Physical Science Fall Final Study Guide

Introduction to science

1. What is a series of logical steps that is followed in order to solve a problem?
2. What is the first step in the scientific method?
3. How do scientists test a hypothesis?
4. What is the SI unit for measuring temperature? Time? Length? Mass?
5. What SI prefix means one thousand (1000)? One-hundredth (1/100)? One-thousandth (1/1000)?
6. Convert 234 cm into meters.
7. Convert 500 g into kilograms.
8. What is any factor that can change in an experiment?
9. What is a possible answer to a scientific problem?
10. What is the application of science to meet human needs?
11. Chemistry and physics are two branches of _____ science.
12. What is the extent to which a measurement approaches the true value?
13. Length, mass, time and temperature are four of the seven SI _____.
14. What are combinations of base units (such as volume, speed, and pressure) called?
15. What does it mean to say that "no experiment is a failure"?

Forces and Motion

16. When forces are balanced, what happens to the motion of the object?
17. For every action, the reaction is _____ and _____.
18. What does the weight of an object vary with?
19. Newton's third law of motion describes why forces act in _____.
20. Which would not be used to reduce friction: wheels, rough surfaces, ball bearings or coil?
21. Which is NOT a fluid: air, water, sugar, or oil?
22. The distance traveled by an object divided by the time it takes to travel that distance is called average _____.
23. The difference between speed and velocity is that velocity includes _____.
24. When an object is standing still, which values are zero: speed, velocity, momentum?
25. Acceleration is defined as the change in velocity divided by _____.
26. What is the combination of all forces acting on an object?
27. A tug-of-war that results in one team pulling the other across the line is an example of _____ forces.
28. What is the force that opposes motion between two surfaces that are touching?
29. When two objects are moved further apart from each other, the force of gravity _____.
30. What law states that every object maintains constant velocity unless acted on by an unbalanced force?
31. What law states that the unbalanced force acting on an object equals the object's mass times its acceleration?
32. Write the formula to calculate speed. Determine the speed of an object that covers 200 km in 5 hours.
33. Deceleration is negative _____.
34. Write the formula to calculate acceleration. What is the acceleration of an object that takes 10 sec to change from a speed of 200 m/sec to 300 m/sec? What is the unit for acceleration?
35. An object traveling at a constant 20 m/sec in a circular path is changing its: speed, velocity, weight, or mass?
36. What is the object from which movement is determined called?
37. Near the surface of the Earth, the acceleration due to gravity is 9.8 m/sec^2. After falling for 3 sec, an object would have a velocity of _____ m/sec.
38. What is the tendency of matter to resist any change in motion?
39. What is a push or pull that gives energy to an object, causing it to start moving, stop moving, or change its motion?
40. What is the length between two places called?
41. Momentum is found by multiplying an object's mass times its _____.
42. The distance-time graph for constant speed is a _____ line.

43. When an object covers equal distances in equal amounts of time, it is moving at _____ speed.
44. Force equals mass times _____.
45. What kind of friction is produced by using wheels or ball bearings?
46. How many laws of motion did Newton develop?
47. The size of the force of gravity depends on the _____ of the objects and the _____ between them.
48. What is the unit for weight?
49. A 500 kg car going 100 km/hr collides head on with a 1500 kg pick-up truck going 10 km/hr. The small car pushes the truck back. Explain.
50. Use Newton's first and second laws of motion to explain why seat-belts save lives.

Work, machines, power, energy

51. What is a force exerted over a distance to move an object?
52. Define compound machine and give some examples.
53. The joule is used to measure _____ and _____.
54. Mechanical energy is associated with _____.
55. What type of energy is associated with the motion of electric charges?
56. What type of energy is associated with the internal motion of particles of matter?
57. What type of energy is energy that bonds atoms or ions together?
58. What is the unit for force?
59. Power equals work divided by _____.
60. An object's kinetic energy varies with its _____ and _____.
61. A brake system on a car is an example of a(n): lever, inclined plane, hydraulic device or simple machine.
62. Write the formula to calculate work. A man pushes a crate with a force of 50 N and it moves a distance of 2 m. How much work does he perform?
63. Write the formula to calculate power. A man lifts a 10 N weight 2 meters over his head in 4 seconds, what is his power?
64. What is the mechanical advantage of a ramp that is 10 meters long and 5 meters high?
65. Where is the fulcrum located in a first-class lever?
66. What is the mechanical advantage of a single fixed pulley?
67. What is the mechanical advantage of a single movable pulley?
68. Name the simple machines in the inclined plane family.
69. Write the formula to calculate gravitational potential energy. Calculate the gravitational potential energy of a 50 kg box that is 2 m above the ground.
70. What three things does gravitational potential energy depend on?
71. Write the formula to calculate kinetic energy. Calculate the kinetic energy of a 2 kg ball that is thrown with a speed of 3 m/s.
72. State the law of conservation of energy.
73. What is a quantity that measures how much a machine multiples force or distance?
74. A _____ is an inclined plane that moves.
75. What is any device that makes work easier?
76. What is a simple machine that is a straight slanted surface?
77. What is the unit for power?
78. _____ is the energy of a moving object due to its motion.
79. The energy of position is called _____ energy.
80. A _____ is an inclined plane wrapped around a cylinder.
81. All levers have a rigid arm that turns around a point called the _____.
82. _____ is the ability to do work.
83. What is a chain, belt or rope wrapped around a wheel?
84. The amount of work done by a machine is the work _____.
85. What is the comparison of work input to work output?
86. Three children exhaust themselves trying to push a large rock that doesn't budge. Have they done any work? Explain.

