


What are Fossil Fuels?

→ **Energy-rich resources** (Coal, Petroleum, Natural Gas) formed from the remains of ancient living organisms buried over millions of years. ?

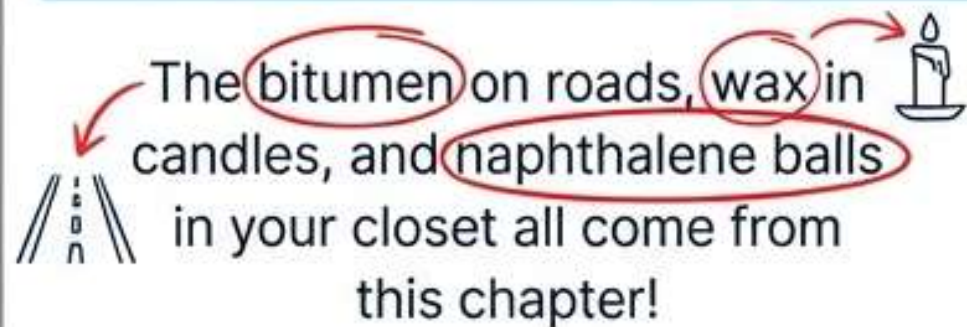
The Engines of Our World

They **power 80% of modern life**—from cooking (LPG) to transport (Petrol) and manufacturing plastics. 

