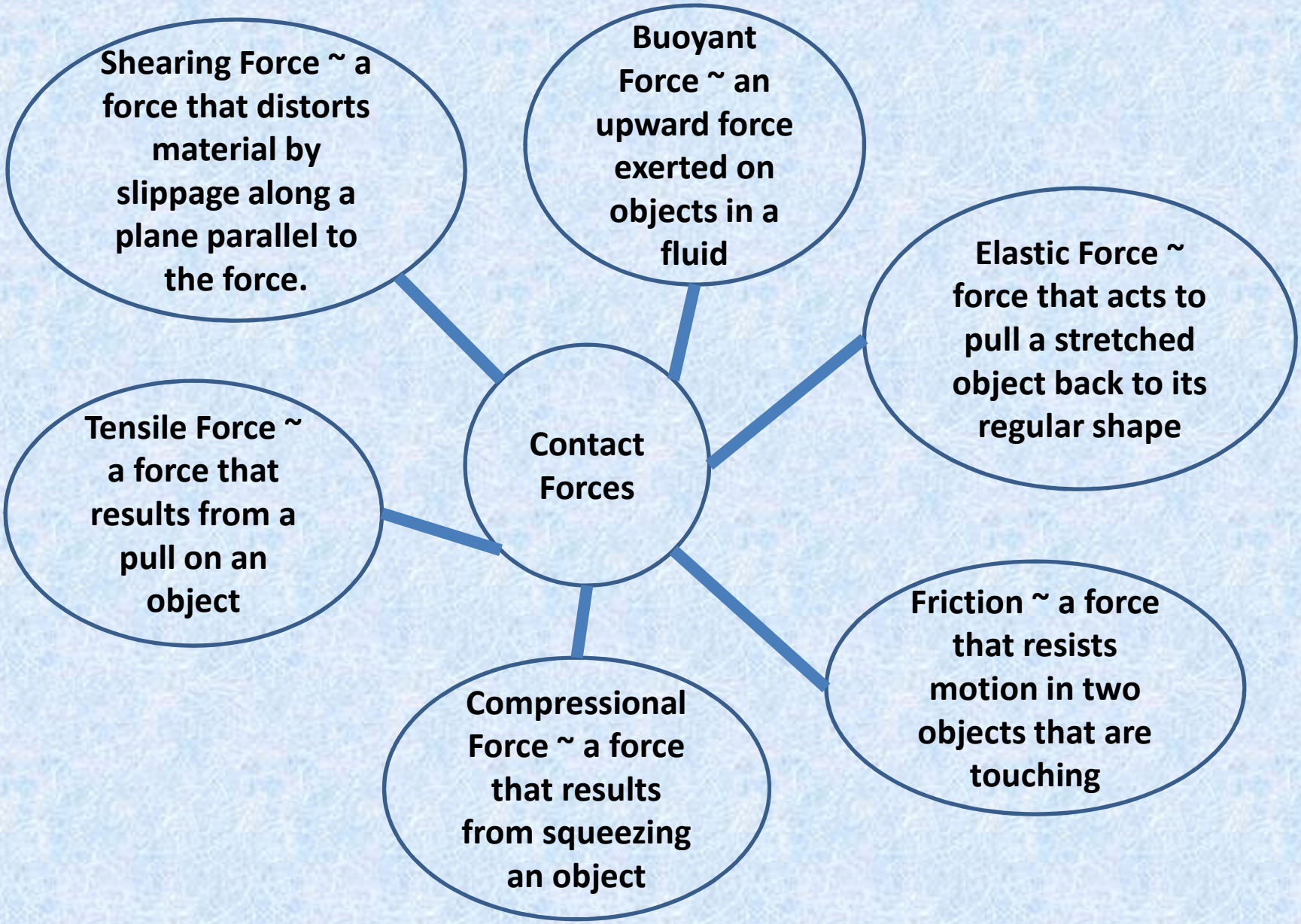
# Unit 4 Chapter 1 Lesson 1

1. Force ~ a push or a pull that changes the motion, size, or shape of an