Name _____ Section _____

Chemistry

Discovering the Elements

Match the person with their discoveries.

____Johann Becher

____Robert Boyle

____Hennig Brand

____Henry Cavendish

____Humphry Davy

____Antoine Lavoisier

____Paracelsus

____Joseph Priestley

A. The first person to challenge the Greek idea of the Four Elements, he believed there were only three elements: the **tria prima**.

B. While looking for a way to extract gold from urine, he discovered a substance that burned brighter than a candle but stayed cold: the **icy noctiluca**. This was the element **phosphorus**.

C. Unlike alchemists, who kept their discoveries secret, he published his methods and discoveries. His most famous work was *The Sceptical Chemist*.

D. Proposed that fire was caused by an ethereal, odourless, tasteless, colourless, weightless substance called **phlogiston**.

E. Discovered the first elemental gas when he added zinc to hydrochloric acid. He named the tasteless, odourless, colourless, inflammable gas **inflammable air**, and believed to to be phlogiston. This was **hydrogen** gas.

F. A Unitarian minister who investigated fixed air given off by fermentation in breweries, he is famous for heating mercuric calc and collecting a gas that could reignite wooden splits. He called this gas **dephlogisticated air**.

G. After hearing about the Unitarian minister's experiments, this natural philosopher discovered that dephlogisticated air was actually an element: **oxygen**.

H. He used the newly-invented electric battery to pass a current through liquid potash, breaking it down into its constituent elements. One of these was a new discovery: **potassium**.

Name Answer Key Section

Chemistry


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Discovering the Elements

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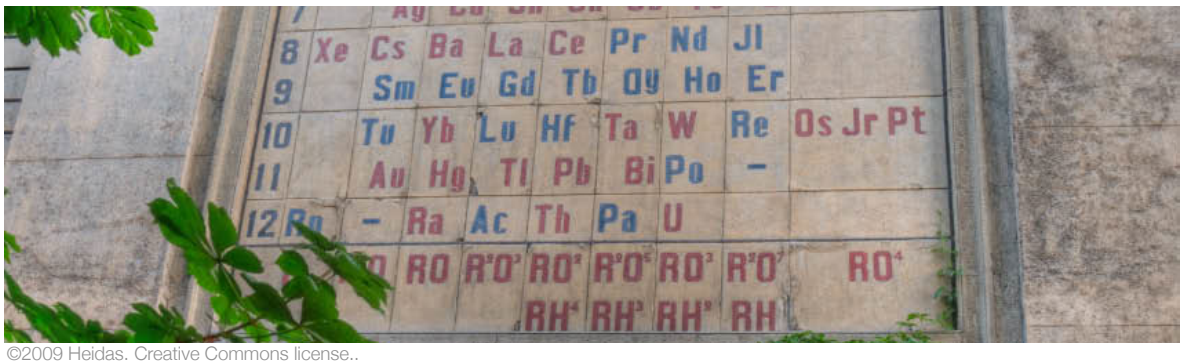


The **Order** of the Elements

Match the person with their discoveries.

____Jöns Jacob Berzelius

____Niels Bohr

____Paul Emile Lecoq de Boisbaudran

____Robert Bunsen

____John Dalton

____Gustav Kirchhoff

____John Newlands

____Dmitri Mendeleev

____Henry Moseley

____William Ramsay

A. He deduced, from the discovery that elements combine to form compounds in fixed proportions, that elements must be made of **atoms**, each with their own unique weight.

B. Obsessed with measuring the **atomic weight** of every element, he also discovered **thorium**, **cerium**, **selenium**, and **silicon**.

C. He noticed that chemical properties repeat, and formulated what we now know as the **Law of Periodicity**.

D. He created an arrangement of elements that combined both their atomic weights and their chemical properties into one organization: the **periodic table**. Although only 63 elements had been discovered, he left gaps and predicted the properties of the missing elements.

E. They invented the **spectroscope** and used it to discover **cesium** and **rubidium**.

F. He used a spectroscope to discover **gallium**, which had exactly the properties predicted by the periodic table.

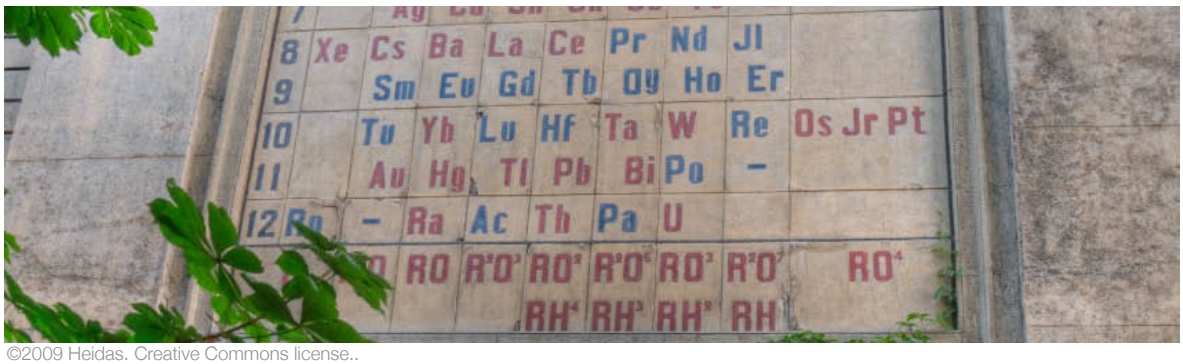
G. He isolated **helium** on Earth, and discovered **argon**, **neon**, and **xenon**: the **noble gases**.

H. His theory of **fixed electron shells** explained chemical properties by the number of electrons in an element's outer shell.

I. He used X-rays to determine the number of protons in an atom's nucleus: the **atomic number**.

Name Answer Key Section

Chemistry



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Chemistry

The **Power** of the Elements

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____Phillip Ableson

____Wallace Carothers

____Marie Curie

____Friedrich Kekulé

____Justus von Liebig

____Edwin McMillian

____Lise Meitner

____Thomas Midgley, Jr.

____Ernest Rutherford

____Friedrich Wöhler

A. They discovered isomerism when one made silver fulminate and one made silver cyanate out of the same number of atoms of the same elements.

B. He formulated the theory of chemical bonds while studying diamond and graphite.

C. He discovered how to draw a fibre from the interface between two liquids, hexane-1,6-diamine and decanedioyl-dichloride, which could be spun into a very fine, very strong thread. This is nylon.

D. He discovered that adding tetraethyllead to gasoline prevents engine knock. No one at the time realized that lead causes brain damage in growing children.

E. She discovered two new elements while investigating radioactivity: polonium and radium.

F. He discovered that the structure of an atom consists of a small, dense nucleus surrounded by empty space and an electron cloud. He also discovered that a nucleus can emit alpha particles and become a new element.

G. She realized that discrepancies in the mass of a nucleus undergoing nuclear fission could be explained by matter converting to energy.

H. They used a cyclotron to create the world's first artificial element: neptunium.

Name Answer Key Section

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The **Power** of the Elements

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