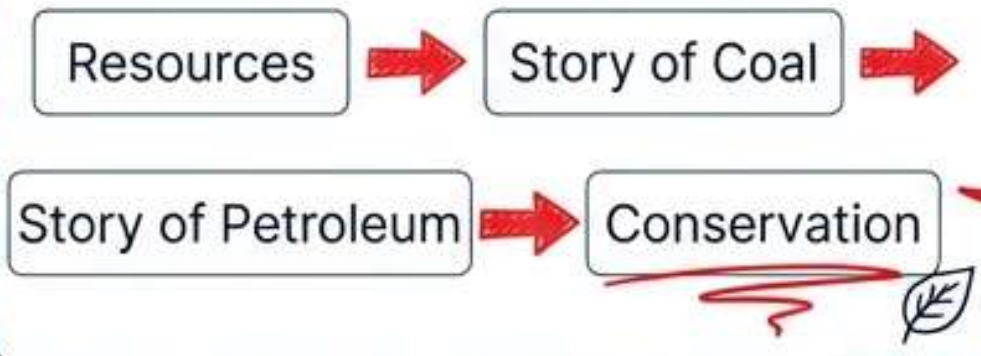
Class 8 | Science

Chapter: Coal and Petroleum

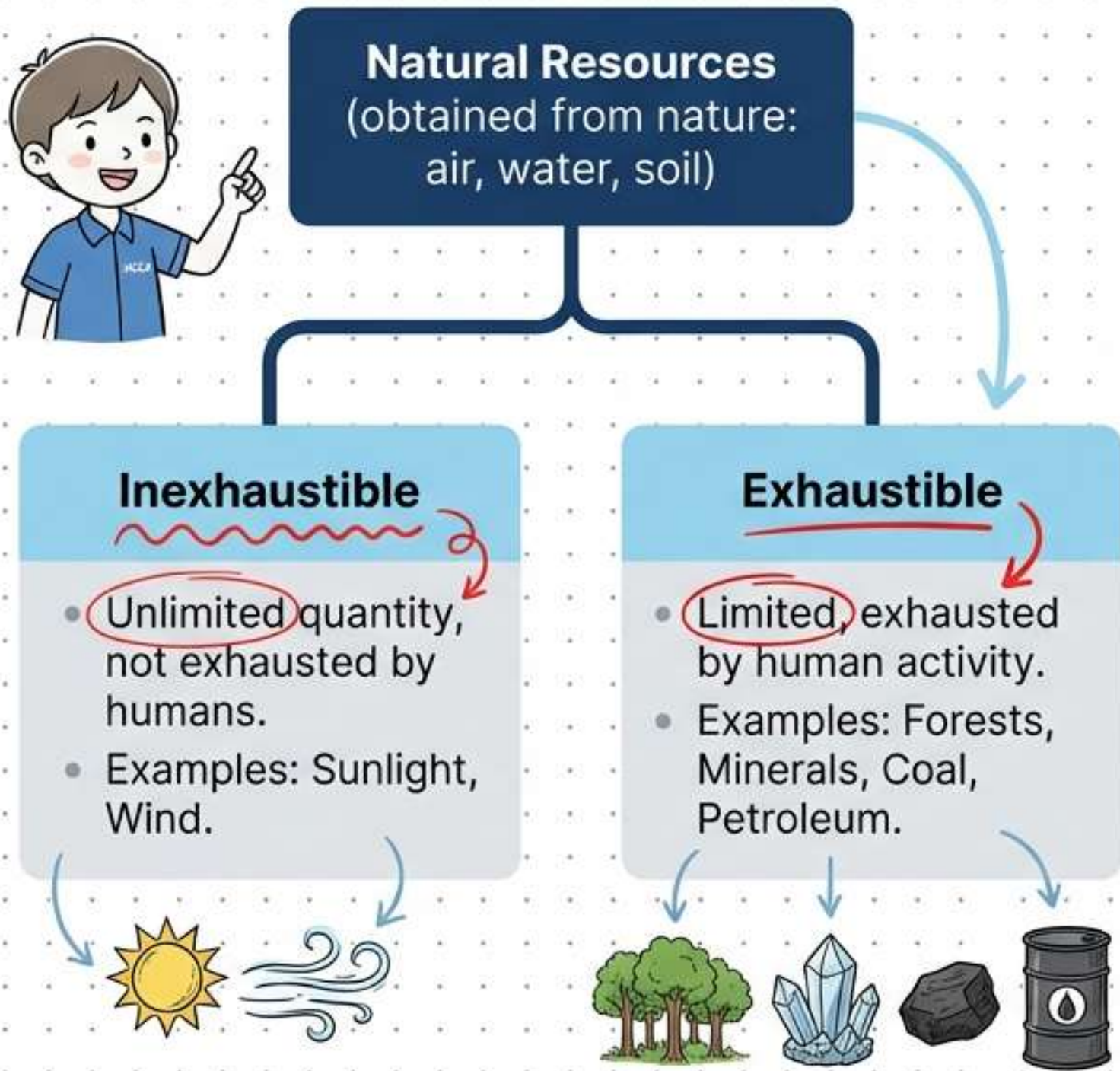
Hidden in Plain Sight

→ The bitumen on roads, wax in candles, and naphthalene balls in your closet all come from this chapter! 