object; measured in newtons (N)

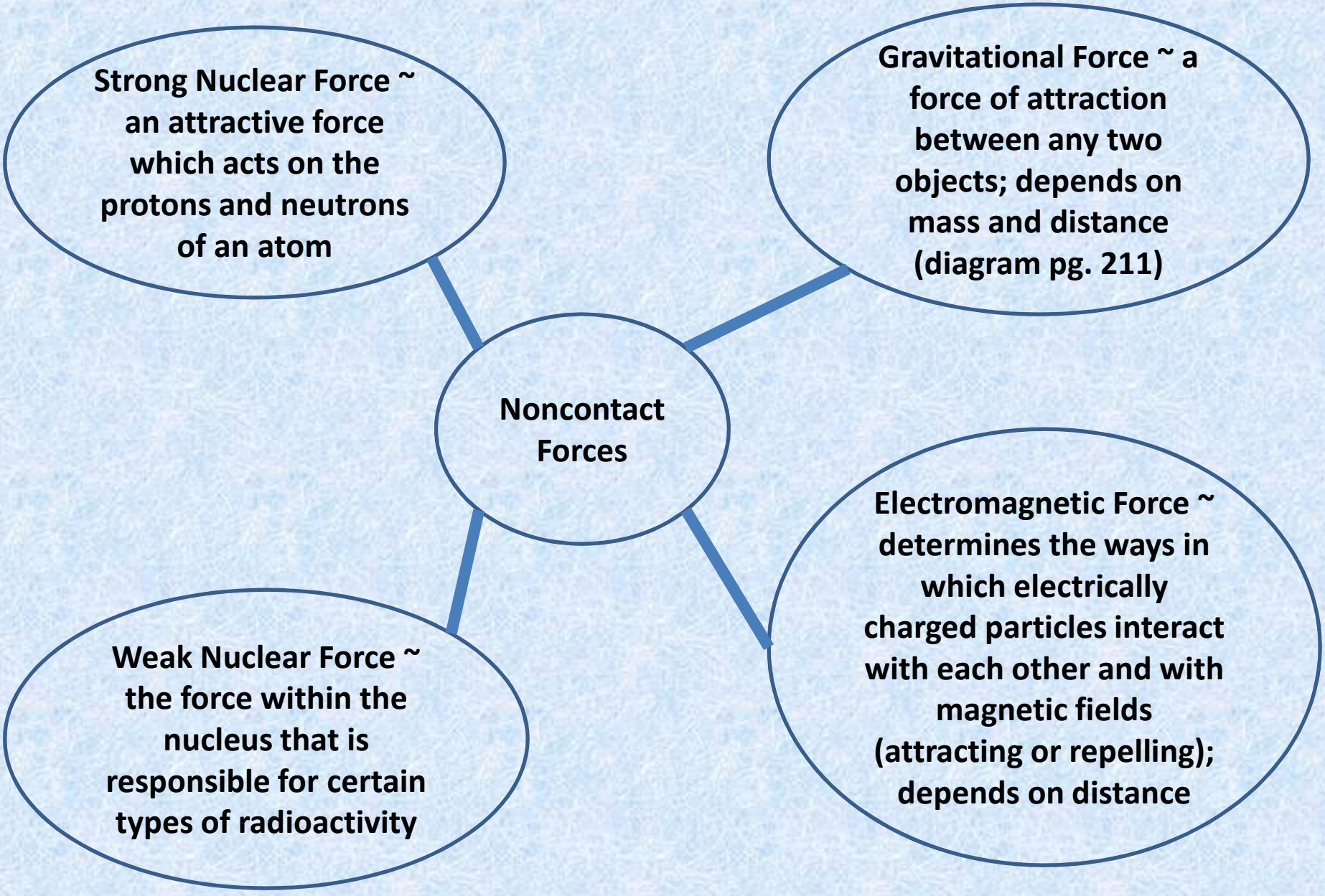
2. Contact Forces ~ a force that requires contact between two objects

