# Science Focus 7

## Heat and Temperature

### Pop Quiz Master
(5-6 questions) for each Topic

**Answer Key**

| Science Focus 7 Topics | Questions | | | | | |
|---|---|---|---|---|---|---|
| | 1. | 2. | 3. | 4. | 5. | 6. |
| Topic 1 - Using Energy From Heat | A | C | C | D | A | |
| Topic 2 – Measuring Temperature | C | C | B | D | A | C |
| Topic 3 - The Particle Model | C | C | C | A | D | |
| Topic 4 - Expansion and Contraction | C | A | C | D | B | |
| Topic 5 - The Particle Model and Changes of State | C | B | A | C | D | |
| Topic 6 - Transferring Energy | C | D | B | A | B | |
| Topic 7 - Sources of Thermal Energy | A | C | B | C | B | |
| Topic 8 - Conserving Our Fossil Fuels | B | D | B | A | B | |

# Heat and Temperature Practice Quiz

## Topic 1 – Using Energy From Heat

1. This type of Thermal Energy source can be used to cook food, but they are hard to control, dangerous and messy.
   A. open fires
   B. fireplaces
   C. pioneer stove
   D. modern gas stove

2. New technologies have been developed to provide thermal energy, without scorching your body. One of these has micro sensors that work like invisible thermostats, that measure the temperature of different parts of your body and generates thermal energy accordingly. This technology is ...
   A. still in the development stage
   B. found only in research labs
   C. an electric blanket
   D. thermal underwear

3. A technology that has replaced boiling water over an open campfire gives us a warning when the water has boiled. This technology is ...
   A. a micro-sensing digital boiler
   B. a solar powered water heater
   C. an electric kettle
   D. a hot water heater

4. Choose the technology that you would need so that you could heat a large room in your house, and maintain a constant comfortable temperature in that room.
   A. a gas furnace
   B. a wood-burning fireplace
   C. an electric fireplace
   D. a digital thermostat

5. Overheating can be a problem for hand-held hair dryers. A device, that is used to shut off the thermal energy when it gets too hot, is needed. This device is ...
   A. automatically controlled
   B. the heating element
   C. the fan
   D. a button on the hair dryer

# Heat and Temperature Practice Quiz

## Topic 2 – Measuring Temperature

1. Estimating temperature is something that we do automatically. Touching something to see how hot or cold it is is one technique that we use. Another is to ...
   A. use a thermometer
   B. look at the moving particles
   C. observe the color
   D. use the back of your hand

2. Because your senses can easily be fooled, thermometers were developed, because they are more reliable. The earliest thermometers contained a glass bottle with a long glass tube for the liquid to rise and fall. An important part was missing though. It was the ...
   A. type of liquid that senses temperature change
   B. type of glass that doesn't expand
   C. the calibrated scale of relative temperatures
   D. the protective stoppers to prevent the liquid from escaping

3. Pressure affects the boiling point and freezing point of water. Extreme pressure under a glacier can cause the ice to flow or even melt at temperatures ...
   A. above $0^{o}C$
   B. below $0^{o}C$
   C. around $0^{o}C$
   D. consistent with $0^{o}C$

4. Absolute zero is a temperature on the Kelvin scale. Although no one has ever been able to cool anything down to absolute zero, scientist know that it is ...
   A. - 137.15 K
   B. - 237.15 K
   C. - 173.15 K
   D. - 273.15 K

5. A material, which is affected by changes in some feature of the environment, such as temperature is called a ...
   A. circuit
   B. sensor
   C. signal
   D. responder

6. Recording thermometers are called thermographs. The 'temperature writer' uses a rotating drum to record changes in temperature. Tiny movements of this device can make large movements of the recording instrument. The device which makes these tiny movements is the ...
   A. lever
   B. pen
   C. bimetallic strip
   D. rotating drum

# Heat and Temperature Practice Quiz

## Topic 3 – The Particle Model

1. The Particle Model of Matter helps to explain ideas about Thermal Energy. This model includes each of the following points EXCEPT ...

