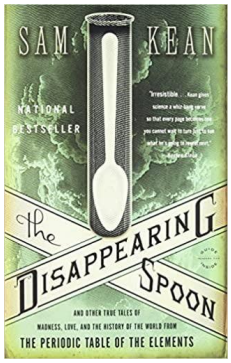
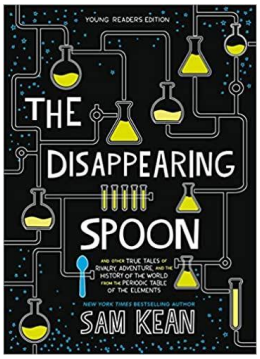
Chemistry Summer Reading





<u>The Disappearing Spoon by Sam Kean</u>
The original or young reader's edition will both have the answers to the questions. I do think that the young readers edition would be less overwhelming and easier to get into. There are more images and the format is less like a textbook. You are free to compare the two. Amazon offers the look inside function. The questions are geared toward the young reader's edition.

You will read the **entire book**. This book is related to the course material taught in Chemistry. The Purpose of the reading is to gain background information before starting class. This will allow us to 'jump' into the material and labs sooner than if we had to cover all the material in class. We will be using this book to varying degrees throughout the year, so keep the book handy.

At the start of the school year you will be assessed on how well you did you summer reading. There are study guide questions for each chapter that will help you prepare. Answer the attached questions.

Students will take the Science Summer Reading Test during the first weeks of school. During the Disappearing Spoon summer reading test, **students may use their completed study guide.** Books will not be permitted during the test, so be sure to answer all questions in the study guide.
Let me know if you have any questions.

Introduction: The Disappearing Spoon

1.Name 3 past uses for the element Mercury.

Part I: Making the Table: Column by Column, Row by Row

Chapter 1: Geography of Elements

1. Describe the basic shape of the Periodic Table. How many vertical columns? How many horizontal rows?

2. How many “bricks” are on the Periodic Table? What are the 4 basic parts of each “brick”?

3. What is the difference between Atomic Mass and Atomic Number?

4. What are the names of elements 35 and 80 on the Periodic Table? What is special about these 2 elements?

5. What is the most important part of an atom? Explain.

6. Where are the Noble gases on the Periodic Table? What is the significance of this group of elements?

7. List 3 characteristics of Alkali Metals.

Chapter 2: The Fathers of the Periodic Table

1. Describe 3 of Robert Bunsen's contributions to the field of Science.

2. What were some similarities in Mendeleev and Meyer's work on the periodic tables? What set Mendeleev's work apart from Meyer's?

3. List the special properties of the element Gallium.

4. What important findings occurred in the town of Ytterby? What is the significance of these substances?

Chapter 3: All in the Family- the Genealogy of Elements

1. What are elements in the same vertical column called?

2. Which element is most closely linked to forming life on Earth? Name 4 other elements in the same family as this element.

3. Explain one possible theory for the extinction of dinosaurs.

4. Name 5 everyday uses for Silicon.

5. What was Jack Kilby's main accomplishment?

Part II: Making Atoms, Breaking Atoms

Chapter 4: Where Atoms Come From- "We Are All Star Stuff"

1. What's the first part of the theory behind B^2 FH?

2. What is B^2 FH's theory regarding Elements 27 through 92?

3. What is the significance of one particular supernova explosion?

4. What are the two different types of planets? Briefly describe some of their differences.

5. Explain Clair Patterson's scientific contribution. What other discoveries did he make?

Chapter 5: Elements in Time of War

1. What was the purpose of the Hague Convention of 1899? What was the outcome of this agreement?

2. Describe the significance of Fritz Haber's scientific work.

3. How did the Germans "work around" the Hague pact?

4. After Haber's two failures with Bromine, what were his next steps?

5. After Germany lost WWI, describe Haber's life leading up to his death.

6. Describe the impact of mining coltan had on the Congo. What was coltan used for?

Chapter 6: Completing the Table….With a Bang

1. What improvements did Mosely make to the Periodic Table?

2. What was the name of the last element discovered and what number was it on the Periodic Table?

3. Who discovered neutrons and in what year? What was their significance to the science behind atoms?

4. What is Monte Carlo Science and what was its significance?

Chapter 7: Competitive Elements- Extending the Table, Expanding the Cold War

1. Describe the unique steps in the discovery of Element 101. What was Element 101's name and why was this significant at the time?

