet with adequate nutrients and 2) eating adequate calories to meet their basal metabolic needs and their daily physical activity needs.

7. Students will calculate caloric expenditure based on a variety of different physical activities.

8. Students will identify factors that have influenced the obesity epidemic.

9. Students will identify the physiological affects of physical inactivity and unhealthful eating on long term health.

10. Students will assess the impact of unhealthful eating and physical inactivity on individual, family, school, and county health.

11. Students will describe potential solutions and strategies to support the creation of a healthier community that includes healthy eating and active living (i.e. individuals, families, schools, Ventura County).

12. Students will present their health assessment of their home, school, or community and defend healthy eating, active living recommendations in a public campaign of their choosing.

Academic Vocabulary

Source: Complete Food and Nutrition Guide, 3rd Edition, Roberta Larson Duyff, MS, RD, FADA, VFCS

- **Energy**: measured in the form of calories. Plants get this from the sun. Humans get this from food consumed and use it to live and move.
- **Photosynthesis**: the process of making energy from sunlight in plants.
- **Fat**: this is a fuel source (i.e. energy) and a major storage form of energy in the body. It supports body functions such as nutrient transport, growth, and being part of many body cells. Some examples of fats are butter, oil, nut and seeds, meat, fish, and some dairy.
- **Protein**: This nutrient is a sequenced combination of amino acids, which build, repair, and maintain all body tissues such as muscles. Good sources are found in meat, beans, fish, and dairy.
- **Carbohydrate**: This is the body's main source of energy (fuel). This nutrient is found in whole grains, beans, dairy, and starchy vegetables.
- **Glycogen**: Stored energy found in the liver and muscles.
- **Glucose**: the main form of carbohydrate used for energy. It is often called "blood sugar" because it circulates in the blood stream and is carried to every cell in the body to be used for energy.
- **Calorie**: the amount of energy in food and the amount of energy the body uses. This energy is locked inside three nutrients known as protein, carbohydrates, and fat.
- **Energy Balance**: the energy consumed equals the energy expended. (Energy In = Energy Out)
- **Caloric Intake:** the amount of calories (i.e. food) consumed within a specific period of time.
- **Caloric Expenditure:** the total amount of calories used while the body is resting and moving.
- **Basal Metabolic Rate**: energy your body burns on "idle." It is the energy that keeps involuntary body processes going such as pumping the heart, breathing, generating body heat, and producing thousands of body chemicals.
- **Fiber:** another form of complex carbohydrates that aids in digestion, promotes health, and offers protection from some diseases such as cancer. This acts as a "scrub brush" to clean out the digestive system. This is found in fruits, vegetables, whole grains, and legumes.

- **Empty Calories:** calories from solid fats and/or added sugars. Solid fats, such as butter and shortening, and added sugars add calories to the food but few or no nutrients.

- **Overweight** weighing in excess of the normal for one's age, height, and build ;typically a body mass index of 25 to 29.9>

- **Obesity** a condition characterized by the excessive accumulation and storage of fat in the body

- **Body Mass Index** a measure of body fat that is the ratio of the weight of the body in kilograms to the square of its height in meters

- **Chronic Disease** a disease marked by long duration, by frequent recurrence over a long time, and often by slowly progressing seriousness

- **Diabetes** a disorder of carbohydrate metabolism caused by a combination of hereditary and environmental factors and usually characterized by inadequate secretion or utilization of insulin, by excessive urine production, by excessive amounts of sugar in the blood and urine, and by thirst, hunger, and loss of weight. http://kidshealth.org/kid/videos/indiabetes_vd.html#cat20580

- **Fatty Liver** an abnormal condition of the liver that is characterized by fat accumulation in the liver cells to the extent that fat accounts for more than five percent of liver weight and that is caused especially by injury, malnutrition, or toxic substances

- **Metabolic Syndrome** is a group of risk factors -- high blood pressure, high blood sugar, high triglycerides, Low HDL (or good) cholesterol, and belly fat -- that increases risk of heart disease and diabetes. Diet, exercise, and medications can help improve it.

- **Cholesterol (high cholesterol)** a waxy, fatty substance that is present in human and animal cells and tissues. It is important in bodily processes, and may be related to the abnormal thickening and hardening of arteries when too much is present

- **Hypertension (High Blood Pressure)** abnormally high arterial blood pressure that is may be genetic or may be caused by a preexisting condition that typically results in a thickening and inelasticity of arterial walls and hypertrophy of the left heart ventricle, and that is a risk factor for various other conditions such as heart disease, heart failure, stroke, etc.)

- **Asthma** a chronic lung disorder that is marked by symptoms such as airway obstruction, labored breathing wheezing, coughing and by a sense of constriction in the chest.

- **Sleep Apnea** brief periods interrupted breathing during sleep that is caused by obstruction of the airway or a disturbance in the brain's respiratory center and is associated especially with excessive daytime sleepiness

Resources

Instructional Technology Tools

Lesson 1

- ☐ Health Happens Here—1 minute video clip
  http://www.youtube.com/watch?v=-AXOouknPIk&list=PLDC01A37A89BF14A2

- ☐ Bill Nye Nutrition Videos
  http://www.schooltube.com/video/8b5b475d98ac476fbdb8/Bill%20Nye%20Nutrition

- ☐ CDC Teen BMI Calculator
  http://apps.nccd.cdc.gov/dnpabmi/

Lesson 2

- ☐ Bill Nye Nutrition Videos
  http://www.schooltube.com/video/8b5b475d98ac476fbdb8/Bill%20Nye%20Nutrition

- ☐ Kids Health: Food Label Introduction 4:43
  http://link.brightcove.com/services/player/bcpid1835313767001?bckey=AQ~~,AAAABNaOSDE~,MV0hcnoQX_kTd8ed4mSztIztph6AcWZo&bctid=2189036120001

Lesson 3

- ☐ Bill Nye Nutrition Videos
  http://www.schooltube.com/video/8b5b475d98ac476fbdb8/Bill%20Nye%20Nutrition

Lesson 4

- ☐ MyPlate Scavenger Hung
  www.MyPlate.gov

Lesson 5

- ☐ Rethink Your Drink 2-minute video
  http://www.youtube.com/watch?v=iP-haqmmXyY&list=PL7EEDEB821D412975

Lesson 6

- ☐ BRAINPOP alternative nutrition activity in computer lab
  http://www.brainpop.com/health/nutrition/nutrition/

Lesson 7

- ☐ Healthy Recipes—Network for Healthy California
  http://www.cachampionsforchange.cdph.ca.gov/en/Snack-Recipes.php

Lesson 8

- ☐ Weight of the Nation for Kids/ "Quiz-Ed"— 30-minute HBO Documentary
  http://theweightofthenation.hbo.com/films/kids-films/quiz-ed#/watch/kids-films/quiz-ed

Lesson 9

- ☐ How to Make a Common Craft Style Video

http://youtu.be/oCl1zoxs3Zo

Activity Break Videos

- ☐ Jammin Minute 1 http://www.youtube.com/watch?v=X6Uyru4fAoc-
- ☐ Jammin Minute 2 http://www.youtube.com/watch?v=uBhpbxlRbJ4
- ☐ Jammin Minute 3 http://www.youtube.com/watch?v=R7JeKUVJAzU
- ☐ Instant Recess http://www.networkforahealthycalifornia.net/pa/InstantRecess.html

Additional Resources

- ☐ Project Based Learning
  http://www.bie.org/
- ☐ Rubric Development
  http://rubistar.4teachers.org/
- ☐ 200 Calorie Servings
  http://www.guardian.co.uk/lifeandstyle/gallery/2013/feb/19/200-calories-look-like-portion
- ☐ Khan Academy BMI video 7:00
  http://www.youtube.com/watch?v=IQJav8cGDLo
- ☐ SPARK
  http://www.sparkpe.org/
- ☐ Alameda County Public Health Department—Nutrition Education Materials
  http://www.healthylivingforlife.org/tools.php
- ☐ Network for Healthy California—Gold Coast Region
  http://www.goldcoastnetwork.org/gc_resources.htm
- ☐ USDA Team Nutrition
  http://www.fns.usda.gov/teamnutrition/team-nutrition
- ☐ USDA Choose My Plate
  http://www.choosemyplate.gov/
- ☐ Harvest of the Month
  http://www.harvestofthemonth.cdph.ca.gov/
- ☐ Partnership for Health Ventura County

http://healthyventuracounty.org/

- ☐ Life Lab
  http://www.lifelab.org/

- ☐ Berkeley Edible School Yard
  http://edibleschoolyard.org/resources-tools

Teacher Background Information

- ☐ Weight of the Nation films
  http://theweightofthenation.hbo.com/films

- ☐ How Obesity Harms a Child's Body
  http://www.washingtonpost.com/wp-srv/health/childhoodobesity/obesityeffects.html

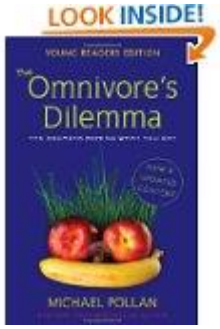
- ☐ Be Well: Obesity PBS Documentary 56:24
  http://www.youtube.com/watch?v=2txrbM-UdbY

- ☐ ABC News Obesity In America 7:56
  http://www.youtube.com/watch?v=yDbocZ438f0

Sample Non Fiction Books

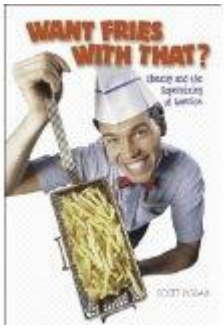
The Omnivore's Dilemma—Young Readers Edition

Author: Michael Pollen



Want Fries with That?

Author: Scott Ingram



Sample Block Plan / Pacing
Science

--Intro PowerPoint --Portfolio Review --Bill Nye Video 1 0--7:55 minute w/guided notes and Cornell Notes --MyPlate Activity --Essential Question Review --Homework (HW): Energy Article and questions & start Vocab Cards	--MyPlate Warm-Up &Review --Bill Nye Video #2 7:55-15 minute w/ guided notes and Cornell Notes --Nutrition Facts Label Reading Activity --Essential Question Review --HW: Balancing Act Article and questions & finish Vocab Cards	-Nutrition Fact Label Warm- Up -Bill Nye video #3 15 minute w/ guided notes and Cornell Notes --Portion Size Matters Activity w/ PPT --Essential Question Review --HW: Food For Fitness Article /Summarize & create questions and answer for article. Study vocab and review previous articles --Wellness Walk (optional)	--Energy Balance Warm-Up --Computer MyPlate Scavenger Hunt (food groups) *Supertracker account set up (optional)* --Essential Question Review --HW: Vocabulary Worksheet	--Rethink Your Drink Warm-Up—*Ingredients for a Dynamic Demonstration* - ReThink Your Drink 2-minute video --Sugar Savvy Students activity --Essential Question Review HW: 3 Day Food Log-Fill out Breakfast together (3 consecutive days)
--Measuring Calories in Food--Experiment --OR BRAIN POP Nutrition Activity on computers	--Complete or Review Experiment/Brain Pop -- Healthy Snack Activity (taste test) Must be scheduled with FNS 2 weeks prior! --HW: Bring in Healthy Snack Recipe	--Warm-Up—Healthy Recipe "share out" --Weight of the Nation for Kids- Quiz Ed w/guided notes and Cornell Notes --HW: Reverse the Trend Written Reflection	--Review and Assign Media Campaign project –Review Brainstorm and Story Board worksheets	--Work on Media Campaign Project --Submit Food Logs & Review
Project Work	Project Work	Media Campaign Project Presentations	Media Campaign Project Presentations	Final Quiz Portfolios

Sample Block Plan / Pacing
Physical Education

100 Calorie Warm Up Out To Lunch	100 Calorie Warm Up Review Energy Balance Concepts with Pair Shares -Skill Based/Sport Day	100 Calorie Warm Up Nutrition Decoder #1 Energy Balance Circuit	100 Calorie Warm Up Review Energy Balance Concepts with Pair Shares -Skill Based/Sport Day	100 Calorie Warm Up Name That Food AR
100 Calorie Warm Up Burn Em Up	100 Calorie Warm Up Review Energy Balance Concepts with Pair Shares -Skill Based/Sport Day	100 Calorie Warm Up PACER or Mile w/ reflection	100 Calorie Warm Up Review Energy Balance Concepts with Pair Shares -Skill Based/Sport Day	100 Calorie Warm Up Nutrition Decoder #2 Nutrition Trivia AR
100 Calorie Warm Up Nutrition Decoder #3 Fat Transfer	100 Calorie Warm Up -Skill Based/Sport Day Review Energy Balance Concepts with Pair Shares	Create 200 Calorie Routine/work out	100 Calorie Warm Up -Skill Based/Sport Day Review Energy Balance Concepts with Pair Shares	Perform 200 Calorie Routine/work out

Science Lesson 1
Agenda

1. Intro and Essential Question PowerPoint

   - ☐ Objectives, Standards, Assessments, Grading
   - ☐ Health Happens Here—1 minute video clip
     http://www.youtube.com/watch?v=-AXOouknPIk&list=PLDC01A37A89BF14A2

   - ☐ Portfolio Assignment—on-going
     Students will receive handouts, worksheets, and quizzes throughout the module. This information is key reference material needed in order to complete the final media project. Review the rubric and instruct the class to compile the materials in a folder or binder daily.

2. Bill Nye Video 1 w/ guided notes

   - ☐ Website for video (0:00-8:00 minutes):
     http://www.schooltube.com/video/8b5b475d98ac476fbdb8/Bill%20Nye%20Nutrition

3. Activity Break—Jammin Minute

   - ☐ http://www.youtube.com/watch?v=X6Uyru4fAoc-

4. *Choose MyPlate Everyday* activity with Food Cards & Placemats

5. Essential Question(s)—

   - ☐ **Based on what you learned today, how are you going to help reverse the trend of physical inactivity and unhealthful eating at home, school, and in the community?** How can you best care for your body? What important information can you share and how will you share it? What will you do to help create a healthy community?

   - ☐ Feel free to use the Cornell Notes, found in the appendix, to help facilitate dialogue about these essential questions.

6. Homework

   - ☐ Energy Article and Comprehension Questions
   - ☐ Start Vocab Cards

Performance Related Nutrition & Energy Balance
Problem Statement and Essential Questions
(Student copy)

The Problem

Approximately 38 percent of children in California are overweight or obese. In Ventura, about 33 percent of children are overweight or obese. Obesity-related illness, such as diabetes and heart disease, is estimated to carry an annual health care cost of $190.2 billion. Chronic diseases, such as diabetes and heart disease, are the most preventable diseases prevalent in the United States, and heart disease is the number one preventable death. This disease can be prevented if Americans are physically active and eat healthfully daily.