   A. all substances are made up of tiny particles that are too small to see
   B. the particles are always in motion
   C. the particles increase their energy output when they collide
   D. the particles have spaces between them

2. Another important idea about temperature and the particle theory is that the motion of particles increases when the temperature increases. Which statement below is also correct?

   A. as the motion of particles decreases the temperature remains the same
   B. as the temperature decreases the motion of the particles also increases
   C. as the motion of the particles decreases the temperature decreases
   D. as the temperature increases the motion of the particles decreases

3. Energy is the measure of something's ability to do work. Which of the following has the most thermal energy?

   A. a dead battery
   B. a melted slurpee
   C. a cup of hot coffee
   D. a swimming pool

4. Which of the following energy transfers would be correct?

   A. thermal energy in a hot drink is transferred to cold hands
   B. thermal energy is transferred from a room to a heater, so it can be heated
   C. an ice cube loses thermal energy when it melts in hot lemonade
   D. thermal energy is lost by a match when it is lit

5. Which of the following statements about energy is a correct scientific description of what energy is?

   A. energy is a substance that can be transferred
   B. the mass of energy can be measured using a precision instrument
   C. energy fills the space with highly charged tiny particles
   D. energy is a description of a quality or a condition

# Heat and Temperature Practice Quiz

## Topic 4 – Expansion and Contraction

1. When a substance is heated the particles gain energy and spread out, creating more volume (spaces between the particles. So what about the mass of the substance? What happens to the mass of a substance when it is heated?

A. mass increases
B. mass decreases
C. mass remains the same
D. mass is lost

2. Solids made of different metals were all heated to 100$^{o}$C to determine how their volume and length would be affected. Which statement describes the most likely outcome of this experiment?

A. All the volumes changed the same amount and the lengths remained constant.
B. All the volumes changed, but each substance was the same length.
C. Only some of the volumes changed with their length being increased.
D. All of the volumes changed and so did their lengths.

3. Some students performed an experiment testing the affect of heat on different liquids. Which of the following variables would have been the manipulated variable.

A. the amount of heat used
B. the size and type of glass tubing each liquid would rise
C. the different types of liquids
D. the different levels each of the liquids reached in the glass tubing

4. Look at the experiment that the students set up to determine if a gas expands when heated. The experiment didn't work because the students were missing an important element to get the results they predicted. What was missing?

A. proper safety equipment
B. a larger balloon
C. a larger flask was needed
D. a heat source

5. A balloon filled with helium was put into a freezer to determine what the effect the lowering of the temperature would have on a gas. The responding variable in this experiment was the ...

A. amount of gas in the balloon before and after
B. the volume of the balloon before and after
C. the temperature variation of the freezer
D. the amount of time needed to change the balloon

# Heat and Temperature Practice Quiz

## Topic 5 – The Particle Model and Changes of State

1. The sun shines down on the banks of a river (and the river itself). The thermal energy absorbed will be ...

   A. more in the water
   B. more in the soil
   C. almost the same in both
   D. dependant on the mass of each

2. When a substance undergoes a change of state, energy is involved. Which change of state involves a release of energy?

   A. melting
   B. sublimation
   C. evaporation
   D. fusion

3. As high-energy particles escape from the surface of a liquid, by evaporation, the remaining liquid cools. This surface cooling phenomenon is described by scientists as ...

   A. evaporative cooling
   B. subliminal cooling
   C. fusion
   D. condensive evaporation

4. During a phase change, the temperature remains the same, so the particles have ...

   A. less average energy
   B. more average energy
   C. the same average energy
   D. a faster speed

5. The water droplets that form on a shower door have undergone a phase change. Prior to the droplets forming, the water was in a state of ...

   A. absolute flux
   B. suspended animation
   C. liquid
   D. gas

# Heat and Temperature Practice Quiz

## Topic 6 – Transferring Energy

1. In a hot tub, your body gains thermal energy from the hot water. This thermal energy is then transferred throughout the inside your body by each of your living cells. It can be dangerous to stay in the tub for a long period of time, because your ...

