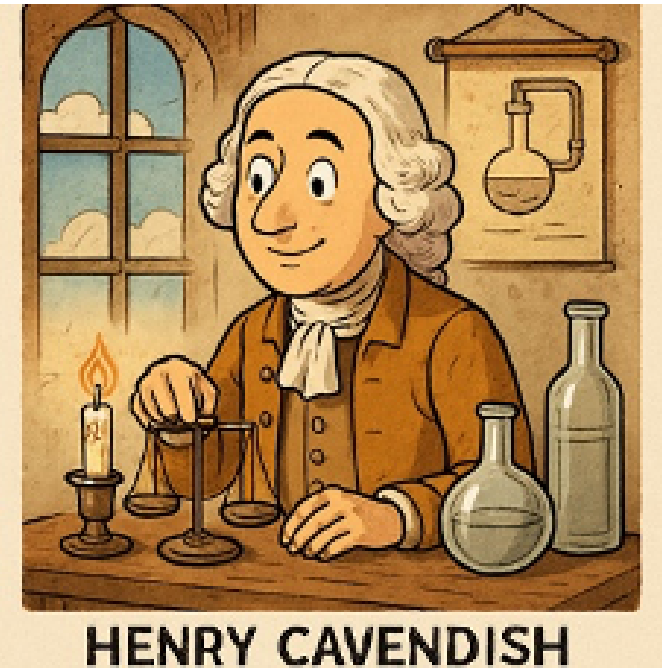
STEAMlab
Science | Technology | Engineering | Arts | Mathematics

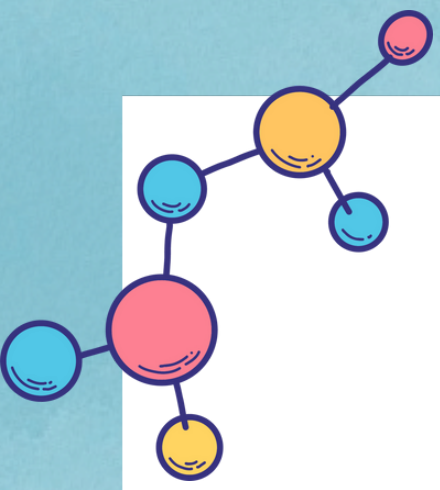
STORY ABOUT HYDROGEN

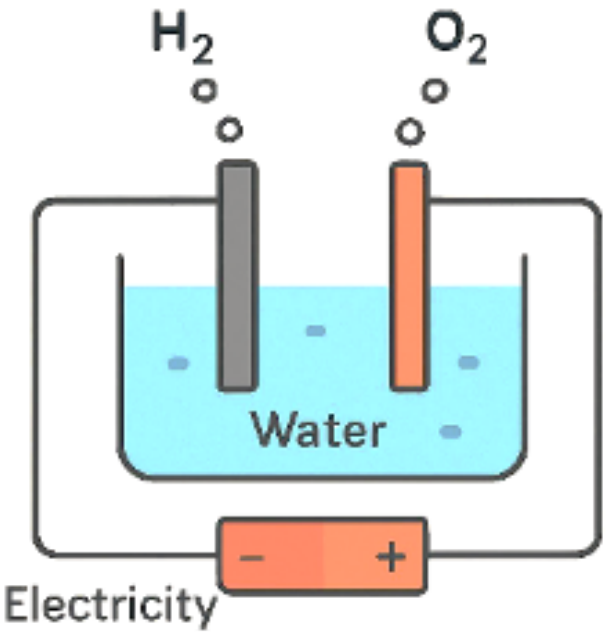
Name: _____ Class: _____ Student No.: _____

The Discovery of Hydrogen and Green Hydrogen Energy



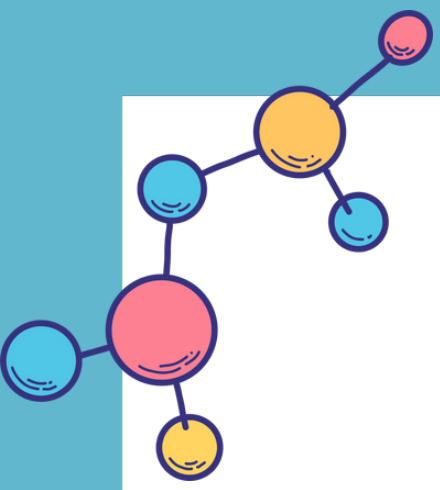
Hydrogen is the lightest element in the universe. It was first discovered in the 18th century by scientist Henry Cavendish. Hydrogen is a colorless, odorless, and tasteless gas. Although it's hard to detect, it plays a crucial role. Hydrogen is a component of water and can be extracted from water through a process called electrolysis. It can also be derived from natural gas.



