THE STRIVING

MUSLIM ACADEMY

Islamic and Academic Education

YEARS 7 TO 9 · SCIENCE

Particles, atoms and elements

Atom, element and compound, the particle model, and what stays the same when matter changes.

WHAT IS INSIDE

- Atom, element, compound
- The particle model, and what each state allows
- What stays the same when matter changes
- Atoms, elements and compounds
- How each one is answered

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1 sets · a hint on every question

Written for a parent teaching at home. No training assumed, and nothing else to buy.

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Atom, element, compound

Read this, then answer the questions on it.



ATOM, ELEMENT, COMPOUND

An atom is the smallest unit of an element that can participate in a chemical change. That is the definition to hold on to, because it says what an atom is for rather than how small it is.

An element consists of only one type of atom. Dalton proposed in 1807 that every atom of an element has the same mass, characteristic of that element, and many of his hypotheses are still valid. That one was later found not to hold. Many of Dalton's hypotheses about the microscopic features of matter are still valid in modern atomic theory.

A compound is two or more elements chemically joined, and the joining changes the properties. Free sodium is a soft, shiny metal and free chlorine is a yellow-green gas; together they are sodium chloride, table salt. A compound is not a mixture of its elements' properties, it is something else.

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What stays the same when matter changes

Read this, then answer the questions on it.



WHAT STAYS THE SAME WHEN MATTER CHANGES

In a chemical change the atoms are rearranged and none is created or destroyed. That is the law of conservation of matter, and it is why a chemical equation has to be balanced: a balanced equation has equal numbers of atoms for each element involved in the reaction on both sides.

In a chemical change there is no detectable change in the total quantity of matter present. The source is careful about how hard that is to show: it is challenging to verify by measurement, because we seldom collect all of the material that is produced.

A law can be true and still be awkward to demonstrate, and a demonstration that seems to refute it usually means something left the container.

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How each one is answered

Mark it together. Where a question asks for a list, the order does not matter.



ATOMS, ELEMENTS AND COMPOUNDS

1. Give the definition of an atom used in this pack.

1. An atom is the smallest unit of an element that can participate in a chemical change.

Answer: **the smallest unit of an element that can take part in a chemical change**

2. How many types of atom does an element consist of, and who proposed that they all share one mass?

1. An element consists of only one type of atom.
2. Dalton proposed in 1807 that every atom of an element has the same characteristic mass.

Answer: **one type, and Dalton in 1807**

3. Sodium reacts violently with water and chlorine is poisonous, yet table salt is safe to eat. Explain what that shows about compounds.

1. Salt is a compound of sodium and chlorine, chemically joined.
2. Its properties are not a blend of its elements' properties.
3. A compound is a new substance, so you cannot predict what it is like from what went into it.

Answer: **that a compound is a new substance whose properties are not a blend of its elements'**

4. Say what increased pressure does to a gas, and how liquids and solids differ.

1. Increased pressure brings the molecules of a gas closer together, so its volume falls.
2. The volumes of liquids and solids are very nearly independent of pressure.

Answer: **it brings a gas's molecules closer together, while liquid and solid volumes are very nearly independent of pressure**

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SAMPLE PAGES

You have read a few pages. The pack is longer.

What you are holding is a short sample, taken from different parts of the pack so that you can see how a week is planned and what a child is actually asked to do, before you decide.

The complete pack, and the rest of the academic materials, are on our website: schemes of work for a parent teaching at home, and practice packs for the skills children get stuck on.

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Members of the homeschool community do not buy these. If you have joined the community, the pack for the term you are working on is given to you at no cost.

Our Islamic Education classes are free. These packs are part of what pays the teachers who teach them.