Grade 7 General Science: Second Semester Study Guide

**EXAM DATE: Friday, May 30 at 9am**

## To make you more comfortable with the exam format and the amount of each type of question, we have created this addition to the study guide, which contains the instructions for each section of the exam. We recommend that you read them carefully.

## PART 1: ELECTRICITY (27 QUESTIONS)

1. Answer the multiple choice questions. (11 points)
2. Decide if the each statement refers to static (S) or current (C) electricity. Then circle the correct choice on your answer sheet. (5 points)
3. Use the word bank to fill in the blanks of the following statements and diagrams. Write the letter of the correct answer in the space provided on your answer sheet. Answers may only be used once. Some answers may not be used at all. (7 points)
4. Short answer questions. Draw diagrams. Explain concepts. (9 points)

PART 2: LIGHT, WAVES, AND THE ELECTROMAGNETIC SPECTRUM (30 QUESTIONS)

1. Mark each sentence as *true* or *false* by circling the letter T or F on your answer sheet. Then, **if a statement is false**, change the underlined term to make the sentence true by writing the correct term in the space on your answer sheet. (8 points)
2. Lenses and Mirrors: Use Figures 1 and 2 for questions. Write your answers in the space provided on your answer sheet. (4 points)
3. Match the terms on the right with the letters on the diagrams on the left. (9 points)
4. Multiple choice questions (4 points).
5. Short answer: Answer in the space provided on your answer sheet. (10 points)

## PART 3: BIOLOGY (55 QUESTIONS)

1. Use the word bank to fill in the blanks. Write the letter of the correct answer in the space provided

on your answer sheet. (10 points)

1. Use the word bank to determine the appropriate labels. Fill in the letter of the correct label on your answer sheet.

Each term will be used exactly once. (1 point each - 23 points)

1. Short answer questions. (16 points)
2. Use the word bank to fill in the blanks. Write the letter of the correct answer in the space provided on your answer sheet. Also multiple choice questions. (9 points)
3. Short answer questions. (14 points)
4. Decide if the statement or picture is describing active transport (AT), diffusion (D), or Osmosis (O). Then circle the correct option

on your answer sheet. (1 point each – 6 points)

PART 4: INVENTION CONVENTION (5 QUESTIONS)

A. Read the article. Answer the questions explaining how it relates to the engineering design cycle (the steps we followed to build our inventions). (9 points)

## Vocabulary for Second Semester Exam

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| --- | --- | --- | --- |
| **Electricity** | Electromagnetic Spectrum | **Biology (including the Microscope)** | |
| 1. static electricity 2. neutral atom 3. charged atom or ion 4. law of conservation of charge 5. spark 6. current electricity 7. conductor 8. insulator 9. open circuit 10. closed circuit 11. switch 12. fuse 13. circuit breaker 14. short circuit | 1. wave 2. wavelength 3. crest 4. trough 5. amplitude 6. reflection 7. law of reflection 8. normal 9. incident ray 10. reflected ray 11. angle of incidence 12. angle of reflection 13. plane mirror 14. refraction 15. convex lens 16. concave lens 17. electromagnetic spectrum 18. nearsighted 19. farsighted | 1. eyepiece 2. body tube 3. arm 4. revolving nosepiece 5. fine adjustment knob 6. coarse adjustment knob 7. objective lens 8. ocular lens 9. stage 10. stage clips 11. diaphragm 12. light source 13. base 14. cell membrane 15. cytoplasm 16. nucleus 17. mitochondrion 18. chromosome 19. lysosome | 1. chloroplast 2. endoplasmic reticulum 3. ribosome 4. Golgi bodies 5. cell wall 6. vacuole 7. selectively permeable membrane 8. diffusion 9. osmosis 10. active transport   30. photosynthesis |

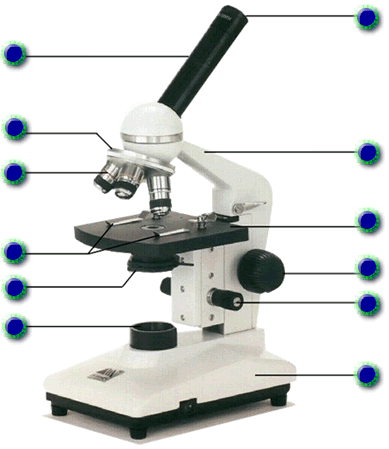
INSTRUCTIONS: Use your notes in your binder or book to answer the following questions and define the terms at the end.