The habits youth form now will either support a healthy life or support an unhealthy life, which puts youth at risk for early onset of chronic disease and even an early death. Scientists have found that many youth are physically inactive and eat unhealthy foods—a trend that is seen all over America. In order to live a healthy life, all youth must care for their bodies by moving more and eating well.

Essential Question(s):

How are you going to reverse the trend of physical inactivity and unhealthful eating at home, school, and in the community? How can you best care for your body? What important information can you share and how will you share it? What will you do to help create a healthy community?

Name _____ Period_____

Performance-Related Nutrition and Energy Balance
Portfolio Grading Checklist (Sample)

Instructions:

1. Grade a classmate's folder. Use the grading scale below for each item.
2. Write the number of points earned for each item (4 points each).
   If less than 4, state why.

Grading Scale (Note: if no work required on page, 4 points is given if page is in folder):

0: Item missing or nothing written.
1: Did not understand. Too many mistakes.
2: "Developing"
3: "Apprentice"
4: Perfect. No mistakes. "Expert"

Items to look for:	Score:	Reason if less than 4:
Design/Neatness		
Table of Contents		
Bill Nye—Notes 1		
MyPlate handout		
Energy Article & Questions		
Nutrition/Energy Balance Vocabulary		
Bill Nye—Notes 2		
Read Food Labels handout		
Rate that Cereal!		
Calories In and Calories Out – It's a Balancing Act! & Questions		
5 Facts from Portion PowerPoint		
Portion Distortion handout		
Handy Portions handout		
Food for Fitness Article & Questions		

Vocabulary Worksheet		
MyPlate Scavenger Hunt		
Re-Think Your Drink		
Sugar Shockers handout		
Three Day Food Log		
Healthy Snack Reflection		
Weight of the Nation Quiz-Ed Notes		
Reverse the Trend—Student Reflection		
Total Points Earned		**Maximum Points--88**

Name_____Period_____

BILL NYE THE SCIENCE GUY

Video Clip 1 (0:00-8:00 minutes)—Guided Notes

1. Food is where you get your _____.

2. Name 3 Foods that are Carbohydrates: _____
   _____ _____

3. What do Carbohydrates do for the body?
   _____

4. What do Proteins do for the body?
   _____

5. Name 3 Foods that are Proteins. _____
   _____ _____

6. What do Fats do for the body?_____

7. Name 3 Foods that are Fats _____
   _____ _____

8. A balanced diet gives you all of the _____you need.

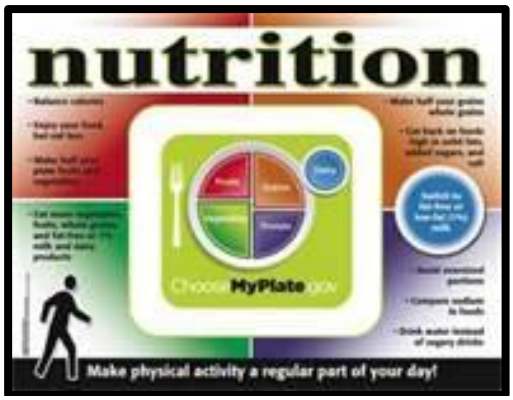
9. Nutrients help the body absorb _____and
   _____.

10. A calorie is a measure of _____ energy.

Choose MyPlate Everyday!

(15 minute activity)

Materials



- MyPlate tear-off sheets
- Food Cards (1 set)
- MyPlate Coloring sheets http://choosemyplate.gov/print-materials-ordering.html
- Muscle and fat models
- Fat test tubes
- Portion Poster

Objectives

- Students will be able to explain the purpose of MyPlate.
- Students will be able to identify where foods go on the MyPlate.
- Students will be able to identify the plate portion for each food group (i.e. ½ plate fruits and vegetables).

Directions

1. Pass out MyPlate sheets to the students and put the MyPlate picture up on the projector. Ask the following question: what is the purpose of MyPlate? What message does it send to us? Answer: MyPlate illustrates the five food groups that are the building blocks for a healthy diet using a familiar image—a place setting for a meal. One of the main goals is to make ½ of the plate fruits and vegetables.

   Ask the students: Why do you think MyPlate messages tell us to eat ½ plate fruits and vegetables?

   Answer: Fruits and vegetables are packed with vitamins and minerals that our bodies need to stay strong and healthy and prevent disease. Many fruits and vegetable consist of antioxidants. These antioxidants prevent oxidation, which means it helps to prevent cancer. Most Americans don't eat enough fruits and vegetables and eat too much of the other plate parts. When we eat too much food and don't exercise, our bodies can get sick (i.e. obesity, heart disease, diabetes, cancer).

   - Pass out food cards (1 per student) and a blank MyPlate. Explain that you are going to review each part of the MyPlate. For each plate part, ask the students who have "protein" foods (for example) to name their food card out loud. Review all the plate parts with the students and foods that fit in each part. Use props to show portion sizes and ask students to name examples of foods that fit into each food group. After

reviewing each plate part, instruct each student to plan a meal consisting of all parts of the plate. Students can draw or write this meal on the blank MyPlate handout.

- Fruits: Any fruit or 100% fruit juice (limit to 6 oz. per day) counts as part of the Fruit Group. Fruits may be fresh, canned, frozen, or dried, and may be whole, cut-up, or pureed. Ages 9-18 need 1 ½ to 2 cups per day. 1 cup of fruit is the size of your fist. You can use props to show portion sizes.

- Vegetables: Any vegetable or 100% vegetable juice (limit to 6 oz. per day) counts as a member of the Vegetable Group. Vegetables may be raw or cooked; fresh, frozen, canned, or dried/dehydrated; and may be whole, cut-up, or mashed. Eat a rainbow of vegetables to get all your vitamins and minerals (i.e. dark green, reds, oranges, and yellows). Ages 9-18 need 2 ½ to 3 cups. Show the ½ measuring cup. The new school lunch regulations require students to take at least ½ cup fruit or vegetable.

- Protein: All foods made from meat, poultry, seafood, beans and peas, eggs, processed soy products, nuts, and seeds are considered part of the Protein Foods Group. Beans and peas are also part of the Vegetable Group. Ages 6-18 need about 5 to 6 ½ ounces per day. In general, 1 ounce of meat, poultry or fish, ¼ cup cooked beans, 1 egg, 1 tablespoon of peanut butter, or ½ ounce of nuts or seeds can be considered as 1 ounce equivalent from the Protein Foods Group. 3 ounces of meet is the size of a deck of cards.
- Grains: Any food made from wheat, rice, oats, cornmeal, barley or another cereal grain is a grain product. Bread, pasta, oatmeal, breakfast cereals, tortillas, and grits are examples of grain products. Grains are divided into 2 subgroups, Whole Grains and Refined Grains. Whole grains contain the entire grain kernel — the bran, germ, and endosperm. Choose 100% whole grains. Ages 9-18 need about 3-4 ounces per day. One slice of bread, 1 cup cereal, and ½ cup rice is about 1 ounce.

- Dairy: All fluid milk products and many foods made from milk are considered part of this food group. Most Dairy Group choices should be fat-free or low-fat. Foods made from milk that retain their calcium content are part of the group. Foods made from milk that have little to no calcium, such as cream cheese, cream, and butter, are not. Calcium-fortified soymilk (soy beverage), almond milk, and rice milk is also part of the Dairy Group. Ages 9-18 need 3 cups of dairy per day.

- Oil: Oils are fats that are liquid at room temperature, like the vegetable oils used in cooking. Oils come from many different plants and from fish. Oils are NOT a food group, but they provide essential nutrients. Therefore, oils are included in USDA food

patterns. Examples are olive oil, canola oil, soybean oil, and safflowers oil. Ages 9-18 need 5-6 tea spoons per day. Most people get enough oil from foods they eat such as fish, nuts, seeds, and salad dressing.

- Empty calories: Also known as "extras." Americans eat and drink these foods that have added sugars and added saturated fats.

2. Most Americans eat too much empty calories and extra fat. Overtime if you eat too much food and empty calories and don't exercise enough ***(at least 60 minutes per day),*** our bodies will store these extra calories as fat. Show the students the fat test tubes and 5# fat model.

Energy

Your body uses **energy** to live and move. To live, your body requires a certain amount of energy. In addition, your body needs energy for physical activity, exercise, and work. Walking to school requires energy. Playing a sport at school requires energy.

Your body gets this energy from the foods you eat. In science class you will learn that all energy comes from the sun. Plants make energy from sunlight in a process called ***photosynthesis.*** This means that you can get energy from eating plants or by eating animals that have eaten plants.

The energy you get from eating food is also stored in your body for when you need it. It is either stored in your body as **fat** or as a **carbohydrate** in a form called **glycogen**. Almost all carbohydrates are from plant food. They usually come from breads, cereals, pasta, beans, and many other plants that you eat. Our bodies change the carbohydrates to glucose to use for energy. Glucose is available in your bloodstream. If we do not need energy, our bodies will change the glucose to glycogen and store it in your muscles, or in an organ of the body, called the liver.

The human body stores energy for when you need it. Storing energy is a good thing, however, storing too much energy as fat means that a person can gain too much weight. Too much weight on the body can be hard on the body and can increase risk of diseases such as type II diabetes, hypertension (high blood pressure), metabolic syndrome and more. This is why it is important to understand **energy balance**. To understand energy balance you need to understand what a **calorie** is. A calorie is a way to express the amount of energy from food that is taken into the body and the amount of energy that is expended or "burned" during activity. The term **calorie expenditure** refers to the calories that we use.

The table below shows the calories that are needed for boys and girls at various ages and activity levels. This number also includes the your **basal metabolic rate (bmr)** or the calories needed to maintain your body at rest and for daily body functions such as eating, sleeping, digestion etc. To get your total calorie needs for the day you add your **basal metabolic rate (bmr)** with your estimated activity needs. (bmr + activity needs = daily calorie budget) ***The estimated basal metabolic rate for a healthy weight 12-13 year old is about 1,520 calories.*** This is what your body requires to maintain itself at rest. You can calculate your personal **bmr** at this website:
www.pediatriconcall.com/fordoctor/pedcalc/basel_energy_expenditure.aspx

(Estimated) DAILY CALORIE NEEDS

Gender	Age (years)	Sedentary Less than 30 minutes MVPA	Moderately Active 30-60 Minutes MVPA	Active 60 or more minutes MVPA
Child	2-3	1,000	1,000-1,400	1,000-1,400
Female	4-8	1,200	1,400-1,600	1,400-1,800
	9-13	1,600	1,600-2,000	1,800-2,200
	14-18	1,800	2,000	2,400
	19-30	2,000	2,000-2,200	2,400
	31-50	1,800	2,000	2,200
	51+	1,600	1,800	2,000-2,200
Male	4-8	1,400	1,400-1,600	1,600-2,000
	9-13	1,800	1,800-2,200	2,000-2,600
	14-18	2,200	2,400-2,800	2,800-3,200
	19-30	2,400	2,600-2,800	3,000
	31-50	2,200	2,400-2,600	2,800-3,000
	51+	2,000	2,200-2,400	2,400-2,800

Energy

Name_____Class Period_____

Directions: Circle the best answer for the questions below.

1. What process do plants use to make energy?
    a. Photogenic
    b. Kinetic Power
    c. Photography
    d. Photosynthesis

2. Fat stored in the body is called
    a. Protein
    b. Cells
    c. Glycogen
    d. Glucose
    e.
3. Too much weight on a human body can cause health problems such as
    a. High Blood Pressure
    b. Type II Diabetes
    c. Metabolic Syndrome
    d. All of the above

4. A calorie is a unit of
    a. Sugar
    b. Energy
    c. Fat
    d. Carbohydrates

5. A healthy weight 13 year old boy who plays 90 minutes of competitive soccer per day needs this many calories per day.
    a. 1800
    b. 1800-2200
    c. 2000-2600
    d. 1520

6. BMR stands for
    a. Basic Metabolism Reference
    b. Body Mass Resistance
    c. Barometric Medicine Reading
    d. Basal Metabolic Rate

Short Answer

1. How old are you?_____ How many minutes per day do you spend in physical activity?_____

2. How many calories are you estimated to need based on your age, gender, and physical activity level? _____Refer to the chart you just read.

3. In 1-2 sentences, explain the central idea of the article, "Energy."

Science Lesson 2
Agenda

1. Day 1 Homework Review and My Plate Warm-Up

- ☐ Pair Share Answers

2. Bill Nye Video—Clip #2(8:00-16:35 minutes) with guided notes

- ☐ Website for video: http://www.schooltube.com/video/8b5b475d98ac476fbdb8/Bill%20Nye%20Nutrition

3. Nutrition Fact Label Reading Activity

- ☐ Food Labels

4. Essential Question(s) Review

- ☐ How are you going to reverse the trend of physical inactivity and unhealthful eating at home, school, and in the community? How can you best care for your body? What important information can you share and how will you share it? What will you do to help create a healthy community?

5. Homework

- ☐ Balancing Act Article and Comprehension Questions
- ☐ Complete Vocabulary List

Name_____Period_____

Warm Up

What is the purpose of MyPlate?
What message does it send us?

_____

_____

_____

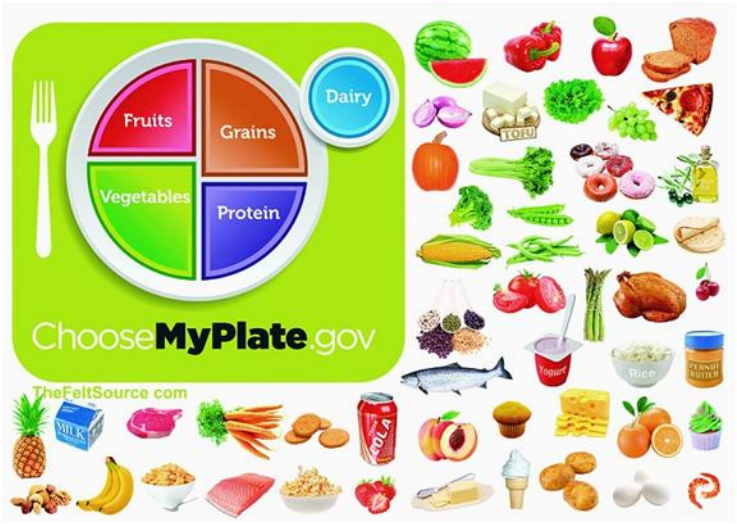
List 2 Foods for each My Plate section.