Energy

87. Describe the kinetic-potential conversions that occur as a pendulum swings from side to side.

88. What is a device used to measure energy changes?
89. Write the formula to convert ^{o}C into K. What is 50 ^{o}C in K?
90. Define insulator and list some examples.
91. Define conductor and list some examples.
92. Temperature is a measure of average _____.
93. What is the transfer of energy by the movement of fluids or gases with different temperatures?
94. A cold-blooded reptile basks on a warm rock. What two forms of energy transfer are warming the reptile?
95. What is the energy transfer of heat between particles as they collide or between two objects in contact?
96. Energy transferred between the particles of two objects because of the temperature difference between the two objects is called _____.
97. _____ is the temperature at which an object's energy is minimal.
98. What is a device for measuring temperature?
99. _____ is the transfer of energy by electromagnetic waves.
100. Radio waves, infrared radiation, visible light, ultraviolet rays, and X rays are all forms of _____.

Waves

101. What type of wave can be transmitted through a vacuum?
102. What is a wave in which particles move at right angles (perpendicularly) to the direction of a wave?
103. What is the number of complete wave cycles per unit time?
104. What does frequency times wavelength equal?
105. The apparent breaking in two of a pencil that is placed in water is due to _____.
106. You can hear a sound produced out of sight around a corner because of _____.
107. What is the maximum displacement of molecules in a medium from their rest position?
108. Write the formula to calculate wave speed. Calculate the speed of a wave with a wavelength of 2 m and a frequency of 8 waves/sec.
109. Which does not require a physical medium to travel through: light or sound?
110. Are sound waves longitudinal or transverse?
111. Are light waves longitudinal or transverse?
112. A _____ wave requires a medium.
113. A(n) _____ wave consists of changing electric and magnetic fields and does not require a medium.
114. What is the highest point of a transverse wave?
115. What is the lowest point of a transverse wave?
116. What is the bouncing back of a wave as it meets a surface boundary?
117. What is the bending of a wave as it passes an edge or opening?
118. What is the bending of waves as they pass from one medium to another?
119. _____ occurs when two waves exist in the same place at the same time.
120. What is a wave in which the motion of the medium is parallel to the direction of the wave?
121. What is the distance between two consecutive crests of a wave?
122. What is the unit for frequency?
123. A _____ is a disturbance that transmits energy through matter or space.
124. What is the matter through which a wave travels?
125. A _____ is a region in the medium of a longitudinal wave where the molecules are crowded together.
126. What is the change in the pitch of a sound due to the motion of the source or observer?
127. What is a wave in which there are stationary nodes and antinodes?

Sound and Light

128. Name three things that the speed of sound depends on.
129. What are waves with frequencies slightly higher than those of visible light?
130. What are waves with frequencies slightly lower than those of visible light?
131. The stirrup, hammer, and anvil are the three small bones in the _____ ear.
132. What type of lens causes light to converge?
133. Sounds with frequencies below 20 Hz are called _____.
134. Sounds with frequencies above 20,000 Hz are called _____.
135. A concave mirror has a surface that curves _____.

136. A convex mirror has a surface that curves _____.
137. What does the loudness of a sound depend on?
138. Light passing into the eye is made to converge on the _____.
139. What does pitch of a sound depend on?
140. The color of light is determined by the _____ of the light waves.
141. What is the effect in which the vibration of one object causes another object to vibrate at natural frequencies?
142. How does a sonar system measure distance?
143. What type of electromagnetic radiation is used to kill cancer cells?
144. State the law of reflection.
145. What is an image that results from an apparent path of light rays?
146. Why does a red rose look red?
147. What is a virtual image caused by the reflection of light in the atmosphere?
148. What is the effect in which white light separates into different colors?
149. Which of the following is used to reflect light: lens, prism, mirror or fluorescent tube?
150. What electromagnetic waves have the highest energy and shortest wavelengths?
151. What is a transparent object that can separate white light into different colors?
152. What kinds of waves are used in communication, radar and for cooking?
153. The two most common models of light describe it as a wave of stream of _____.
154. The decibel is a unit of _____.
155. Light is made up of a stream of energy packets called _____.
156. What is the resulting color when three primary pigments are mixed in equal amounts?
157. Why do sounds travel faster in solids than in liquids, and faster in liquids than in gases?
158. Explain how rainbows are formed.

Electricity

159. An object that contains more electrons than protons is _____ charged.
160. There is a repulsive force between two charged objects when charges are _____.
161. There is an attractive force between two charged objects when charges are _____.
162. When a glass rod is rubbed with silk and becomes positively charged, _____ are removed from the rod.
163. The electric force varies depending on the _____ and the _____.
164. Every charged particle produces an _____ field.
165. Electric field lines point toward a _____ charge and away from a _____ charge.
166. Do electric field lines ever cross each other?
167. Electrons that move from one object to another and then remain at rest produce _____ electricity.
168. _____ is the SI unit of resistance.
169. If different parts of a circuit are found on separate branches it is a _____ circuit.
170. What is the unit for potential difference?
171. What is the opposition to the flow of electricity?

Magnetism

172. Unlike poles of different magnets will _____.
173. Where is the magnetic field the strongest?
174. What is the best core for an electromagnet?
175. Current is produced from a changing magnetic field in electromagnetic _____.
176. A magnetic field is described by magnetic line of _____.
177. What can cause a magnet to lose magnetism?
178. Materials that are difficult to magnetize, but tend to stay magnetized are called _____ magnets.
179. _____ is a naturally occurring magnetic rock.
180. In a magnetized object, domains are _____.