name:_____ period:_____ lesson 1.3: forces on matter

1 Warm Up

1. What are the three particle that make up an atom? Which one is positive, negative, and neutral?

particle	charge

2. Draw a picture of a $^{4}_{2}$He atom. Label the nucleus, protons, neutrons and electrons.

2 Forces on Matter

3. A force is a _____or a _____on an object.

4. We draw a force with an arrow that shows the _____of the force.
5. There are two kinds of forces:
   (a) _____ force
   (b) _____ force

2.1 Gravitational Force

6. Gravity is a force on the _____of an object caused by the mass of _____object.
7. Gravity is always a _____force between two masses.
8. The gravitational force between two masses happens no matter how _____the masses are from each other.
9. The gravitational force gets _____when the masses get farther apart.
10. On Earth the gravitational force on objects is always _____.

2.2 Electromagnetic Force

11. The electromagnetic force is caused by the pushing and pulling between the electric charges of _____and _____in an object no matter how far apart they are.

12. The electromagnetic force gets _____when the electric charges are farther apart.

13. Two positive charges (protons) will _____(repel) each other away.

14. Two negative charges (electrons) will _____(repel) each other away.

15. A positive charge (proton) and a negative charge (electron) will pull (_____) each other.

2.3 Examples of Electromagnetic Force

16. _____electric charges (protons) in a metal can pull on (_____) negative electric charges (electrons) in a balloon.

17. The positive (protons) and negative (_____) electric charges in a magnet can either push the magnets apart (_____) or pull them together (attract).

18. The negative electric charges (electrons) in your hand _____on the negative electric charges (electrons) in an object that you touch.

19. When you stretch a rubber band the protons attract the electrons and _____back.

2.4 Temperature and Matter

20. Temperature measures the _____of the _____of atoms and _____in a material.

21. The modern metric system unit of temperature is degrees _____(°C) or degrees _____(°K).

22. Degrees Kelvin (°K) = degrees Celcius (°C) + _____°

23. The symbol for temperature is _____.

3 Phet Temperature Simulation

1. Click on the "States" box.

2. Click on "Water" in in the box in the upper right.

3. Use the "Heat" or "Cool" controls to add or remove energy from the water. Observe what happens to the water temperature and to the water molecules. Try using the "Cool" control to lower the temperature to 0 K.

4. Note that you can change the units of the temperature to either Celsius or Kelvin.

3.1 Answer the questions below

1. What happens to the molecules of matter when the temperature goes up?

2. What happens to the molecules of matter when the temperature goes down?