Fruits:

Vegetables:

Grains:

Proteins



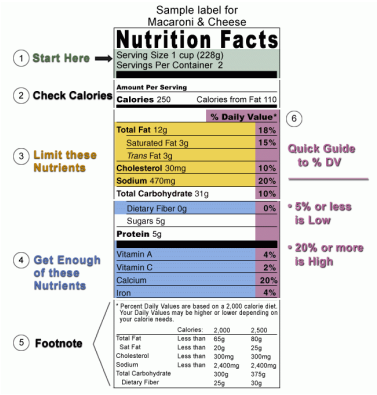
Name_____Period_____

BILL NYE THE SCIENCE GUY

Guided Notes—Video Clip 2 (8:00-16:35)

1. How do plants get minerals?_____
   _____
2. What 3 foods contain the mineral iron?
   _____
   _____
3. Why do we need iron in our body?_____
   _____
   _____
4. Where can you find nutrition facts on foods?_____
   _____
5. Name (3) things you can find on a food label? _____
   _____
6. Name 6 foods that are considered carbohydrates. _____ _____
   _____ _____ _____ _____
7. Protein is the _____ _____of the body.
8. What two foods when combined are considered a complete protein?
   _____ _____
9. We need fat to_____.

Nutrition Facts Label Reading
(15-45 minutes)



Materials

- Nutrition Fact Label Poster
- 1 box cereal
- 2 bowls
- 1 set of measuring cups
- *A Healthy Habit: Read Food Labels* tear-off sheets

Objectives

- Students will be able to explain the purpose of a nutrition fact label.
- Students will be able to locate and identify the main nutrients on the fact label.
- Read a nutrition facts label to find serving size, number of servings per container, calories, grams of fat and fiber
- Compare and contrast nutritional values of several products
- Students will be able to rate a cereal based on the fact label to determine the healthiest option

Directions: Activity 1

1. Ask the students: What is the purpose of a nutrition fact label?
   Answer: In 1990 a law was passed requiring all packaged foods to bear nutrition labeling. It's important for us to know what is in our food, and what nutrients it is or is not providing. People look at Nutrition Facts labels for different reasons. People with specific diseases, such as diabetes or heart disease need to watch their intake of sugars and fats. Other people may want to compare calories or nutrients to make better choices. This lesson will help students compare labels and make informed food choices for better health.

2. Using the nutrition fact label poster and/or *A Healthy Habit: Read Food Label* tear-off sheets, identify the serving size, number of servings per container, calories, grams of fat, and grams of fiber. Explain that the serving size tells you the size of an individual serving. The label also tells you the number of total servings.

3. Understanding the difference between the individual serving size and the number of total servings in a package can be a tricky concept. Using a box of the "sugary" cereal (as a group), determine the individual serving size and the number of servings.

4. Pick one volunteer to come to the front of class. Instruct this student to pour a "usual" bowl of cereal. Using measuring cups, measure the portion. Instruct the student to measure out one serving (as indicated on the label). This is the time to emphasize portion control!

5. As a class, answer the questions on the back of the nutrition fact label tear-off sheet.

6. Based on what was learned, invite each student to plan a healthy breakfast that contains at least 3 parts of MyPlate. Invite students to briefly share the breakfast meal plan aloud.

Activity 2

If you would like to spend more time on this lesson, complete the following activity.

Materials

- Cereal Box nutrition fact labels (class set)
- Cereal score card
- "Rate that Cereal" worksheet
- *Whole grain: Energize your Day!* Tear-off sheets

Directions

1. Ask the students what portion of our plate should be whole grains. Answer: ¼ plate

2. Ask students for examples of whole grains. Answer: brown rice, whole grain bread, whole grain pasta, whole grain corn, oats, and other whole grain cereals. All of these are served in the cafeteria!
3. Pass out Whole Grain tear off sheets. Review the whole grain kernel picture and health benefits of whole grains.

4. Pass out the *Rate that Cereal* worksheet and a cereal box nutrition fact label. As a class, work through the worksheet.

5. After everyone completed the worksheet, ask a student with the raisin bran cereal to report answers to the class. Most people think that raisin bran is a healthy option. In reality, 2 cups of raisin bran has the same amount of sugar in one can of soda!

6. Ask one student to report about his/her "A" rated cereal to the class.

7. End by the activity by reinforcing the importance of reading labels to inform food choices and eating whole grain foods.

Name:_____ Period: _____

Rate that Cereal!

Directions: Read your cereal nutrition fact label. Check to see if the product has a "whole grain" in the ingredient list, identify the grams of fiber, and identify the grams of sugar per for one serving size. Write your answers below. Using the criteria and grade information, grade your cereal.

1. Does your cereal have a whole grain listed in the ingredient list? Yes or No (circle your answer) Hint: Rice is not a whole grain unless the ingredient says "brown rice." Refer to the *Whole Grains* handout as needed.

2. If you answered yes above, write the name of the whole grain. _____

3. How many grams of fiber does your cereal have in one serving? _____ grams fiber

4. How many grams of sugar does your cereal have in one serving? _____ grams sugar

5. Using the criteria and grades information below to grade your cereal. Circle your grade.

A B C D

Criteria
One serving size contains:
1. A type of whole grain in the ingredient list
2. More than 3 grams fiber
3. Less than 8 grams of sugar

Grades
A = meets three criteria
B= meets two criteria
C= meets one criteria
D=meets no criteria

Calories In and Calories Out – It's a Balancing Act!

Energy balance includes the food or energy you take into the body and the energy you use. The energy you take in is called **caloric intake**. The energy you use is known **as caloric expenditure**. Expenditure comes from the work expend, meaning to make use of. So when your body moves, you expend calories.

People often wonder about how the body gains, loses, or maintains weight. If you watch the evening news or pick up a fitness magazine, you will notice many fad diets that promise weight loss as if it were a magic pill. The truth is, body weight is simply an energy balance between caloric intake and caloric expenditure. If you eat too many calories, your body will gain weight. If you burn more calories than you eat, your body will lose weight. To maintain body weight, you must balance the calories taken in with the calories used in all activities. There are 3,500 calories in 1 pound of body weight.

You can find the number of calories of energy for almost any food you eat. Food labels list the number of calories in food by portion size. Portion size is important because people often eat more than one portion in a sitting. Food tables also list the number of calories in food. These tables can be found in books and on the internet.

You can estimate your daily caloric expenditure if you know your weight and how many minutes you spent in physical activity. There are many resources on the internet to calculate your estimated caloric expenditure. MyPlate.org is an excellent resource for tracking both caloric intake and expenditure.

Energy Balance

Name_____Class Period_____

Directions: Circle the best answer for the questions below based on the article entitled, *Calories In and Calories Out—It's a Balancing Act!.*

1. Energy Balance is the balance between
    a. Carbohydrates and fats
    b. Food energy eaten and the energy the body uses
    c. Vitamins and minerals
    d. None of the above
2. When your body moves, it expends or burns
    a. Calories
    b. Oxygen
    c. Nitrogen
    d. None of the Above

3. If you eat more calories than you expend, you will
    a. Lose Weight
    b. Maintain Weight
    c. Gain Weight
    d. Become Underweight

4. If you eat less calories than you expend, you will
    a. Lose Weight
    b. Maintain Weight
    c. Gain Weight
    d. None of the above

5. Food Labels can tell you
    a. How many calories are in a serving size
    b. How much you should weigh
    c. How many minutes you should exercise
    d. All of the above.

Short Answer:

1. Suzie wants to lose one pound per week. How many calories is one pound? _____

2. If Suzie wants to lose 1 pound per week, for four weeks, how many calories does she need to expend over the four weeks? _____.

3. Suzie likes to run. If she wants to lose 1 pound per week, for four weeks, how many minutes of running does she need to do? She expends 100 calories for every 10 minutes of running.

Science Lesson 3
Agenda

1. Homework Review & Nutrition Fact Label Warm-Up
2. Bill Nye video—Clip #3 (16:35-23:03 minutes) w/ guided notes
   - ☐ Website for video: http://www.schooltube.com/video/8b5b475d98ac476fbdb8/Bill%20Nye%20Nutrition
3. Portion Size Matters activity
   - ☐ Portion Size PowerPoint
   - ☐ Portion Distortion PowerPoint (review 5-6 examples) http://hp2010.nhlbihin.net/portion/
4. Wellness Walk with Partner Vocab Flashcard Review (optional)
5. Essential Question(s) Review
   - ☐ **Based on what you learned today, how can you help reverse the trend of physical inactivity and unhealthful eating at home, school, and in the community?** How can you best care for your body? What important information can you share and how will you share it? What will you do to help create a healthy community?
6. Homework—Food for Fitness Article
   - ☐ Students must create 5 multiple choice questions and 5 short answer questions and provide answers using the article.

Name_____Period_____

Warm-Up

What is the purpose of a Nutrition Fact Label?

Kellogg's
Frosted Flakes®

Nutrition Facts
Serving Size 3/4 Cup (30g)

Amount Per Serving	Cereal	with ½ cup skim milk
Calories	110	150
Calories from Fat	0	0
	% Daily Value*	
Total Fat 0g*	**0%**	**0%**
Saturated Fat 0g	**0%**	**0%**
Trans Fat 0g		
Polyunsaturated Fat 0g		
Monounsaturated Fat 0g		
Cholesterol 0mg	**0%**	**0%**
Sodium 140mg	**6%**	**9%**
Potassium 35mg	**1%**	**7%**
Total Carbohydrate 27g	**9%**	**11%**
Dietary Fiber less than 1g	**3%**	**3%**
Sugars 11g		
Protein 1g		
Vitamin A	10%	15%
Vitamin C	10%	10%
Calcium	0%	15%
Iron	25%	25%
Vitamin D	10%	25%
Thiamin	25%	30%
Riboflavin	25%	35%
Niacin	25%	25%
Vitamin B_6	25%	25%
Folic Acid	25%	25%
Vitamin B_{12}	25%	35%

* Amount in cereal. One half cup of skim milk contributes an additional 40 calories, 65mg sodium, 6g total carbohydrates (6g sugars), and 4g protein.
** Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat. Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Potassium		3,500mg	3,500mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Ingredients: Milled corn, sugar, contains 2% or less of malt flavoring, salt, BHT for freshness.
Vitamins and Minerals: Iron, vitamin C (ascorbic acid and sodium ascorbate), niacinamide, vitamin B_6 (pyridoxine hydrochloride), vitamin B_2 (riboflavin), vitamin B_1 (thiamin hydrochloride), vitamin A palmitate, folic acid, vitamin D, vitamin B_{12}.
CORN USED IN THIS PRODUCT CONTAINS TRACES OF SOYBEANS.

_____

_____

_____

_____

_____

List 2-3 things you learned about your cereal.

1.

2.

3.

Name_____Period_____

BILL NYE THE SCIENCE GUY

Video Clip 3(16:35-23:03 minutes)—*Guided Notes*

1. Foods with calories but no nutrients are called _____.

2. Explain what fiber does for the body. _____
   _____

3. Name 3 types of food that contain fiber. _____
   _____ _____

4. What is "waste" in the body?_____
   _____

5. Explain the simile, "Not eating breakfast is like trying to drive a car without any gas."
   _____
   _____

Review:

6. If you eat more calories than you expend, you will _____.

7. Nutrients help the body absorb _____and _____

8. Draw a My Plate below showing what you ate for breakfast today. Was this a balanced meal? Explain.

Portion Size Matters!

(15-45 minutes)

Materials

- MyPlate Poster
- *Handy Portion* handouts
- *Portion Distortion* handouts
- *US Food Plate* handouts
- Portion Models box
- Fat test tubes
- Portion Size PowerPoint
- Portion Distortion PowerPoint
  (Source: National Heart, Lung, and Blood Institute Obesity Education Initiative)

Directions for 15 Minute Lesson

1. Pass out handouts as needed. Begin the warm-up with a discussion. Ask the class to explain what they already know about "portions." Answer: A "portion" is the amount we are served and/or the amount of food we put on our own plate. Ask: How have portion sizes changed over the years? Answer: Portion sizes have increased over the years. Restaurants are serving a lot of food (too much food) and plate sizes have increased. Serving sizes are the proper, recommended amount of food we should be served, but large portions have superseded this recommendation. As a result, many Americans eat too much food or unhealthy foods and oftentimes are not physically active. These individuals have a positive energy balance, which means that more calories are consumed than used. These extra calories are stored as fat in the body.

2. If we follow the MyPlate recommendations (eat ½ plate fruits and vegetables) and exercise at least 60 minutes per day, are bodies will be healthy!

3. Continue with the Portion Distortion PowerPoint from the National Heart, Lung, and Blood Institute Obesity Education Initiative.

Directions for a 45 minute lesson

1. Use the Portion Size Power Point to facilitate the lesson.

2. Finish the lesson with the Portion Distortion PowerPoint from the National Heart, Lung, and Blood Institute Obesity Education Initiative

Food for Fitness

Food is fun to eat, but what does it really do? Food provides the basic nutrients required for growing, repairing, and maintaining every part of your body. Food and beverages provide the water that every cell of your body needs to function and to keep you cool during exercise. Food also provides the energy needed to fuel the body during athletic training and competition. Without the right amount and mix of food as well as sufficient water, you may find yourself:

- hungry
- Irritable
- Unable to concentrate
- Losing weight
- Tired
- Missing your period (if you're female)
- Frequently injured or sick
- Not growing properly

Energy Givers

Most of your daily calories—50 to 60 percent—should come from complex carbohydrates such as potatoes, fruits, and vegetables, as well as the whole grains found in cereals, bread, rice, and pasta. Growing bodies depend on these powerhouse foods. Your body slowly digests and breaks down complex carbohydrates into glucose, allowing the energy it contains to be released in a steady, measured, prolonged fashion.

Glucose is taken from the bloodstream to be used as the body's main source of energy. If it's not needed right away, the glucose is stored in the muscles and liver as glycogen. Any stored glycogen that isn't used for energy within a day or two goes into long-term storage as fat.

Sugar Highs and Lows

Simple carbohydrates are found in processed foods like candy, cakes, and cookies. They are broken down into glucose quickly so that your body gets a large, sudden jolt of fast energy. Just one candy bar can give you a sugar high, but that good feeling only lasts about one hour before your body says "Enough!" It can't handle the introduction of too much glucose in the bloodstream at one time, so it sweeps it all into storage.

When this happens, you are left with less glucose available for energy than you had before eating the candy bar. You begin to feel tired, hungry, and cranky. Now your lowered blood sugar level makes you want to eat again. If you choose another sugary treat, you'll fall into the same trap again, and the cycle will repeat. Only complex carbohydrates can give you the sustained, steady energy level you're looking for.

Your blood sugar will become low if you miss a meal, too. So, to keep your energy level steady, eat three healthy meals each day and two small, healthful snacks as needed. This measured eating schedule will also help with weight control. Eating smaller, more frequent meals boosts the rate at which you burn calories throughout the day and keeps your blood sugar levels steady, reducing the likelihood of binge snacking. .

The Importance of Breakfast

After sleeping all night, your body is begging for breakfast. It's the most important meal of the day because it kick-starts your body's engine. Start the day with a well-balanced breakfast like a bowl of whole grain cereal with low-fat milk (or whole wheat

toast), a banana (or other fruit or juice), and some yogurt (preferably an all-natural kind that does not include sugar, high fructose corn syrup, or artificial flavors).

