

Physical Science

Semester 1

MATCHING

Directions: Place the correct letter on the line that matches the definition to the word

- | | |
|---------------------------------------|--|
| _____ 1. Conduction | A. energy that travels by radiation |
| _____ 2. Convection | B. does not allow heat to move easily through them |
| _____ 3. Fluid | C. this is how heat engines burn fuel and means rapid burning |
| _____ 4. Radiation | D. device with a large surface area designed to heat the air near it by conduction |
| _____ 5. Insulator | E. uses no fans or mechanical devices to transfer heat from one area to another |
| _____ 6. Radiant energy | F. transfer of energy through matter by direct contact of particles |
| _____ 7. Radiator | G. energy from the sun |
| _____ 8. Solar energy | H. uses solar collectors to heat water and then pump it through the house |
| _____ 9. Passive solar heat | I. transfer of energy by the bulk movement of matter |
| _____ 10. Active solar heat | J. fuel is burned outside the engine |
| _____ 11. Solar collectors | K. fuel burns inside the engine in chambers called cylinders |
| _____ 12. Heat engines | L. any material that flows |
| _____ 13. Internal combustion engines | M. transfer of energy in the form of waves; does not require matter |
| _____ 14. External combustion engines | N. devices that convert thermal energy into mechanical energy |
| _____ 15. Combustion | O. devices that absorb radiant energy from the sun |

MATCHING - 2

Directions: Place the correct letter on the line that matches the definition to the word

- | | |
|--------------------------------------|---|
| _____ 1. Wheel and axle | A. sloping surface used to raise objects |
| _____ 2. Inclined plane | B. simple machine consisting of two wheels of different sizes that rotate together |
| _____ 3. Screw | C. rate at which work is done |
| _____ 4. Wedge | D. inclined plane wrapped in a spiral around a cylindrical post |
| _____ 5. Compound machine | E. combination of two or more simple machines |
| _____ 6. Efficiency | F. has definite shape and volume |
| _____ 7. Power | G. inclined plane with one or two sloping sides |
| _____ 8. Solid | H. gas like mixture with positively and negatively charged particles |
| _____ 9. Kinetic Theory
Of Matter | I. tiny particles in constant motion make up all matter |
| _____ 10. Crystals | J. measure of how much work put into a machine is changed to useful work put out by a machine |
| _____ 11. Liquids | K. ability of a fluid (liquid to gas) to exert an upward force on an object immersed in |
| _____ 12. Plasma | L. particle arranged in repeating geometric patterns |
| _____ 13. Thermal expansion | M. matter that flows and takes the shape of its container |
| _____ 14. Pressure | N. amount of force exerted per unit of area |
| _____ 15. Buoyancy | O. matter that expands as it gets hotter and contracts when it cools |

MATCHING - 3

Directions: Place the correct letter on the line that matches the definition to the word

- | | |
|--------------------------------|---|
| _____ 1. Stroke | A. force applied to a machine |
| _____ 2. Turbine | B. device that does work with only one movement |
| _____ 3. Heat mover | C. device that makes work easier |
| _____ 4. Heat pump | D. force applied to machine to overcome resistance |
| _____ 5. Evaporation | E. bar that is free to pivot or turn about a fixed point |
| _____ 6. Machine | F. fixed point of a lever |
| _____ 7. Simple machine | G. number of times a machine multiplies the effort force |
| _____ 8. Effort force | H. up and down movement of the piston |
| _____ 9. Resistance force | I. part of the lever in which the effort force is applied |
| _____ 10. Mechanical Advantage | J. refrigerant removes heat from food as it changes from a liquid to a gas |
| _____ 11. Lever | K. special two way heat mover |
| _____ 12. Fulcrum | L. part of the lever that exerts the resistance force |
| _____ 13. Effort arm | M. a grooved wheel with a rope or a chain running along the groove |
| _____ 14. Resistance arm | N. device that removes thermal energy from one location and transfers it to another location at a different temperature |
| _____ 15. Pulley | O. huge fanlike device |

FILL IN - 1

Directions: Use each of the terms below just once to complete the passage.

wedges

inclined plane

effort arm

lever

screw

internal combustion

thermal

mechanical

resistance arm

external combustion

fulcrum

1. In a(n) _____, fuel is burned inside the engine.
2. In a(n) _____, fuel is burned outside the engine.
3. Heat engines are devices that convert _____ energy into _____ energy.
4. A _____ is a bar that is free to turn about a fixed point.
5. The _____ is the part of the lever on which the effort force is applied.
6. A ramp is an example of a simple machine called a(n) _____.
7. Chisels, knives and axes are examples of _____.
8. A(n) _____ is an inclined plane wrapped in a spiral around a cylindrical post.
9. The _____ is the part of the lever that exerts the resistance force.
10. The fixed point of a lever is called the _____.

