

DRAFT

NYC HIGH SCHOOL SCIENCE REGENTS SCOPE & SEQUENCE



The New York City Department of Education
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52 Chambers Street, Room 208 • New York, NY 10007

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.

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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: #e0f2f7; 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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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

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

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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

DRAFT

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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.

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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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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 – Newton’s Three Laws of Motion Standard 6– 4.2 • Two-Dimensional Motion and Trajectories: 5.1b, 5.1c, 5.1f, – Fired Horizontally and at an Angle 5.1g, 5.1h • Uniform Circular Motion 5.1n • Newton’s Universal Law of Gravitation 5.1l, 5.1n, 5.1s, – Gravitational Field Strength 5.1t, 5.1u – 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 – 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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Scientific Inquiry (i.e., asking questions, making discoveries, gathering data, analyzing explanations and communication) is an integral component of this course.

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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, 5.3f, – Classification of Subatomic Particles 5.3g, 5.3i, – Quarks 5.3j 	<ul style="list-style-type: none"> • First-Term Topics • Regents Exam Prep

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acknowledgements

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