

Class 6 to 8 Science: Key Concepts Made Simple

The ideas that matter most from Classes 6, 7 and 8 science, grouped by topic, with easy memory tips.

1. Living things and their food

- Living things grow, breathe, respond to the environment, reproduce and need food. Plants make their own food by **photosynthesis**; animals depend on plants or other animals.

Photosynthesis: carbon dioxide + water (sunlight, chlorophyll) → glucose + oxygen

- Food has carbohydrates (energy), proteins (growth and repair), fats (stored energy), vitamins and minerals (protection), fibre and water.
- Deficiency examples: vitamin C: scurvy; vitamin D: rickets; iron: anaemia; iodine: goitre.

2. Plants and animals

- Parts of a plant: roots (absorb water, hold the plant), stem (carries water and food), leaf (makes food), flower (reproduction), fruit and seed.
- Animals: herbivores eat plants, carnivores eat animals, omnivores eat both.
- Animals breathe through lungs, gills, skin or tracheae depending on the habitat. Respiration releases energy from food.

3. Cells and body systems

- The cell is the basic unit of life. Plant cells have a cell wall, large vacuole and chloroplasts; animal cells do not.
- Digestion breaks food down; the heart pumps blood; lungs exchange gases; kidneys filter waste; the brain controls the body.
- Adolescence (puberty) brings physical and emotional changes. Balanced food, sleep and exercise help.

4. Matter around us

- Matter has mass and takes up space. States: solid, liquid, gas. Heating and cooling can change the state.
- Substances can be pure or mixtures. Separation methods: sieving, filtration, evaporation, sedimentation, magnetic separation, distillation.
- Physical change: no new substance (melting ice). Chemical change: new substance forms (rusting, burning, curd from milk).
- Acids taste sour and turn blue litmus red; bases taste bitter, feel soapy and turn red litmus blue. Neutralisation: acid + base gives salt + water.

5. Materials and metals

- Metals are shiny, conduct heat and electricity, and are malleable and ductile. Non-metals are usually dull and brittle (graphite and iodine are special cases).
- Rusting needs both air (oxygen) and moisture. Prevent it by painting, oiling or galvanising.
- Fibres: natural (cotton, wool, silk, jute) and synthetic (nylon, polyester, acrylic).

6. Motion, force and energy

Speed = Distance ÷ Time

- A force can push, pull, change speed, direction or shape. Friction opposes motion and produces heat; it can be reduced with lubricants or wheels.
- Pressure = force ÷ area. A sharp knife cuts well because of a small area. Liquids and gases also exert pressure.
- Energy exists as heat, light, sound, electrical and chemical energy. It changes form but is never lost.

7. Heat, light and sound

- Heat flows by conduction (solids), convection (liquids and gases) and radiation (no medium needed). Dark surfaces absorb more heat.
- Light travels in straight lines. A plane mirror forms a virtual image of the same size, left and right reversed. White light splits into 7 colours (VIBGYOR).
- Sound needs a medium and cannot travel in a vacuum. Pitch depends on frequency and loudness depends on amplitude. Noise pollution harms hearing.

8. Electricity and magnets

- A circuit needs a cell (source), wires, a switch and a bulb. Metals are conductors; plastic, rubber and wood are insulators.
- The heating effect of current is used in heaters; the magnetic effect in electric bells and cranes. A fuse protects against overload.
- Magnets have two poles: like poles repel, unlike poles attract. A freely suspended magnet points north-south.

9. Earth, weather and environment

- Weather is the day-to-day condition; climate is the average over many years. Monsoon rain is vital for India.
- Soil layers, water cycle and air (about 78% nitrogen, 21% oxygen) support life.
- Save water, plant trees, reduce plastic and use public transport to protect the environment. Remember 3Rs: reduce, reuse, recycle.
- Conserve forests and wildlife: national parks, sanctuaries and biosphere reserves protect biodiversity.

10. Reproduction and growth

- Plants reproduce by seeds or by vegetative parts (stem cutting, root). Pollination moves pollen; fertilisation forms the seed.
- Animals reproduce by laying eggs or giving birth. Metamorphosis: butterfly (egg, larva, pupa, adult) and frog (egg, tadpole, adult).

Tip: Always draw and label a diagram in science answers. Examiners reward neat, labelled diagrams.

Revision routine

- After each chapter, write 5 key points in your own words and 3 questions you can ask a friend. Revise on day 1, day 3 and day 7 for lasting memory.