

NYC HIGH SCHOOL SCIENCE REGENTS SCOPE & SEQUENCE



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CHEMISTRY

For the purposes of this document, a period is defined as a 45-minute block of time and is meant to be for planning only.

first term: september – january

UNIT 1 The Physical Nature of Matter (30 days)	UNIT 2 Atomic Concepts (20 days)	UNIT 3 Nuclear Chemistry (5 days)	UNIT 4 Chemical Bonding (20 days)	UNIT 5 Periodicity (5 days)
<ul style="list-style-type: none"> • Definition of Chemistry • Matter <ul style="list-style-type: none"> – Particulate Nature of Matter – Substances – Mixtures • Phases of Matter <ul style="list-style-type: none"> – Gases – Liquids – Solids – Effect of Solute on Solvent – Calorimetry • Energy 	<ul style="list-style-type: none"> • Atoms <ul style="list-style-type: none"> – History of Atomic Structure – Subatomic Particles – Structure of Atoms 	<ul style="list-style-type: none"> • Radioactivity • Nuclear Energy • Alternative Energy Sources • Medical Applications 	<ul style="list-style-type: none"> • Why Atoms Bond • Bonds Between Atoms • Molecular Attraction • Solubility • Chemical Formula • Chemical Equation 	<ul style="list-style-type: none"> • Development of the Periodic Table • Properties and Trends of the Elements

The Reference Tables for the Chemistry document is an integral component of the Regents Chemistry course and can be found at: www.emsc.nysed.gov/osa/scire/reftable.html

Scientific Inquiry (i.e., asking questions, making discoveries, gathering data, analyzing explanations and communication) is an integral component of this course.

The right hand column in each unit represents the Major Understandings taken from the New York State Chemistry Core Curriculum, Standard 4, available at: www.emsc.nysed.gov/cia/mst/scirg.html

Science Process Skills from Standards 1, 2, 6 and 7 should be used in conjunction with this scope and sequence.

CHEMISTRY

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second term: february – june

UNIT 6 Moles/Stoichiometry (12 days)	UNIT 7 Kinetics and Equilibrium (15 days)	UNIT 8 Acids and Bases (15 days)	UNIT 9 Carbon and Organic Chemistry (13 days)	UNIT 10 Review (10 days)
<ul style="list-style-type: none"> • Moles/ Stoichiometry 3.1cc, 3.1ee, 3.1n, 3.3e, 3.4e • Mole Interpretation 3.3d, 3.3c • Use of the Mole Concept 3.3a, 3.1oo, 3.1pp, 3.1qq • Stoichiometry 3.3f, 3.2b • Solutions 3.1oo, 3.1pp, 3.1qq 	<ul style="list-style-type: none"> • Kinetics 3.4d, 3.4f, 3.4a, 3.4b, 3.4c, 3.4g • Equilibrium 3.1g, 3.4h, 3.4i, 3.4j, 4.1c, 4.1d, 4.2b, 4.2c, 3.1ll, 3.1mm 	<ul style="list-style-type: none"> • Electrolytes 3.1rr, 5.2n • Acids and Bases 3.1uu, 3.1vv, 3.1ww, 3.1yy, 3.1ss, 3.1tt • Acid-Base Reactions 3.1xx, 3.1zz, 3.2b <div style="text-align: center; background-color: #e0f0ff; padding: 5px; margin: 10px 0;"> Oxidation-Reduction (15 days) </div> <ul style="list-style-type: none"> • Redox 3.1b, 3.2d, 3.2e, 3.2f, 3.2g, 3.2h, 3.3b, 3.2i • Electro- chemistry 3.3a, 3.1i, 3.2j, 3.2k, 3.2l 	<ul style="list-style-type: none"> • Carbon Chemistry 3.1ff, 3.1gg, 3.1hh, 3.1ii • Classify, Name and Identify Organic Compounds Based on Structure, Bond Type 3.1ff, 3.1gg, 3.1hh, 5.2e • Properties of Organic Compounds 3.1hh, 3.1ii, 5.2e • Reactions 3.2c 	<ul style="list-style-type: none"> • First-Term Topics • Regents Exam Prep

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EARTH SCIENCE

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first term: september – january