**Electricity**

1. Describe how the following pairs of objects act with respect to one another:
   1. 2 positively charged objects
   2. 2 negatively charged objects
   3. 1 positively charged and 1 negatively charged object.
2. How do you use friction to charge an object?
   1. Describe what happens.
   2. Draw a diagram of what an object is like before and after it is charged.
3. A neutral fluorine atom has 9 electrons, protons, and neutrons.
   1. What charge would it have if it gained an extra electron?
   2. What do we call this type of atom?
4. If you rub a balloon on your head, the balloon will steal electrons from your hair. Then the balloon can stick to a wall.
   1. Why is this happening?
   2. Use a diagram that shows the movement of electrons to help with your written explanation.
5. What is electrical discharge?
   1. Give an example of when you saw it happen in the lab
   2. Give an example of when you saw it happen in nature.
6. What is the difference between insulators and conductors? Give an example of each.
7. Draw a picture of a light bulb in a closed circuit.
   1. In your diagram be sure to label the battery, wires, switch, and light bulb.
   2. Is the light bulb on or off? Why?
8. Compare and contrast fuses and circuit breakers in a Venn diagram.
9. Compare and contrast static and current electricity in a Venn diagram.

# Electromagnetic Spectrum

1. In what 2 ways did we describe light as capable of moving?
2. Draw a wave and label the wavelength, amplitude, crest, and trough.
3. What is the relationship between the angle of incidence and the angle of reflection in a reflected light ray? What do we call this relationship?
4. Draw a diagram of a light ray as it is reflected from
   1. a plane mirror
   2. a convex mirror
   3. a concave mirror
5. Draw a diagram of what happens to three light rays as they move through each type of lens. Have 1 of the rays go through the exact center of each lens.
   1. a convex lens
   2. a concave lens.
6. Use a diagram and written explanation to describe what happens when a ray of white light hits
   1. a white shirt
   2. a black car
   3. a magenta butterfly.
7. Explain and draw a diagram to show how lenses can be used to correct the vision for a patient that is
   1. near-sighted
   2. far-sighted.



# Biology

1. Label all of the parts of the microscope we studied in class.
2. Draw a diagram of a plant cell and label all of the parts studied in class.
3. What is the only organelle we find in a plant cell that we do not find in animal cells? What does it look like?
4. Compare and contrast plant cells and animal cells. Use a Venn diagram to organize your answer.
5. What are the 3 main functions of the cell membrane?

1. Describe the 3 processes by which materials may leave or enter a cell. In your answer include (a) concentrations and movement of particles, (b) types of particles moved, and (c) is energy needed?
2. Draw a picture of a cell with a high concentration of sodium ions outside and a low concentration inside. Label the cell membrane and a sodium ion and draw arrows to show in which direction the sodium ions will move.
3. Is the example above and example of diffusion, osmosis, or active transport? Why?
4. Explain what the difference between diffusion and osmosis is.
5. Explain how you would calculate the magnification of a specimen you are looking at under the microscope. (low, medium, high)
6. If a *Euglena* cell was moving to the right in the field of view of the microscope, in what direction would you have to move the slide to keep watching it? Why?
7. List two tips for properly handling a microscope slide.
8. Explain the process of photosynthesis. What are the reactants in this process? What are the products in this process?

**Invention Convention**

1. Explain each of the steps used in the invention convention project (the steps of the engineering design cycle). Describe what should be done in each step using a specific example.