Research has found that kids who eat breakfast before school improve their test scores, miss fewer days of school, are happier, and are more energetic. They also have more strength and endurance, concentrate better, and solve problems more easily.

Muscle Makers

Protein has a crucial role to play in maintaining the body's health and boosting energy levels. Protein's main purpose is to grow and repair all of our body tissues, including muscles, tendons, bones, organs, teeth, hair, and skin. Protein has a secondary role as an emergency source of energy, but this only kicks in when you aren't eating enough food, particularly carbohydrates. Protein-rich food includes meat (beef, poultry, and pork), fish, milk, eggs, peas, beans, and nuts. Between 15 and 20 percent of your daily calories should come from protein.

Fat's Function

Too much body fat and dietary fat (the fat you eat) is unhealthy, but fat isn't all bad. Body fat protects our vital organs. It stores and helps our bodies use certain vitamins. It keeps us warm. The fats in foods make us feel full so we don't keep eating. Stored fat is used for energy when the body is very active for long periods. Growing bodies need about 25 to 30 percent of their caloric intake to come from fats. Some fats are better for us than others. The best are unsaturated fats containing essential fatty acids, which help keep our bodies healthy. Essential fatty acids make and repair cell membranes and help cells efficiently obtain nutrition and eliminate waste products. They also play a role in regulating heart rate, blood pressure, blood clotting, fertility, conception, and infection fighting. Unsaturated fats include plant oils like olive, soybean, canola, corn, sunflower, and peanut oil.

Sad to say, the saturated fats and trans fats in butter, cakes, ice cream, fried food, and much commercially packaged food and snacks are harmful and are to be avoided. They boost levels of bad cholesterol and decrease good cholesterol, leading to heart disease and possibly diabetes. The Food and Drug Administration recommends that trans fats should account for no more than 1 percent of your daily caloric intake (or only 2 grams if you are on a 2,000 calorie/day regimen).

Water's Wonder

Water makes up about two-thirds of your body and is essential to continued life. Water is important to digestion because it assists in breaking down and absorbing nutrients. It then helps to deliver those nutrients through the bloodstream and to all parts of your body. It helps your muscles to contract (which is essential to movement). It keeps your body at the right temperature. Water also ends up as urine and sweat, removing waste from your body.

For water to do all that work, it must be replenished. It's believed that the average person loses anywhere from four to ten cups of water a day through sweating, excretion, and other bodily functions. What we eat and drink has to make up that daily deficit. The food we eat contains enough water to supply about four cups of water. Additional water can be gained from beverages, including tap and bottled water, juice, and milk. Coffee and tea contain caffeine and can cause dehydration. Lastly, the more you exercise, the more you will need in the way of fluid replenishment (see "Win with Water" below).

Micronutrients

The word "micro" means "small." Vitamins and minerals are called micronutrients because we need only small quantities of them. Although they don't supply energy, vitamins and minerals are vital because they do keep the body working properly.

Consider your bones. Between the ages of nine and fourteen, your bones are growing. Although the building of bone mass (their density and thickness) continues throughout the early twenties, most young people's bones stop growing and lengthening by their mid- to late teens. To reach their full size and strength, bones need the nourishment of food and the beneficial stress of exercise.

You can't build your bones without calcium. This mineral is found in dairy products such as milk and cheese, leafy green vegetables, and fish such as salmon. You also need vitamin D to help your body absorb calcium. Milk is a good source of vitamin D. Your skin also produces vitamin D. It is recommended that you try to be out in the sun without sunscreen for about

fifteen minutes, three to four times a week. Millions of kids are getting too little of this bone-building vitamin, partly because they are chugging soft drinks instead of milk.

Another mineral second only to calcium in bone-building is phosphorous. It is found in eggs, milk, and meats. Phosphorous is also found in soft drinks. But when considerably more phosphorus is consumed than calcium, phosphorus can actually begin to interfere with the body's ability to absorb calcium. This is because vitamin D is required by the body to properly metabolize phosphorus and calcium. An excess of phosphorus means that there will be less vitamin D available to metabolize calcium and promote bone growth and strengthening.

Bones need exercise in order to develop. The pull of muscle against bone signals to the body that it must grow bigger and stronger bones. If you get too little exercise, your bones do not become as strong as they could be.

Exercise is also crucial to maintaining a healthy heart and good circulation, but it isn't enough by itself. You also need two minerals: iron and potassium. Iron helps bring oxygen to your blood and the cells of your body. An iron deficiency can lead to a loss of strength and endurance, so that exercise will tire you out faster. To make sure you have enough iron, eat red meat, egg yolks, beans, nuts, green vegetables, and raisins. Potassium helps your heart beat and your muscles move. It is found in bananas, oranges, peanuts, peas, beans, potatoes, yogurt, and meat. A potassium deficiency can result in tiredness and muscle weakness, slow reflexes, and dry skin. In extreme cases, it can even lead to heart failure and death.

Food and the Playing Field

Whether you like to spend your free time playing sports or playing on the computer, you have the same basic nutritional needs. However, physically active teenagers will need to take in more calories to fuel their activities. The longer and harder you exercise, the more calories you need to consume because sports and other physical activities demand a lot of energy.

What you eat can directly affect how you perform on game day. When you're pushing your body to perform at its peak level, you need to eat food packed with the nutrients that will make you strong and healthy by building, repairing, and maintaining your body's cells. You need the food that will provide the energy you need to play for the duration of the game, in addition to the energy already required by your body for normal daily life and growth spurts. So what's the best plan for feeding such an active body?

It's especially important to be well fueled before you start exercising. Without the right amount and type of food, your chance of getting sick, exhausted, or injured increases. If you participate in after-school sports, eat a good breakfast, a midmorning snack, a hearty lunch at noon, and a small snack at around 2 p.m. Good snacks are fruit, yogurt, peanut butter or cheese crackers, granola bars, and low-sugar, high-fiber cereals like Cheerios and Wheat Chex. If you skip that last snack and then have sports practice around 3 or 4 p.m., you may feel shaky and light-headed.

Don't overeat, however. A full belly may make you feel so uncomfortable and cramped that you don't play well. Besides, food that's still in your stomach and not yet digested won't help you during a game. The energy it could provide has not yet been released through digestion.

Win With Water: Notice how you sweat while playing a sport? Well, a lot of water is lost during vigorous exercise, through both sweating and respiration (breathing, which typically gets heavy during vigorous exercise). If you don't drink enough water to make up this fluid loss, you may become dehydrated. Dehydration makes it harder for the body to do its work and interferes with sports performance. It can cause headaches, pain, and fatigue.

Experts recommend drinking 16 ounces (or 2 cups) of water approximately an hour before vigorous physical activity. (One gulp equals about one ounce.) Drink 6 ounces (or 3/4 cup) about every fifteen to twenty minutes during the activity, and 16 ounces (or 2 cups) per pound of weight loss within two hours of the activity. Also, after exercising, eat a snack with protein and carbohydrates to help your muscles recover faster.

Reviewed by: Susan Drake, MSRD
Updated: August 2011 **Article Citation:**

"Food and Physical Activity." *Teen Health and Wellness*. Rosen Publishing Group, Inc., 2013. Web. 19 Feb. 2013 <http://www.teenhealthandwellness.com/article/156/food-and-physical-activity>

Name_____Period_____

Food for Fitness

Directions: Read the article "Food for Fitness." Underline or highlight important facts in the article as you read. Write a one paragraph summary of the article in your own words. Then create 6 questions with answers using the information from the article. Three (3) questions must be multiple choice. Three (3) questions must be short answer. Use both sides of this paper for your questions.

Paragraph: Write 5-7 sentences in your own words.

Multiple Choice Questions: Write 3 multiple choice questions.

Short Answer Questions: Write three short answer questions.

Science Lesson 4
Agenda

1. Energy Balance Warm-Up

   ☐ Pair Share your answers

2. My Plate Scavenger Hunt & Worksheet (computers needed)

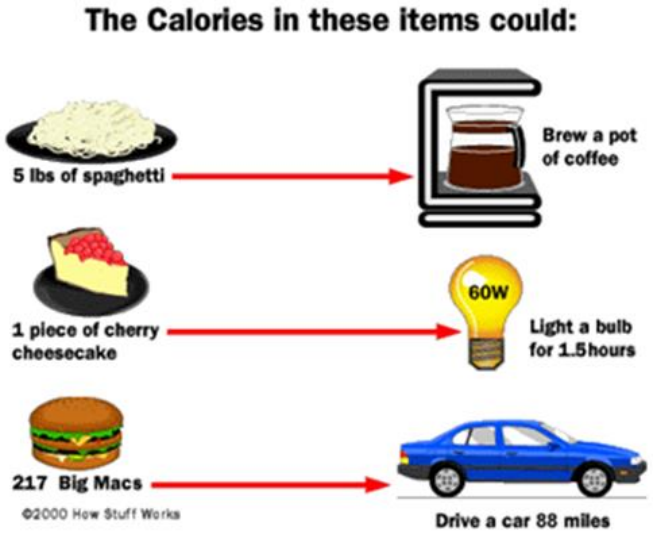
   ☐ www.myplate.gov

3. Essential Question(s) Review

   ☐ **Based on what you learned today, how can you help reverse the trend of physical inactivity and unhealthful eating at home, school, and in the community?** How can you best care for your body? What important information can you share and how will you share it? What will you do to help create a healthy community?

4. Homework

   ☐ Vocabulary Worksheet

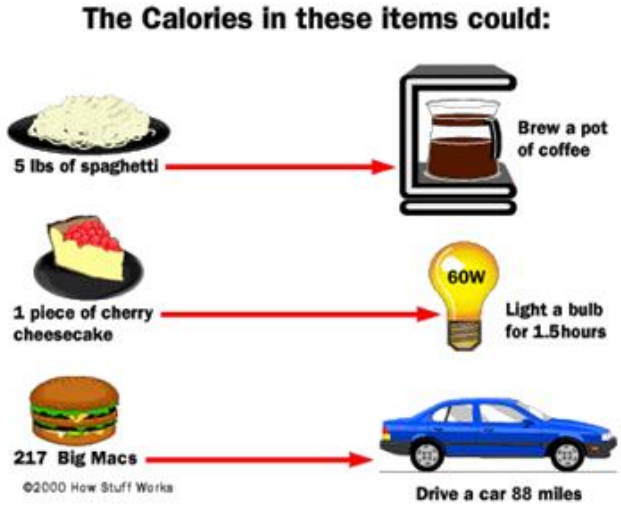


Name_____Period_____

Energy Balance Warm-Up

What is the difference between caloric intake and caloric expenditure?
What happens if caloric intake is greater than caloric expenditure?

_____
_____
_____
_____
_____
_____



Day 4

MyPlate Scavenger Hunt
(25 minutes)

Materials

- Projector & Internet Capability (if in classroom) Or computer lab computers
- MyPlate Scavenger Hunt worksheet (page 2)

Objectives

- Students will be able to navigate the www.MyPlate.gov website
- Students will be able to look up questions pertaining to MyPlate and locate the answers.

Directions

4. This activity can be done in the classroom or in the computer lab. If facilitated in the classroom, the teacher will navigate through the website to the pages needed to answer the questions on the worksheet. If you reserve a computer lab, students can navigate the website indecently to answer the work sheet questions.
5. Go to www.MyPlate.gov to begin!
6. Answer all the questions on the worksheet.
7. Review answers as a class.

Name_____Period_____

MyPlate Scavenger Hunt Worksheet

Direction: Go to www.myplate.gov. Navigate the website to answer the following questions about MyPlate.

Questions:

1. Name one health benefit of eating fruits. _____
2. Name one example of a dark green vegetable. _____
3. Name one health benefit of eating vegetables. _____
4. How many cups of fruit and vegetables does it recommend you eat in 1 day?

   _____ cups fruit _____ cups vegetable
5. In regard to "Grains," what is the "key consumer message?"

   _____
6. Name one example of a whole grain. _____
7. What is one health benefit of eating nuts and seeds? (hint: These are protein foods.)

   _____
8. What is the "key consumer message" for the dairy group?

   _____
9. Name one type of oil. _____
10. Name one way to increase physical activity.

    _____

Name_____Period_____

Vocabulary Worksheet

Directions: Review your vocabulary words. Write 10 sentences using the vocabulary words. Bonus points may be earned if you can use 2 or more vocabulary words in the same sentence.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Science Lesson 5
Agenda

1. Homework Review

2. Rethink Your Drink (RYD) Warm-Up
   - ☐ RYD 30 second clip—*I Got This!* http://www.youtube.com/watch?v=22haRfyWOJw
   - ☐ *Ingredients for Dynamic Demonstration* Use this guide, located in the appendix, to conduct a 15 minute introduction about sugary beverages

3. Re-think Your Drink 2-minute video
   - ☐ http://www.youtube.com/watch?v=iP-haqmmXyY&list=PL7EEDEB821D412975

4. *Sugar Savvy Students—Three Days of Activities* (grades 6-8)packet
   - ☐ Use this lesson plan, located in the appendix, to facilitate one or more RYD activities

5. Essential Question(s) Review
   - ☐ Based on what you learned today, how can you help reverse the trend of physical inactivity and unhealthful eating at home, school, and in the community? How can you best care for your body? What important information can you share and how will you share it? What will you do to help create a healthy community?

6. Assign food log homework. Complete an example meal as a class.

ReThink Your Drink (RYD) Activity

(15 minutes to 3 class periods)

Materials

- *Ingredients for Dynamic Demonstration* packet (located in appendix)
- *Sugar Savvy Students—Three Days of Activities* (grades 6-8)packet (located in appendix)
- Rethink Your Drink poster
- Sugar test tubes, sugar, & measuring spoons
- Sugary beverage nutrition fact labels

Directions

Review and use the packet entitled *Ingredients for Dynamic Demonstration* to facilitate a 15 minute Rethink Your Drink warm-up. If you would like to spend more time on this content, use the *Sugar Savvy Students—Three Days of Activities* (grades 6-8) packet to conduct a series of nutrition lessons.

Resources

The following sites have great resources to utilize in the classroom such as RYD posters and activity sheets.

- **Center for Disease Control**

  http://www.cdc.gov/healthyweight/healthy_eating/drinks.html

- **Network for Healthy California—Gold Coast Region**

  http://www.goldcoastnetwork.org/gc_resources.htm#rethink_title

Healthy Living ...for life!

Alameda County Public Health Department

Sugar Shockers!

