Hot Chocolate Science

Name _____

Part A: Cocoa Science

What causes the powder to clump? Why? _____

_____

How do you avoid lumps? _____

What is the difference between hydrophilic and hydrophobic? Give an example of each.

Hydrophilic → _____ Example → _____

Hydrophobic → _____ Example → _____

What protein in milk acts as an emulsifier in hot cocoa? _____

What does the term viscosity mean? How does it relate to hot chocolate? _____

_____

Part B: Marshmallow Science

What is the key ingredient for "pillowy" puffy marshmallows? _____

What are the other ingredients in marshmallows? _____

_____

Which ingredient gives it the elastic, squishy texture? _____

What protein does it contain? _____

What do we call the ingredients that help to hold their shape? _____

Part C: Allasonic Effect

What causes the Allassonic effect in a cup of hot chocolate? _____

Why does it happen?

More bubbles → _____

Less bubbles → _____

Part D: Quick Review

1. What happens to the kinetic energy as each substance changes: increase or decrease? Shade in the correct arrow for each example.

A. Steam rises from the surface 

B. Sugar is melted to make marshmallows 

C. Melted chocolate becomes solid chocolate 

D. Hot cocoa cools to room temperature 

E. Marshmallows melt in the hot water 

F. Putting hot chocolate in the freezer 

2. What type of change is occurring in each example? Use P for Physical or C for Chemical.

☐ A. Hydrogen and oxygen combine to form water molecules

☐ B. Water is heated up until it turns to steam

☐ C. Mixing cocoa powder, sugar, and other ingredients to make the dry mix

☐ D. Ripping open the powder packet

☐ E. Powder dissolving in the water

☐ F. Marshmallows melting in the solution

☐ G. Stirring the hot chocolate

☐ H. Drinking the hot chocolate

Part E: Exploring More - Brainstorm with your table group to develop 5 questions about this activity. Use online resources to help you answer the questions. Be prepared to share your results with the class.