

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? _____

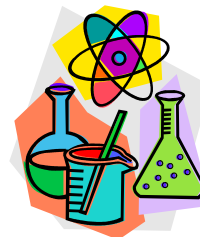
Part 2: The Chemistry of Crime Solving

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 How much did the historical document sell for?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? _____

Physical Science – Chemistry

Answer Key

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

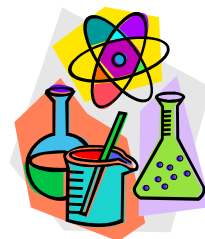
9. How much did the historical document sell for? **\$40,000**
10. What was the difference between the inks in Hoffman's documents? **Some documents had ink that was cracked, while others the ink was smooth.**
11. What type of light was used to examine the documents? **UV (Ultraviolet)**
12. Where did 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!