

Curriculum Overview

Science

Classes 6 - 8

2022/2023

Physics

Class 6	Class 7	Class 8
Understands some sources of sound, and that sound quality is determined by material and method of sound production.	Understands the 3 factors determining the frequency of a vibrating string – length, mass and tension – and the relationship to pitch.	Knows that sounds can be reflected, directed, focused and absorbed
Understands that sound is associated with vibrations	Understands the relationship between the amplitude of vibration and the volume of sound	Knows the speed of sound through air, and that the speed of sound depends on the medium it is travelling through
Pitch – understands that pitch is related to size	Understands the harmonics of a vibrating string, and the relationship to audible overtones. Understands that this forms the basis of consonance and dissonance	Knows that sound needs a medium to travel through

	in musical harmony.	
Volume – understands that volume is related to the intensity of production	Understands that the length of a column of air primarily determines the pitch of blown sounds.	Knows that sound travels in longitudinal waves
Propagation – understands that sound can travel through various media	Understands that the relative consonance of musical intervals can be expressed by the simplicity of the ratio of their frequencies.	Knows how understanding of sound can be applied to design of buildings and instruments
Understands that there are many sources of light	Understands the principle of resonance.	Knows how convex and concave lenses affect the propagation of light
Understands the propagation of light – light travels in all directions, with decreasing intensity	Understands how the above principles are used in musical instruments from various cultures.	Knows the causes and effects of the refraction and diffraction of light
Understands the difference between transparent, translucent and opaque materials.	Understands the human perception of sound, the function of the ear, including the danger of high volume sound] (see also human biology)	Understands and describes changes of state of liquids, solids, gases, including evaporation
Understands a relationship of light, darkness and colour	Understands that light can be reflected, and the reflective quality of various materials	Understands how pressure affects temperature and the state of matter.
Understands a difference between colour	Understands that the angle of incidence	Understands that the absorption and of

pigment and colour light, and their primary and secondary colours.	equals the angle of reflection.	heat depends on the material and mass
Understands illumination and shadow, complementary colours, and contrast	Understands that light can be focused to create images	Understands the heating, magnetic and chemical effects of electric currents
Understands some different sources of heat and cooling, including combustion and friction	Understands that light can be focused by a small aperture or a lens.	Understands electric circuits, switches and fuses
Understands that heating and cooling substances causes expansion and contraction.	Experiences the different effects of concave and convex lenses	Knows how a telegraph works
Understands how heat can travel by conduction, convection and radiation.	Understands that light can be reflected and focused by curved mirrors	Understands the electrical conduction and insulation effects of various materials, and earthing
Understand magnetite, natural magnetic rock, its use in early navigation and its relationship to the earth's magnetic field	Can explain the typical properties of solids, liquids and gases using ideas about particles	Understands the magnetic effect of a current and its applications, e.g. electro-motor, dynamo
Understands the nature of the 2 magnetic poles, attraction and repulsion, and their relationship to the earth's magnetic field	Understands how temperature affects the states of matter of various substances.	Understands how liquids exert pressure in proportion to their depth (hydrostatic force)

Understands how magnetism can be induced, temporarily and permanently. Understands how magnets can be de-magnetised	Can use a thermometer to measure heat, and understands how the Celsius scale is based on the properties of water.	Understands how a manometer can measure water pressure
Understands which materials can be magnetised and attracted by magnetism.	Understands that every substance has a specific boiling and freezing point, and that altering the composition of a substance can affect these.	Understands Pascal's Law
Understands the magnetic force field	Understands that the density of a substance is affected by its temperature, and the exceptional behaviour of water	Understands that liquids cannot be compressed
Understands that static electricity can be produced by rubbing certain substances together	Understands the anomaly point of water and its significance in the natural world	Know some applications of hydraulic power
Understands that static electricity can be detected by the senses or by an electroscope	Understands how electric currents can be generated by chemical reactions	Understands Archimedes' Principle
Observes and can describe the phenomena of electro-static attraction and repulsion	Understands the principle of the Voltaic Cell and the Battery.	Understands how density (of the object and the liquid) affects buoyancy
Understands that electrostatic charges	Understands the difference between	Understands why a boat floats

can be positive or negative, and that like charges repel each other and opposite charges attract each other	static and current electricity.	
Can compare and contrast the effects of static electricity and magnetism	Understands that magnetism can be created by electricity	Understands that liquids have different densities
	Understands how electromagnetism can be used to create motion (electric motor)	Understands that liquids have surface tension
	Can construct a simple electric motor	Understands that air has volume and mass
	Can describe a variety of practical uses of electricity	Understands that air offers resistance to moving objects
	Can describe some of the dangers of an electric current, and of lightning	Understands that air exerts pressure. Knows how a siphon and a syringe work
	Understands the principle of mechanical advantage	Understands Bernoulli's Principle
	Understands the law of the lever, and the principles of the 3 classes of lever.	Understands vacuum as an absence of substance
	Understands the principles of: the pulley, the wheel and axle, the inclined plane, the wedge, the screw.	Understands how Magdeburg Hemispheres work

	Understands the effects of friction and lubrication.	Understands vacuum in relation to steam power and the industrial revolution
		Understands the factors which affect gas pressure: number of particles, volume of container, temperature

