

Format: 20 multiple choice questions and 10 open ended questions

Concepts to Review:

- Scientific Inquiry Skills (see Homework 4 and 5)
 - Understand the terms *hypothesis*, *independent variable*, *dependent variable*, *control*, and *placebo*.
 - Be able to explain how scientific ideas are different from ideas in other subjects.
 - Be able to identify the independent and dependent variables in an experiment.
 - Be able to write a hypothesis in “If... then...” form.
 - Be able to identify the control group and the experimental group in an experiment.
 - Be able to identify factors that must be kept the same in both the control and experimental groups.
 - Be able to design a scientific experiment.
 - Be able to explain why it is important to repeat an experiment and use many test subjects.
- Cells (see Homework 7 and 8)
 - Understand the terms *organelle*, *cell*, *tissue*, *organ*, *organ system*, and *organism*, and be able to order these terms from the simplest to most complex.
 - Be able to explain what the cell theory tells us about cells.
 - Understand the terms *structure* and *function*, as well as how they relate to each other.
 - Know the function (job) of each of the following cell organelles: *cell membrane*, *nucleus*, *ribosome*, *mitochondria*, *cell wall*, *chloroplast*.
 - Be able to label a diagram of a plant cell and an animal cell.
 - Know the differences between a plant cell and an animal cell.
 - Be able to explain how two cell organelles work together to maintain homeostasis.
- Transport of Molecules through a Membrane (see Homework 10 and 11)
 - Understand the terms *diffusion*, *concentration*, *equilibrium*, *osmosis*, and *active transport*.
 - Know which cell organelle is responsible for regulating what comes in and out of cells.
 - Be able to predict the way molecules will move naturally across a selectively permeable membrane or into/out of cells.
 - Be able to explain how diffusion is different from active transport (in terms of the direction in which molecules move and the role of energy).
- Photosynthesis (see Homework 12 and 13)
 - Be able to define the terms *photosynthesis*, *autotroph*, and *heterotroph*.
 - Understand the difference between *organic molecules* and *inorganic molecules*.
 - Know which cell organelle photosynthesis takes place in.
 - Be able to write the chemical equation for photosynthesis.
 - Know all the raw materials (reactants) and products of photosynthesis.
 - Know which raw material (reactant) provides all the energy for photosynthesis and know which product all the energy is stored in.
 - Be able to explain how guard cells on leaves help maintain homeostasis in plants.
- Respiration (see Homework 14)
 - Be able to define the term *respiration*.
 - Know the molecule that contains a useable form of energy that living things use to carry out the life functions.
 - Know which cell organelle respiration takes place in.
 - Be able to write the chemical equation for respiration.
 - Know all the raw materials (reactants) and products of respiration.
 - Know which raw material (reactant) provides all the energy for respiration and know which product all the energy ends up in.

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- Diffusion in the Human Body (see Homework 15 and 16)
 - Be able to explain the jobs of each of the following organs in the body: *lungs*, *kidneys*, and *small intestine*.
 - Be able to describe how *nutrients*, *oxygen*, *carbon dioxide*, and *wastes* move by diffusion in the human body.
- Enzymes and the Digestive System (see Homework 17)
 - Understand the terms *metabolism* and *homeostasis*.
 - Understand the terms *organic* and *inorganic*.
 - Understand the job of *enzymes* and understand how it relates to the terms *substrate* and *catalyst*.
 - Be able to explain why the shapes of enzymes are important.
 - Understand the term *denature* and be able to explain how a protein can become denatured.
 - Know the basic building blocks and functions of *carbohydrates* and *proteins*.
- Hormones and the Endocrine System (see Homework 18)
 - Be able to describe the role of a few hormones (such as insulin) in the human body.
 - Be able to explain how *negative feedback* ensures that hormone levels remain stable.
 - Be able to explain what happens in *diabetes*, including the gland and hormone involved.
- Neurotransmitters and the Nervous System (see Homework 19)
 - Be able to explain how the nervous and endocrine systems control all body activities.
 - Be able to explain how a nerve impulse travels through a synapse.
- Antibodies and the Immune System (see Homework 19)
 - Know the difference between an *antigen* and an *antibody*.
 - Be able to explain how antibodies and white blood cells protect the body from pathogens.
 - Be able to explain how vaccines help the immune system function.
 - Be able to describe the symptoms of HIV/AIDS.
- Lab Skills
 - Be able to describe some lab safety rules (Lab 1).
 - Be able to use a microscope (Labs 4, 5, and 6).
 - Be able to identify the chemical used to test for starch and describe the color change that takes place when the starch indicator comes in contact with starch (Lab 7).
 - Understand how the difference in sizes between starch and glucose affect transport across the cell membrane (Lab 8).
 - Be able to predict what happens to a cell in salt water and support your prediction (Lab 9).
 - Be able to construct a line graph or bar graph (Lab 10).
 - Be able to analyze data based on pulse rate and exercise (Labs 11, 12, and 13).

Practice Exam Questions:

- Visit the “Practice Exam Questions” page on the course website at www.spraguescience.com.
- Download the following files and try as many practice questions as you can:
 - Scientific Inquiry and Experimental Design
 - General Lab Skills: Graphing, Measurement, Microscopy
 - Cell Structure and Function
 - Diffusion and Active Transport
 - Photosynthesis and Respiration
 - Homeostasis in the Human Body
- Check your work to each set of practice questions by downloading the answer key.