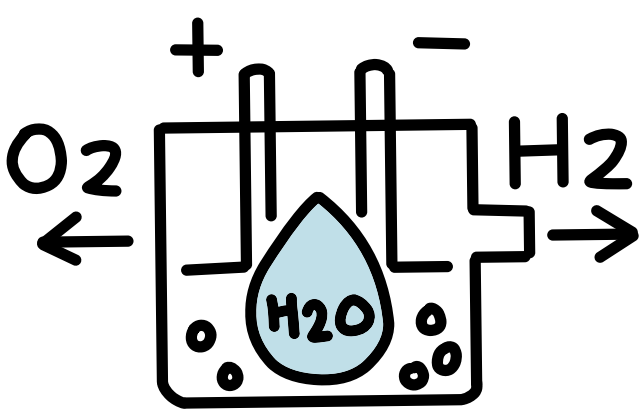


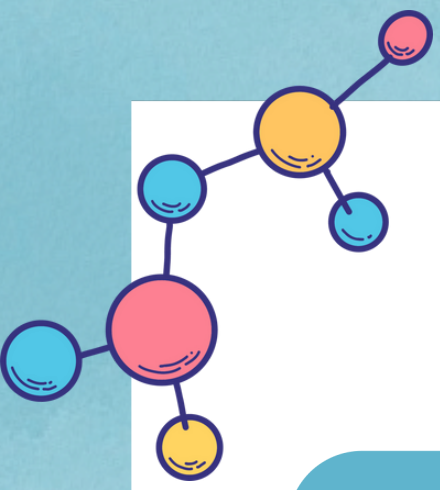
Hydrogen energy has many advantages, such as reducing air pollution, because it only produces water vapor when burned and no harmful gases are released. However, storing and transporting hydrogen remains a challenge, making it relatively costly.

"Green hydrogen" is hydrogen produced from renewable energy sources (like wind and solar power) without emitting carbon dioxide during production. That's why it's called a "green" energy source.



This type of hydrogen is clean and versatile. It can power hydrogen fuel cell vehicles, which emit only water vapor while driving. Green hydrogen can also provide clean electricity for homes and factories. With technological advancements, hydrogen energy will play an even greater role in the future.