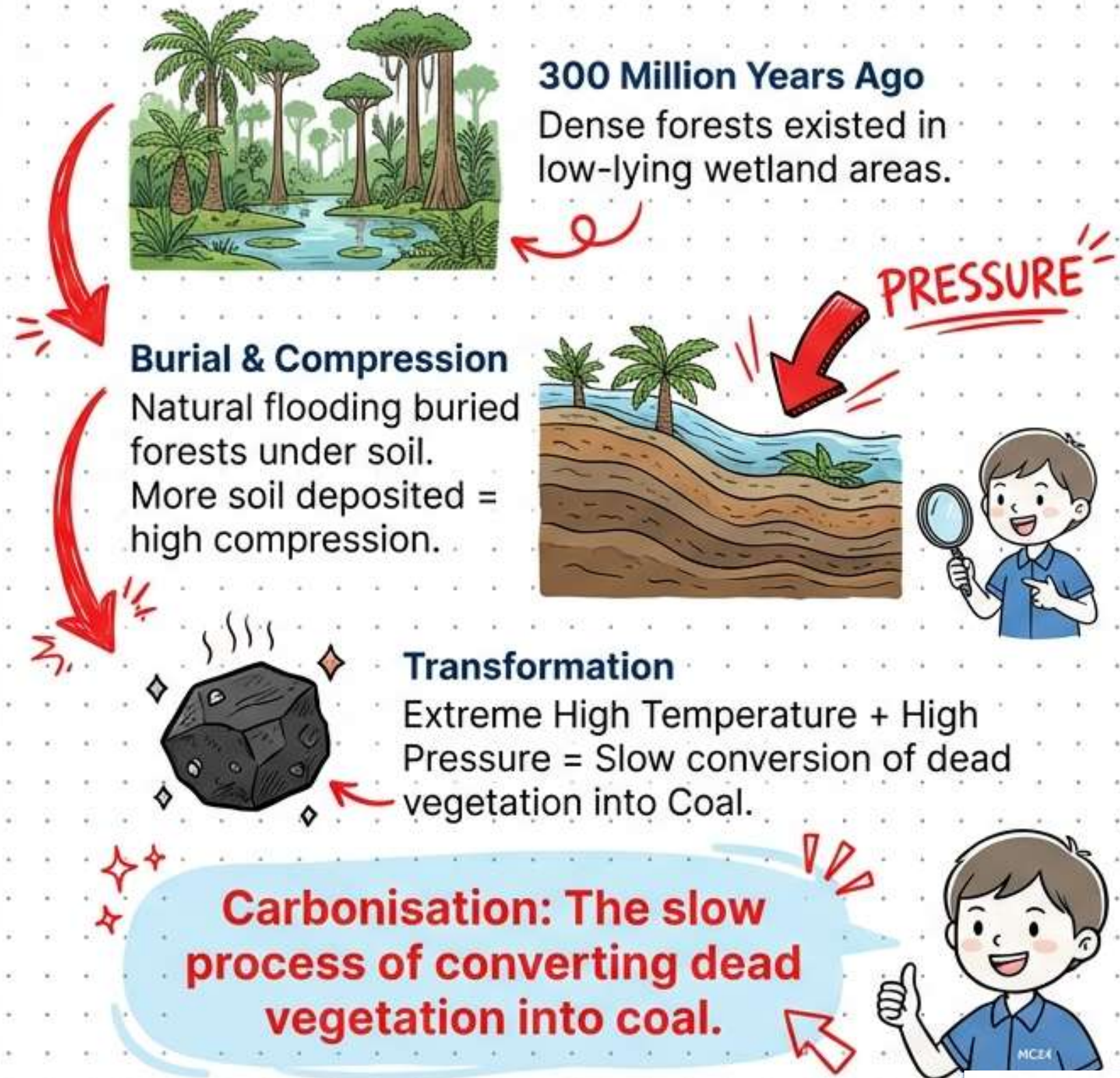
Quick Flow



Classification Tree




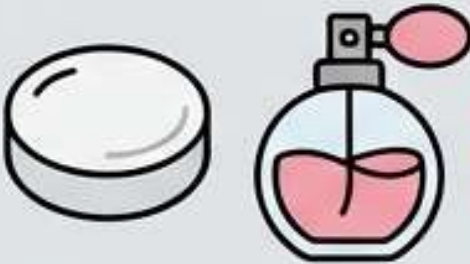

The Story of Coal



Destructive Distillation of Coal



Definition: Processing coal by heating it to high temperatures in the absence of air to extract useful products.

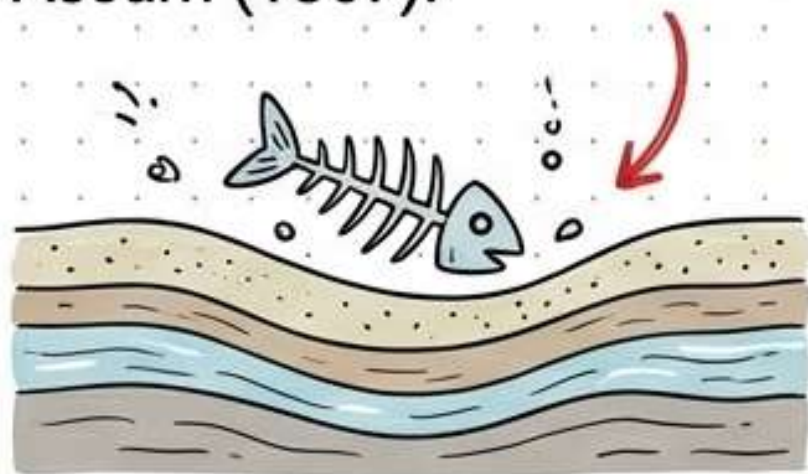
Coke	Coal Tar	Coal Gas
 <p>Properties: Tough, porous, black substance. Almost pure carbon.</p> <p>Uses: Manufacturing of steel and extraction of many metals.</p>	 <p>Fun Fact: Naphthalene balls (moth repellents) come from coal tar!</p> <p>Properties: Black, thick liquid with an unpleasant smell. A mixture of ~200 substances.</p> <p>Uses: Synthetic dyes, drugs, perfumes, explosives, plastics.</p>	 <p>Properties: Combustible gaseous fuel obtained during coke processing.</p> <p>Uses: Industrial fuel for plants situated near coal mines. (Used for London street lighting in 1810!)</p>

Note: Bitumen (a petroleum product) has now replaced coal tar for metalling modern roads!