Popular Food Items Ranked by Amount of Sugar

Food	Typical Serving	Calories	Sugar (g)	Sugar (tsp)
McDonald's Triple Thick Choc Shake (medium)	16 oz	580	84	21
Pepsi Cola (regular)	20 oz	250	69	17
Rockstar Energy Drink	16 oz	280	62	16
Wendy's Vanilla Frosty (medium)	16 oz	410	59	15
Jarritos Mandarina Drink	13.5 oz	220	58	15
Classic Cinnabon	1 roll	850	51	13
Snapple Lemonade Iced Tea	16 oz	220	50	13
McDonald's Deluxe Breakfast (w/ regular sized biscuit)	1 meal	1270	49	12
Starbucks Grande Mocha Frappuccino (no whipped cream)	16 oz	260	45	11
Dryer's Grand Rainbow Sherbet	1 cup	260	48	12
Tropical Skittles (regular sized bag)	2.17 oz	250	47	12
Original Gatorade	20 oz	125	35	9
Vitamin Water	20 oz	125	32	8
Pancake Syrup	¼ cup	210	32	8
Plain M&Ms (regular sized bag)	1.69 oz	240	31	8
Snickers (regular bar)	2.07 oz	280	30	8
Yoplait Yogurt (flavored, 99% fat free)	6 oz	190	28	7
Otis Spunkmeyer Wild Blueberry Muffin	1 muffin	330	27	7
Red Bull Energy Drink	8 oz	110	27	7
Cap'n Crunch Cereal	1.5 cups	220	24	6
Bubble/Boa Tea	12.7 oz	207	22	6
Gummi Bears	22 bears	150	22	6
Sunny D Tangy Original Style	6.75 oz	120	16	4
Capri Sun Fruit Drink (small pouch)	6 oz	60	16	4
SpaghettiOs	1 cup	180	13	3
Nutrigrain Mixed Berry Cereal Bar	1 bar	130	12	3
GoGurt	2.5 oz	70	10	2
Soy Vay Teriyaki Sauce	1 tbsp	30	5	1
Subway Turkey Breast Salad	1 salad	110	5	1
Newman's Own Low-fat Sesame Ginger Dressing	2 tbsp	35	4	1
Kellogg's Special K Cereal	1 cup	120	4	1
Subway Fat Free Italian Salad Dressing	1 packet	35	4	1
Del Monte Ketchup	1 tbsp	15	4	1

Please note: Product formulations, as well as packaging and portion size, may change over time. As a result, ingredients, amounts listed, and nutrition information may change.

CHAMPIONS for CHANGE

Alameda County Public Health Deparment • Nutrition Services • 3600 Telegraph Ave. • Oakland, CA 94609 • 510-595-6454 • www.healthylivingforlife.org

For important nutrition information, visit www.cachampionsforchange.net. For food stamp information, call 877-847-3663. Funded by the USDA Supplemental Nutrition Assistance Program, an equal opportunity provider and employer. • California Department of Public Health

Revised June 2010

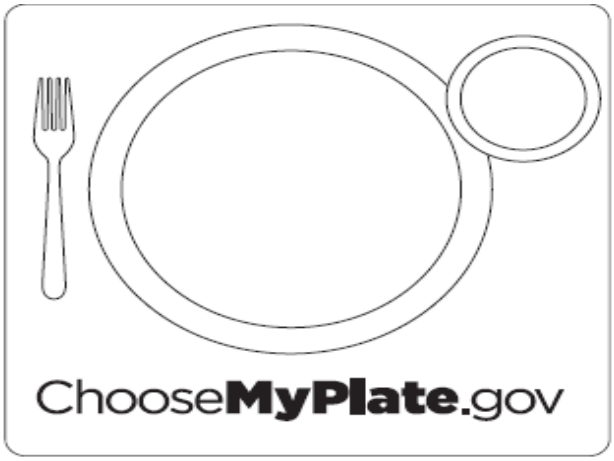
Three Day Food Log—Option 1

Name_____Period_____

Directions: Draw pictures of the food you eat at each meal for three consecutive days. Write the serving and description of the food in the space provided next to each plate. Label each food as a fruit, vegetable, whole grain, protein, or dairy food. Foods like soda, cookies, potato chips, and donuts are empty calorie foods and do not fit into any MyPlate category.

Date:_____

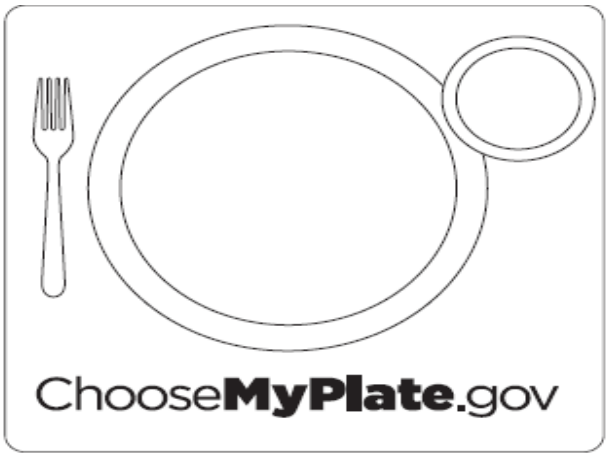
BREAKFAST



_____
_____
_____
_____
_____
_____
_____

Date:_____

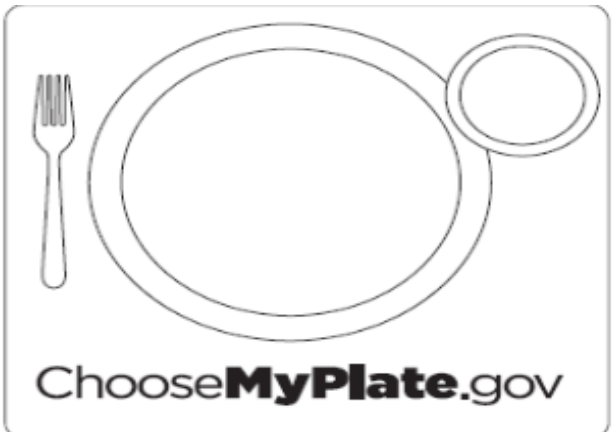
LUNCH



_____
_____
_____
_____
_____
_____
_____

Date:_____

DINNER

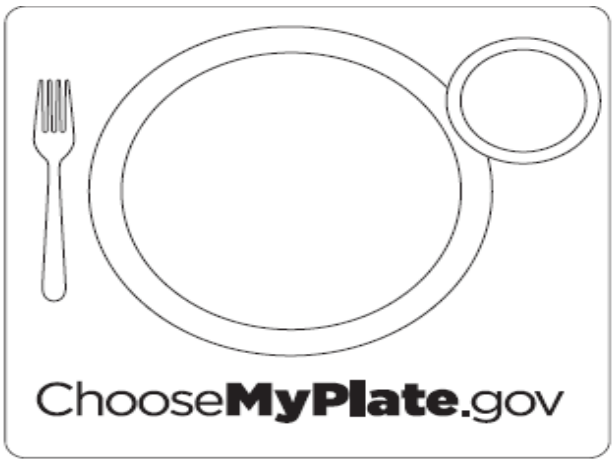


_____
_____
_____
_____
_____
_____
_____

SAMPLE

Date: Thursday, 8/26/13

BREAKFAST



2 Scrambled Eggs – protein

2 slices whole grain toast-whole grain

1cup Orange juice 100% - fruit

4 large strawberries – fruit

1 small donut—empty calories

Food & Activity Log—Option 2

Name_____Date_____Period_____

Student Data:

Basal Metabolic Rate_____*(calories you need at rest/body functions)*

Total Daily Calorie Allowance_____*(based on daily activity level)*

BREAKFAST	SERVING SIZE	CALORIES

LUNCH	SERVING SIZE	CALORIES

DINNER	SERVING SIZE	CALORIES

SNACKS	SERVING SIZE	CALORIES

Total Calorie Intake _____

\-

Approximate Total Energy Expenditure _____

Physical Activity Minutes: _____

Total Calories _____

Reflection: (see sample on back)

Did you balance your energy today? YES NO Explain in 3-5 sentences why or why not and how you can improve or maintain your energy balance tomorrow.

Food & Activity Log *(student sample)*

Name_____Date_____Period_____

Student Data:

Basal Metabolic Rate_____1,520_____ *(calories you need at rest/body functions)*

Total Daily Calorie Allowance_____1800_____ *(based on daily activity level)*

BREAKFAST	SERVING SIZE	CALORIES

LUNCH	SERVING SIZE	CALORIES

DINNER	SERVING SIZE	CALORIES

SNACKS	SERVING SIZE	CALORIES

Total Calorie Intake 2,050

Total Energy Expenditure - 150

Activity: PE Class 30 min

Total Calories 1,900

Reflection:

1. Did you balance your energy today? YES NO Explain in 5-6 sentences why or why not and how you can maintain or improve your energy balance tomorrow.

I did not balance my energy today. I ate more calories than I burned (100 more). My caloric intake is too high because I ate too many snacks that were high in calories. I also didn't exercise enough in PE class today so I did not burn enough calories to balance my snacking. Tomorrow I will choose healthier snacks and try to increase my fruit and vegetable intake. I also have soccer practice tomorrow so I can eat more because I will burn more energy there.

SAMPLE FOOD ITEMS

Utilize USDA's Food-a-Pedia to research nutritional facts

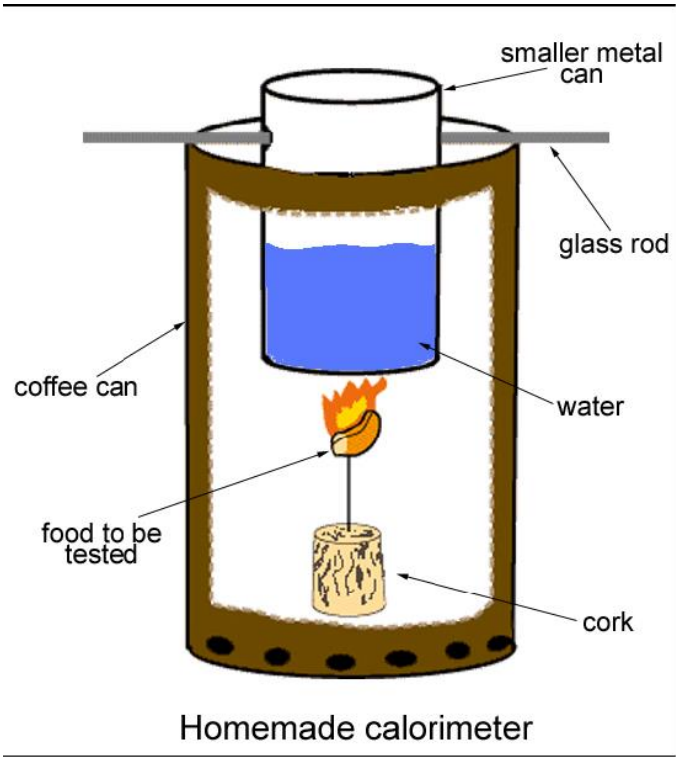
-https://www.choosemyplate.gov/SuperTracker/foodapedia.aspx

Breakfast type items	**Serving Size**	**Calories**
Blueberry muffin	1	160
Nutri-Grain strawberry bar	1 bar	140
Oatmeal, maple & brown sugar, instant	1 packet	160
Cheerios	1 cup	110
Frosted Mini-Wheats	5 biscuits	175
Honeycomb	1 cup	86
Rice Krispies	1 cup	102
Trix	1 cup	88
Bagel	1 large	365
Pancake, frozen	1	92
Entrée items	**Serving Size**	**Calories**
Cheese pizza	1 medium slice	290
Taco Bell 7-layer burrito	1	520
Bean burrito	1	225 - 400
Enchiladas with cheese	1	320
Cheese quesadilla	1	550
Nachos with beef, beans, cheese & peppers	1	570
Hamburger, double patty, large, with condiments, vegetables and mayonnaise	1	942
Cheeseburger, large with vegetables and condiments	1	480
McDonalds Big Mac	1	590
Hamburger, single large patty, condiments, vegetables and mayonnaise	1	560
Ham & cheese sandwich	1	350
Turkey with mayonnaise sandwich	1	330
Spaghetti & meat balls with tomato sauce, prepared	1 ½ cup, 2 oz meat	350
Fried chicken	1 piece	225 - 325
Crispy chicken salad with honey mustard	1 salad	700
Caesar salad, with chicken, no dressing	1	220
Fruits and Vegetables (grains)		
Apple-raw with peel	1 medium	95
Banana	1 medium	105
Carrots, raw	½ cup	25
Green peppers	10 strips	5
Mango	½ fruit	67
Mashed potatoes	½ cup	85-115
Orange juice	½ cup	56
Pear	1 medium	105
Refried beans, canned	½ cup	119
Rice	½ cup	100
Tomato	1 medium	20
Beverages	**Serving Size**	**Calories**
Tap water	12 ounces	0
Coca-Cola Classic	12 ounces	98
Root beer	12 ounces	160
7-Up	12 ounces	150
Sunny Delight	12 ounces	195
Gatorade Thirst Quencher	12 ounces	96
Whole milk	1 cup	146
Reduced fat 2% milk	1 cup	138
Lowfat 1% milk	1 cup	102

Science Lesson 6
Agenda

1. Measuring Calories in Food—Experiment
   - ☐ Demonstration can be performed by teacher, and students fill in individual lab reports during the demonstration.
   - ☐ Optional: students can conduct the experiment in groups. This is also a great science fair project.

1. BRAINPOP alternative nutrition activity in computer lab
   - ☐ http://www.brainpop.com/health/nutrition/nutrition/



Homemade calorimeter

Published on *SEP LESSONS* (http://seplessons.ucsf.edu/)
Source URL: http://seplessons.ucsf.edu/node/349

Measuring Calories in Food

Lesson Overview

Grade level(s):

Grade 4, Grade 5, Grade 6, Grade 7, Grade 8, Grade 9

Subjects(s):

Biology/Life Science

Topic:

Nutrition and Food chemistry

Big ideas(s):

-Understand the concept of calories and how they can be measured

-Be able to give examples of high calorie and low calorie foods

-Understand how calories relate to body weight and obesity

Vocabulary words:

Calorie, energy, high calorie food, low calorie food, physical activity, weight gain, nutrition label, carbohydrates, protein, fat, calorimeter.

What you need:

Materials needed:

- Pre-weighed food items containing 200 calories: broccoli, celery, carrots, peanut butter, butter and Hershey kisses (see weblink)
- To make a homemade calorimeter: coffee can, small metal can, 1 ml pipette, cork, paper clip,
- graduated cylinder, water bottle, thermometer (in °C), lighter, safety glasses, forceps, weigh boats, scales, gloves, lab coat,
- food item for calorimeter activity (peanuts, pop corn, Cheetos, Doritos all work well)
- hand-outs: procedure, lab report, pictures of calorimeters, formula for calculations.

Grouping:

Part 1: Concept of calories = whole class discussion

Part 2: Calorimeter = Students will work in groups of 6 students and each student will have one task:

1. Weighing the food
2. Reading the temperature of the water
3. Recording the data
4. Assembling the calorimeter system
5. Filling the water
6. Calculation

Setting:

- The introduction will take place in the classroom.
- Building the calorimeter will occur in the classroom.
- The experiment will take place in the courtyard (burning of food items) unless you have a fume hood in your classroom.

