



CLASS 8 SCIENCE · 2026-27

Metals, non-metals and combustion

Chemistry

33

QUESTIONS

30

MINUTES

3

EXERCISES

This belongs to _____ Date _____

WHAT YOU'LL GET GOOD AT

- Lists the physical properties of metals and non-metals with an exception for each
- Predicts a displacement reaction from the order of reactivity
- Writes a word equation for a simple reaction
- Names the three conditions for combustion and applies them to putting out a fire
- Identifies the zones of a flame and which is hottest

Take your time, and have a go at every one. If you get stuck, look at the orange box — Ollie has already done one for you.

Metals, non-metals and combustion

Chemistry · 33 questions · tick each box as you finish

Exercise 1 of 3 · 12 questions Metal or non-metal? Give the property that shows it, and name an exception to that property.

☐

WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

Copper is a metal - it conducts heat and electricity well and can be beaten into sheets. The exceptions are what the paper likes: mercury is a liquid metal, sodium and potassium are soft enough to cut with a knife, graphite is a conducting non-metal, and iodine is a lustrous one. Four exceptions, and knowing them is usually worth more than knowing a longer list of properties.

1) Copper

2) Sulphur

3) Iron

4) Iodine

5) Mercury

6) Graphite

7) Aluminium

8) Phosphorus

9) Silver

10) Oxygen

11) Sodium

12) Carbon (diamond)

Exercise 2 of 3 · 10 questions Will a reaction happen? If yes, write the word equation and say what you would see. ☐

WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

An iron nail in copper sulphate: iron is more reactive than copper, so it displaces it - iron sulphate and copper. The observation is half the answer and is what proves the reaction happened: the blue solution turns pale green and a reddish-brown layer forms on the nail. An answer with the equation and no observation is missing exactly the part that shows the child understood what a displacement reaction is.

1) An iron nail placed in copper sulphate solution

2) A copper wire placed in iron sulphate solution

3) Zinc granules placed in copper sulphate solution

4) Zinc added to dilute sulphuric acid

5) Copper turnings placed in silver nitrate solution

6) Silver wire placed in copper sulphate solution

7) Magnesium ribbon placed in zinc sulphate solution

8) Iron filings added to dilute hydrochloric acid

9) Copper placed in dilute hydrochloric acid

10) Zinc placed in magnesium sulphate solution

Exercise 3 of 3 · 11 questions Answer in two or three sentences.

WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

Water puts out a fire by doing two of the three things at once - it cools the fuel below its ignition temperature and it cuts off the air. That is why the three conditions are worth learning as a set rather than as a list: every question about putting out a fire is really asking which of the three you are removing, and every question about starting one is asking which is missing.

1) What three conditions are needed for combustion, and how does water put out a fire?

2) Why is water not used on an oil fire or an electrical fire?

3) Which zone of a candle flame is the hottest, and why?

4) Why does a matchstick catch fire when struck but not when simply held in air?

5) What is calorific value, and why does it matter when choosing a fuel?

6) Why does a candle go out when covered with a glass?

7) What is the ignition temperature of a substance?

8) Why is a fire extinguisher that gives out carbon dioxide effective?

9) Why does coal burn without a flame while a candle burns with one?

10) Why should a burning object never be carried through a crowded room?

11) Why is LPG considered a good fuel?

**All done? How did that feel?**

Colour in a star. Three stars means you could teach it to someone else.



Tricky · Getting there · Easy now



Answer key

For grown-ups

Metals, non-metals and combustion · keep this page back until your child has finished.