Petroleum Formation

- Organisms living in the sea died → Bodies settled at the bottom → Covered by layers of sand and clay.
- **Over millions of years:** Absence of air + High Temp + High Pressure = Petroleum & Natural Gas.
- **First Oil Wells:** Pennsylvania, USA (1859) and Makum, Assam (1867).



Refining (The Black Gold)

- **Definition:** The process of separating various constituents (petrol, diesel, wax) in a petroleum refinery.
- **Petrochemicals:** Useful substances derived from petroleum/gas, used to make detergents, synthetic fibers (nylon), and plastics.



Natural Gas (CNG)

- **Storage:** Stored under high pressure as Compressed Natural Gas (CNG).
- **Why it's great:** Clean fuel, less polluting, leaves no solid residue, can be piped directly to homes and factories for burning.



Fossil Fuels

Fuels formed by the remains of dead plants and animals buried millions of years ago.

Carbonisation

The slow process of conversion of dead vegetation into coal.

Destructive Distillation

Decomposition of organic material by heating to high temperatures in the absence of air.

Petroleum Refining

The process of separating various constituents (fractions) of crude petroleum.

LPG

Liquefied Petroleum Gas. Petroleum gas subjected to high pressure to become liquid. Mixture of Butane, Propane, and Ethane.

PCRA

Stands for Petroleum Conservation Research Association. (Advises people on how to save fuel).



