**Chapter 5**

1. Define **motion: a change in distance relative to a reference point**

**reference point:** an object used to determine if another object is in motion

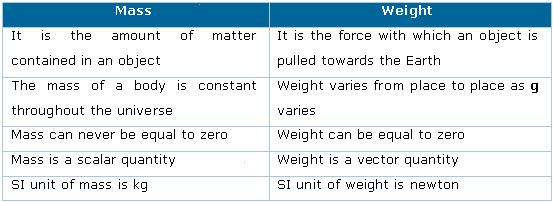
**speed:** the distance an object travels in a given amount of time

1. What is the difference between **speed** and **velocity**?
   1. Speed is distance traveled in a given amount of time and velocity is the speed of an object in a certain direction
2. Describe the difference between **velocity** and **acceleration**. (page 120-121)
   1. Velocity is speed in a certain direction and acceleration is any change in motion (speed up, slow down, change direction)
3. What is a **force**? (page 124 and notes)
   1. A force is a push or a pull that could result in the change in motion of an object
4. Define: **balanced force – an unmoving object with a net force of zero**

**Newtons**

**unbalanced force** – a moving object with a net force of greater than zero Newtons

1. Define **friction**. (page 128)
   1. An unbalanced force that slows down moving objects
2. List 2 ways to ***increase* friction**. (page 132-133)
   1. Rougher surfaces
   2. Increase applied force
3. List 2 ways to ***decrease* friction**. (page 132-133)
   1. Smoother, lubricated surfaces
   2. Rolling kinetic friction instead of sliding friction
4. Define **gravity**. (page 134)
   1. the force that attracts a body toward the center of the earth, or toward any other physical body having mass
5. How is **gravitational force *increased***? (p. 136-137)
   1. Increase mass and decrease distance
6. How is **gravitational force *decreased***? (p. 136-137)
   1. Increase distance and decrease mass
7. What is the ***difference*** between **mass** and **weight**? (page 138)



**Chapter 6**

1. Define **inertia**. (page 160)
   1. the resistance of any physical object to any change in its state of motion, including changes to its speed and direction.
2. Explain the relationship between **force, mass, and acceleration**. (page 161)
   1. The force it takes to move (or accelerate) an object varies – depending on the mass of the object. Example: less force is required to move (or accelerate) an empty shopping cart than a cart filled with grocery items
3. Describe **action force: the force applied to an object or person**

**reaction force:** the equal and opposite force occurring after an action force is applied

**Chapter 8**

1. What is **work**?
   1. Work occurs force and motion occur in the same direction
2. What is a **machine**?
   1. A machine is a device that makes work easier

18. Describe the ***six simple machines***:

**Lever: A simple machine made with a bar that pivots (move) around a fixed point called a fulcrum**

**Pulley: A simple machine made with a rope or chain wrapped around a grooved wheel; A pulley changes the direction of the force OR the size of the force**

**Wheel and Axle: A wheel and axle consists of 2 circular objects of different sizes. Example: faucet, pencil sharpener, door knob**

**Inclined Plane: A simple machine with no moving parts. It is simply a straight slanted surface. ( Ex. a ramp.)**

**Wedge: A modification of an inclined plane that moves. It is made of two inclined planes put together.**

**Screw: An inclined plane that wraps around a cylinder.**

**Chapter 9**

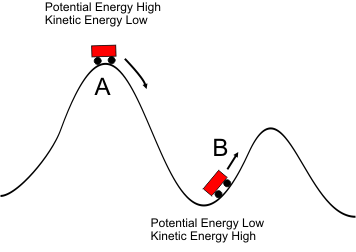
1. Define **energy**.
   1. The ability to do work
2. Define **kinetic energy**. (page 241)
   1. The energy of motion
3. Define **potential energy**. (page 242)
   1. Stored energy; energy due to an object’s position or height

22. Describe the ***seven forms of energy***. (pages 244 – 246)

* **Thermal energy – energy of the motion of atoms/molecules in a substance**
* **Chemical energy – the energy stored in the bonds of compounds of matter (ex.: gasoline, food, batteries)**
* **Electrical energy – the energy of the moving electrons**
* **Sound energy – energy of vibrating molecules in a solid, liquid, or gas**
* **Light energy – reflected or emitted from objects in the form of electrical and magnetic waves that can travel through space.**
* **Nuclear energy – energy from the splitting or fusing of nuclei**
* **Mechanical energy – potential + kinetic energy**

**Chapter 9 (continued)**

23**.**  Draw and label the **energy conversion** that occurs on a **roller coaster**. (page 254)

Also, thermal energy is used.