Time needed:

- 45 minutes to introduce the topic and show example foods.
- 60 minutes to assemble calorimeter, use calorimeter and record data.
- 30 minutes to complete and discuss the lab report.

Author Name(s): Luna Abdallah, Elinor Sullivan, Bethany Currin, Mathew Campana

Summary:

The lesson introduces the concept of calories and provides examples of high calorie and low calorie foods. Students learn a number of ways to determine how many calories a food item has and discuss how calories influence body weight. Students learn how to measure calories by constructing and using a calorimeter.

Prerequisites for students:

Required skills:

- using balance to weight food.
- measuring volume of liquids.
- reading thermometer and measuring temperature change.
- Knowledge of basic mathematical calculations (multiplication, division and subtraction).

Learning goals/objectives for students:

Students will be able to:

- define what a calorie is.
- explain why the body needs calories and what happens to excess calories
- give examples of low calorie and high calorie food items
- read nutrition labels
- build a calorimeter using supplies from home
- use a calorimeter to determine calorie content of a food item

Content background for instructor:

A calorie is a unit of energy. We tend to associate calories with food, but they apply to anything containing energy.
A calorie is the amount of energy, or **heat**, it takes to raise the temperature of 1 gram of water 1 degree Celsius (1.8 degrees Fahrenheit).
Humans need energy to survive -- to breathe, move, pump blood, think -- and they get this energy from food.
The number of calories in a food is a measure of how much potential energy that food has.
See weblink "What does 200 calories look like" to see examples of high and low calorie foods.

We will be using a homemade calorimeter in this lesson. A particular food item will be ignited, the homemade calorimeter will trap the heat of the burning food, and the water above will absorb the heat, and cause the temperature (T) of the water to increase. By measuring the change in temperature (ΔT) of a known volume of water, students will be able to calculate the amount of energy in the food tested because the heat gained by the water will equal the heat lost by the food item.

Getting ready:

- Purchase food items including those to be burnt in calorimeter.
- Weigh out 200 calories of each food item (See weblink: How does 200 calories look like)
- Drill holes in coffee can and small can to make calorimeter assembly easier (kit with pre-assembled calorimeters is now available at SEP).
- Prepare hand-outs

Lesson Implementation / Outline

Introduction:

Have students brainstorm what a calorie is and what they know about it so far.
I. What is a calorie? A calorie is a unit of energy. Often used to describe how much energy your body gets from eating or drinking a certain food or drink.
Record responses and keywords on the board and together come up with a definition for calorie.
Assess students' misconceptions about calories by asking whether calories are bad or good for a person.
II. Are Calories Bad for You? 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 physical activity - leads to weight gain.

Activity:

Activity 1: calorie content of example food

Class Discussion:

Ask students to give examples of high versus low calorie foods.

Show students the pre-weighed amount of each food item that equals 200 calories
For this activity it is fun to have students guess for each food item how much makes 200 calories first. Put amount of food on plate until students agree that it makes 200 calories and then present them with the pre-weighed amount. This will be a shocker for some!

Show students how to determine the calorie content of various food items by reading the nutritional label. You can find out how many calories are in a food by looking at the nutrition label. (The label also will describe the components of the food - how many grams of carbohydrate, protein, and fat it contains. Here's how many calories are in 1 gram of each of the following: carbohydrate—4 calories, protein—4 calories, and fat—9 caloriee.

That means if you know how many grams of each one are in a food, you can calculate the total calories. You would multiply the number of grams by the number of calories in a gram of that food component. For example, if a serving of potato chips (about 20 chips) has 10 grams of fat, 90 calories are from fat. That's 10 grams X 9 calories per gram.

Some people watch their calories if they are trying to lose weight. Most kids don't need to do this, but all kids can benefit from eating a healthy, balanced diet that includes the right number of calories - not too many, not too few.

How do you know how many calories you need?

Kids come in all sizes and each person's body burns energy (calories) at different rates, so there isn't one perfect number of calories that a kid should eat. But there is a recommended range for most school-age kids: 1,600 to 2,500 per day.

Most kids don't have to worry about not getting enough calories because the body, including feelings of hunger, help regulate how many calories a person eats. But kids with certain medical problems may need to make sure they eat enough calories. Kids with cystic fibrosis, for instance, have to eat high-calorie foods because their bodies have trouble absorbing the nutrients and energy from food.
Kids who are overweight might have to make sure they don't eat too many calories. (Only your doctor can say if you are overweight, so check with him or her if you're concerned. And never go on a diet without talking to your doctor!)

What happens to excess Calories?

If you eat more calories than your body needs, the leftover calories are converted to fat. Too much fat can lead to health problems. Often, kids who are overweight can start by avoiding high-calorie foods, such as sugary sodas, candy, and fast food, and by eating a healthy, balanced diet. Exercising and playing are really important, too, because activity burns calories.

How Does the Body Use Calories?

Some people mistakenly believe they have to burn off all the calories they eat or they will gain weight. This isn't true. Your body needs some calories just to operate - to keep your heart beating and your lungs breathing. As a kid, your body also needs calories from a variety of foods to grow and develop. And you burn off some calories without even thinking about it - by walking your dog or making your bed.
But it is a great idea to play and be active for at least 1 hour and up to several hours a day. That means time spent playing sports, just running around outside, or riding your bike. It all adds up. Being active every day keeps your body strong and can help you maintain a healthy weight.

Watching TV and playing video games doesn't burn many calories at all, which is why you should try to limit those activities to 1 to 2 hours per day. A person burns only about 1 calorie per minute while watching TV, about the same as sleeping!

Activity 2: Calculate the amount of energy in a food item using a calorimeter

Students are provided with the lab report containing building instructions for the calorimeter, tables to record data and a formula to make calculation. Explain how calorimeter works and demonstrate how to assemble and use it.

This activity is conducted in groups of 6 students; each is responsible of a specific task. The tasks assigned are the following:

a) Weighing the food items
b) Reading the temperature of the water
c) Recording the data
d) Assembling the calorimeter system
e) Filling the water into the calorimeter
f) Calculation

Procedure:

1. Choose a food item.
2. Obtain a weigh boat and determine its weight. Record your data.
3. Obtain a food item and using the same weigh-boat, determine the weight of the food (wi). Record your data.
4. Using the graduated cylinder, measure out 100 ml of distilled water from the water bottle and pour it into the small metal can.
5. Measure the initial temperature of the water (Ti). Record your data in table 1. Make sure to leave the thermometer in the water for a while before reading the temperature.
6. Position the small can inside the large can and slide the glass rode through the holes of both cans.
7. Unfold the paper clip and insert it into the cork.
8. Gently wrap the paper clip attached to the cork around the food. It is better to have the food at a slight angle. If the food breaks, use another one; however, you will have to reweigh the new food item.
9. Place the cork with the food on a nonflammable surface (outside of under fumehood). Put on your safety glasses and call the teacher. The teacher will help you light the food. It may take a while for the food to catch on fire.
10. As soon as the food catches fire, immediately place the coffee can around the burning food.
11. Allow the food to burn until it goes out. If possible try to keep an eye on it and if it goes out quickly (less than a minute), relight the food.
12. Once the food has finished burning, **carefully** stir the water with the thermometer and then measure the temperature again (Tf). **Caution! The cans and water will be warm!** You may have to leave the thermometer in the water for a while in order to get the highest reading. Record your data.

13. **After the burnt food has cooled**, transfer it to the original weigh-boat (use the forceps if necessary) and weigh the remnants (wf). Record your data.
14. Calculate the amount of calories in the food item using the equation provided (students are shown how to calculate caloric content using a formula based on the data collected).

After the activity, the whole class discusses and compares the values obtained by each group and talks about possible sources of discrepancies between students.

Checking for student understanding: Student learning is assessed based on their answers to questions during the discussion and based on their laboratory reports.

Wrap-up / Closure: Wrap up by asking students to list something they learned in this lesson and make sure that each of the key points is discussed.

Extensions and Reflections

Extensions and connections: These activities are tied to other content areas such as math, chemistry and health.

Reflections:

- Make sure to set up an area to use the calorimeter ahead of time.
- Get adult volunteer to help burn the food.
- Try burning the food item prior to the lesson (some items do not burn well in this system).

Web Links and References

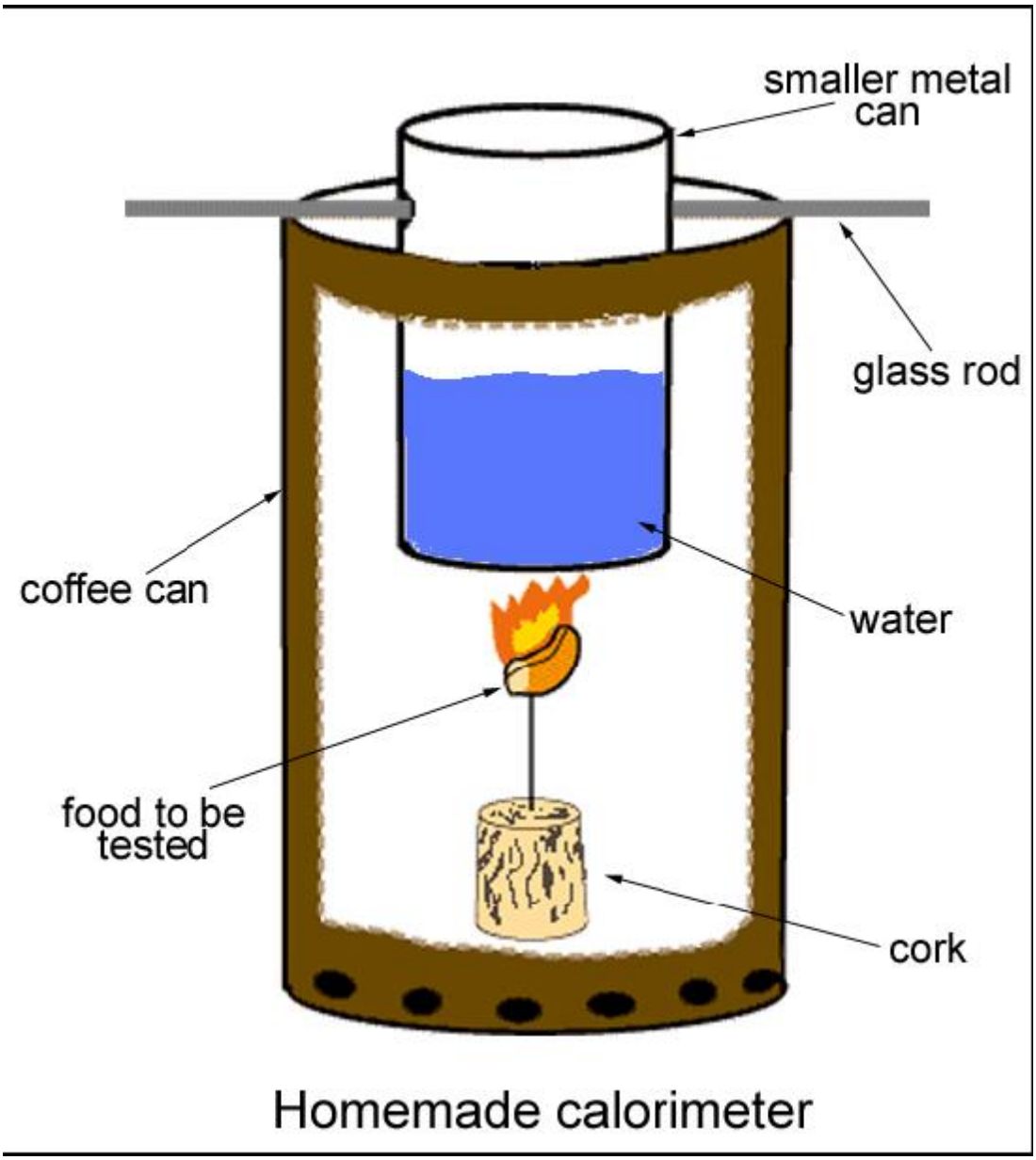
Weblinks:
Teaching Kids the Science of Calories [1]
What Does 200 Calories Look Like? [2]

What is a calorimeter?

A calorimeter (calor =Latin for heat) is a device that measures the heat generated by a chemical reaction, change of state, or formation of a solution. There are several types of calorimeters but the main emphasis of all calorimeters is to insulate the reaction to prevent heat loss.

How does a calorimeter work?

We will be using a homemade calorimeter. A particular food item will be ignited, the homemade calorimeter will trap the heat of the burning food, and the water above will absorb the heat, and cause the temperature (T) of the water to increase. By measuring the change in temperature (ΔT) of a known volume of water, you will be able to calculate the amount of energy in the food tested because the heat gained by the water will equal the heat lost by the food item:



Homemade calorimeter

How can we calculate the amount of energy in a food item?

$$Q_{\text{lost by food}} = Q_{\text{gained by water}}$$

The energy gained by the water can be calculated as follows:

$$Q_{\text{water}} = (m)(c)(\Delta T)$$

Q is the heat gained in calories (cal)
m is the mass of water in grams (g)
c is the specific heat capacity of water (1 calorie/g °C)
ΔT is the change in temperature in degrees Celsius (°C)

Procedure

1. Of the food items we will be testing, hypothesize which ones will have more Calories (energy). Can you rank the food items according to the energy content (from the highest to the lowest)? Record your prediction in the Laboratory Report.

2. Obtain a weigh boat and determine its weight. Record your data.

3. Obtain a food item and using the same weigh-boat, determine the weight of the food (wi). Record your data.

4. Using the graduated cylinder, measure out 100 ml of distilled water from the water bottle and pour it into the small metal can.

5. Measure the initial temperature of the water (Ti). You may have to leave the thermometer in the water for a while in order to get an accurate reading. Record your data in table 1.

6. Position the small can inside the large can and slide the glass rode through the holes of both cans.

7. Unfold the paper clip and insert it into the cork.

8. Gently wrap the paper clip attached to the cork around the food. It is better to have the food at a slight angle. If the food breaks, use another one; however, you will have to reweigh the new food item.

9. Place the cork with the food on a nonflammable surface. Put on your safety glasses and call the teacher. The teacher will help you light the food. It may take a while for the food to catch on fire.

10. As soon as the food catches fire, immediately place the coffee can around the burning food.

11. Allow the food to burn until it goes out. If possible try to keep an eye on it and if it goes out quickly (less than a minute), relight the food.

12. Once the food has finished burning, **carefully** stir the water with the thermometer and then measure the temperature again (Tf). **Caution! The cans and water will be warm!** You may have to leave the thermometer in the water for a while in order to get the highest reading. Record your data.

13. **After the burnt food has cooled**, transfer it to the original weigh-boat (use the forceps if necessary) and weigh the remnants (wf). Record your data.