Diagram 1: Petroleum and Natural Gas Deposits

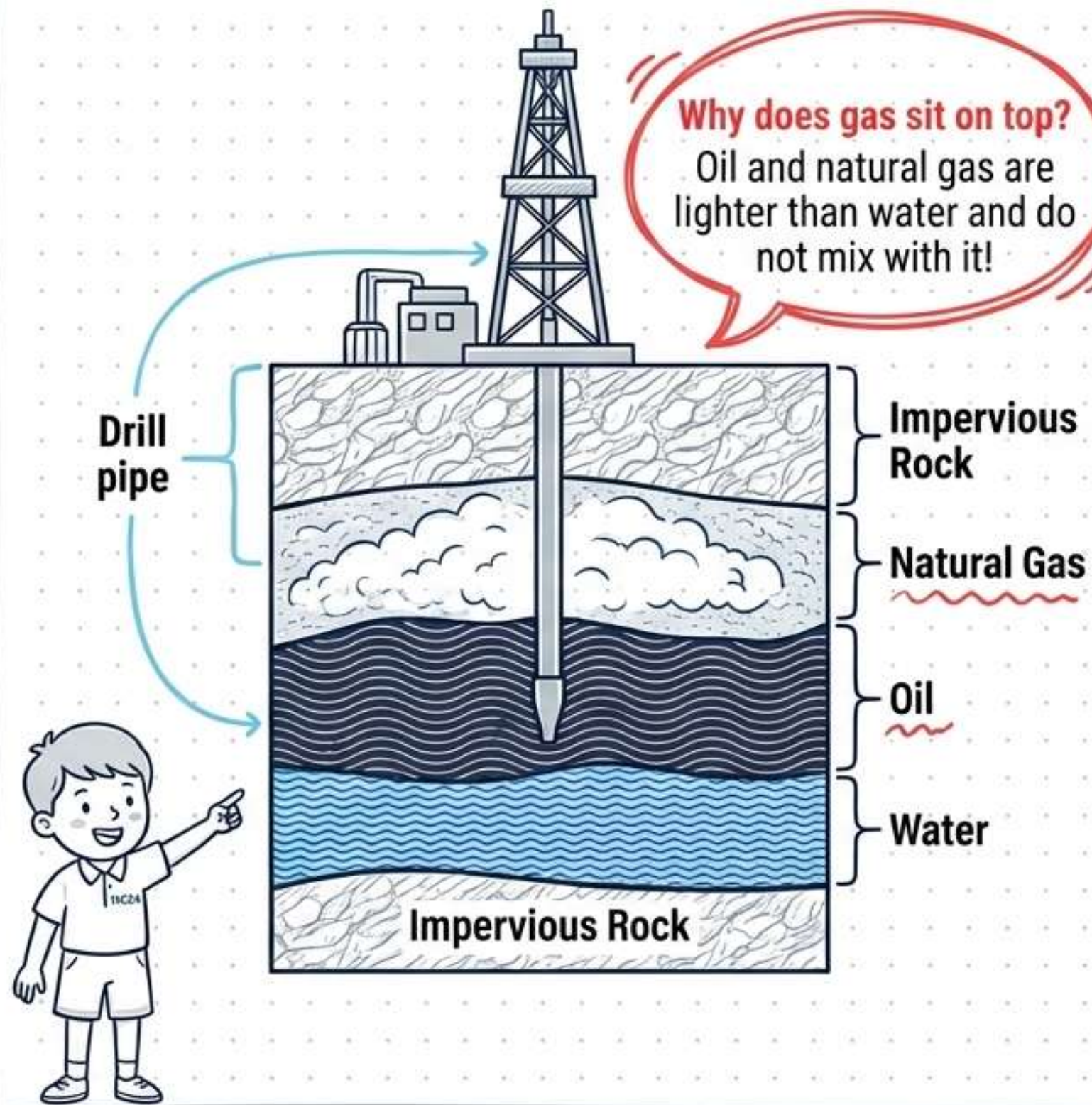
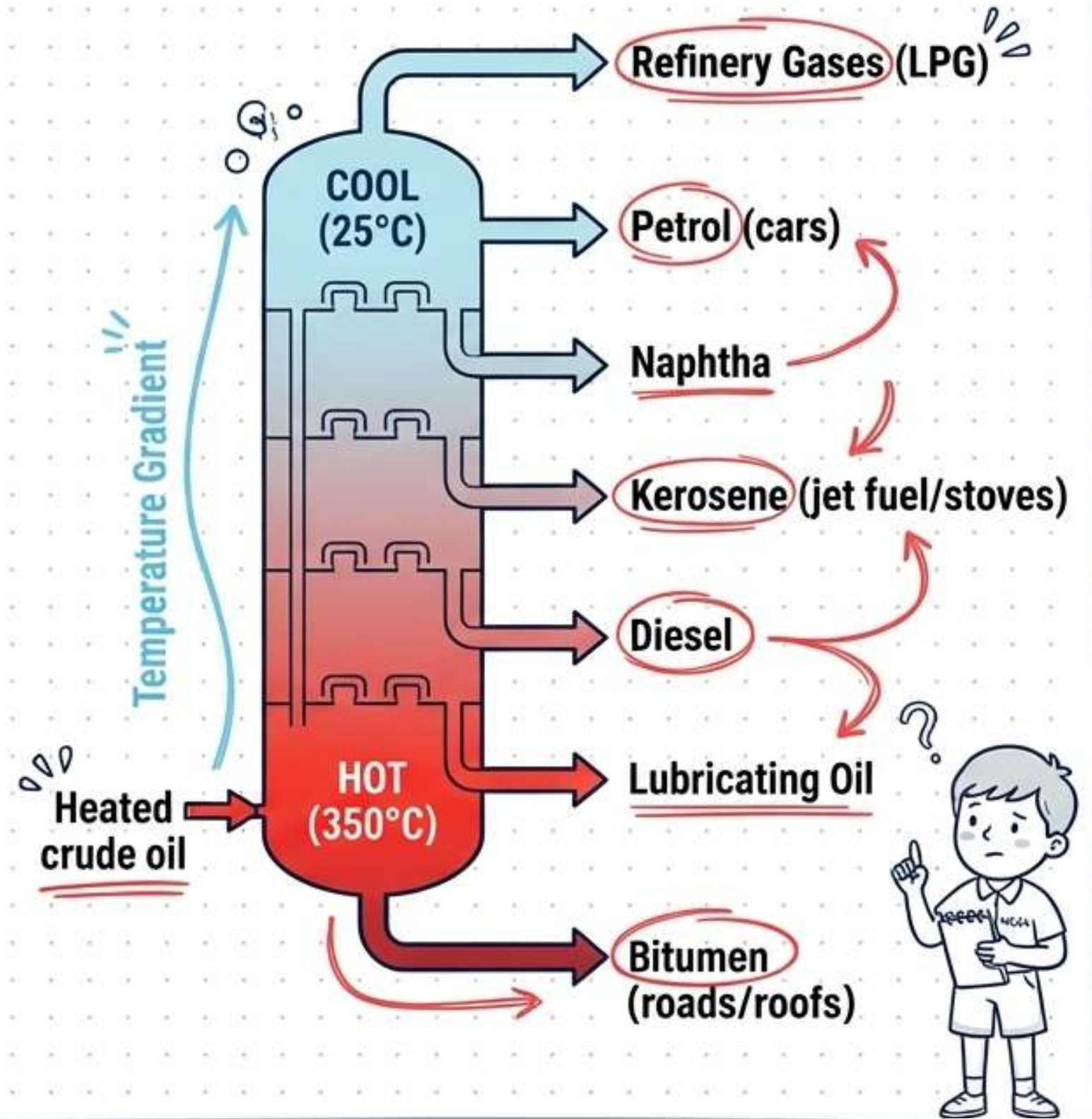


