

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

Period: \_\_\_\_\_

## Episode 1 - Discovering The Elements.

1. What element did Humphrey Davy discover?
2. What force did he use?
3. What is everything made of (and how many are there)?
  
4. What is an element?
  
5. Greek elements were:
6. 16<sup>th</sup> century alchemists were trying to do what?
7. Paracelsus' idea was...
  
8. Mercury facts:
  
  
9. The pursuit of gold led to what idea?
10. Brandt used urine to discover what element?
11. What did it look like? What does it do?
  
12. Uses of Phosphorus (and phosphates):
  
  
13. Boyle's experiment:
  
  
14. What useful item did it lead to?
15. What did Boyle do to alchemy?
16. 1667 The Blind Alley...flogiston explain what their idea was...
  
  
17. Cavendish's experiment with "airs" (describe it) led to what discovery?
  
  
18. H \_\_\_\_\_ is the most a \_\_\_\_\_ element in the universe
19. What was the Hindenburg? What happened and why?

20. Why couldn't water be an element?
21. 19 elements discovered so far...in the mid 1700's there were 3 Airs:  
a, b, c,
22. Priestley investigated carbon dioxide (F\_\_\_\_\_air) What does carbon dioxide do to flame?
23. 1774 Mercuric oxide heated ... created what gas?
24. What test was used on this gas?
25. Deflogisticated air plus a mouse; the first on Earth to breath pure O\_\_\_\_\_
26. Oxygen facts:
  
27. Lavoisier used a quantitative approach to investigate...what did he do?
  
28. Lavoisier destroyed the Flogiston myth and discovered the significance of O\_\_\_\_\_ crushing the idea of greek elements
29. Lavoisier's definition of an element:
  
30. How many elements did he list?
31. He developed a new language to identify elements...what did they use to call iron oxide?
  
32. What happened to Lavoisier?
33. Humphrey Davy broke down potash with what?
34. How does the narrator create a current? How does this match your own recent labs?
  
35. Describe the experiment that Davy did as reproduced onscreen?
  
36. What would Davy had seen?
37. Potassium facts:
  
38. How many elements had been found at the time of Davy's death?

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## Episode 2 - The Order of the Elements.

1. 1869, A R \_\_\_\_\_ called Mendeleev had the idea for the Periodic Table
2. How many natural elements are there?
3. Dalton: What was he like
4. Salt is always made of what? S \_\_\_\_\_ and C \_\_\_\_\_ atoms
5. Dalton proposed atoms have their unique A \_\_\_\_\_ weight
6. What instrument is used to see atoms?
7. Copper facts:
8. Berzelius did what?
9. He had to make his own L \_\_\_\_\_ Why?
10. What elements did he discover?
11. Silicon facts:
12. Dobereiner looked at element's chemical properties and R \_\_\_\_\_. He noted there were groups of 3 called T \_\_\_\_\_
13. Lithium, Sodium and Potassium are called A \_\_\_\_\_ Metals. Describe their reaction with water.
14. What is the trend that you observe?
15. Canizzaro finally produced precise A \_\_\_\_\_ W \_\_\_\_\_
16. Arranged in order of Atomic Weight, Newlands noted that every E \_\_\_\_\_ element had S \_\_\_\_\_ properties. He called this the Law of O \_\_\_\_\_
17. Smell tests...Chlorine: \_\_\_\_\_ the eighth after that is Bromine: \_\_\_\_\_
18. Now called the Law of P \_\_\_\_\_
19. How did Mendeleev's "chemical solitaire" find the patterns in the Periodic table?
20. Why was he using an incomplete deck of cards?
21. What did he dream?
22. He combined A \_\_\_\_\_ W \_\_\_\_\_ and P \_\_\_\_\_ to design his table
23. Most of the elements are M \_\_\_\_\_