A. cells will get so large they will burst, losing all of their nutrients to the water
B. normal body temperature begins to be transferred to the water
C. cells will shrink because of osmosis
D. blood vessels enlarge, blood pressure goes down, and your heart rate increases

2. Radiation is the transfer of energy without any movement of matter. This type of energy transfer is called ...

A. radiative transduction
B. radioactive transfer
C. electrospectrum radiation
D. electromagnetic radiation

3. A certain type of thermal energy transfer moves the energy by direct collisions, particle-to-particle. This type of thermal energy transfer is called ...

A. concurrent
B. conductive
C. conduit
D. convective

4. The transfer of energy in a fluid is very different. The heated particles become less dense and so they rise, with the colder, more dense particles rushing in to take their place. This type of thermal energy transfer creates a ...

A. conduction current
B. convection current
C. radiative pathway
D. concurrent current

5. Energy systems have five things in common - input energy, energy transfer, output energy, waste energy and ...

A. collisions between particles
B. energy source
C. energy equilibrium
D. concentrated flow

# Heat and Temperature Practice Quiz

## Topic 7 – Sources of Thermal Energy

1. Much of the energy used in Alberta is found in the vast resources of fossil fuels. This type of energy source is useful and is stored until we need it. Fossil fuels are considered to be sources of ...

A. chemical energy
B. industrial energy
C. biological energy
D. geothermal energy

2. Electrical energy can be generated at a Dam, using generators and can also be generated by thermo-electric generating stations which burn coal. The reason that thermo-generating stations are used is because ...

A. coal is so abundant
B. it is cleaner and cheaper
C. a large waterfall is not available
D. heated water is more efficient

3. Thermal energy from inside the Earth's crust can be harnessed as a useful thermal energy source. Volcanoes, hot springs and geysers are example of this type of thermal energy source. This type of thermal energy is ...

A. an environmental pollutant
B. a clean alternative to using fossil fuels
C. called geovolcanic energy
D. used to generate fossil fuel resources

4. Solar energy can be a very good alternative thermal energy source. The way a house is situated on the lot it is built on is a passive solar energy technique. This technique is important because the sun is not always ...

A. shining
B. in the same direction
C. on the same plane
D. providing EMR

5. Co-generation is the use of ...

A. electrical energy to get waste energy
B. waste energy to generate electrical energy
C. waste energy to generate mechanical energy
D. mechanical energy to generate waste energy

# Heat and Temperature Practice Quiz

## Topic 8 – Conserving Our Fossil Fuels

1. Prior to the enormous pollution problem caused by the Industrial Revolution and the automobile, a pollutant was creating problems that were just as deadly. The horse and buggy age in our big cities, was slow and also dangerous to our health, because of the ...

A. dangers of being run over
B. large quantities of manure
C. temperament of the animals
D. lack of safety standards

2. Programmable thermostats can be used while the occupant of the home is asleep or away. These devices ...

A. adjust the temperature
B. increase the temperature
C. decrease the temperature
D. all of the above

3. An **ENERGUIDE** label is found on most household electrical appliances and tells the consumer how much electricity is ...

A. needed to run the appliance
B. used running the appliance
C. wasted by the appliance
D. generated while running the appliance

4. Thermal energy has the power to hurt us and destroy our possessions. All of the following practices are dangerous and harmful EXCEPT ...

A. reclamation programs
B. dumping of toxic chemicals
C. forest fires
D. volcanic eruptions

5. A dangerous by-product, from the use of fossil fuels (coal, natural gas and oil) enters the atmosphere when the fuel is burned. This by-product can cause irritations to the eyes, nose and throat. This pollutant greatly affects asthma sufferers. It is ...

A. carbon dioxide
B. sulfur dioxide
C. carbon monoxide
D. sulfur monoxide