FILL IN - 2

Directions: Use each of the terms below just once to complete the passage.

conduction	radiation	radiator	mechanical advantage
radiant energy	movement	effort force	compound machine
resistance force	efficiency		

1. _____ is a measure of how much of the work put into a machine is changed to useful work put out by the machine.
2. The number of times a machine multiplies the effort force is the _____ of the machine.
3. The force applied to a machine is called the _____.
4. A solar collector is a device that absorbs _____ from the sun.
5. _____ is the transfer of energy in the form of waves.
6. A(n) _____ is a combination of two or more simple machines.
7. The force applied by a machine is called the _____.
8. A simple machine does work with only one _____.
9. A(n) _____ is a device used to heat air by conduction.
10. _____ is the transfer of energy through matter by direct contact of particles.

FILL IN - 3

Directions: Use each of the terms below just once to complete the passage.

effort force	efficiency	screw	wheel and axle
inclined plane	pulley	lever	resistance force
mechanical advantage		wedge	

1. The force used to move an object is the _____.
2. A ramp is an _____.
3. The direction of force can be changed by a _____.
4. A machine that doubles a person's effort force has a _____ of 2.
5. The force that opposes the effort force is the _____.
6. An ax is an example of a _____.
7. A bar moving on a fixed point is a _____.
8. The measure of how much work a machine does compared to the effort used is _____.
9. A _____ spreads the effort along the spirals length.
10. A wheel and rod make up a _____.

MULTIPLE CHOICE

Directions: Circle the answer that best completes the question.

1. A _____ changes thermal energy into mechanical energy.
A. heat engine
B. refrigerator
C. solar collector
D. conductor
2. Which of these does not require the presence of particles of matter?
A. radiation
B. conduction
C. convection
D. combustion
3. In which of these forms is water not a fluid?
A. a liquid
B. ice
C. water vapor
D. steam
4. Which material is a poor insulator of heat?
A. aluminum
B. feathers
C. air
D. plastic
5. In _____, fuel is burned inside chambers called cylinders.
A. internal combustion engines
B. external combustion engine
C. heat pumps
D. steam engines
6. In order for radiant energy to change to thermal energy, it must be _____.
A. reflected
B. conducted
C. convected
D. absorbed
7. Heat can move through a good _____.
A. insulator
B. carburetor
C. conductor
D. collector
8. A _____ is an example of a heat mover.
A. refrigerator
B. steam engine
C. combustion engine
D. four stroke engine

9. Waste gases are removed during the _____ of a four stroke engine.

- A. power stroke
- B. intake stroke
- C. compression stroke
- D. exhaust stroke

10. What is a method of heat transfer?

- A. conduction
- B. convection
- C. radiation
- D. all the above

11. There are _____ types of simple machines.

- A. three
- B. six
- C. eight
- D. ten

12. In an ideal machine, the work input _____ the work output.

- A. is equal to
- B. is greater than
- C. is less than
- D. is independent of

13. To raise a resistance 4 m, the effort rope of a single fixed pulley must move _____.

- A. 2 m
- B. 8 m
- C. 1 m
- D. 4 m

14. In a wheel and axle, the resistance force is usually exerted by the _____.

- A. axle
- B. larger wheel
- C. gear ratio
- D. pedals

15. As the efficiency of a machine increases, the _____ of the machine increases.

- A. work input
- B. work output
- C. friction
- D. IMA

16. The IMA of an inclined plane can be increased by _____.

- A. increasing the length
- B. increasing the height
- C. decreasing the length
- D. making its surface smoother

17. The IMA of an inclined plane 8 m long and 2 m high is _____.

- A. 2
- B. 4
- C. 16
- D. 8

18. The ideal mechanical advantage of a pulley system in which five ropes support an object is _____.

- A. 2.5
- B. 5
- C. 10
- D. 25

19. The _____ of a machine is the number of times it multiplies the effort force.

- A. efficiency
- B. power
- C. mechanical advantage
- D. resistance

20. Which of these can be done by a machine?

- A. multiply a force
- B. work
- C. change direction of a force
- D. all the above