Laboratory Report

1. Can you predict how these food items rank according to their energy content (from the highest to the lowest)?

2. Data Table:

3. Record your data.						
Food Item	Weight (Mass) of Food (g)			Temperature of Water (°C)		
	Initial Weight (wi)	Final Weight (wf)	Mass of Sample Burned (Δw =wi – wf)	Initial Temperature (Ti)	Final Temperature(Tf)	Change in Temperature(ΔT = Tf – Ti)

Don't forget to subtract the weight of the weigh-boat.

Determine the Calories of the food:

Food		Energy or calories (cal)	Calories (Cal) or kilocalories (kcal)	Cal/g
	calculations			
	answer			
	calculations			
	answer			
	calculations			
	answer			
	calculations			
	answer			
	calculations			
	answer			

$$Q_{\text{lost by food}} = Q_{\text{gained by water}}$$

The energy gained by the water can be calculated as follows:

$$Q_{\text{water}} = (m)(c)(\Delta T)$$

Q is the heat gained in calories (cal)
m is the mass of water in grams (g)
c is the specific heat capacity of water (1 calorie/g °C)
ΔT is the change in temperature in degrees Celsius (°C)

*Remember that the density of water is 1g/ml therefore 1 g of water = 1 ml of water.

Questions:

How many Calories are in each whole food item you tested?

Were you able to determine the entire Calorie content of the food item? Why?

Do you think the number of Calories you calculated is likely to be lower or higher than it really is? Explain why.

What is the original source of energy in all of the foods tested?

Science Lesson 7
Agenda

1. Review Experiment or Brain Pop

2. Healthy Snack Activity (taste test)
   - ☐ Facilitate a healthy snack cooking class and taste test. Must be scheduled with Food and Nutrition Services 2 weeks in advance to get the food.
   - ☐ Contact Alise.Echele@venturausd.org

3. Healthy Snack Reflection
   - ☐ Worksheet and class discussion

4. Homework: Bring in a healthy snack recipe that you use at home or find one in a cook book or on the internet.
   - ☐ Healthy Recipes http://www.cachampionsforchange.cdph.ca.gov/en/Snack-Recipes.php

Name_____Class Period_____

Healthy Snack Reflection

Directions: Answer the questions below about your healthy snack and taste test today.

1. What snack did you make in class today? _____

2. What were the ingredients? _____
   _____

3. What part(s) of MyPlate did your snack fit into?
   _____
   _____

4. What did this food smell like? _____

5. What was the texture of this food?_____

6. Use 3 adjectives to describe how this food tastes. _____
   _____, _____

7. Did you like this healthy snack?_____

8. Would your parents let you make this at home? _____

9. Who in your family might like this snack? _____

10. What is your favorite, healthy snack? _____

11. Why is healthy snacking important?_____

_____

12. Name 3 snacks that are considered "empty calories." _____

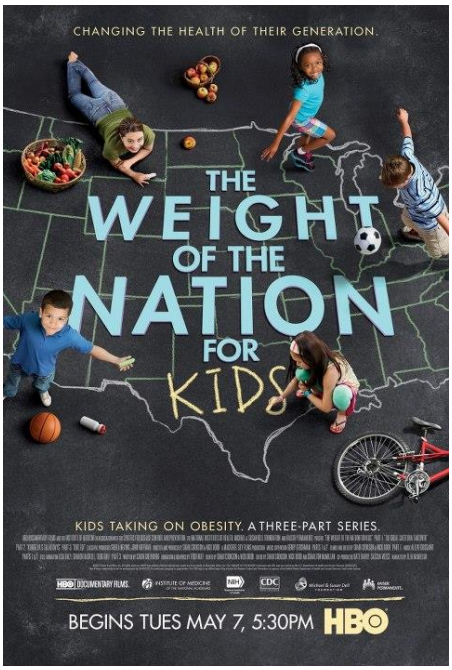
_____, _____

Science Lesson 8
Agenda

1. Warm Up: Share healthy recipes with class

2. Weight of the Nation for Kids – Quiz Ed
   - ☐ Guided notes & Cornell Notes
   - ☐ http://theweightofthenation.hbo.com/films/kids-films/quiz-ed#/watch/kids-films/quiz-ed

3. Homework: Reverse the Trend Reflection



Name_____Period_____

Weight Of The Nation
Quiz-Ed
Guided Notes

1. How do you burn food without cooking? _____

2. How many miles do you have to run to burn off a cheeseburger?_____

3. How do you lose a race if you've already won it?_____

_____

4. Exercise is good for the _____, _____, and _____.

5. How many minutes of swimming does it take to burn off a small bag of chips? _____

6. What can you break without getting into trouble? _____

7. Why is sweating important for the body? _____

8. Why do you gain weight when you get too little sleep?_____

_____

9. What three ingredients in junk food that make you crave it?
_____, _____, and _____

10. Why do food companies use Red and Yellow in their marketing campaigns?_____

_____

11. Name 3 brands that use Red and Yellow on their packages.
_____,_____, and _____

Name_____Period_____

"Reverse the Trend"
Student Reflection

Directions: Over the last two weeks you have learned a lot about nutrition, energy balance, and the many health problems associated with unhealthful eating and inactive living. In the space below, write your own reflection that clearly explains your understanding of the problem and the potential solutions. Be sure to explain the health consequences of regular physical inactivity and unhealthful eating. Share specific strategies individuals and communities can use to reverse this trend, creating a healthier community. Use your guided notes and be sure to write accurate statements.

Paragraph 1: The Problem

Paragraph 2: The Solution *(If you do not believe there is a solution to the problem then you must explain in a paragraph why)*

Science Lesson 9
Agenda

1. Review and Assign a Media Project

- ☐ The goal of this project is to use **synthesis and evaluation skills** to answer the essential question and advocate for healthy eating and active living.
- ☐ Review the Sample Media Project examples and the Media Campaign sample project.
- ☐ Allow each group to pick a media project of interest.
- ☐ Instruct the students to refer to their portfolios to reference facts and information collected.

2. Media Campaign Project—sample project

- ☐ Media Campaign Directions
- ☐ Fact and Opinion Brainstorm worksheet
- ☐ Script Notes & Story Board worksheet
- ☐ How to Make a Common Craft Style Video
  http://www.youtube.com/watch?v=oCl1zoxs3Zo&feature=youtu.be

Sample Media Projects

*(Excerpted from **High Level Thinking Questions & Strategies** located in the appendix)*

Synthesis: (Support, Decide, Recommend, Assess, Defend, Critique, Debate, Justify, Persuade)

- Create a poster(s) that illustrates the need for a specific healthy change and present it to key stakeholders to post in their classrooms, businesses, etc.
- Produce a video that persuades your peers, parents, neighbors to participate in healthy eating and active living. Show a video screening to key audiences.
- Assess the offerings in the cafeteria over the course of a week and write an article for the newspaper explaining what meals students should be selecting and why.
- Critique the foods in the salad bar over the course of a week (think health-food critic) and write a review for the school newspaper.
- Write a letter to the principal, cafeteria manager, director of food services, physical education teachers, city council, persuading them to support specific healthy school environment efforts.

Evaluate: (design, compose, adapt, structure, propose, integrate, construct, support, devise)

- Write a newspaper article debating the role schools, students, parents, and communities have in living healthfully and creating healthy environments: is it the school's responsibility to make changes for students and/or is it up the student's responsibility to make changes for themselves.
- Propose a 3 part action plan to improve the health of your school, home, or community that you will present to your class, principal, school board or city council.
- Design and plan an event at your school, home, community that will bring awareness and information about the importance of healthy eating/active living and the impact it has on your school, home, and community.

Performance Based Nutrition & Energy Balance

Media Campaign Directions—sample project

Group Names: _____ _____ _____

_____ _____ _____

Local Ventura TV station, CAPS TV, has selected your group to produce a mini-public service, documentary on the physical inactivity and unhealthful eating trend. You will receive 3-5 minutes of airtime. Your documentary will be aired every night for 2 weeks. The documentary should be created as a Common Craft Style Video. Click on this link to learn more about Common Craft Style Videos:
http://www.youtube.com/watch?v=oCl1zoxs3Zo&feature=youtu.be

In your 3-5 minutes you must explain:

1. Examples of physical inactivity and unhealthful eating and the health consequences.
2. How your group feels about the unhealthy lifestyle trend and how it directly affects you as a young person in Ventura.
3. Why individuals and the local community should care about healthy eating and active living.
4. What challenges individuals/communities face when trying to live a healthier life.
5. What steps Ventura residents can take to live a healthier life. Include steps that help people in the community make healthy choices the easiest choices.

Documentary Components

1. Introduction to group
2. Purpose of the documentary (objectives)
3. The facts and opinions (from next page)
4. Conclusion and the "Public Ask" (what are you asking of the audience?)

Note: All group members must have equal number of lines in the script and video. The videographer does not need as many lines but should be introduced at the beginning, and can strategically come out from behind the camera when necessary.

Equipment Needs:

1. Flip Cameras/Video/Digital cameras/ipads
2. Important Facts/opinions Sheet
3. Group Script/Storyboard (these are your lines, just like real actors!)
4. Computer to load and edit video
5. Props- these are selected by the group but should be approved by the teacher. Examples: special clothes, food, wrappers, pictures, posters, etc.
6. Music (optional but always makes videos more fun)

Due Date:_____

Performance Based Nutrition & Energy Balance

Media Campaign
Fact & Opinion Brainstorm

Directions: Answer the following questions with your media campaign group. Use the information you captured here to complete the story board worksheet.

1. What are some examples of health consequences resulting from physical inactivity and unhealthful eating?

-
-
-
-
-

2. What challenges do individuals and communities face when trying to live a healthier life?

-
-
-
-
-

3. How do unhealthy lifestyle choices affect your school, home, or community? (Remember--pick one for the storyboard.)

-
-
-
-

4. What issues should be addressed at school, home, or community? (Remember--pick one for the storyboard.)

-
-
-
-

5. Why do you think that healthy eating and active living is important?

-
-
-
-

6. Why should the public care about healthy eating and active living?

-
-
-
-

7. What action steps can society take to create an environment of healthy eating and active living?

-
-
-
-

Performance Based Nutrition & Energy Balance

Media Campaign
Script Notes & Story Board

Directions: Write your script out word for word. Then make copies for every group member so they can practice their lines. See the sample lines below.

SAMPLE

Introduction and Attention Grabber

Lizzette: Hi, my name is Lizette and these are my friends, Jen, Matt, and Tia.

Tia: We are here to present very important information that you cannot ignore!

Matt: Our community is facing a huge problem and we need your help!

Jen: Many people in our community are not caring for their bodies. Many American are physically inactive and eating unhealthy foods, which resulted in a chronic disease epidemic.

Introduction and Attention Grabber:

_____

_____

_____

_____

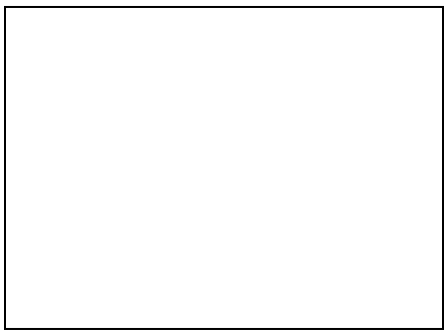
Facts :

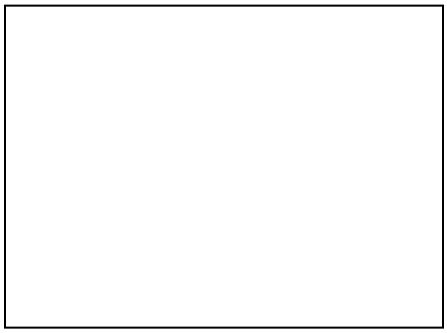
_____

_____

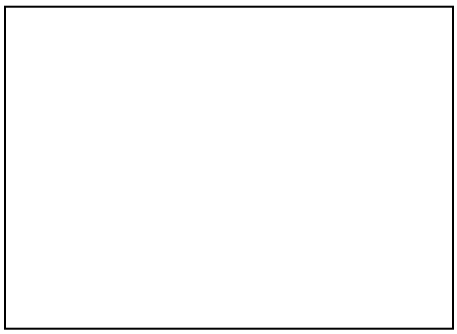
_____

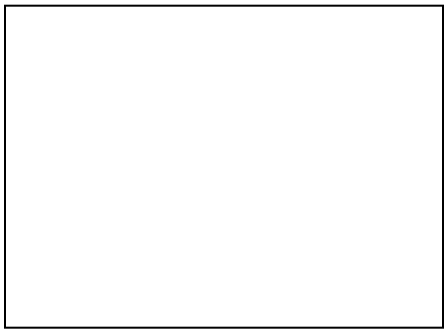
_____

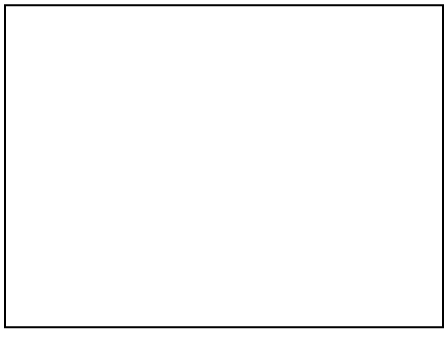




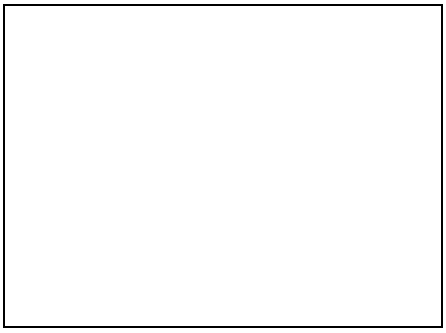
Opinion/Personal Impacts:

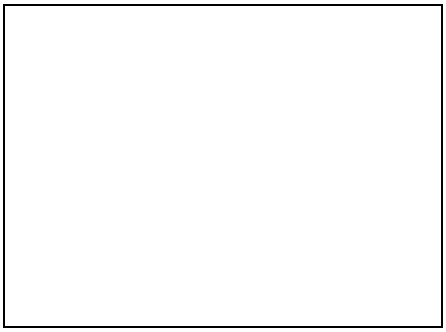


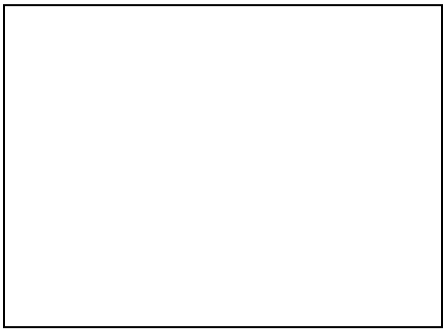




Call to Action/Conclusion:







APPENDIX

Daily Cornell Notes 82

Higher Level Thinking Questions & Strategies.....83

AVID Best Practice Instructional Strategies.....85

Final Quiz.....89

Nutrition Kit Material Inventory.....92

Presentation Guide: Be Sugar Savvy.....93

Sugar Savvy Students—Three Days of Activities (Grade 6-8).....102

Daily Cornell Notes

Topic Objective:	Name:
	Period:
	Date:
Essential Question: How can we reverse the trend of physical inactivity and unhealthful eating at school, home, and in the community?	