Test Your Knowledge

1. Hydrogen was discovered by scientist (☐Newton / ☐Galileo / ☐Henry Cavendish).

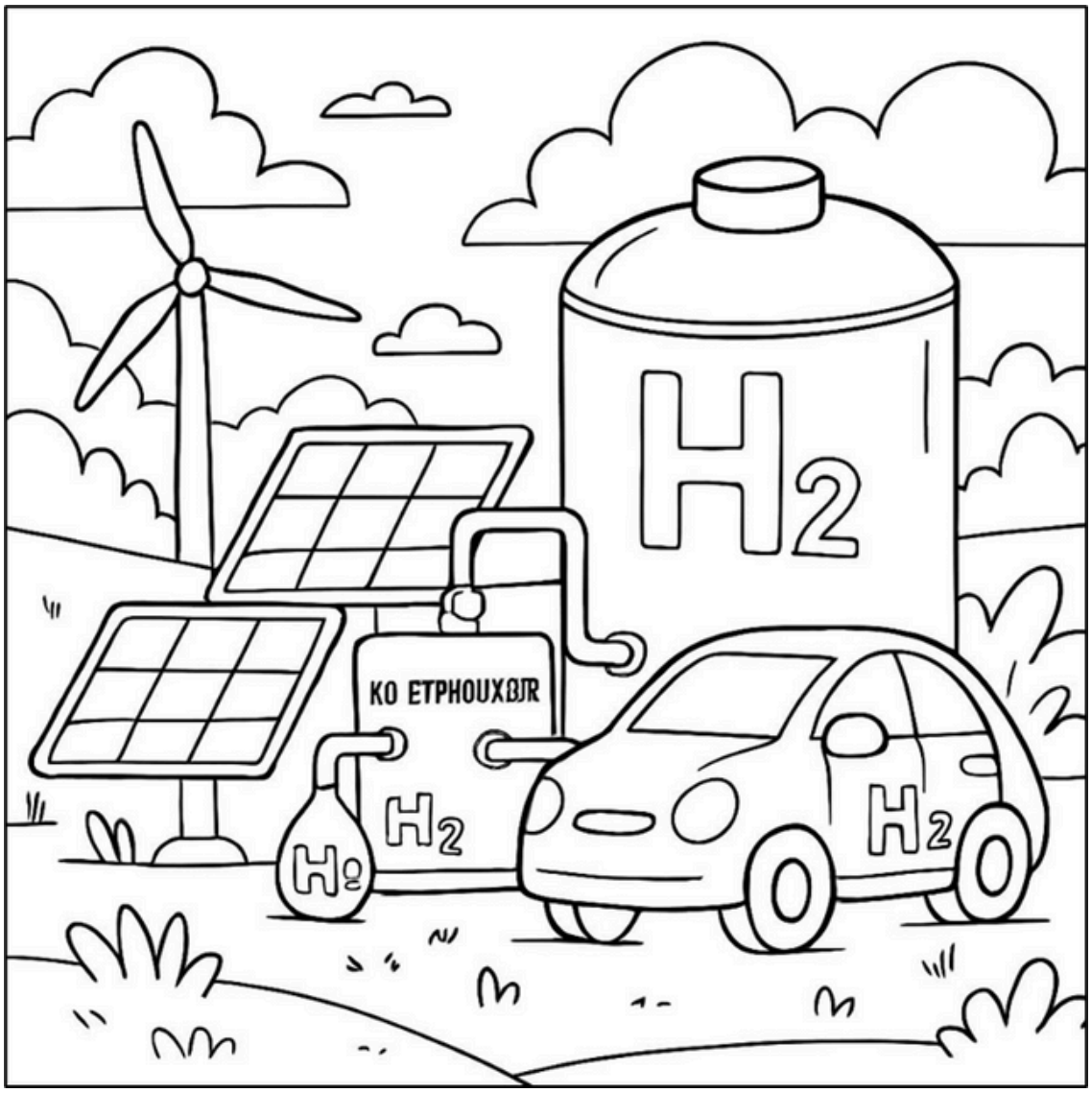
2. Hydrogen is a (☐solid / ☐liquid / ☐gas), and it is (☐white / ☐yellow / ☐colorless). Hydrogen has a (☐ fragrant / ☐odorless / ☐smelly) smell.

3. Hydrogen can be extracted from (☐natural gas / ☐water / ☐sandstone). Using electrolysis of water produces (☐hydrogen gas / ☐oxygen gas / ☐water vapor / ☐ carbon dioxide).