Chemistry

Class 7	Class 8
Understands the difference between chemical and physical change	Understands the role of carbon dioxide in human and plant respiration
Understands that combustion is a form of chemical change	Understands solution & mixtures Implications of water being a good solvent: nature, human, industry
Is able to observe and describe a range of forms of combustion, connecting these observations with the substance being burned	Understands some properties of glucose,; chemical properties, implications for animal and plant life. Solubility, energy
Understands the role of oxygen in combustion.	Understands the process of testing food for sugar
Knows the composition of air	Understands the production in plants of glucose and oxygen through photosynthesis, including the chemical equation
Has observed combustion with pure oxygen gas	Understands the role of glucose in human nutrition and respiration
Knows how oxygen was discovered.	Understands the production of sugar from cane and beet
Understands the concept of elements and compounds	Understands the symbiosis between animal and plant kingdoms in relation to photosynthesis and nutrition and respiration.
Understands that an element (e.g. oxygen) can be isolated from	Understands the effects of sugar on teeth, diet and blood sugar;

a compound, and is generated by plants	understands diabetes
Understands the concept of acid & base/alkali & salts, and can describe the difference between an acid and a base.	Understands the properties of starch
Understands that combustion can separate a substance into acid smoke and basic ash.	Understands the properties of starch: its transformation into sugar, in relation to plants (germination), animals and food production
Understands some implications for the environment, including greenhouse gases and acid rain	Can draw the molecular structure of some sugars
Knows that organic chemistry is the chemistry of carbon based substances	Understands the structure, origin and uses of cellulose
Understands the concept of an indicator. Understands that cabbage water and litmus are indicators for acidity.	Understands the role of cellulose in paper manufacture
Know that acidity is measured using the pH scale.	Understands the origins and properties of fats and oils
Understands the lime cycle in relation to: <ul style="list-style-type: none"> • Geography/geology, wildlife • Industry (Some uses & effects of lime) • Chemistry 	Can test foods for fat content
Knows the history and has a rudimentary understanding of the Periodic Table, including some chemical symbols	Understands the nature of burning oil, and the causes and dangers of a 'chip pan fire'.
Understands the concept of a balanced chemical equation	Understands the chemical properties and manufacture of soap

Understands the Law of Conservation of Mass	Understands the origins and properties of proteins
Understands the dissolving & crystallising process of a salt	Can test foods for protein content
Understands the filtering of a salt in solution	Understands a simple atomic model
Knows the different qualities of various metals	Understands the differences between atoms, elements and compounds
(Silver, copper) plating	Knows the chemical symbols and formulae for some elements and compounds
Understands redox reaction	Knows the basic structure of the Periodic Table
Understands redox reaction in relation to smelting (lead, copper)	Sets some scientific understanding within its historical context, through the study of the biographies of significant scientific figures
Understands some industrial and historical significance of purification and smelting a range of metals	

Biology

Class 7	Class 8
<p>Understands and describes the sensory organs and systems of the human being</p> <ul style="list-style-type: none"> • Understands and describes structure and functioning of the eye <ul style="list-style-type: none"> ○ Understands issues related to the care of the eyes and eyesight • Understands and describes structure and functioning of the ear as the organ of hearing and balance <ul style="list-style-type: none"> ○ Understands issues related to the care of the ears and hearing • Understands and describes the senses of taste and smell, with reference to the tongue and nose • Understands and describes the sense of touch in relation to the nervous system 	<p>Understands the form and functions of the skeleton as a whole, including support, protection, movement and making blood cells</p>
<p>Has a basic knowledge of the human gas exchange system</p> <ul style="list-style-type: none"> • Understands and describes structure and functioning of the lungs for breathing <ul style="list-style-type: none"> ○ Understands issues related to the care of the lungs, and associated diseases • Understands and describes structure and functioning of the heart and the circulatory system <ul style="list-style-type: none"> ○ Understands issues related to the care of the heart, and associated diseases 	<p>Understands the form and function of the spinal column and its relation to uprightness</p>

<p>Has a basic knowledge of the human digestive system</p> <ul style="list-style-type: none"> • Understands and describes the structure and function of the organs of the digestive system, including the roles of enzymes and bacteria • Understands the breakdown and passage of the nutrients into the blood, and its transport to cells • Understands the excretion of waste products as faeces and urine, and through the skin 	<p>Understands the form and function of the foot, its arch and its relation to uprightness and movement</p>
<p>Has a basic knowledge of the effects of ingesting various substances</p> <ul style="list-style-type: none"> • Understands and describes the main features of a healthy diet, including: <ul style="list-style-type: none"> ○ Carbohydrates, lipids, proteins, vitamins, minerals, fibre and water • Understands the calculations of energy requirements in a healthy diet • Understands some consequences of an unbalanced diet, including obesity, starvation and deficiency diseases • Has a basic understanding of eating disorders • Understands and describes the effects of some medical drugs • Understands and describes the effects and benefits of some medical drugs • Understands and describes the effects and dangers of some recreational drugs 	<p>Understands aspects of proportion within the human body, in relation to the Golden Mean</p>

<p>Has a basic knowledge of the structure and function of the skin</p> <ul style="list-style-type: none"> • Understands issues related to the care and healing of skin 	<p>Understands polarities and contrasts in the skeletal structure of the head, chest and limbs</p>
<p>Has a basic knowledge of the brain and nervous system</p>	<p>Has studied the forms of specific contrasting bones: e.g. the vertebrae and femur</p>
<p>Has a basic knowledge of the human reproductive system</p> <ul style="list-style-type: none"> • Understands issues related to: <ul style="list-style-type: none"> ○ Puberty ○ Relationships ○ Parenthood ○ Sexual health ○ Contraception 	<p>Understands the relationship of bones and muscles in major joints, the lever principles involved, and the measurement of force exerted by different muscles</p>
<p>Has a basic knowledge of other health factors, including:</p> <ul style="list-style-type: none"> • Exercise • Sleep • Personal hygiene 	<p>Understands the function of muscles, including the roles of antagonistic muscles</p>
	<p>Has studied the form and function of a sense organ: e.g. the eye or ear</p>

