Science Curriculum Overview: Türkiye

Grades	Life Systems	Matter and Energy	Structures and Mechanisms	Earth and Space Systems	STEM Skills and Connections
Grade 6	**Systems in Our Body** - Human locomotor system: *skeleton, bones, joints, cartilage, muscles, posture* - Human digestive system: *structures and organs, chemical and physical digestion, accessory organs* - Circulatory system: *structures and organs, heart, blood vessels, blood circulation, structure and functions of the blood, blood groups, blood donation* - Respiratory system: *structures and organs* - Excretory system	**Matter and Heat** - Particle Theory of Matter - Condensation - Matter and Heat: *thermal conductivity and insulation, insulating products* - Fuels: *solid fuels, liquid fuels, gas fuels, renewable and non-renewable energy sources*	**Force and Motion** - Resultant Force - Constant speed motion **Sound and its Properties** - Propagation of the Sound - Sounds in Different Environments - Speed of the Sound - Interaction of Sound with Matter **Electrical Conduction** *: conductive and insulative materials, electrical resistance, and related factors*	**The Solar System** : *the solar system, the basic features of planets, satellites of planets, asteroids, meteorites* **Eclipse** : eclipse of the Sun and Moon	n/a
Grade 7	**Cells and Diffusions** - Cell: *animal and plant cells, tissue, cell-tissue-organ-system-organism relationship, DNA, gene, chromosome* - Mitosis: *cell diffusions, stages of mitosis, the importance of mitosis* - Meiosis: *cell production, the difference between mitosis and meiosis, the importance of meiosis* **Reproduction, Growth and Development in Living Things** **-** Human: *reproduction in human, structure and organs, sperm, egg, zygote, embryo, fetus, baby* - Plant and animals: *reproduction, growth, and development in animals and plants, sexual and asexual reproduction*	**Pure Substances and Mixtures** - Particle Theory of Matter: *atom, nucleus, layer, proton, neutron, electron, molecule* - Pure substances: elements, element symbols, compound, compound formulations - Mixtures: *homogenous mixture, heterogenous mixture, solution, solute, solvent, soluble, dissolution*	**Force and Energy** - Mass and Weight Relationship: *mass, weight, gravity, gravitation* - Force, Work and Energy: *physical work, kinetic energy, gravitational and elastic potential energy* - Energy transformations: *conservation of energy, friction and kinetic energy loss, air and water resistance* **Light and Matter Interaction** - Absorption of light, mirrors, refraction of light and lens **Circuits** - Connections in Light Bulbs: *series connection, parallel connection, electrical current, voltage*	**The Solar System and Its Beyond** - Space Research: *space technology, space debris, sky observation tools, telescope* - Astronomical Objects: *star, nebula, constellation, galaxy, black hole*	n/a

