Nutrition and Digestion

Glossary

TERM	DEFINITION
nutrition	*the process by which organisms obtain energy for growth; the name of a scientific branch that researches the nutrient needs of organisms*
enzyme	

Objective

In this lesson, you will

Energy Requirements

All organisms need _____.

- Different types of work and lifestyles affect _____ _____.

Key Term **calorie:** a unit of energy used to measure the energy value of food

Daily Nutrition Needs

Nutrition labels show the amount of _____ and composition of _____ in a food product.

Six sources of nutrients are

1. carbohydrates 2. _____ 3. fats 4. vitamins 5. _____ 6. _____

This product has

- _____ grams in one serving.
- _____ calories in one serving.

Vitamins and minerals don't provide energy, but they make bodily functions work properly.

Nutrition Facts

Serving Size 1 cup (200g)
Servings per Container 4

Amount Per Serving	
Calories 300	Calories from Fat 110
	% Daily Value
Total Fat 12g	20%
Saturated Fat 4g	22%
Cholesterol 0mg	0%
Sodium 70mg	6%
Total Carbohydrate 30g	10%
Dietary Fiber 0g	0%
Sugars 20g	
Protein 5g	
Vitamin A 5%	Vitamin C 0%
Calcium 10%	Iron 0%

_____ – a mineral that helps maintain the salt-water balance in the body

_____ - a mineral that helps with muscle contraction

Sources of Energy	
Carbohydrates	• made of _____ • act as a _____ source • primary source of _____
Proteins	• made of long chains of _____ _____ • _____ tissues • create _____ • _____ worn-out and injured tissues
Fats/Lipids	• reservoirs of _____ • made of long chains of triglycerides and _____ _____ • help to absorb fat-soluble vitamins

Question

Fat contains nine calories per gram. Calculate the number of calories from total fat, saturated fat, and other types of fat in one serving of the food shown on the nutrition label.

Nutrition Facts
Serving Size 1/4 Cup (30g)
Servings Per Container About 38

Amount Per Serving

Calories 200	Calories from Fat 150
	% Daily Value*
Total Fat 17g	**26%**
Saturated Fat 2.5g	**13%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 120mg	**5%**
Total Carbohydrate 7g	**2%**
Dietary Fiber 2g	**8%**
Sugars 1g	
Protein 5g	

Vitamin A 0% • Vitamin C 0%
Calcium 4% • Iron 8%
*Percent Daily Values are based on a 2,000 calorie diet.

Total fat:

_____ calories per gram × 17 grams = _____ calories

Saturated fat:

9 calories per gram × _____ grams = _____ calories

Calories from other fats:

153 calories (total fat) – 22.5 calories (saturated fats) = _____ calories

Proteins contain 4 calories per gram. Imagine you need to eat 50 grams of protein per day and you have already eaten 180 calories of protein today. How many more grams of protein do you need to eat today?

4 calories per gram of protein × 50 grams of proteins = 200 calories of protein per day

200 total calories of protein – 180 calories of protein already eaten = 20 calories of protein left to eat today

20 calories of protein left to eat ÷ 4 calories per gram = 5 more grams of protein left to eat today

The Cycle of Energy

The digestive system breaks down food so that our bodies can absorb and _____ nutrients to different cells.

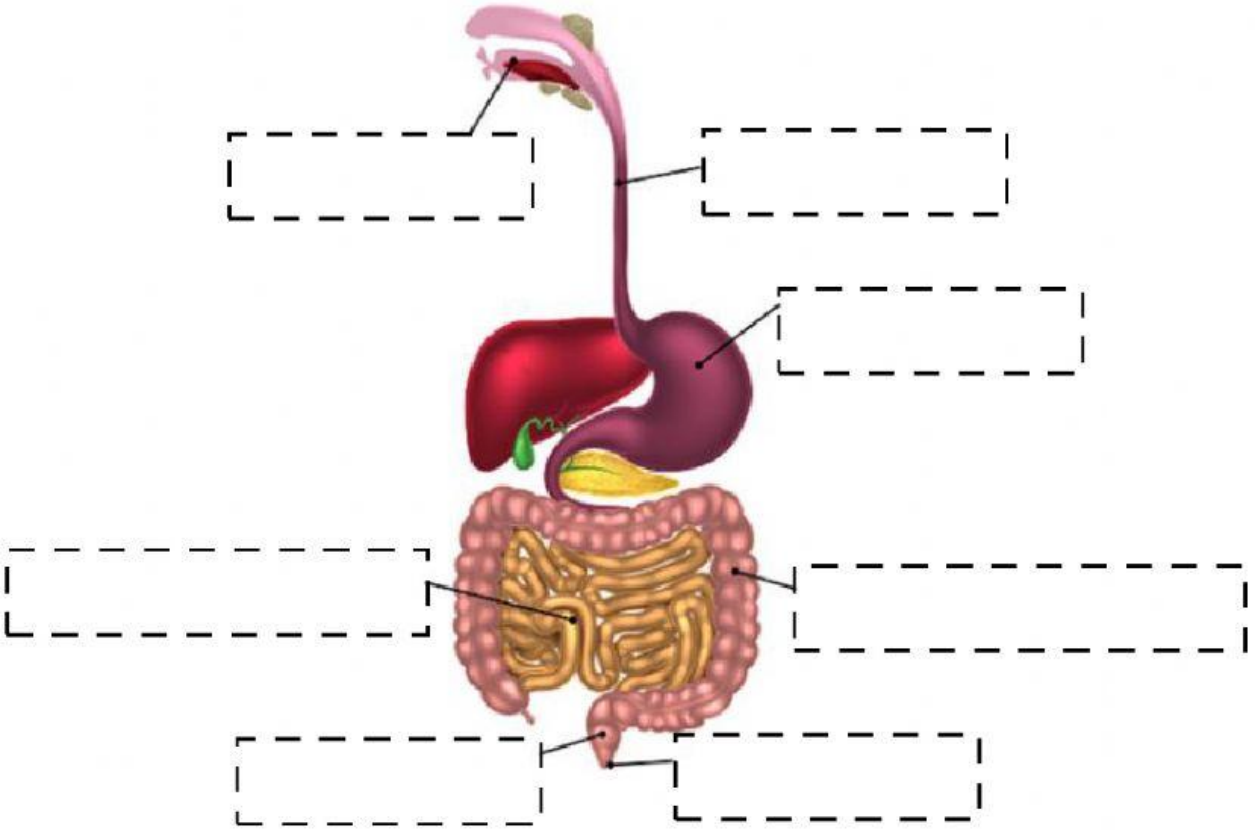
Cells use this _____ to carry out functions that are necessary to keep us healthy and active.