24. State the law of conservation of energy.

Energy cannot be created or destroyed – it changes forms

**Chapter 10**

25. Define **heat**.

The transfer of thermal energy from high temperature to lower temperatures until equilibrium is reached

26. What is **conduction**?

Heat transferred through direct contact

27. What is **convection**?

heat transfer by differences in density of a fluid such as air or water (gases and liquids)

28. What is **radiation**?

Heat transferred through empty space

**Chapter 17**

29. What is an **insulator**?

A material that does not allow thermal or electrical energy to flow easily (glass, rubber, wood)

30. What is a **conductor**?

A material that allows thermal/electrical energy to flow easily (metals, water)

31. What is a **series circuit**?

A single pathway for electrical energy to flow; if a break in the circuit occurs, all energy stops flowing

32. What is a **parallel circuit**?

A pathway for electrical energy with multiple routes; if a break in the circuit occurs, charges have alternate routes to flow

33. What are the ***three parts*** *of an electric circuit*?

Load, energy source, wires

**Chapter 18**

34. What is a **magnet**?

a piece of iron (or an ore, alloy, or other material) that has its aligned atoms (domains) so ordered that the material exhibits properties of magnetism

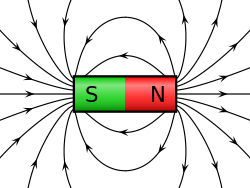
35. Define **magnetic force**.

attraction or repulsion that arises between poles of a magnet due to their atomic alignment (domains)

36. How can you make an **electromagnet**?

Wrap wire around an iron bar and attach ends of wire to a battery – the iron core becomes magnetic; the stronger the battery and/or the more coils of wire, the stronger the electromagnet

37. *Draw a magnet with north and south poles and draw the magnetic field lines*.



**Chapter 20**

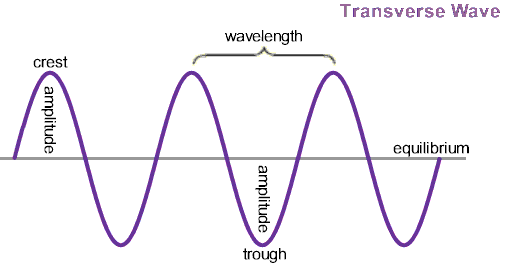
38. *What do waves transfer?*

*Waves transfer energy*

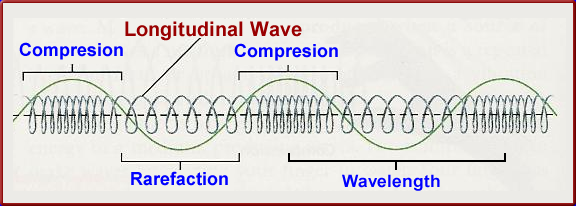
39. What is the difference between ***mechanical and electromagnetic waves***?

Mechanical waves require a medium and electromagnetic waves can travel through empty space

40. Draw and label a **transverse wave**.



41. Draw and label a **longitudinal wave**.



42. List and define the *4 properties that all waves have*.

1) AMPLITUDE – the distance from the rest position to the crest or trough of a wave; relates to height of a wave and volume of a sound wave

2) FREQUENCY - the number of crests of a **wave** that move past a given point in a given unit of time. The most common unit of**frequency** is the hertz (Hz)

3) WAVELENGTH – the distance between any 2 corresponding points on a wave (ex.: two crests or two rarefactions)

4) SPEED - the distance traveled by a given point on the wave (such as a crest) in a given interval of time