3. Noncontact Forces ~ a force that doesn't require contact

# Unit 4 Chapter 1 Lesson 1



# Unit 4 Chapter 1 Lesson 1

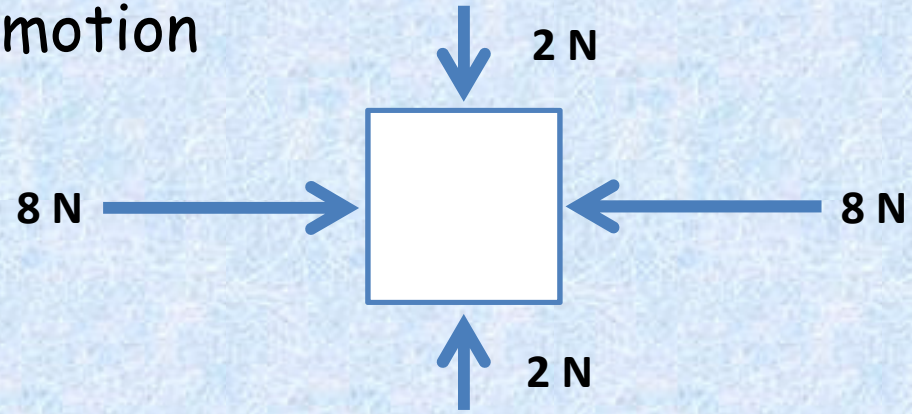


# Unit 4 Chapter 1 Lesson 2

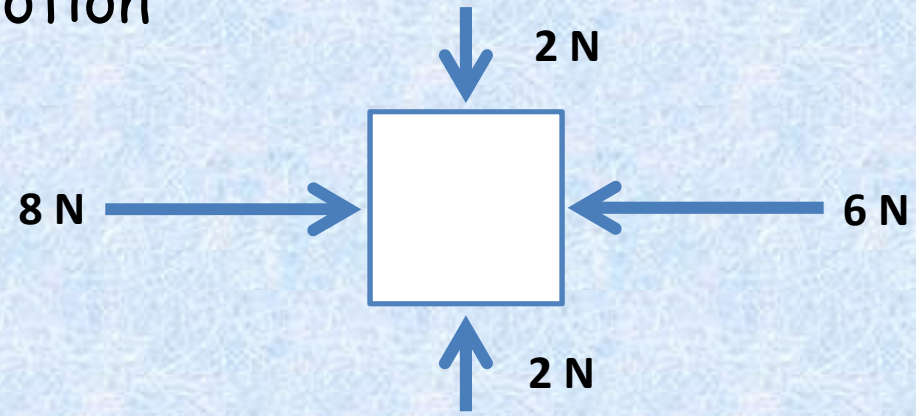
1. Net Force ~ the sum of all the forces acting on an object

***Forces in the same direction are added; forces in opposite directions are subtracted**

2. Balanced Force ~ when the net force equals zero; there is not change in motion




3. Unbalanced Force ~ when the net force is greater than zero; there is a change in motion



# Unit 4 Chapter 2 Lesson 1

1. Work ~ the action that results when a force causes an object to move; the motion must be in the same direction as the force (copy chart on pg. 244); W=fd where f=force in Newtons and d=distance in meters; measured in joules (J)

2. Energy ~ the ability to do work; measured in joules (J)

# Unit 4 Chapter 2 Lesson 4

1. Power ~ the amount of work done (a.k.a. the energy provided in a period of time); P=W/t; the unit for power is the watt

2. Machine ~ a device that makes work easier by changing the size or direction (or both) of a force in one of four ways (see next slide)

3. Resistance Force ~ the force needed to do work without a machine (a.k.a. load force)

4. Effort Force ~ the force needed to do the same work with a machine

5. Mechanical Advantage ~ a measure of how much a machine increases a force applied; no units

6. Ideal MA ~ MA that doesn't take friction into account

# Unit 4 Chapter 2 Lesson 4

## 4 Ways Machines Make Work Easier

1. Machines can change the direction of a force.
2. Machines can reduce the size of the force that must be applied.
3. Machines can transfer force from one place to another.
4. Machines can increase the size of the force.

Examples in the reading……pgs. 256-257

# Unit 4 Chapter 2 Lesson 5

1. Efficiency ~ the measure of the amount of useful work done by the machine compared with the amount of work done to make the machine operate;
   Efficiency = (work output/work input) * 100

2. Work Output = the resistance force / distance; measured in Joules

3. Work Input = force*distance; measured in Joules

4. Actual MA ~ MA that takes into account friction and any other forces working against the efficient operation of a machine; AMA=efficiency*IMA