Key Term

digestion: the process of _____ molecules in food being broken down into _____ molecules so the body can use them

The Human Digestive System

Label the main organs of the digestive system.



Fill in the information about each of these organs in the digestive system.

mouth
- start of digestion
- teeth and tongue: _____ food particles during chewing
- salivary glands: secrete _____ which helps soften the food

esophagus
- muscular, hollow _____
- peristalsis: _____ _____ of food by muscle contraction and relaxation

stomach
- a big, muscular _____
- mechanical digestion: churns food
- chemical digestion: hydrochloric acid (HCl) and other enzymes break complex food into simple molecules
  - carbohydrates → _____
  - _____ → fatty acids
  - proteins → _____ _____

small intestine
- _____: partially digested food
- further digestion occurs in the small intestine
  - digestive juices (from the _____)
  - bile (from the liver)
    - acts on _____ particles
- small, broken-down food particles are _____

large intestine
- absorbs _____ from chyme
  - maintains salt-water balance and _____
- remaining undigested material _____

rectum (part of the large intestine)
- stores _____ food material until it is passed

anus (part of the large intestine)
- muscles control the release of undigested food from the body

Follow the arrows in the diagram above to list the main organs of the digestive system in the order that food particles pass through them.

mouth → _____ → stomach → small intestine → _____ intestine

Enzymes help break _____ molecules into _____ molecules.

Example:

amylase (*enzyme*) – breaks down carbohydrates (*substrate*) into _____ (*product*)

If an enzyme can't bind to a substrate, there is a decrease in the rate that the product forms.

Nutrient Transport and Cellular Respiration

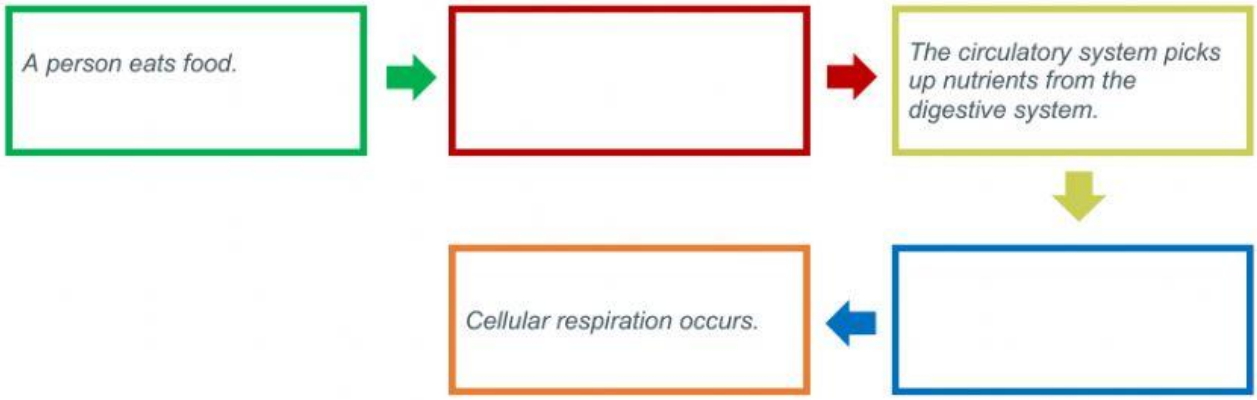
The small intestine _____ nutrients.

Key Term

villi: fingerlike projections that increase the _____ area and the rate of _____ in the small intestine

Question

Fill in the flowchart to show how food becomes energy that cells can use.



Science in the News: Fad Diets

Most fad diets ○ work ○ don't work in the long run and they often ○ follow ○ fail to follow scientific regulations.

Summary

Think about whether you eat a healthy balance of carbohydrates, fats, proteins, vitamins, and minerals and how much water you drink. What is one way you could change your diet to make it healthier?