Diagram 2: Fractional Distillation Column



Most Asked Board Questions

Q1. Explain why fossil fuels are exhaustible natural resources.

They require millions of years and specific geological conditions to form. Human consumption is vastly faster than their formation rate.

Examiner Expects

Mention 'millions of years' AND 'consumption vs. formation rate'.

Q2. Describe the characteristics and uses of coke.

It is a tough, porous, and black substance. It is an almost pure form of carbon. Used in manufacturing steel and extracting metals.

Examiner Expects

Three keywords:
Tough, Porous, Pure Carbon.

Q3. What are the advantages of using CNG and LPG as fuels?

They burn easily, have high calorific value, produce no smoke/ash (clean), and can be transported easily through pipes.

Examiner Expects

Mention 'High calorific value' and 'No residue/clean fuel'.

Q4. Where was the world's first oil well drilled?

Pennsylvania, USA, in 1859.


Examiner Expects


Pennsylvania, USA.




Common Mistakes + Exam Traps


Trap 1 Box: The Origin Mix-Up

 Thinking Coal and Petroleum are formed from the same source.

 Coal = Land vegetation (wetland forests).
Petroleum = Marine organisms (sea).


Trap 2 Box: The Gas Confusion

 Writing "Natural Gas" when asked what gas is produced during coal processing.

 Coal produces Coal Gas.
Natural Gas is found alongside petroleum.


Trap 3 Box: The Lab Illusion

 Believing fossil fuels can be synthetically created in a laboratory.

 Impossible! Formation requires millions of years and extreme geological heat/pressure that cannot be replicated.

