Name answer Key Date _____ Hour _____

Cocoa Collision Discussion Questions

1. What do the cards represent?

molecules of air or cocoa

2. What do the numbers on the cards (and the beans) represent?

Kinetic Energy carried by a molecule

3. Why does the cocoa start with more total kinetic energy (TKE) than the air?

Because the cocoa has a higher initial temperature.

4. What happens to an air molecule and a cocoa molecule in the collision zone? Is there an exchange of something? The air & cocoa molecules collide & energy is transferred between 2 molecules.

5. Which molecule gains energy and which molecule loses energy? Why?

The cocoa molecule loses some of its energy to the air molecule during the collision b/c the air molecule had less energy to start with.

6. Was there a pattern to how you shuffled the cards?

No, there was no pattern. Just like real life molecules.

7. Did any of the cocoa molecules leave the cocoa side and join the air? What does this tell you about the movement of the molecules? No molecules left the cocoa side to join the air. Kinetic Energy was exchanged during collisions, but the number of molecules remained the same. This tells me that the movement of molecules results in a transfer of energy, not molecule mixing.

8. Why do we need to divide by the total number of molecules at the end of each round? What are we really calculating? Can you think of a science word for this?

We divide the total number to see how many beans each molecule would get. What we are really calculating is the average energy each molecule carries.