UNIT 1 Maps and Measurements (17 periods)	UNIT 2 Dynamic Earth (18 periods)	UNIT 3 Rocks and Minerals (15 periods)	UNIT 4 Landscapes (30 periods)	UNIT 5 Earth History (12 periods)
<ul style="list-style-type: none"> • Short Introduction of Origin of Earth and Our Place in the Universe (Big Bang, Solar System) 1.1b, 1.2a, 1.2c, 1.2b • Measurements, Reference Tables, Graphing, Nature of Earth Science 2.1q • Locating Points on the Earth, Latitude, Longitude, Maps 1.1c, 1.1d, 1.1e, 1.1g, 2.1q • Isomaps (Topographic Maps) 2.1q • GPS/GIS 	<ul style="list-style-type: none"> • Structure of Earth and Properties 2.1a, 2.1j • Convection Cycles and Density 2.1a, 2.1b, 2.1j, 2.1k, 2.1l, 2.1m • Evidence of Movement 2.1l, 2.1n, 2.1p • Plate Tectonics 2.1j, 2.1k, 2.1l, 2.1m, 2.1n, 2.1o • Earthquakes and Volcanoes – Tsunamis 2.1j, 2.1k, 2.1l, 2.1m, 2.1n 	<ul style="list-style-type: none"> • Minerals 3.1a, 3.1b, 3.1c • Igneous Rocks 3.1c • Metamorphic Rocks 2.1m, 3.1c • Sedimentary Rocks (Intro— May Be Taught with Weathering) 1.2.f, 2.1v, 2.1w, 3.1c • Mining and Natural Resources 3.1a, 3.1c 	<ul style="list-style-type: none"> • Water cycle 1.2g, 2.1b, 2.1u • Hydrology (Stream Mechanics, Ground Water) 1.1i, 1.2f, 1.2g, 2.1r, 2.1u, 2.1v, 2.1w • Weathering Agents 1.2g, 2.1s, 2.1t, 2.1u, 3.1c • Erosion and Deposition 1.2d, 2.1p, 2.1r, 2.1s, 2.1t, 2.1u, 2.1w, 2.1v • Sedimentary Rocks If Not Covered Previously • Soils (Porosity, Permeability) 1.2g, 2.1s, 2.1u • Real-World Applications: Agriculture, Mud Slides 2.1p, 2.1t, 2.1u, 3.1c 	<ul style="list-style-type: none"> • Fossils 1.2d, 1.2f, 1.2h, 1.2i, 1.2j • Geologic Time 1.2h, 1.2i, 1.2j • Stratigraphy 1.2j, 2.1o • Radioactive Dating 1.2j

The Reference Tables for the Earth Science document is an integral component of the Regents Earth Science course and can be found at: www.emsc.nysed.gov/osa/scire/reftable.html

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EARTH SCIENCE

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second term: february – june

UNIT 6 Insolation (13 periods)	UNIT 7 Meteorology (17 periods)	UNIT 8 Climate (10 periods)	UNIT 9 Astronomy (17 periods)	UNIT 10 Review (10 days)
<ul style="list-style-type: none"> • Arc of Sun’s Travel 1.1a, 1.1h, 2.2a • Seasons 1.1a, 1.1f, 1.1h • Energy Exchanges in the Atmosphere 1.2e, 2.1b, 2.1i, 2.2a, 2.2b 	<ul style="list-style-type: none"> • Systems 1.2e, 1.2h, 2.1b, 2.1c, 2.1f, 2.1g, 2.1h, 2.2b • Models 2.1c, 2.1e, 2.1f, 2.1g, 2.1h • Weather Variables – El Niño 2.1b, 2.1c, 2.1d, 2.1e, 2.1f, 2.2d 	<ul style="list-style-type: none"> • Factors that Affect Climate (Altitude, Latitude) 1.1a, 1.2b, 2.1i, 2.1o, 2.1r, 2.1s, 2.2b, 2.2c • Water Budget (Concept—Not Actual Budget) 1.2g, 2.2c 	<ul style="list-style-type: none"> • Phases of the Moon 1.1d, 1.1f, 1.1i • Solar System— Eccentricity 1.1a • Tides 1.1i • Celestial Observations, HR Diagram 1.1a, 1.1f, 1.1g, 1.2a, 1.2b 	<ul style="list-style-type: none"> • First-Term Topics • Regents Exam Prep

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LIVING ENVIRONMENT

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first term: september – january