2. Describe the old Russian myth as to why their country had such an abundant supply of minerals.

Part III: Mistakes and Rivalries

Chapter 8: Bad Chemistry

1. Name the 7 accidental discoveries discussed in this chapter.

2. Briefly describe Pauling's mistake with his description of DNA. Who discovered the correct structure of DNA?

3. Despite inaccurately describing DNA's structure, what awards did Pauling end up winning?

Chapter 9: Poisoner's Corridor-

"Ouch-Ouch" 1. During WWI, what were the main uses of zinc?

2. What was the Itai-Itai Disease? Describe the symptoms and what caused the disease.

3. What is considered to the deadliest element on the Periodic Table. Explain why.

Chapter 10: Take Two Elements, Call Me in the Morning

1. What causes the condition called argyria? What special property does copper and silver possess that was significant to science in terms of how we fight disease today?

2. What was Gerhard Domagk's role in the development of antibiotics?

Chapter 11: How Elements Deceive

1. What happened to the 5 NASA technicians working on the spaceship Columbia in 1981?

2. Identify 2 elements that "trick" the senses and describe their characteristics.

3. Elements are arranged on the Periodic Table by increasing atomic mass. Name the 4 pair reversals that go against this general rule.

4. Why is it necessary to add iodine to common salt? What country was opposed to this practice? Explain why.

Part IV: The Elements of Human Character

Chapter 12: Political Elements

1. Who named Polonium and why was it named that way?
2. What is Polonium linked to?

3. What are Tracers used for?

4. Why was Meitner not given credit for the 1944 Nobel Prize in Chemistry? What more exclusive “prize” did Meitner receive?

Chapter 13: Elements as Money

1. What term describes “mixtures of metals”? What is the difference between Bronze and Brass?

2. What makes the Euro currency “the most sophisticated piece of currency ever devised?” What element is used in the ink of the Euro and what makes it special?

3. Briefly describe Aluminum’s properties and history of evolving from an extremely precious metal to a more productive metal (and worth less).

Chapter 14: Artistic Elements

1. What was the first main use of Lithium?

2. What is one interesting fact or behavior exhibited by pure Lithium?

3. Describe Lithium’s effect on the human body.

Chapter 15: An Element of Madness

1. What are some of the unique characteristics of Selenium? What is the connection between Selenium and cattle?

2. List some symptoms of Selenium poisoning.

3. Where was Manganese found and what was inside the samples? What was the significance of this finding?

4. What is a Crookes tube?

5. What are Rontgen rays?

Part V: Element Science Today and Tomorrow

Chapter 16: Chemistry Way, Way Below Zero

1. Why did Scott use tin to seal his kerosene canisters? What proved to be problematic with that choice?

2. Describe one of the theories associated with the downfall of Napoleon's army in Russia.

3. What is a colloid?

Chapter 17: The Science of Bubbles

1. What is transmutation? What element did Rutherford discover that went through this process?

2. What happens to a Noble gas when you run an electrical current through it?

3. Why do submarine propellers disintegrate when the rest of the hull remains intact?

4. Name 4 other discoveries due to the behavior of bubbles.

Chapter 18: Tools of Ridiculous Precision 1.What is the major responsibility of the BIPM?

2. What is the International Prototype of the Kilogram? What is it made of?

3. How do they insure that the 6 copies of the International Prototype of the Kilogram are exactly one kilogram?

4. List the 7 base units of measurement used in science. What is unique about the kilogram?

5. Explain what is happening with the standard for time. What did the US Standards bureau develop to alleviate this issue? Which element is involved?

Chapter 19: Above (And Beyond) The Periodic Table

1. What are the two most common elements found in the universe? What percentage do they make up compared to the other elements?

2. What are scientists talking about when they refer to the “island of stability” on the Periodic Table?

3. What was Glenn Seaborg’s contribution to the Periodic Table between the late 1930s and early 1960s? Which element was key in this new arrangement of the Periodic table?

4. What are the names of the two families of elements that are placed at the bottom of the Periodic Table?