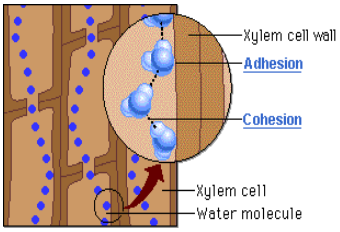
Amazing Properties of Water

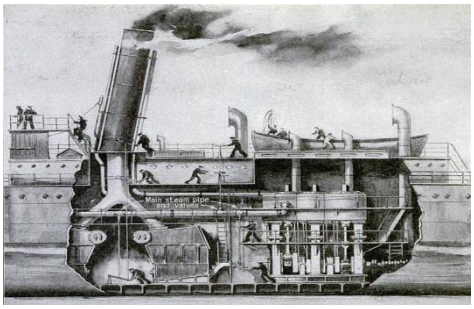


- **Universal Solvent:** Water dissolves more substances than any other liquid, allowing it to carry minerals, nutrients, and chemicals essential for life.
- **Density Anomaly (Ice Floats):** Unlike most substances, water expands when it freezes. Because ice is less dense than liquid water, it floats, insulating the water below and protecting aquatic life.
- **High Specific Heat:** Water can absorb or release significant amounts of heat with little change in its own temperature. **This helps regulate Earth's climate and maintains stable body temperatures.**



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- **Cohesion and Surface Tension:** Water molecules are "sticky" (cohesion), allowing them to form drops, and creating high surface tension that allows small insects to walk on water and water droplets to condense.
- **Adhesion and Capillary Action:** Water sticks to other surfaces (adhesion). Combined with cohesion, this allows for capillary action, **enabling water to move against gravity in plants**.
- **High Heat of Vaporization:** A lot of energy is required to turn water into vapor, making evaporation an excellent cooling mechanism (e.g., sweating).
- **Polarity:** Water molecules have a positive charge near the hydrogen atoms and a negative charge near the oxygen atom, allowing them to attract and bond with many other molecules
- **Expansion potential:** Water expands to **1600-1700 times greater volume**, fueling the industrial revolution with steam engine power. One cubic inch expands to 1 cubic foot. Hydrogen bonds are broken causing both immediate and rapid expansion for a great source of energy.



- **Life's building block:** The first substance mentioned in the Bible is water; NASA's quest, "Follow the Water…," acknowledges that **all life requires water to metabolize, grow, or survive**.
- **Water's Forms (3 states of matter at Earth's temps): Water is unique in existing naturally as a solid (ice), liquid (water), and gas (steam) on Earth.**
- **Earth's temperate conditions rely on the presence of water:** Water is the number one greenhouse gas, essential for warming Earth (preventing frozen conditions), but it also prevents overheating due to clouds and reflective snow/ice. **Water's unique temperature of evaporation/condensation at Earth's temps maintain life-giving heat for Earth's creatures.**
- Ocean currents, salt/freshwater variability, and tidal action regulate seasons, food resources, and biological abundance preventing stagnation and providing life.