

Name: \_\_\_\_\_

***The Disappearing Spoon***  
**Part V (Chapters 16-19)**

Chapter 16: Chemistry Way, Way Below Zero **Sn Ar Nd Rb**

1. Why is it significant that tin can form alpha and beta shapes of its crystals?
2. Why was it so hard for scientists to make a compound from argon?
3. What does maser stand for? What does laser stand for?
4. Besides making strong lasers, neodymium can help make the world's strongest  
\_\_\_\_\_.
5. Why does a Bose Einstein Condensate require such an extremely cold temperature?

Chapter 17: Spheres of Splendor: The Science of Bubbles **H Ca Rf Rn Zr Xe**

1. What earned Donald Glaser the Nobel Prize at just the age of 33?
2. What did Rutherford discover about the structure of the atom?
3. Why is the firing of a rifle into water considered the antithesis to work done by Rutherford.

Chapter 18: Tools of Ridiculous Precision **Pt Kr Cs U Sm Cr Fm Mg**

1. Why is the official kilogram in Paris made mostly of platinum?
2. What is an atomic clock and how does it work? Why is cesium the ideal element for these clocks?
3. What is significant about the constant alpha?

4. Why is it impossible for a number like pi to change but apparently possible for other constants like alpha to change?
  
5. **Opinion:** We all agree what something like a second or a mile is on a daily basis. Do you think that it is important that scientists have an extremely exact definition of a second? Why or why not?
  
6. Why is it such a big deal if a constant has changed a whopping 0.001 percent over 10 billion years?
  
7. What does it mean for something to be a paradox?
  
8. **Research:** Look up and write down the Drake Equation. What does each variable stand for?
  
9. **Opinion:** Do you feel there is life somewhere else in our universe? Why or why not?

#### Chapter 19: Above (and Beyond) the Periodic Table **Fr At Es Ac In**

1. Francium is terribly dangerous. Why don't we hear about it being used as a weapon?
  
2. What are the other two fundamental forces besides the strong and electromagnetic forces? Which force is responsible for radiation?
  
3. What is the "island of stability?"
  
4. Why is it believed that we could never go beyond element 137 on the periodic table?

**5. Research and Opinion:** Find two alternative ways to arrange the periodic table and explain how they are arranged. Would you prefer the table was designed differently? Why or why not?

**Summary:** Write down 5 facts from Part V that you found interesting.

1.

2.

3.

4.

5.

**Reflection:** Write at least a 5 sentence paragraph about your reaction to the book up through Part V. Include evidence from the book to support your reaction. After reading the book, are there any additional questions that are coming to your mind about any topics being covered that you want to know more about?