

CLASS 7

SCIENCE

NCERT SOLUTIONS

NCERT Solutions for Class 7 Science Chapter 4: The World of Metals and Non-metals – Curiosity

Complete NCERT Solutions for Class 7 Science Chapter 4 "The World of Metals and Non-metals" from the Curiosity textbook, covering in-text questions, exercise questions, and all chapter activities.

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In-Text Questions

Q1. Can you give some examples of metal sheets?

Answer: Silver foil and aluminium foil are common examples of metal sheets.

Q2. Can you name some metals used for making cooking vessels?

Answer: Aluminium, copper, and stainless steel are commonly used for making cooking vessels.

Q3. What type of material is used for making a screwdriver’s handle?

Answer: The handle of a screwdriver is usually made of plastic or rubber, since these are insulators and protect the user from electric shock.

Exercise Questions

Q1. Which metal is commonly used to make food packaging materials as it is cheaper and its thin sheets can be folded easily into any shape?

(i) Aluminium (ii) Copper (iii) Iron (iv) Gold

Answer: (i) Aluminium

Q2. Which of the following metals catches fire when it comes in contact with water?

(i) Copper (ii) Aluminium (iii) Zinc (iv) Sodium

Answer: (iv) Sodium

Q3. State whether True [T] or False [F], with reasons:

Aluminium and copper are examples of non-metals used for making utensils and statues. **[F]** — Aluminium and copper are metals, not non-metals.

Metals form oxides when combined with oxygen, the solution of which turns blue litmus paper to red. **[F]** — Metal oxides are basic; they turn red litmus paper to blue, not blue to red.

Oxygen is a non-metal essential for respiration. **[T]** — Oxygen is indeed a non-metal essential for respiration.

Copper vessels are used for boiling water because they are good conductors of electricity. **[F]** — Copper vessels are used for boiling water because copper is a good conductor of heat, not because of its electrical conductivity.

Q4. Why are only a few metals suitable for making jewellery?

Answer: Only a few metals (like gold and silver) are suitable for jewellery because they are lustrous and soft enough to be shaped into intricate designs, and they resist reacting with air or water, so they retain their shine over time.

Q5. Match the following:

Column I	Answer
Used in electrical wiring	Copper
Most malleable and ductile	Gold
Living organisms cannot survive without it	Oxygen
Plants grow healthy when fertilisers containing it are added to the soil	Nitrogen
Used in water purification	Chlorine

Q6. What happens when oxygen reacts with magnesium and sulphur? What is the main difference in the products?

Answer: Oxygen reacts with magnesium to form magnesium oxide, a basic oxide that turns red litmus paper blue. Oxygen reacts with sulphur to form sulphur dioxide, an acidic oxide that turns blue litmus paper red. The key difference: metal oxides are basic, while non-metal oxides are acidic.

Q7. This flowchart question is based on a textbook diagram and cannot be reproduced without the figure.

Q8. Which material is best for a pan used to boil water, and why?

Answer: The pan must be a good conductor of heat. Between iron and copper, copper is the better choice, since it conducts heat well and resists rusting far better than iron, making it ideal for boiling water.

Q9. Three iron nails are dipped in oil, water, and vinegar. Which one will not rust, and why?

Answer: The nail dipped in oil will not rust, because the oil coats the nail and prevents it from coming into contact with air and moisture, both of which are required for rusting.

Q10. How do the different properties of metals and non-metals determine their everyday uses?

Metals:

Malleable — aluminium foil is used for wrapping food.

Ductile — copper/aluminium wires are used in electrical fittings.

Sonorous — produce a ringing sound when struck.

Good conductors of heat — used for cooking vessels.

Good conductors of electricity — used for electrical wires.

Non-metals:

Poor conductors of heat/electricity — sulphur and carbon used in insulating materials.

Brittle — sulphur and phosphorus used in matchsticks since they react/break easily.

Often gaseous at room temperature — oxygen is essential for breathing.

Non-lustrous — carbon (as graphite) is used in pencils and dry-cell batteries.

Q11. Can sulphur be used to coat iron and prevent rusting, since it does not react with water?

Answer: No. Even though sulphur does not react with water, it cannot form a protective adherent layer over iron the way zinc does, so it cannot stop air and moisture from reaching the iron surface underneath.

Q12. Why does an ironsmith heat iron before shaping it into tools?

Answer: Heating the iron until it is red-hot makes it soft and more malleable, so it can be easily bent, hammered, and shaped into the desired tool.

Chapter Activities

Activity 4.1: Appearance, hardness and effect of hammering

Material	Appearance	Hard/Soft	Effect of hammering
Copper	Lustrous	Hard	Flattens
Aluminium	Lustrous	Hard	Flattens
Iron nail	Lustrous	Hard	Flattens
Coal	Non-lustrous	Soft	Breaks into pieces
Sulphur (lump)	Non-lustrous	Soft	Breaks into pieces
Wood	Non-lustrous	Hard, but softer than metal	Neither flattens nor breaks

Conclusion: Metals (copper, aluminium, iron) are lustrous, hard, and malleable (can be flattened into sheets). Coal and sulphur are non-lustrous, soft, and brittle (break into pieces). Wood is neither malleable nor brittle.

Activity 4.2: Sonorosity test

A metal spoon and coin produce a ringing sound, while coal and wood produce dull sounds. **Conclusion:** Metals are sonorous.

Activity 4.3: Heat conduction test

A metal spoon in hot water becomes hotter to touch faster than a wooden spoon. **Conclusion:** Metals are good conductors of heat; wood is a poor conductor.

Activity 4.4: Electrical conduction test

Material	Bulb glows?	Conductor type
Aluminium foil	Yes	Good conductor

Iron nail	Yes	Good conductor
Sulphur (lump)	No	Poor conductor
Copper wire	Yes	Good conductor
Coal	No	Poor conductor
Dry wood	No	Poor conductor
Stone	No	Poor conductor

Conclusion: Aluminium, iron, and copper are good conductors of electricity; sulphur, coal, dry wood, and stone are poor conductors.

Activity 4.5: Rusting test

Bottle	Water present?	Air present?	Observation
A	No	Yes	No brown deposit
B	Yes	No	No brown deposit
C	Yes	Yes	Brown deposit (rust) formed

Conclusion: Both air and water together are essential for iron to rust.

Activity 4.6: Burning magnesium ribbon

Magnesium burns with a dazzling white flame, forming a white powder (magnesium oxide). The resulting solution turns red litmus paper blue. **Conclusion:** Metal oxides are generally basic in nature.

Activity 4.7: Burning sulphur

Sulphur burns in air/oxygen to form sulphur dioxide gas. When dissolved in water, it forms sulphurous acid, which turns blue litmus paper red. **Conclusion:** Non-metal oxides are generally acidic in nature.

Activity 4.8: Sulphur and water

Sulphur placed in water shows no reaction. **Conclusion:** Sulphur does not react with water.

Extra Questions: [Class 7 Science Chapter 4](#)

Revision Notes: [Class 7 Science Chapter 4](#)