City School District of Albany
Science Curriculum Pacing Map
Grade 7 Honors

***Indicates mandatory lab**

MONTH	CONTENT/TOPIC(S)	NYS STANDARD/KEY IDEA/PERFORMANCE INDICATOR	LABS	SKILLS	ASSESSMENTS
September – Mid-September	**Lab Safety** **Advanced Lab Skills** (calibrating equipment, making solutions for lab experiments, etc.) **Advanced Study Skills** **Solving problems through experimentation** **Advanced Metric System** ***Nanoscale science*** **Graphing** Predicting Interpolation Extrapolation **Microscopes** Types-Phase/contrast, oil immersion, compound, dissecting, electron	Standard 1 Skills Math/Science/Tech M1.1a 2.1ab 3.1c Science Skills S1.1 a-c S2.1 a, b, d S3.1 a-b S3.2a S3.2f S3.2h	Station Rotations/Timed Activities Using, calibrating, preparing tools of the scientist Problem solving with lab equipment Graduated cylinders Problem solving with Metric measures and converting *Measuring at the Nanoscale* Triple Balance calibrating and reading Advanced Graphing ***Microscope Use (field of view, measurement)**	Safety & equipment Metric ruler/system Triple beam balance Stopwatch Graduated cylinder Breakers Thermometer Labeling answers with correct units of measure Recognize/analyze patterns & trends Sequence events Identify cause & effect relationships ID parts and function of Microscope Use microscope ID and measure objects & organisms Using data tables to create graphs	Assessments should utilize previous NYS Grade 8 Intermediate Level Science (ILS) Test Questions Performance Tasks (timed) Chapter & Unit Assessments Student/group projects, Reports, presentations, role playing, models, demonstrations Science fairs/contests independent Problem design, experimentation, research, and reporting

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MONTH	CONTENT/TOPIC(S) LIVING ENVIRONMENT	NYS STANDARD/KEY IDEA/PERFORMANCE INDICATOR	LABS	SKILLS	ASSESSMENTS
Mid-September to Thanksgiving Break	**Cells & Cell Organelles: Structure, Function, & Interactions** Cell membrane, cell wall, cytoplasm, ribosomes, chloroplasts, mitochondria, vacuoles, golgi, endoplasmic reticulum Nucleus-genetic material, chromosomes, DNA, genes **Photosynthesis** **Respiration** **Cell division** Mitosis Asexual vs. sexual reproduction Cancer-uncontrolled mitosis *Nanomedicine* **Intro to Genetics** Mendel, probability, inheritance, DNA, mutations, meiosis, protein synthesis **Modern Genetics** Human Inheritance Advances in Genetics Cloning, selective breeding *Nanobiology* **What is molecular Biology?**	Living Environment 1.1a-d 6.2a-b 1.2d 2.1a-e 4.4a-d 2.2a-c 4.2a-b 3.1a-c 4.1a-c	Station Rotations/Timed Activities Look at cells & identifying organelles: Cheek Onion Preparing and staining slide specimens Stains and microscopy Plant vs. animal cell structure/organelles ***Microscopic measurement: Animal cell** Examine cells in phases of mitosis Probability Lab Dice, coin Punnett Squares Chromosome Inheritance Pedigree charts ***Grouping Living Things Lab**	Using a compound microscope Measuring with a compound microscope Preparing a wet mount slide Using appropriate staining techniques to view specimens with a microscope Identify various stains and their role in studying at the cellular level Identify life processes carried out by cell organelles Construct and use a Punnett Square or a pedigree chart to predict probability of traits	Assessments should utilize previous NYS Grade 8 Intermediate Level Science (ILS) Test Questions Performance Tasks (timed) Chapter & Unit Assessments Student/group projects, Reports, presentations, role playing, models, demonstrations Science fairs/contests Independent Problem design, experimentation, research, and reporting ***Human Genetic Disorders-research project**

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After Thanksgiving to Mid- January	**Introduction to matter** Describing matter Measuring matter & density Atoms, nuclear chemistry and half life, *nanoparticles* **Changes in Matter** Solids, liquids, gases, sublimation, phase changes Physical vs. chemical changes **Elements and Periodic Table** Understanding & using the periodic table Organizing Elements Metals, nonmetals, noble gases, radioactive elements **Chemical Reactions** Electron structure and role in reactions (Lewis structures, the Bohr model) Bonding (ionic vs. covalent) Basic chemical formulas Law of Conservation of Mass (reactants & products) Models of molecules & compounds **Acids/Bases/Solutions** Using chemical indicators to identify substances $_{P}$H paper & scale, litmus test, phenolphthalein, etc.	Physical Setting 3.2 a-e 3.1 a, c, d, e, f, g, h, i 3.3 a-g 4.2 c,d	Station Rotations/Timed Activities Classify & compare atoms, molecules, elements, compounds, mixtures ***Density – density & buoyancy** ***Candy Bar Lab** Physical vs. Chemical Change (freezing point, melting point, boiling, evaporation, condensation, tearing, crushing, etc.) Element activity I.D. and locate on periodic table (Top 20) Radiation & Half life Electron configurations Chemical reaction labs – endothermic vs. exothermic reactions Models of molecules & compounds Chemical indicator labs	Classification Finding & Describing density of different objects/substances Determine density of liquids, regular, irregular shaped solids Determine volume of regular & irregular-shaped solids using water displacement Identifying matter Identify Physical vs. chemical changes Describing Changes in matter Calculate half life of radioactive substances Use periodic table to distinguish between metals, nonmetals, or noble gases Recognize the function of the electron in reactions Recognize and identify chemical reactions Use and apply chemical indicators to identify substances	Assessments should utilize previous NYS Grade 8 Intermediate Level Science (ILS) Test Questions Performance Tasks (timed) Chapter & Unit Assessments Student/group projects, Reports, presentations, role playing, models, demonstrations Science fairs/contests Independent Problem design, experimentation, research, and reporting