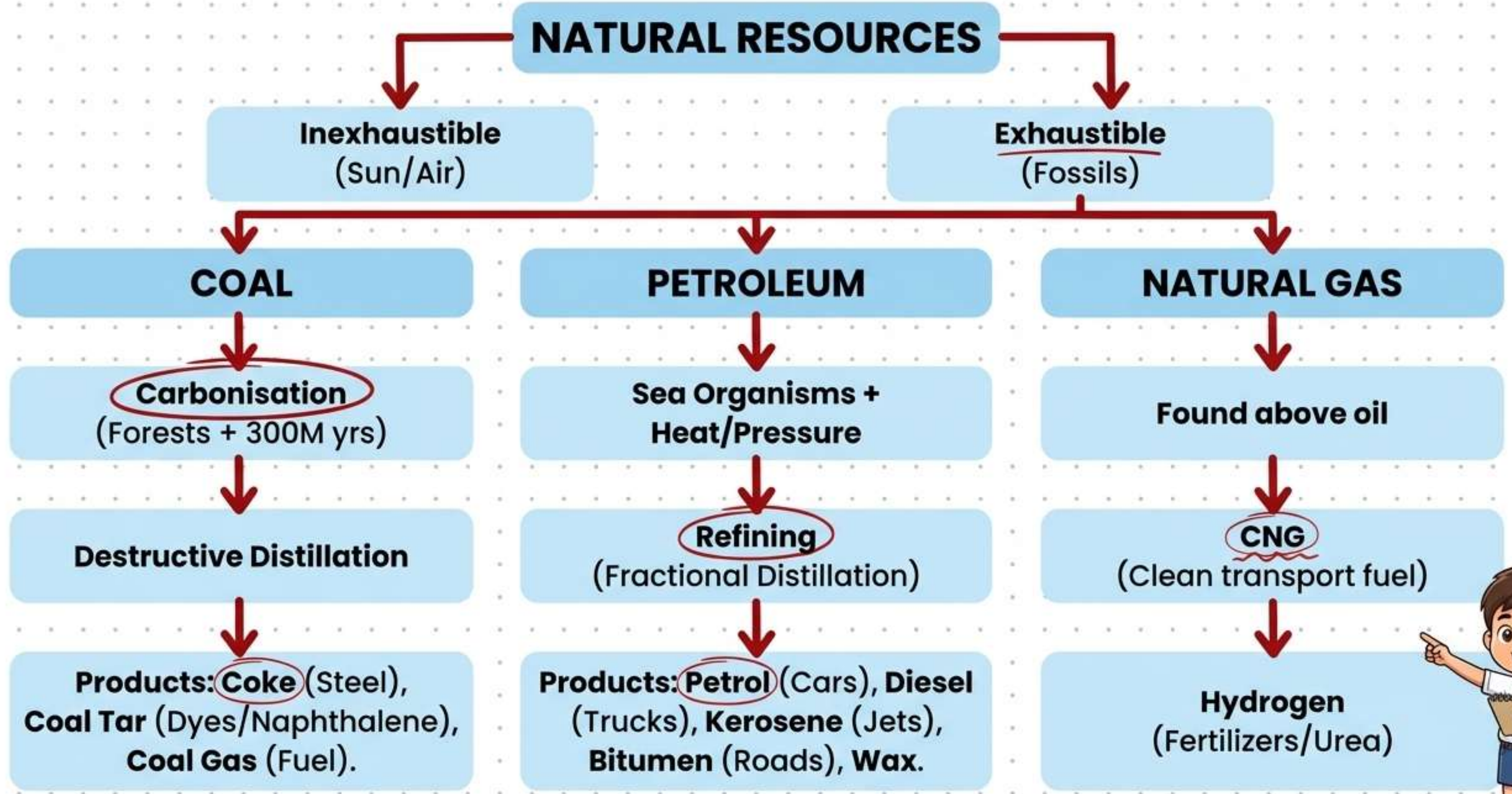
Trap 4 Box: The Road Metalling Error

 Stating that Coal Tar is used for modern road construction.

 **Bitumen** (a petroleum product) is used today, not coal tar.



Rapid Revision Sheet



Answer Writing Framework

2-Mark Questions

Structure: 1 precise definition line + 1 clear example.

Example: 'Define Inexhaustible resources.'

Answer format → Resources present in unlimited quantity.
Example: Sunlight.


3-Mark Questions

Structure: Draw a table with 3 distinct points of difference OR write 3 sequential steps using arrows.

Example: 'Explain the Formation of Coal.'

Answer format →
(1) Dense forests →
(2) Buried/Compressed →
(3) Heat/Pressure = Carbonisation.