Questions:	Notes:

Summary:

Higher Level Thinking Questions & Strategies (Samples)

Note: These strategies and questions guide students toward answering the essential question.

Knowledge: (Who, What, When, Define, Recall, List, Name, Describe, Tell, etc.)

- Define the term_____.
- List 3 negative influences that are contributing to the physical inactivity and unhealthful eating trend
- Name 3 foods that are carbohydrates/proteins/fats.
- What chronic diseases are related to obesity?
- How many minutes of physical activity do you need a day?
- What are the MyPlate categories?
- List 3-5 health obstacles at school, home, community.
- Describe 3 things you can do at school, home, in community to reduce the risk of obesity.

Comprehension: (Compare, Relate, Discuss, Describe, Explain, Predict ,Illustrate, Classify etc.)

- Explain/Summarize the main idea of the article, video etc.
- What is the difference between nutrient rich calories and empty calories?
- Classify the following foods as carbohydrate, protein, fat, empty calories….
- Explain the importance of eating breakfast every day.
- Explain the the phrase "Re-think Your Drink."
- What will happen if Society continues on its current nutrition & physical activity path?

Application: (apply, calculate, choose, demonstrate, interpret, modify, solve, use, design,)

- Calculate how many calories you would consume if you ate:_____
- How many minutes of running will burn off a 20oz. Pepsi?
- Design a 30 minute work- out that would burn 300 calories.
- Create a healthy lunch that is 600 calories, tastes good, and meets the MyPlate guidelines.
- What are other examples of empty calories? Whole grains? Lean Proteins?
- Identify healthful substitutions for empty calories foods.

Analysis: (analyze, examine, test, infer, prioritize, correlate, deduce, estimate, devise)

- Examine your food diary and explain which meal was your healthiest and unhealthiest based on MyPlate recommendations.
- Compare the corner of Victoria/Telegraph to the Corner of Mills/Telegraph; which of these environments is healthier? Why?
- Which drink(s) has the fewest grams of sugar per serving?
- How is the obesity epidemic similar to the smoking epidemic? How is it different?

Synthesis: (Support, Decide, Recommend, Assess, Defend, Critique, Debate, Justify, Persuade)

- Create a poster(s) that illustrates the need for a specific healthy change and present it to key stakeholders to post in their classrooms or business.
- Produce a video that persuades your peers, parents, neighbors to participate in healthy eating and active living. Show a video screening to key audiences.
- Assess the offerings in the cafeteria over the course of a week and write an article for the newspaper explaining what meals students should be selecting and why.
- Critique the foods in the salad bar over the course of a week (think health-food critic) and write a review for the school newspaper.
- Write a letter to the principal, cafeteria manager, director of food services, physical education teachers, city council, persuading them to support specific healthy school environment efforts.

Evaluate: (design, compose, adapt, structure, propose, integrate, construct, support, devise)

- Write a newspaper article debating the role schools, students, parents, and communities have in living healthfully and creating healthy environments: is it the school's responsibility to make changes for students and/or is it up the student's responsibility to make changes for themselves.
- Propose a 3 part action plan to improve the health of your school, home, and community that you will present to the school board or city council.
- Design and plan an event at your school, home, community that will bring awareness and information about the importance of healthy eating/active living and the impact it has on your school, home, and community.

Best Practice Instructional Strategies

The following is a list of instruction strategies that ***AVID*** encourages teachers to incorporate in their lessons. These strategies may be adapted to any subject. They also support the methodologies of the ***AVID*** instructional program: WICR (Writing, Inquiry, Collaboration, Reading).

Carousel Brainstorming

Ideas gathered quickly, topic written as headings on chart paper. Students divided into groups and given different colored markers, move clockwise to brainstorm ideas. After all groups have written on each chart, they should do a gallery walk to see the ideas that were added. Good precursor to a formal essay.

Concept Mapping

Allows for connections between new concepts and prior knowledge. Students should be given a list of related concepts and asked to make connections between them. Students can also create their own lists.

Consultants

Designed for discussion several topics during a class period. Students divide into several groups according to particular topics and serve as consultants to each other. They can be instructed to report out briefly at the end of the period.

Cornell Notes

With Cornell Notes, students take detailed notes from class lectures and texts in a wide right-hand margin and develop clarifying ideas or questions regarding these notes in a narrow left-hand margin. This helps students develop long-term retention and a deeper understanding of the material studied.

Dialectical Journal

Dialectical Journals allow students to record their thought in preparation or a discussion with a partner, small group or entire class. The following is a list of activities that students may do to interact with lecture notes, text, or video. With each activity students should divide their papers in half and place notes on the right side. They should then be instructed to respond to these notes on the left side in one or more of the following ways

- Create a graphic organizer(s) to visually represent the major ideas.
- Write a one-sentence summary to capture the main idea.
- Explain the significance of a particular piece of information.
- Make an inference in terms of what a fact suggests about the time period,
- event, etc.
- Create an analogy to show similarity between the relationships.

- Develop a "what if" statement that speculates what might have happened
- if an event had not occurred or had occurred differently.
- Make a connection to a similar event which may have occurred recently or
- in the past.
- Turn the title, heading, or subheading into questions.
- Create new titles, headings, and subheadings for each section.
- Write a simile or metaphor for an idea, event or person.

Meetings of the Minds

With this activity, students should research diverse characters from a specific time period and then engage in a "meeting of the minds" (conversation) in small groups or in a fishbowl setting. To do this, students should choose a character from a unit of study or time period, research him or her, and then write three questions that the character would ask each of the other characters on an assigned topic.

Pair Share

This activity is helpful when it is necessary to have small group discussions of individual issues. After completing an assigned reading, students should share their responses to open-ended questions with a partner. A whole-class discussion should follow

Parking Lot

This technique assesses level of understanding at carious intervals of a lesson. In preparation for the next days' lesson, student should be provided with sticky notes on which to write questions or statements about a given topic or concept. They should place their notes on a large chart that is posted in the room. The chart should be divided into three sections and labeled with headings such as I Don't Understand, I am Starting to Understand, and I Completely Understand. The teacher should take note of the questions and use them in preparing the lesson. At key points the students should be able to collaborate and move their sticky notes to the section most representing their level of understanding. The teacher is able to determine a general level of understanding among the students and to adjust the instruction accordingly. With this method, students who are hesitant to ask question orally will have their concerns addresses.

Philosophical Chairs

Philosophical Chairs is a technique that allows students to critically think, ponder and write their belief. First, the chair in the room should be arranged in the shape of a horseshoe. Then student should come to class with notes taken on an article, short story, essay, or literary selection. After being presented with a statement that will elicit thought and discussion, they should be told they will argue the merits of the statement and that their choice of seat during the discussion will illustrate their stance. For example, if they agree with the statement, they should sit on the right side of the room. If they disagree,

they should sit on the left side, and if undecided, they should sit in the back. At designated intervals, student should be given the opportunity to change sides if they change their viewpoint. A good follow-up to this activity would be to write an argumentative essay.

Problem-Solution Journal

In this journal student record their thinking about possible solutions to problems being investigated. This strategy assists students in making connections between problems and solutions of the past and those of today. Students should divide into groups and separate their papers into three columns. The left column should represent the problems investigate; the middle column, a brainstorming of possible ideas; and the right column, a list of realistic solutions.

QuickWrites

Quickwrites involve asking a question, giving people a set amount of time for responding (usually between one to ten minutes), and either hearing or reading the responses. The quickwrite can be modified endlessly, depending on circumstances. Quickwrites encourage critical thinking warm-ups: use the quickwrite at the start of a class to get students focused on a new concept, or the material from last class, or preparatory reading material, etc. Student-directed quickwrites: have students lead the quickwrite session, having prepared a question in advance and thought through a method for fielding the responses. Class-closers: as with the warm-ups, use the quickwrite to prompt reflection through summary, synthesis, explanation, a question.

QuickSpeak

This activity is the oral equivalent of the quickwrite. A student draws a topic from a stack of index cards, thinks about it for five seconds, and then speaks before the class for a predetermined time. The topics are based on prior reading assignments.

Four Corners

Post four pieces of paper in the four corners of the classroom. Write a controversial topic on the board (for example: Schools should eliminate report cards). Have students move to the corner that best matches their position (Strongly Agree, Somewhat Agree, Strongly Disagree, Somewhat Disagree). If social cliques are a problem, have students write their choice on a card first in order to ensure honest reactions. Each corner will have 2 minutes to discuss and solidify their reasoning/logic. Each group selects a spokesperson to express the group's position. He/she has 30 seconds to express thoughts concisely and persuade their classmates. Other groups must listen intently. After the first corner presents, invite those who have been persuaded to move to the appropriate corner. Direct each group to present their group's position in turn. Allow students to move to the appropriate corners if they have changed their minds.

Jigsaw

The Jigsaw method is a cooperative learning technique in which students work in small groups. Jigsaw can be used in a variety of ways for a variety of goals, but it is primarily used for the acquisition and presentation of new material, review, or informed debate. In this method, each group member is assigned to become an "expert" on some aspect of a unit of study. After reading about their area of expertise, the experts from different groups meet to discuss their topic, and then return to their groups and take turns teaching their topics to their group mates.

Name_____Period_____

Performance Based Nutrition & Energy Balance
Final Quiz

Directions: Circle the answer that best answers the question.

1. What process do plants use to make energy?
   a. Photogenic
   b. Kinetic Power
   c. Photography
   d. Photosynthesis

2. Extra carbohydrates consumed that are not used are stored in the liver as:
   a. Protein
   b. Cells
   c. Glycogen
   d. Glucose

3. Too much weight on a human body can cause health problems such as:
   a. High Blood Pressure
   b. Type II Diabetes
   c. Metabolic Syndrome
   d. All of the above

4. A calorie is a unit of:
   a. Sugar
   b. Energy
   c. Fat
   d. Carbohydrates

5. Energy Balance is the balance between the following:
   a. Carbohydrates and fats
   b. Food energy eaten and the energy the body uses
   c. Vitamins and minerals
   d. None of the above

6. The following is consumed in food and expended during physical activity :
   a. Calories
   b. Oxygen
   c. Nitrogen
   d. None of the Above

7. If you eat more calories than you expend, you will:
   a. Lose Weight
   b. Maintain Weight
   c. Gain Weight
   d. Become Underweight

8. If you eat less calories than you expend, you will:
    a. Lose Weight
    b. Maintain Weight
    c. Gain Weight
    d. None of the above

9. Nutrition Facts Labels can tell you the following:
    a. How many calories are in a serving size
    b. How much you should weigh
    c. How many minutes you should exercise
    d. All of the above.

10. If you do not eat a healthy, balanced diet that provides all of the nutrients the body needs, you may:
    a. Feel stronger
    b. Feel tired and irritable
    c. Feel smarter
    d. Get Sick
    e. Both a and b
    f. Both b and d

11. Lack of adequate sleep makes your body want to:
    a. Eat more than you normally do
    b. Eat less than you normally do
    c. Eat the same as you always do
    d. Eat more fruit and vegetables

12. What are 3 things you find on a nutrition facts label?
    a. Serving Size, Calories Per Serving, Ingredients
    b. Cost, Calories, Fat
    c. Health Claims, Calories, Carbohydrates
    d. None of the above

13. Carbohydrates, Proteins, and Fats are examples of:
    a. Energy balance
    b. Empty Calories
    c. Sugar
    d. Nutrients

14. What are the 5 parts of MyPlate?
    a. Carbohydrates, Protein, Fats, Water, Dairy
    b. Dairy, Fruits, Vegetables, Grains, Protein
    c. Meat, Dairy, Carbohydrates, Fats
    d. None of the above

15. According to MyPlate recommendations for healthy eating, your plate should be filled with ½ of the following:
    a. Meat and Potatoes
    b. Beans and Rice
    c. Fruits and Vegetables
    d. Fish and Chips

Short Answer: Write the answer to the questions in the space provided.

1. List 3 challenges communities face when trying to life a healthy lifestyle.

_____
_____
_____

2. List 3 health problems associated with long-term physical inactivity and unhealthful eating.

_____, _____, _____

3. Name 3 strategies that will help individuals move more and eat healthfully.

_____, _____, _____

4. What are empty calories? Give 3 examples of foods that have empty calories.

Empty calories are_____

_____, _____, _____

5. Why should people "Re-Think" their drinks?

_____

_____

6. Why is eating fiber important? _____

_____

7. List 3 foods that contain fiber. _____, _____, _____

8. When does the body obtain "Energy Balance?"_____

_____

9. How many minutes of moderate to vigorous physical activity do you need per day to be healthy? _____

10. Nutrients help the body absorb _____and _____

Nutrition Kit
Material Inventory

The Nutrition Kit consists of nutrition education materials that can be used to teach the *Performance-Related Nutrition & Energy Balance* co-curricular module, specifically when teaching the nutrition activities. Each kit consists of the materials identified below. These kits will be utilized annually, so caring for the materials is required in order to use the kits. **At the end of each academic year, please complete the inventory checklist below and submit to Food and Nutrition Services.**

Item	Amount per box	Check box to confirm inventory	Check box if material is broken or lost
My Plate handouts	2 sets		
Food Cards	1 set	☐	☐
*Muscle & Fat Model**	*1-2 sets per site*	☐	☐
Fat Test Tubes	1 set	☐	☐
US Food Plate Poster	1 set	☐	☐
1 set of measuring cups	1	☐	☐
Food Intake Weekly recorder tear off sheets	1 set		
Dietary Guidelines handouts	1 set		
Handy Portions handouts	1 set		
Read Food Labels handouts	1 set		
Nutrition Fact Label Poster	1 each	☐	☐
Whole Grain handouts	1 set		
Portion Distortion handouts	1 set		
Handy Portion handouts	1set		
Portion Model Box: Dice, deck cards, tennis ball, ½ cup spoodle	1 each	☐	☐
Sugar Test tubes	1 set	☐	☐
Tupperware of Sugar	1 each	☐	☐
Rethink Your Drink Packet: 10 Nutrition Fact Labels, 2 posters	1 set	☐	☐

Please note that each school is supplied with 1-2 Muscle and Fat model sets. These materials were too expensive to supply for every teacher, so these materials will need to be shared within the science department.* ***Students should NOT touch these models,*

Name:_____**Signature:**_____**School:**_____

Inventory Checklist Due Date: May 1st

Submit to: Alise Echele, R.D., Healthy School Project Coordinator, Food and Nutrition Services
alise.echele@venturausd.org