43. What is **reflection**?

change in direction of **waves** when they bounce off a barrier;

44. What is **refraction**?

change in the direction of **waves** as they pass from one medium to another;

45. What are the ***2 kinds of interference***?

Constructive interference and Destructive interference

**Chapter 21**

46. Is sound a ***mechanical or electromagnetic wave***?

Sound is a mechanical wave because it has to travel through a medium

47. What is **sound**?

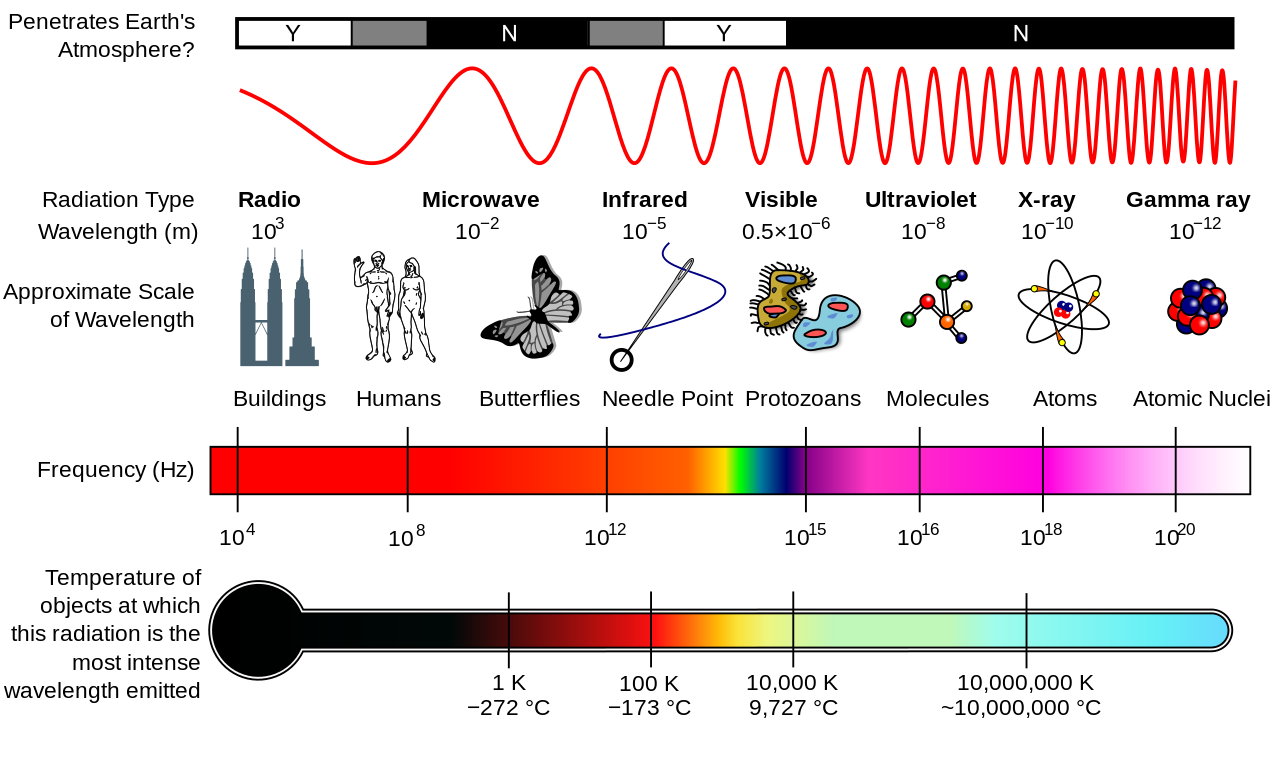
Sound is a a wave of compression and rarefaction, by which sound is vibrates in a medium such as air.

48. What is the *speed of sound*?

**340.29 m / s**

**Chapter 22**

49. Draw and label the ***electromagnetic spectrum***.



50. What colors are included in ***visible light***?

Red, Orange, Yellow, Green, Blue, Indigo, Violet