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Mid- January to 1st week of February	**Solutions & Solubility** Solute & solvent Factors affecting solubility – temperature, stirring, particle size, pressure Saturated vs. supersaturated solutions – changing and manipulating variables **Mixtures** Separating mixtures – filtration, magnet, settling, evaporation, etc. **Motion** Describing & measuring motion	Physical Setting 3.1b 4.2e 5.1 a-e 5.2 a,d	Station Rotations/Timed Activities Determining solubility, recognize & analyze a solubility curve, create curve Separating mixtures lab Supersaturation lab ***Motion Lab: Ball and ramp, car and ramp**	Read and understand solubility curves Use appropriate tools to separate the parts of a mixture Differentiate between saturated and supersaturated solutions Manipulating variables in experiments Measuring time, distance, and mass	Assessments should utilize previous NYS Grade 8 Intermediate Level Science (ILS) Test Questions Performance Tasks (timed) Chapter & Unit Assessments Student/group projects, Reports, presentations, role playing, models, demonstrations Science fairs/contests Independent Problem design, experimentation, research, and reporting

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2nd week of Feb. to end of March	**Forces** Nature of force Force, mass and acceleration Friction and Gravity Action and Reaction **Forms of Energy** Nature of Energy Energy conversion and conservation Potential vs. Kinetic Energy **Thermal energy and Heat** Nature of heat **Energy Transformations** *Nanoscience and how it defies the laws of Newton*	Physical Setting 4.1d,e 4.4d 4.5a,b 4.2a,b 5.2d	Station Rotations/Timed Activities Forces and friction labs Measuring times/distance/mass labs Speed and acceleration of moving objects lab Pendulum Lab Heat transfer Lab Rube Goldberg experiment	Measuring time, distance and mass ID Different forces ID and describe Newton's Laws, Archimedes principle Determine speed and acceleration of a moving object Compare and contrast Potential vs. kinetic energy Explain conservation of energy Measuring temperature Calculating specific heat	Assessments should utilize previous NYS Grade 8 Intermediate Level Science (ILS) Test Questions Performance Tasks (timed) Chapter & Unit Assessments Student/group projects, Reports, presentations, role playing, models, demonstrations Science fairs/contests Independent Problem design, experimentation, research, and reporting ***Rube Goldberg project**

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April - May	**Astronomy** Review of exploring the universe (life cycle of a star, galaxies, space exploration) Shape of earth, planets, stars Sun & solar system (celestial bodies, gravity) Earth's Motions – rotation vs. revolution, tilt, orbit, eastern vs. western horizon, sunrise/sunset, seasons, day, year, system of time, latitude vs. longitude, magnetic north, magnetic compass, cardinal directions Phases of the moon Eclipses Tides Meteor showers Comets **Solar System-** learning the time system on other planets – day, year, etc. vs. earth *Nanoscience in space exploration*	Physical Setting 1.1a-j	Station Rotations/Timed Activities Latitude & Longitude lab Sunrise/sunset lab- Eastern & Western Horizons Gravity and planetary orbits lab Magnetic Compass and cardinal directions lab Reflection of light and phases of the moon lab Seasons: Tilt & Rotation of the Earth Phases of the moon	Understanding and applying latitude and longitude based on celestial observations Understanding and applying our system of time based on celestial observations (sunrise/sunset) Recognize the role of gravity in planetary orbits Use a magnetic compass to find cardinal directions Understand and apply phases of the moon (light reflection, eclipses, tides, etc.) Understand how tilt and rotation of the Earth cause seasons	Assessments should utilize previous NYS Grade 8 Intermediate Level Science (ILS) Test Questions Performance Tasks (timed) Chapter & Unit Assessments Student/group projects, Reports, presentations, role playing, models, demonstrations Science fairs/contests Independent Problem design, experimentation, research, and reporting

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June	**Earth's Changing Surface** The Water Cycle Weathering & Erosion *Nanoscience in earth and atmospheric science*	Physical Setting 2.1 a-d 2.1 g-j 3.2a	Station Rotations/Timed Activities Water Cycle lab- Evaporation, condensation, precipitation, transpiration Weathering & Erosion lab *Nanoscience and water recycling*	Understand interactions between Earth's atmosphere (air), hydrosphere (water), and lithosphere (land) Identify and explain the cause of various land formations	Assessments should utilize previous NYS Grade 8 Intermediate Level Science (ILS) Test Questions Performance Tasks (timed) Chapter & Unit Assessments Student/group projects, Reports, presentations, role playing, models, demonstrations Science fairs/contests Independent Problem design, experimentation, research, and reporting

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