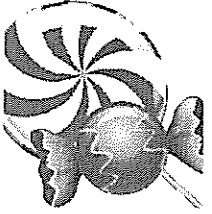


Candy Calories



Introduction: Supplying enough energy to support the many functions of the body at work and play is one of the chief functions of food. This energy comes from the fats, carbohydrates, and proteins in the food you eat. Of the three, fat is the most concentrated source of energy because it furnished more than twice as much energy for a given weight as protein or carbohydrate.

Energy requirements are ordinarily expressed in terms of calories. A calorie is the amount of energy required to raise the temperature of 1 gram of water by 1 degree Celsius. The calorie used in nutritional discussions is actually the "large calorie" – Calorie. This is really a kilocalorie.

The three main classes of food provide the following amount of energy: carbohydrates and proteins provide about 4 Calories per gram; fats provide about 9 Calories per gram. When you choose foods that furnish more energy, or Calories than you need, the excess energy is stored as fat in the body -- a gain in weight may result. If too little food is eaten to meet energy demands, the body's stored fat serves as an energy source -- a weight loss will result. Your weight stays about the same if the energy from food matches the energy requirements of the body.

The body and cells need a constant supply of energy for a variety of reasons. Energy is needed to carry out mechanical work, which involves the change in location or orientation of a body part or the cell itself. A major example is the energy required for the contraction of muscles.

Molecular transport also requires energy. The movement of molecules from an area of low concentration to an area of higher concentration requires energy since this is opposite to the normal movement of molecules. This process is also called active transport. Examples include the movement of nutrients into a cell and waste materials out of the cell.

Electrical work is also included under molecular transport since the establishment of a differential concentration of ions across a membrane is used to build up an electrical charge. The result of electrical work is the excitation and conduction of impulses in nerve and muscle cells.

Finally, energy is needed for the synthesis of new complex biochemical molecules. Biosynthesis involves the formation of many new molecules from simpler molecules. New cellular material is produced not only during active periods of growth but also in existing structures to repair and replace damaged molecules.

Background – Complete before the activity begins.

1. Define Calorie - _____

2. What is a kilocalorie - _____

3. List the three main classes of food. _____
4. List 4 reasons why your body needs a constant supply of energy. _____

Activity (will complete as a class)

Now that we have done a little learning, let's look at calories. We said a calorie is the amount of energy needed to raise the temperature of one gram of water by one degree Celsius. A commonly used measure is the kilocalorie or Calorie (note the capital C), which is equivalent to 1,000 calories. The calories you read from calorie charts when you're on a diet are always kilocalories, whether the publisher of the chart knew enough to capitalize the word Calorie or not.

Now, if you have a piece of candy in front of you which produces a 120° rise in the temperature of 100 grams of water, how many calories are in that candy? Well, if one calorie (small c) can cause a 1° rise in one gram of water, then it must take 120 calories for each gram of water. And since we have 100 grams of water, the total calorie content of the food should be:

Temperature Rise _____ °C X amount of water _____ g = _____.

This must not be very much food, because in kilocalories, this is only _____.

Procedure (will complete in groups)

1. Each group will be given 5 labels from candy wrappers.
2. You will find the total calories per serving and the mass of one serving on the label. Then you will divide the calories by the mass to get calories/gram.
3. Next, you will support your answers by ranking the foods in order from the most to least stored energy.
4. Then you will evaluate which food has the most stored energy and how much of a temperature rise the candy will produce in 100 grams of water by dividing the total number of calories by the amount of water used (remember, you must use calories not kilocalories)

Fill in the table below using your candy wrappers.

Candy	Calories	calories	Grams	Calories/gram	Most to least stored energy	Temperature Rise