4. Hydrogen fuel cell vehicles emit (☐hydrogen gas / ☐ oxygen gas / ☐ water vapor / ☐ carbon dioxide) while driving.

Coloring Activity

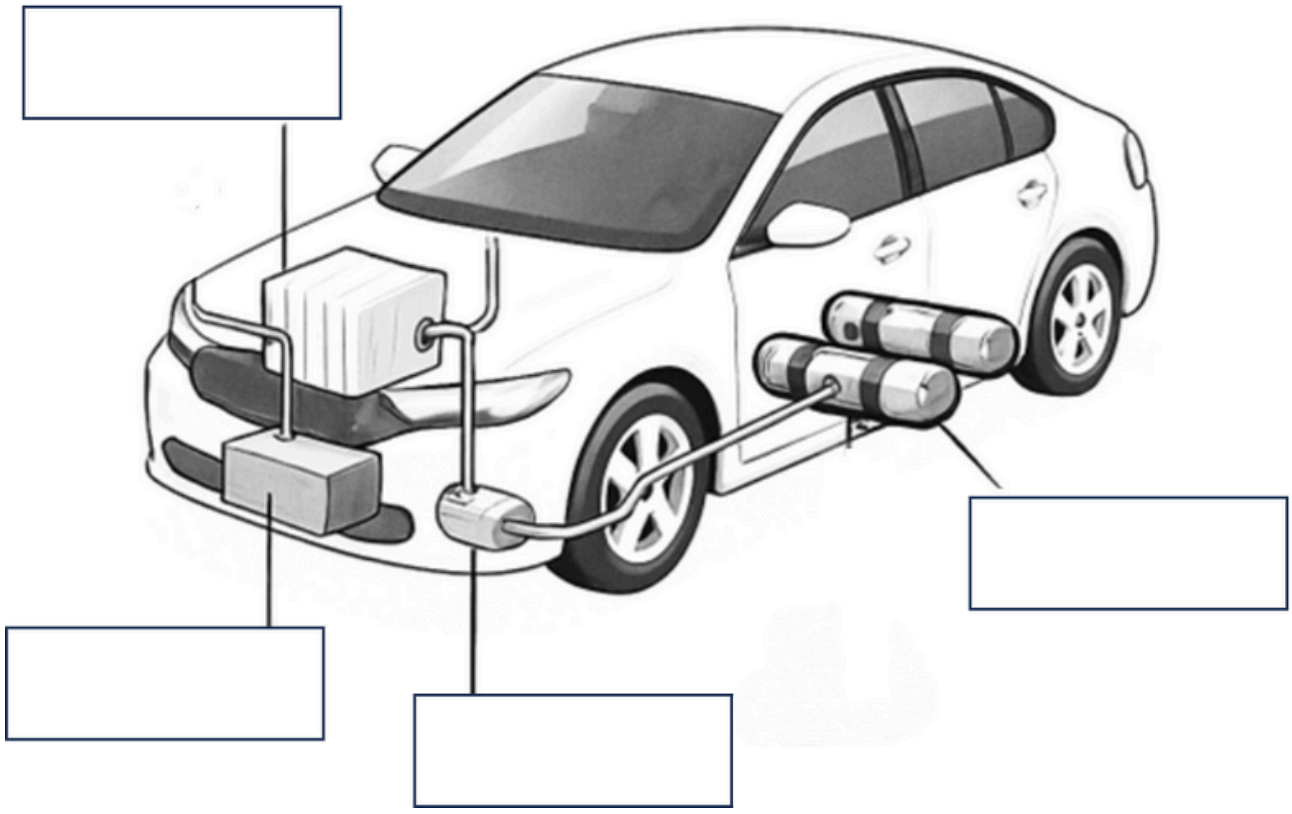
Color the images associated with Green hydrogen applications.

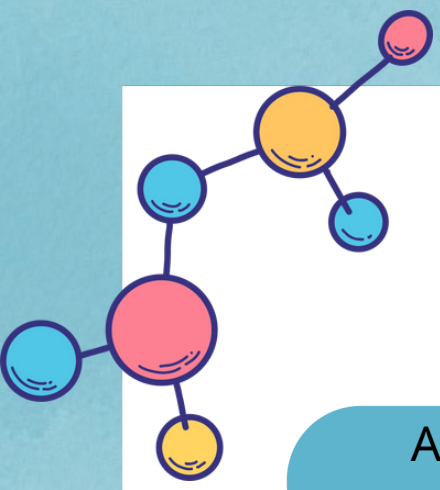


Structure of a Hydrogen Fuel Cell Vehicle

Fill in the blanks below with the correct names of the parts of a hydrogen fuel cell vehicle:

Electric Motor / Battery Pack / Fuel Cell / Hydrogen Storage Tank





Advantages and Disadvantages of Hydrogen Energy

Identify whether each statement is an Advantage or a Disadvantage:

	Advantage	**Disadvantage**
1. The only emission from hydrogen is water vapor, with no CO_2 or harmful gases.		
2. Hydrogen must be stored under high pressure or liquefied, increasing storage and transport costs.		
3. Hydrogen has a higher energy density than traditional fuels, storing more energy.		
4. Hydrogen is versatile, used in transportation, power generation, industry, and more.		
5. Hydrogen can be produced from renewable sources like water, wind and solar.		
6. Lack of hydrogen refueling stations limits its widespread use.		
7. Most hydrogen today still comes from fossil fuels, which may emit CO_2 during production.		
8. Hydrogen is highly flammable and explosive, requiring special safety measures.		

Future Design

Design a hydrogen-powered innovative tool or vehicle in the space below, and explain how it improves human life or protects the environment.

I designed a hydrogen-powered _____

_____.

It can _____

and helps _____.