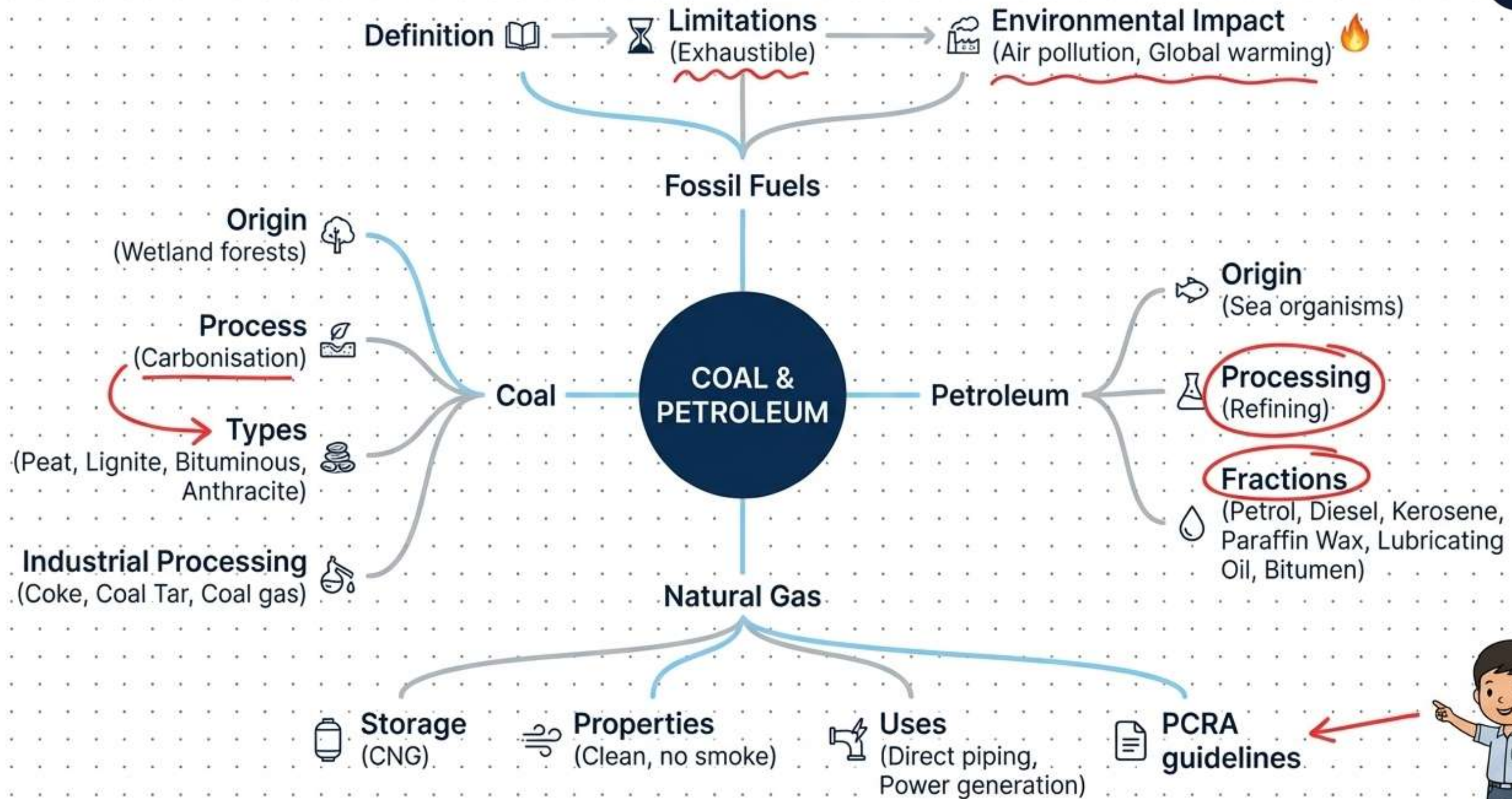
5-Mark Questions

Structure: Introduction (Definition) → Body (Process details + Diagram) → Conclusion (Uses/Impact). 

Example: 'Explain Petroleum refining and list 4 products.'

Pro-Tip: Always draw a quick, labeled diagram for 5-mark science questions, even if the question doesn't explicitly ask for one!





Memory Tricks / Mnemonics

Mnemonic for Coal Products

Trick: Cats Take Guitars

Meaning: **C**oke, **C**oal Tar, **C**oal Gas



Mnemonic for Coal Types (Ranked Low to High Carbon)

Trick: **P**lease **L**eave **B**efore **A**fternoon

Meaning: **P**eat, **L**ignite, **B**ituminous, **A**nthracite



PCRA Fuel Saving Tips

Trick: Be a **D.R.I.V.**er!

→ **D** = **D**rive at constant/moderate speed.

→ **R** = **R**educe engine at traffic lights.

→ **I** = **I**nflate tyres with correct pressure.

→ **V** = **V**erify vehicle maintenance regularly.



The Ultimate Pre-Exam Checklist

- I can classify exhaustible vs. inexhaustible resources with examples.
- I can explain Carbonisation and the formation of petroleum.
- I have memorized the differences and uses of Coke, Coal Tar, and Coal Gas.
- I can draw and label the 'Petroleum Deposits' and 'Fractional Distillation' diagrams.
- I know the advantages of CNG/LPG and the PCRA fuel-saving tips.

**Checkmarks complete?
You are Exam Ready!**