Grade 8	**DNA and Genetic Code** - DNA and Genetic Code: *DNA, nucleotide, gene, chromosome, match in DNA* - Genetic: *gene, hybrid, kinship marriage, genotype, phenotype, dominant and recessive gene, cross-breeding, sex* - Mutation and Modification - Adaptation: *adaptation, natural selection, variation* - Biotechnology: *genetic engineering, superficial selection, biotechnology* **Energy Transformations** **-** Food Chain: *consumer, producer, decomposer, ecological pyramid, food chain, food web, bioaccumulation* - Energy Transformations: *photosynthesis, respiration*	**Matter and Industry** - Periodic Table: *group, period, periodical system, metal, non-metal, semi-metal, noble gas* - Physical and Chemical Changes - Chemical Reactions: *chemical reaction, conservation of mass* - Acids and Bases: *acid, base, pH, acid rains* - Matter-Heat Interactions*: specific heat, heat* - Chemistry Industry in Türkiye: *chemistry industry, sector, charities*	**Pressure** - Solid, Liquid, and Gas Pressure: *pressure, force, surface area, Pascal, depth, liquid type* **Simple Machines** - Electrical Charges and Electrification: *electrical charges, electrification, impulse and attraction* - Electrically Charged Objects: *positively charged, negatively charged, neutral, electroscope, grounding* - The Transformation of Electrical Energy: *heat energy, power plant, electrical energy, light energy, saving, energy transformation, motion energy*	**Seasons and Climate** - Occurrence of Seasons: *rotational axis of Earth, heat energy, orbital plane, seasons* - Climate and Air Movements: *climate, climatology, climatologist, global climate change* **Environmental Science** - Matter Cycles: *water cycle, oxygen cycle, nitrogen cycle, carbon cycle, ozone layer, global warming* - Sustainable Development: *sustainable life, saving, recycling*	n/a
Grade 9	**Life Science Biology** - Biology and common threads of living things: *nutrition, biology, excretion, growth, liveliness, development, motion, homeostasis, cell, metabolism, organization, respiration, irritation, adaptation, reproduction* - Inorganic compound: *water, acid and cases, salt and minerals* - Organic compounds: *carbohydrates, lipids, proteins, enzymes, hormones, vitamins, nucleic acids, ATP* **Cell** - The structure of cell: *procaryote, eucaryote* - Units of cell: *nucleus, cytoplasm, cell membrane, active and passive transport, exocytosis, endocytosis, diffusion, osmosis, organelle* - Scientific method: *experiment, qualitative observation, quantitative observation, hypothesis, estimation, independent and dependent variable, reality, data, problem* **The World of Living Things** - Diversity and taxonomy of living things: *binomial nomenclature, taxonomy, species* - Life domains and its features: *archaea, bacteria, plants, animals, fungi, viruses, protists*	**Chemistry Science** - From Alchemy to Chemistry: *alchemy, alchemist, chemistry, scientist* - Chemistry Disciplines: *biochemistry, analytical-, organic-, inorganic-, industrial-, physical-, polymer chemistry* - Symbolic Language of Chemistry*: elements, element symbols, compound* - Chemistry Applications: *occupational health safety, laboratory, signs, environmental impacts* **Atom and Periodic Table** - Atomic Models: *atomic model, planetary model, absorption, emission, spectrum, orbital, energy level, layer, shell, ground state* - The Structure of Atom: *neutron, proton, electron, nucleus, subatomic particle* - Periodic Table: *main group, transition group, lanthanide, actinoid, metal, non-metal, semimetal, noble gas, electronegative* **Interactions Among Chemical Species** : *polar covalent bond, bond energy, valence electron, ion, ionic bond, chemical bond, metallic bond, covalent bond, molecules, polar covalent bond* **States of Matter** : *viscosity, Avogadro's number, relative humidity, pressure, vapor-pressure, vaporization, freezing, melting, expansion, volume, boiling, sublimation, mole, absolute temperature, humidity, plasma, sublimation, condensation* **Nature and Chemistry** : *chemical contaminants, contamination, global warming, greenhouse gases, hard/soft water*	**Introduction to Physics Science** **:** *physics science, base/derived/vector/scalar quantity, science research centers* **Matter and Its Properties** : *mass, volume, density, resistance, adhesion, cohesion, surface tension, capillarity* **Motion and Force** : *translational/rotational/oscillatory motion, frame of reference, position, travelled distance, displacement, velocity, speed, instantaneous speed, average speed, instantaneous velocity, force, gravitational-, balanced-, unbalanced-, net-, frictional-, action and reaction force, gravitational acceleration, weight, inertia* **Energy** : *work, energy, power, translational kinetic-, gravitational potential-, elastic potential-, mechanic- energy, renewable and non-renewable energy, conservation of energy, transformation of energy, efficiency* **Heat and Temperature** : *heat, temperature, intrinsic energy, specific heat, change of state, thermal equilibrium, energy transfer rate, expansion, contraction, thermal insulation, felt temperature, global warming* **Electrostatics** *: electrical charge, unit charge, charging by electricity {frictional, contact, effect}, conservation of charge, electroscope, conductive and insulant material, distribution of charge, Faraday cage, grounding, electrical force, Coulomb law, Electric field*	**Natural Systems** - Human and Geography: *nature, atmosphere, hydrosphere, lithosphere, biosphere, geography* - Shape and Motions of Earth: *geoid, axis, equator, perihelion, aphelion, ecliptic, season, tropic of cancer, tropic of Capricorn, equinox, axial tilt, terminator, climate zone* - Geographic Location: *coordinate, parallel, latitude, meridian, longitude, local time, distance from sea* - Map Knowledge: *map, bird's-eye view, scale, projection, contour line, cylindrical, conical, plane* - Climate Knowledge: *atmosphere, weather forecast, climate, temperature, pressure, wind, humidity, environment, precipitation* **Environment and Society** : *nature, interaction, need, limitation, pollution, natural environment*	n/a

Adopted from: The Ontario Science and Technology Curriculum, (2022), https://www.dcp.edu.gov.on.ca/en/curriculum/science-technology & Science (Gr. 3-8), Biology (Gr. 9-12), Chemistry (Gr. 9-12), Physics (Gr. 9-12), and Geography (Gr. 9-12) Curricula of the Turkish Ministry of National Education (2023): http://mufredat.meb.gov.tr/Programlar.aspx

** **Strand** | Subtheme: *key concepts*