

Semester One Exam Review Packet: Physical Science 2009-2010

The semester 1 exam covers chapters 1, 2:1, 3, 5, 6, 8, 9, 17 & 18. Please review all of your notes, quizzes and tests to help you prepare for the exam.

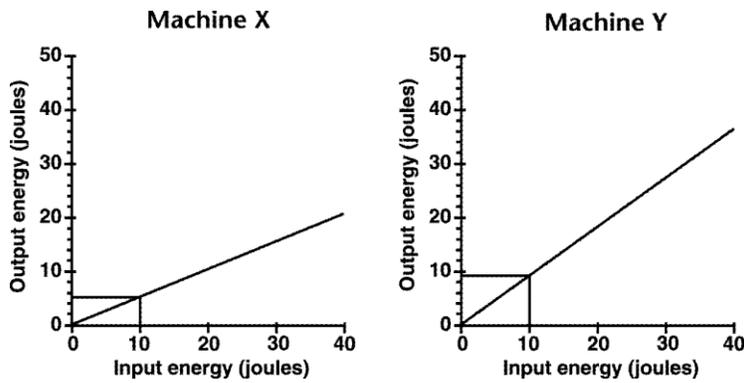
Due Dates: # 1-22 DUE: _____
23-44 DUE: _____
45-67 DUE: _____

Short Answer

1. Explain why the results of one experiment are never really final results.
2. Explain how the accuracy of your observations might affect how you develop a hypothesis.
3. Name two safety rules of science.
4. List the standard SI unit used to express each of the following and the tool used to measure each quantity:

	SI Unit	Tool
a. length	_____	_____
b. volume	_____	_____
c. mass	_____	_____
d. temperature	_____	_____
5. What is a variable?
6. Explain the difference between a control group and an experimental group.

7. The efficiency of a system is determined by comparing its output energy with its input energy. The graphs below show the output energy and input energy for two different machines.



- a. What is the independent variable for this experiment? _____
- b. What is the dependent variable for this experiment? _____

8. Name two advantages of using the SI system of measurement.

9. What are the two properties of all matter?

10. In one or two sentences, explain the different processes in 1) measuring the volume of a liquid 2) measuring the volume of an irregularly shaped object and 3) measuring the volume of a rectangular solid.

11. In one or two sentences, explain the relationship between mass and inertia.

12. Rank solids, liquids, and gases in order of decreasing particle speed.
13. Describe solids, liquids, and gases in terms of shape and volume.
14. How are evaporation and boiling different? How are they similar?
15. Classify each change of state (melting, freezing, vaporization, condensation, and sublimation) as endothermic or exothermic.
16. What is the difference between speed and velocity?
17. What distinguishes the measurement of speed from that of velocity and acceleration?
18. Explain the difference between balanced and unbalanced forces and how each affects the motion of an object.
19. What two things must you know in order to determine the gravitational force between two objects?
20. Explain the difference between mass and weight.

21. How does the mass of an object relate to the gravitational force the object exerts on other objects?
22. Explain why friction occurs.
23. What is a net force? How do we measure the net force of an object?
24. Does a change in direction affect acceleration? Explain your answer.
25. What is the net force when you combine a force of 10 N north with a force of 2 N south?
26. Why, in a classroom, would a feather dropped from the same height as an acorn fall to Earth more slowly than the acorn?
27. How does air resistance affect the acceleration of falling objects?
28. Explain how an orbit is formed.
29. How does Newton's second law explain why it is easier to push a bicycle than to push a car with the same acceleration?

30. How does Newton's third law explain how a rocket takes off?

31. Explain why friction can make observing Newton's first law of motion difficult.

32. Which has more momentum, a mouse running at 1 m/s north or an elephant walking at 3 m/s east? Explain your answer.

33. Work is done on a ball when a pitcher throws it. Is the pitcher still doing work on the ball as it flies through the air? Explain.

34. Explain why work output can never be equal to or greater than work input.

35. Suppose you exert 15 N on a machine, and the machine exerts 300 N on another object. What is the machine's mechanical advantage?

36. Explain the difference between work and power.

37. You lift a chair that weighs 50 N to a height of 0.5 m and carry it 10 m across the room. How much work do you do on the chair?

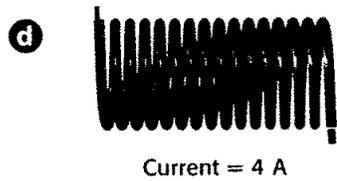
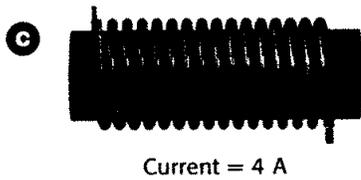
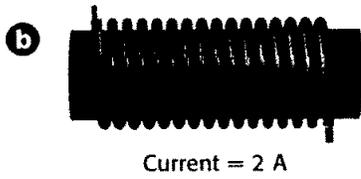
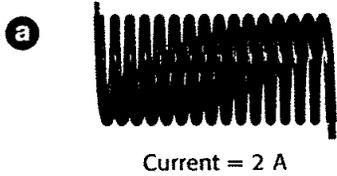
38. How does reducing friction increase the mechanical efficiency of a compound machine?
39. What are the two things that must happen for work to be done?
40. What two things do you need to know in order to calculate mechanical efficiency?
41. How does a machine make work easier?
42. What is an energy conversion?
43. Describe an energy conversion involving chemical energy.
44. Describe the kinetic-potential energy conversions that occur when you bounce a basketball.
45. Compare energy and work. What does one have to do with the other?
46. What is the difference between kinetic and potential energy? Can you describe an activity that utilizes both?

47. How much work is done on a 30 N rock that is lifted 1.5 m off the ground? Show your work.
48. Compare charging by conduction and induction.
49. What is static electricity? Give an example of static electricity.
50. Name the parts of a cell, and explain how they work together to produce an electric current.
51. What is electric current?
52. Which wire would have the lowest resistance: a long, thin wire at a high temperature or a short, thick copper wire at a low temperature?
53. Use Ohm's law to find the voltage needed to produce a current of 3 A in a device with a resistance of 9 Ω .
54. Name and describe the three essential parts of a circuit.
55. Why are switches useful in a circuit?

56. What is the difference between series and parallel circuits?
57. Discuss the difference between a conductor and an insulator. Give an example of each.
58. Describe how direct current differs from alternating current.
59. What is the resistance of an object if a voltage of 40 V produces a current of 5 A?
60. Name three properties of magnets.
61. Suppose you have two bar magnets. One has its north and south poles marked, but the other one does not. Describe how you could use the first magnet to identify the poles of the second magnet.
62. Name the metals used to make ferromagnets.
63. How are temporary magnets different from permanent magnets?
64. Explain how an electromagnet works.

65. How do you increase the strength of an electromagnet?

66. Study the solenoids and electromagnets shown below. Rank them in order of strongest magnetic field to weakest magnetic field. Explain your ranking.



67. Explain the energy conversions taking place in a generator and in an electric motor.