21. Pascal's principle is the basis for _____.

- A. aerodynamics
- B. buoyancy
- C. hydraulics
- D. changes of state

22. The temperature at which all particle motion of matter would stop is _____.

- A. absolute zero
- B. its melting point
- C. 0°C
- D. 273°C

23. A material's heat of fusion gives the amount of energy needed to _____.

- A. condense a gas
- B. boil a liquid
- C. melt a solid
- D. evaporate a liquid

24. The state of matter that has a definite volume and a definite shape is _____.

- A. gas
- B. liquid
- C. plasma
- D. solid

25. In general, when a solid is heated, it _____.

- A. becomes a gas
- B. condenses
- C. contracts
- D. expands

26. The most common state of matter is _____.

- A. gas
- B. liquid
- C. plasma
- D. solid

27. Particles separate completely from each other in a(n) _____.

- A. gas
- B. liquid
- C. solid
- D. amorphous material

28. Most pressure is measured in _____.

- A. grams
- B. kilopascals
- C. newtons
- D. kilograms

29. Bernoulli's principle explains why _____.

- A. airplane fly
- B. boats float
- C. pistons work
- D. ice melts

30. The state of the matter of the sun and other stars is primarily _____.

- A. amorphous
- B. plasma
- C. liquid
- D. gas

31. The amount of thermal energy needed to raise the temperature 1kg of a material 1°C is _____.

- A. heat engine
- B. specific heat
- C. thermal energy
- D. radiation

32. Any device that converts thermal energy into work is a _____.

- A. heat engine
- B. thermal energy
- C. radiation
- D. specific heat

33. The sum of kinetic and potential energy of particles in an object and is transferred by conduction, convection and radiation is _____.

- A. specific heat
- B. radiation
- C. heat engine
- D. thermal energy

34. The transfer of thermal energy by electromagnetic waves is _____.

- A. thermal energy
- B. specific heat
- C. radiation
- D. heat engine

35. The transfer of thermal energy by collisions between particles in matter at a higher temperature and particles of matter at a lower temperature is _____.

- A. radiation
- B. conduction
- C. convection
- D. heat engine

36. What is the transfer of thermal energy in a fluid by the movement of warmer and cooler fluid from place to place?

- A. convection
- B. radiation
- C. conduction
- D. temperature

37. This law states that it is impossible for heat to flow from a cool object to a warmer object unless work is done.

- A. internal combustion engine
- B. first law of thermodynamics
- C. thermal energy
- D. second law of thermal dynamics

38. A device that regulates the temperature of a system is called a _____.

- A. heating appliance
- B. refrigerator
- C. heat engine
- D. thermostat

39. What is it called when a materials volume decreases when its temperature decreases?

- A. thermal insulator
- B. thermal conductor
- C. thermal contraction
- D. thermal expansion

40. A machine that converts thermal energy into mechanical energy is called _____.

- A. heat engine
- B. thermostat
- C. heating appliance
- D. thermal conductor

SHORT ANSWERS

Directions: Answer all short answer questions using complete sentences. Spelling and grammar count.

1. Compare the characteristics of solids and liquids.

2. List five sources of water pollution.

3. Name and describe the state changes in which solids and liquids become gases.

4. Describe and give examples of three ways that a simple machine can make work easier.

5. Give an example of a compound machine. Explain what it does.

6. What are the simple machines that make up a compound machine.

7. How are power, work and time related?

8. Give one example of each kind of simple machine.

9. Explain why the six kinds of simple machines are really variations of just two basic machines.

10. When would the friction of an inclined plane be useful?

11. How are temperature and kinetic energy related?

12. How do heat and thermal energy differ?

13. Name 3 ways thermal energy is transferred.

14. Give three examples of internal combustion engines.

15. What are three types of heating systems?

16. How does the human body transfer its thermal energy into the surrounding environment?

17. What happens to the energy put into a liquid during boiling?

18. Name the four states of matter.

19. What is the kinetic theory of matter?

20. If machines make work easier, explain why most machines actually increase the amount of work you do in accomplishing a task.