UNIT 1 Scientific Inquiry (10 periods)	UNIT 2 Origin of Life (3 periods)	UNIT 3 Ecology (22 periods)	UNIT 4 Organization and Patterns in Life (20 periods)	UNIT 5 Homeostasis and Immunity (25 periods)
<ul style="list-style-type: none"> • The Role of Scientific Inquiry in Studying Biology Standard 1–1.1a, 1.1b, 1.1c, 3.1, 3.2, 3.3 • The Methods of Science Standard 1–1.2a, 1.2b, 1.3a, 1.3b, 2.1, 2.2, 2.3a, 2.3b, 2.3c, 2.4, 3.4a, 3.4b, 3.4c, 3.5a, 3.5b 	<ul style="list-style-type: none"> • Formation of First Cells from Molecules 3.1a, 3.1j • The Nature of Prokaryotes 1.3a, 3.1j 	<ul style="list-style-type: none"> • Relationships 1.1c, 1.1d, 6.1g, 6.2a, 6.2b, 6.3a • Interactions 1.1a, 1.1b, 1.1d, 1.1e, 1.1f, 6.1a, 6.1b, 6.1c, 6.1d, 6.1e, 6.1f, 6.3b, 6.3c 	<ul style="list-style-type: none"> • Cell Structure 1.2a, 1.2e, 1.2g, 1.2i • Cell Physiology 1.2c, 1.2f, 1.2g, 1.2i, 1.3a • Cell Chemistry 1.2h, 1.2j, 5.1c, 5.1f, 5.1g • Photosynthesis 5.1a, 5.1b • Respiration 5.1d, 5.1e, 5.1f • Diffusion and Osmosis 1.2g • Mitosis 4.1a, 4.1b 	<ul style="list-style-type: none"> • Body System Overview 1.2a, 1.2b, 1.2c, 1.3a • Homeostasis and Feedback Systems 1.1e, 1.2d, 5.2a, 5.2b, 5.2h, 5.2j, 5.3a, 5.3b • Immune Response 5.2c, 5.2d, 5.2e, 5.2f, 5.2g, 5.2j

Scientific Inquiry (i.e., asking questions, making discoveries, gathering data, analyzing explanations and communication) is an integral component of this course.

The right hand column in each unit represents the Major Understandings taken from the New York State Living Environment Core Curriculum, Standard 4, available at www.emsc.nysed.gov/ciai/mst/scirg.html

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LIVING ENVIRONMENT

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second term: february – june

UNIT 6 Reproduction and Development (30 periods)	UNIT 7 Genetics and Biotechnology (25 periods)	UNIT 8 Evolution (15 periods)	UNIT 9 Human Influences on the Environment (15 periods)	UNIT 10 Review (10 periods)
<ul style="list-style-type: none"> • Meiosis 4.1c • Reproductive Systems 2.1d, 4.1a, 4.1e, 4.1f, 4.1g • Fertilization 2.1e, 4.1c • Development 4.1d, 4.1e, 4.1h • Stem Cells 	<ul style="list-style-type: none"> • Mendel Overview Intermediate Core Curriculum LE 2.2a, 2.2b, 2.2c • DNA/RNA 2.1a, 2.1b, 2.1c, 2.1f • Protein Synthesis 2.1g, 2.1i, 2.1j, 2.1k • Diseases 2.2e, 5.2h • Mutations 2.1h, 2.2d, 2.2e, 5.2i • Bio-engineering 2.2a, 2.2b, 2.2c • Bioethics 1.2c 	<ul style="list-style-type: none"> • Natural Selection 3.1a, 3.1b, 3.1c, 3.1d, 3.1e, 3.1f, 3.1g, 3.1h, 3.1i, 3.1j, 3.1k, 6.2a • Evidence 3.1l 	<ul style="list-style-type: none"> • Positive Influences 7.1a, 7.1b • Negative Influences 7.1c, 7.2a, 7.2b, 7.2c • Decision Making (Risk/Benefit) 7.3a, 7.3b 	<ul style="list-style-type: none"> • First-Term Topics • Regents Exam Prep

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PHYSICS

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first term: september – january