24. To make it work he had to do what?
25. When the missing elements were discovered did they match his predictions?
26. Kirchoff and Bunsen used spectroscopes examine the C\_\_\_\_\_ Spectrum given off by elements?
27. They discovered Cesium and Rubidium using its S\_\_\_\_\_.
28. G\_\_\_\_\_ fit into the gap left in his table
29. Gallium facts:
30. Search for extraterrestrial elements led to the discovery of H\_\_\_\_\_ using a spectroscope during an E\_\_\_\_\_
31. Ramsey dissolved Cavite to produce H\_\_\_\_\_
32. Helium facts:
33. Ramsey also discovered A\_\_\_\_\_
34. The missing group on the table was called the N\_\_\_\_\_ because they were “aloof” and un-reactive. Other such elements include N\_\_\_\_\_ and X\_\_\_\_\_
35. Data + prediction + experimentation are all part of the S\_\_\_\_\_ M\_\_\_\_\_
36. Why do elements behave as they do? Rutherford discovered what about atomic structure? The N\_\_\_\_\_
37. Bohr said e\_\_\_\_\_ orbit the nucleus in fixed shells holding a set number of electrons
38. Closest shell can only hold \_\_\_\_\_
39. Second can hold \_\_\_\_\_
40. Number of electrons in o\_\_\_\_\_ shell determines properties.
41. To be s\_\_\_\_\_ atoms want to have a f\_\_\_\_\_ outer shell.
42. U\_\_\_\_\_ is the heaviest known natural element
43. Moseley used an X Ray spectrometer to examine atoms. He measured X rays knocked off the copper atoms, and was able to measure the number of P\_\_\_\_\_ in the nucleus.
44. Atomic N\_\_\_\_\_ is the number of Protons in the nucleus. Only whole numbers of protons exist, so there are only \_\_\_\_\_ natural elements ending at U\_\_\_\_\_

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## Episode 3 - The Power of the Elements

1. Elements combine to make C \_\_\_\_\_ that make up our world
2. First synthetic paint: P \_\_\_\_\_ blue and Chrome Y \_\_\_\_\_
3. Iron facts:
4. 1.7% C \_\_\_\_\_ added to iron makes more durable S \_\_\_\_\_
5. Why did they act differently? Isomers: same components combined in a d \_\_\_\_\_ way... like lego
6. Smithson Tennant burnt a D \_\_\_\_\_ in oxygen, producing Carbon D \_\_\_\_\_ so d \_\_\_\_\_ has to be pure carbon
7. Graphite and diamond are both composed of C \_\_\_\_\_ with greatly different physical properties because of the way their atoms are combined.
8. Carbon has f \_\_\_\_\_ bonds How are graphite and diamond different regarding bonds?
9. Carbon can form R \_\_\_\_\_ and long C \_\_\_\_\_
10. Carbon facts:
11. Carbon comes from dying S \_\_\_\_\_
12. There are M \_\_\_\_\_ carbon compounds than any other element.
13. Carbon chemistry is behind P \_\_\_\_\_ such as Bakelite
14. Why was lead added to gasoline as Tetra Ethyl Lead?
15. Why was that a bad idea in the long run?
16. Lead facts:
17. Marie Curie examined pitchblende, why was it 4 times more radioactive than uranium?
18. What 2 radioactive elements did she discover? Polonium and R \_\_\_\_\_
19. What health risk did radium have?
20. According to Rutherford, Atoms are mostly E \_\_\_\_\_ S \_\_\_\_\_ with electrons orbiting a tiny nucleus
21. Rutherford discovered that atoms can change or D \_\_\_\_\_ as its number of protons change as they give off radiation
22. Alpha particles consist of two protons...these are visible in a c \_\_\_\_\_ chamber

23. How are O and N different with the fire?
24. 1932, Chadwick discovered N \_\_\_\_\_, with neutral charge.
25. Fermi wanted to make an element heavier than Uranium by pounding its nuclei with alpha particles...but the + nucleus tends to repel the + alpha particle so he shot N \_\_\_\_\_ at the uranium, making it unstable, spitting out an electron and therefore adding a proton. (If you think of a neutron as a + and - canceling each other out)
26. Meitner and the water droplet analogy: adding a neutron does what?
27. This was N \_\_\_\_\_ fission, the resultant masses were slightly less, energy was given off ...explained in Einstein's equation
28. Converting mass into energy creates possibility of a weapon : the A \_\_\_\_\_ B \_\_\_\_\_
29. The M \_\_\_\_\_ Project developed the bomb used on the Japanese
30. A Chain Reaction creates N \_\_\_\_\_ that go on to cause other nuclei to decay...describe the mousetrap analogy.
31. Each nucleus decaying releases E \_\_\_\_\_. A chain reaction creates enormous amounts of energy
32. Uranium fuels nuclear \_\_\_\_\_ stations.
33. An element heavier than uranium was created by using a cyclotron to collide charged particles into uranium making element 93 (Neptunium). The first s \_\_\_\_\_ element
34. Element 94: Plutonium can undergo f \_\_\_\_\_ to be used as a bomb
35. The death toll of the two bombs used on Japan was:
36. Plutonium facts:
37. So far the heaviest element is number \_\_\_\_\_ called Copernicium
38. Describe how they create new elements?
39. Describe features of 112:
40. What element will be next?