1. Metal or non-metal? Give the property that shows it, and name an exception to that property.

- 1) Metal - it conducts heat and electricity well and is malleable. The exception among metals is mercury, which is liquid at room temperature.
- 2) Non-metal - it is dull and brittle, and breaks into pieces when hammered rather than flattening.
- 3) Metal - it is sonorous, malleable and a good conductor. It is also the metal most obviously affected by rusting.
- 4) Non-metal, and the exception to the rule that non-metals are dull - iodine is lustrous.
- 5) Metal, and the exception to the rule that metals are solid at room temperature.
- 6) Non-metal, and the exception to the rule that non-metals do not conduct electricity - graphite does, which is why it is used in electrodes.
- 7) Metal. It is malleable and conducts heat and electricity well.
- 8) Non-metal. It is brittle, dull and a poor conductor.
- 9) Metal. It is lustrous, ductile and the best conductor of electricity.
- 10) Non-metal. It is a gas at room temperature and does not conduct.
- 11) Metal. It is lustrous when freshly cut and conducts electricity, though it is soft enough to cut with a knife.
- 12) Non-metal. It is a very hard non-metal and does not conduct electricity, unlike graphite.

2. Will a reaction happen? If yes, write the word equation and say what you would see.

- 1) Yes. Iron sulphate + copper. Iron is more reactive than copper, so it displaces it. The blue solution turns pale green and a reddish-brown deposit forms on the nail.
- 2) No reaction. Copper is less reactive than iron, so it cannot displace iron from its salt. The solution stays as it was.
- 3) Yes. Zinc sulphate + copper. Zinc is more reactive than copper, so the blue colour fades and copper is deposited.
- 4) Yes. Zinc sulphate + hydrogen. Bubbles of hydrogen gas are given off, and the gas burns with a pop when a lighted splint is brought near.
- 5) Yes. Copper is more reactive than silver: copper + silver nitrate → copper nitrate + silver.
- 6) No. Silver is less reactive than copper, so it cannot displace it.
- 7) Yes. Magnesium is more reactive than zinc: magnesium + zinc sulphate → magnesium sulphate + zinc.
- 8) Yes. Iron + hydrochloric acid → iron chloride + hydrogen.
- 9) No. Copper is below hydrogen in the reactivity series, so it does not displace hydrogen from an acid.
- 10) No. Zinc is less reactive than magnesium, so no reaction takes place.

3. Answer in two or three sentences.

- 1) A fuel, a supply of air to provide oxygen, and heat to reach the ignition temperature. Water works by bringing the temperature below the ignition temperature and by cutting off the air.
- 2) Oil floats on water, so the burning oil spreads instead of going out. Water conducts electricity, so using it on an electrical fire risks a shock. Carbon dioxide is used instead, because it is heavier than air and smothers the fire without conducting.
- 3) The outermost blue zone, because combustion there is complete - the fuel meets enough oxygen to burn fully. The inner yellow zone glows brightly but burns only partly, and the dark innermost zone is unburnt vapour.
- 4) Because it has not reached its ignition temperature. Striking it produces heat by friction, and that heat takes the chemical on the head above its ignition temperature.
- 5) The amount of heat produced by burning one kilogram of a fuel completely, measured in kilojoules per kilogram. A fuel with a higher calorific value gives more heat for the same mass, which is one of the things that makes a fuel worth using.
- 6) Because the supply of air is cut off. Combustion needs oxygen, and once the oxygen inside the glass is used up the flame dies.
- 7) The lowest temperature at which a substance catches fire. Below it, the substance will not burn however long it is heated by a spark.
- 8) Because carbon dioxide is heavier than air and does not support combustion. It forms a blanket over the fire, cutting off the oxygen supply.
- 9) Because a flame is produced only by substances that vaporise on heating. Wax vaporises and the vapour burns as a flame, while coal burns as a glowing solid.
- 10) Because it can set light to clothing or other objects it passes, and a fire in a crowded space traps people. It is a hazard even if it looks small.
- 11) Because it has a high calorific value, burns cleanly without much smoke or ash, and is easy to store and transport as a liquid under pressure.

WHILE YOUR CHILD WORKS

- The exceptions are what the paper asks about. Mercury, sodium, graphite, iodine - four of them, and they are worth more than a longer list of properties.
- In displacement questions, insist on the observation as well as the equation. That is where the mark for understanding sits.
- For any fire question, ask 'which of the three conditions is being removed?' Every version of the question reduces to that.

**Spotted a gap while marking?**

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