UNIT 1 Measurement and Mathematics (15 days)	UNIT 2 Mechanics (40 days)	UNIT 3 Energy (15 days)	UNIT 4 Projects and Problem Based Learning Activities (10 days)
<ul style="list-style-type: none"> • Units Standard 1–M1.1 • SI Prefixes • Tools in Measurement S3.1 • Scientific Notation Standard 6–3.2 • Significant Figures PS 4.1c PS 5.2c • Evaluating Experimental Results M2.1 • Graphing Data M1.1, 2.1 • Scalar and Vector Quantities M1.1, 5.1a • Solving Equations Using Algebra M1.1 	<ul style="list-style-type: none"> • Kinematics 5.1d <ul style="list-style-type: none"> – Free Fall: Gravity – Distance/Displacement – Speed/Velocity – Acceleration • Statics 5.1b, 5.1c, 5.1 j <ul style="list-style-type: none"> – Forces • Dynamics 5.1e, 5.1i, 5.1k, 5.1q Standard 6– 4.2 <ul style="list-style-type: none"> – Newton’s Three Laws of Motion • Two-Dimensional Motion and Trajectories: 5.1b, 5.1c, 5.1f, 5.1g, 5.1h <ul style="list-style-type: none"> – Fired Horizontally and at an Angle • Uniform Circular Motion 5.1n • Newton’s Universal Law of Gravitation 5.1l, 5.1n, 5.1s, 5.1t, 5.1u <ul style="list-style-type: none"> – Gravitational Field Strength – Weight • Friction 4.1h, 5.1o <ul style="list-style-type: none"> – Incline Plane • Momentum 5.1p, 5.1r <ul style="list-style-type: none"> – Law of Conservation • The Simple Pendulum 4.1a, 4.1c, 4.1d, 4.1e 	<ul style="list-style-type: none"> • Work and Energy 4.1g, 4.1h, – Power 4.1j • Forms of Energy 4.1a, 4.1i, 5.3f, 5.3j • Potential Energy 4.1c • Elastic Potential Energy 4.1c, 5.1m <ul style="list-style-type: none"> – Hooke’s Law • Kinetic Energy 4.1d • Work-Energy Relationship 4.1a, 4.1b, – Conservation 4.1e, 4.1f, 4.1j 	<ul style="list-style-type: none"> • Egg Drop Standard 1– S2.1, 2.2, 2.3, 2.4 • Trebuchet Standard 2– 1.1-1.5 • Bridge Building

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PHYSICS

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second term: february – june

UNIT 5 Electricity and Magnetism (25 days)	UNIT 6 Waves (25 days)	UNIT 7 Modern Physics (20 days)	UNIT 8 Review (10 days)
<ul style="list-style-type: none"> • Electrostatics 5.1t, <ul style="list-style-type: none"> – Structure of Atoms 5.3b, – Charged Objects 5.3f – Transfer of Charge – Law of Conservation – Coulomb’s Law • Electric Fields 5.1s, 5.1u <ul style="list-style-type: none"> – Field Strengths – Potential Difference • Electric Currents 4.1l, 4.1n <ul style="list-style-type: none"> – Ohm’s Law – Resistivity • Electric Circuits 4.1a, 4.1b, <ul style="list-style-type: none"> – Series and Parallel 4.1j, 4.1l, – Electric Power 4.1m, 4.1n, – Electric Energy 4.1o, 4.1p • Magnetism 5.1t <ul style="list-style-type: none"> – Fields, Flux Lines, and Strength • Electromagnetic Induction 4.1k <ul style="list-style-type: none"> – Electromagnetic Radiation 	<ul style="list-style-type: none"> • Introduction to Waves 4.3a, 4.3b <ul style="list-style-type: none"> – Types of Waves 4.3c, 4.3h – Wave Behavior – Wave Characteristics – Pulses and Periodic Wave • Periodic Wave Phenomena 4.3d, 4.3e, <ul style="list-style-type: none"> – Doppler Effect 4.3f, 4.3m, – Interference 4.3n, 4.3h, – Standing Waves 4.3i, 4.3j – Resonance – Diffraction – Sound • Light 4.3l, 4.3i, <ul style="list-style-type: none"> – Speed of light 4.3j, 4.3h, – Reflection 4.3k – Refraction – Absolute Index of Refraction – Snell’s Law • The Electromagnetic Spectrum 4.1b, 4.1k, <ul style="list-style-type: none"> – Frequencies and Wavelengths 4.3g, 4.3k 	<ul style="list-style-type: none"> • Wave-Particle Duality of Energy and Matter 5.3e <ul style="list-style-type: none"> – Quantum Theory – Energy vs. Frequency – Photon-Particle Collisions (DeBroglie & Compton) • Early Models of the atom 5.3a, <ul style="list-style-type: none"> – Thomson’s Model 5.3c, – Rutherford’s Model 5.3d – Bohr’s Model – Atomic Spectra – Cloud Model • The nucleus 5.3h <ul style="list-style-type: none"> – Nuclear Force – Universal Mass Unit – Mass-Energy Relationship • The Standard Model of Particle Physics 4.1b, <ul style="list-style-type: none"> – Fundamental Forces 5.3b, – Classification of Subatomic Particles 5.3f, – Quarks 5.3g, 5.3i, 5.3j 	<ul style="list-style-type: none"> • First-Term Topics • Regents Exam Prep

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