

*Complete this worksheet as you watch the video.*

**Part 1: Introduction to Chemistry**

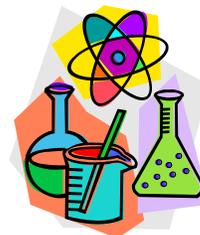
1. A typical person contains \_\_\_\_\_ gallons of water, a pint of hydrochloric acid, enough carbon for \_\_\_\_\_ pencils, and enough phosphorus for 3,000 match heads.
2. We take in oxygen, which combines with food in chemical reactions to release \_\_\_\_\_.
3. Everything in the world is \_\_\_\_\_, which is made of tiny particles called \_\_\_\_\_.
4. When substances join together in a compound, they are bonded together in a \_\_\_\_\_ and a new substance with different properties is created.
6. Energy in a chemical reaction can take many forms, such as \_\_\_\_\_, light, and \_\_\_\_\_.
7. What substance beneath the ground is used for energy? \_\_\_\_\_
8. What element is used to make the chips in our computers? \_\_\_\_\_

**Part 2: The Chemistry of Crime Solving**

9. How much did the historical document sell for? \_\_\_\_\_
10. What was the difference between the inks in Hoffman's documents? \_\_\_\_\_  
\_\_\_\_\_
11. What type of light was used to examine the documents? \_\_\_\_\_
12. Where did the investigator find the chemicals in the old forgery books? \_\_\_\_\_
13. What element reacts with oxygen and turns orange as it forms rust? \_\_\_\_\_
14. What compound was used to change the ink color quickly? \_\_\_\_\_
15. What substance was added to the ink to give it a glossy shine? \_\_\_\_\_

**Part 3: Fuel Cells**

16. What type of engine is found in most cars and trucks? \_\_\_\_\_
17. What is produced by the fuel cell? \_\_\_\_\_ and \_\_\_\_\_



#### Part 4: The Chemistry of Fire

18. Fire can transform sand into \_\_\_\_\_ and iron into \_\_\_\_\_, but also destroys homes and takes lives.
19. Fire is a chemical reaction made of three components: a \_\_\_\_\_ (wood or candle wax), \_\_\_\_\_ (found in the air), and a spark of high \_\_\_\_\_.
20. What types of energy are produced by fire? \_\_\_\_\_ and \_\_\_\_\_
21. What national park was damaged from an extreme wildfire in 1988? \_\_\_\_\_
22. What term refers to the accumulation of leaves, needles, and other debris in a forest? \_\_\_\_\_

#### Part 5: The Chemistry of Smell

23. How many smells can the human body detect? \_\_\_\_\_
24. Why do we often associate feelings or memories with a particular scent? \_\_\_\_\_  
\_\_\_\_\_
25. Smell is one of our chemical senses? What is the other? \_\_\_\_\_
26. How many taste buds are on our tongues? \_\_\_\_\_
27. What animal has the best sense of smell? \_\_\_\_\_ How many times more powerful is its sense of smell than our own? \_\_\_\_\_

**Part 1: Introduction to Chemistry**

1. A typical person contains **15** gallons of water, a pint of hydrochloric acid, enough carbon for **1,000** pencils, and enough phosphorus for 3,000 match heads.
2. We take in oxygen, which combines with food in chemical reactions to release **energy**.
3. Everything in the world is **matter**, which is made of tiny particles called **atoms**.
4. When substances join together in a compound, they are bonded together in a **chemical reaction** and a new substance with different properties is created.
6. Energy in a chemical reaction can take many forms, such as **heat**, light, and **motion**.
7. What substance beneath the ground is used for energy? **Oil**
8. What element is used to make the chips in our computers? **Silicon**

**STOP VIDEO AT THIS POINT AND GO OVER ANSWERS FOR PART 1**

**Part 2: The Chemistry of Crime Solving**

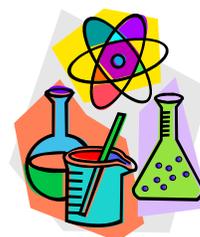
9. How much did the historical document sell for? **\$40,000**
10. What was the difference between the inks in Hoffman’s documents? **Some documents had ink that was cracked, while others the ink was smooth.**
11. What type of light was used to examine the documents? **UV (Ultraviolet)**
12. Where did the investigator find the chemicals in the old forgery books? **A kid’s chemistry set**
13. What element reacts with oxygen and turns orange as it forms rust? **Iron**
14. What compound was used to change the ink color quickly? **Ammonia**
15. What substance was added to the ink to give it a glossy shine? **Gum Arabic**

**STOP VIDEO AT THIS POINT AND GO OVER ANSWERS FOR PART 2**

**Part 3: Fuel Cells**

16. What type of engine is found in most cars and trucks? **Internal combustion**
17. What is produced by the fuel cell? **Water and Energy**

**STOP VIDEO AT THIS POINT AND GO OVER ANSWERS FOR PART 3**



#### **Part 4: The Chemistry of Fire**

18. Fire can transform sand into **glass** and iron into **steel**, but also destroys homes and takes lives.
19. Fire is a chemical reaction made of three components: a **fuel** (wood or candle wax), **oxygen** (found in the air), and a spark of high **heat**.
20. What types of energy are produced by fire? **Heat and light**
21. What national park was damaged from an extreme wildfire in 1988? **Yellowstone**
22. What term refers to the accumulation of leaves, needles, and other debris in a forest? **Duff**

**STOP VIDEO AT THIS POINT AND GO OVER ANSWERS FOR PART 4**

#### **Part 5: The Chemistry of Smell**

23. How many smells can the human body detect? **Over 10,000**
24. Why do we often associate feelings or memories with a particular scent? **Scents are processed in the same part of our brain as our emotions.**
25. Smell is one of our chemical senses? What is the other? **Taste**
26. How many taste buds are on our tongues? **Over 9,000**
27. What animal has the best sense of smell? **Dogs** How many times more powerful is its sense of smell than our own? **100**

**GO OVER THE ANSWERS FOR PART 5** – Collect worksheets for a grade!