

FOOD AS FUEL

Class Period 1

ENGAGE

Have different food examples with different macromolecules: peanut, oil, sugar, cornstarch, fruit, beef jerky, etc. and some junk food. Try to burn each of these to show that they are full of energy, which we call calories.

EXPLORE

Have product labels for these foods, ask student to bring out any snacks. Include sports drinks and smoothies, energy supplements. Talk about calories vs. kilocalories, mention minerals & nutrients. Have students calculate calories; give a label with missing calories for protein, have them work back to total calories. May want to use *Data Analysis 12 (p. 253)* from Lab Manual B.

EXPLAIN

Go through Food and Nutrition powerpoint presentation to review and reinforce concepts.

ELABORATE: **Designer Smoothies**

Students will design their own energy drink. Give groups list of ingredients and let them start thinking about design. Come up with scenario (you want to build muscle after workout, you need a snack during the game, you want to lose fat, etc.) or assign them one. This activity will overlap with the second class period. Students need to have a prediction and hypothesis. Students may bring specific ingredients or request them if justified for their recipe. Make sure they know that they and classmates will taste these as well as our expert taster (sports nutritionist/sport physiologist/ other expert). They may have to complete and test recipes as homework or after school.

Class Period 2

EXPLAIN

Discuss sports nutrition and performance with students. Introduce how food is a fuel and helps the body to perform. Connect to cellular respiration and breathing, introduce how muscles work. May want to use *Inquiry into Scientific Thinking: You are What You Eat(p.128) and Energy and Exercise (p.135)* from Workbook B.

ELABORATE : **Using Heart Rate to Approximate Energy Use**

Student groups participate in a race. Each group chooses a runner. Students collect heart rate and respiration rate for the runner before and after running. Then each group is given a choice of different snacks (fastest to slowest?) or assigned one. Include sports drinks and snacks with different macromolecule contents. Students will hypothesize which snack will

help their runner do better. Ask students if this is a valid experiment (it's not! there are no controls or replication). Check runner's pre- and post run heart rate and respiration.

EVALUATE

Students will have a worksheet to complete and collect data for the nutrition label reading and racing exercises. Students will develop preliminary hypotheses and recipes (methods) for their energy drink.

Class Period 3

ENGAGE, EXPLORE, EXPLAIN

If possible, guest lecture/presentation from sports nutritionist or physiologist.

ELABORATE: **Designer Smoothies**

Students will make their energy drink. All drinks will be made in a blender and served to the class and our guest!

EVALUATE: **Smoothie Taste Test and Nutrition Evaluation**

Students, teachers, and our guest(s) will have taste test evaluation forms and we will share the results at the end of class or during the next class period. Students will evaluate and discuss their hypotheses and recipes (methods) with the class. Students will write a paragraph about the outcome of their experiment, giving conclusions and making an argument for why their drink was successful or not.

Additional related enrichment

Data Analysis 37(p.307) from Lab Manual B.