**Chesapeake Math & IT Academy – MS North**

**Science Department**

**Grade 7**

1. **Introduction to Chemistry (Suggested Time Frame: Quarter 1 & 2)**

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| **Curriculum** | **List of Suggested Labs and Experiments (Wet & Dry)** | **Virtual** |
| 1. Introduction to Matter
 |  |  |
| * Describing Matter
 | Inquiry: How Do You Describe Matter?Observing Physical Properties |  |
| * Classifying Matter
 | Inquiry: What Is a Mixture?Modeling Atoms and MoleculesChromatography: Separating Mixtures  |  |
| * Measuring Matter
 | Inquiry: Which has more mass?Quick Lab: Calculating VolumeInvestigation: Making Sense of Density |  |
| * Changes in Matter
 | Inquiry: Is a New Substance Formed?What Is a Physical Change?Demonstrating TarnishingWhere Was the Energy? |  |
| 1. Solid, Liquid & Gas
 |  |  |
| * States of matter
 | Inquiry: What Are Solids, Liquids, and Gases?Quick Lab: Modeling ParticlesAs thick as honeyHow do particles in a gas move? |  |
| * Changes of State
 | Inquiry: What Happens When You Breathe on a Mirror?Lab Investigation: Melting IceQuick Lab: Keeping CoolObserving Sublimatiuon |  |
| * Gas Behavior
 | Inquiry; How Can Air Keep Chalk From Breaking?Quick Lab: How Are Pressure and Temperature Related?Quick Lab: Hot and Cold BalloonsQuick Lab; It’s a Gas |  |
| 1. Elements & the Periodic table
 |  |  |
| * Introduction to Atoms
 | What’s in the Box?Visualizing an Electron CloudHow Far Away Is the Electron? |  |
| * Organizing the Elements
 | Inquiry: Which Is Easier?Quick lab: ClassifyingQuick lab: Using the Periodic TableQuick lab: Expanding the Periodic Table |  |
| * Metals
 | Copper or Carbon? That Is the Question *(Pre-Lab/Directed Inquiry/Open Inquiry)*Finding Metals |  |
| * Nonmetals and Metalloids
 | Inquiry: What Are the Properties of Charcoal?Carbon—A NonmetalFinding Nonmetals |  |
| * Radioactive Elements
 | What Happens When an Atom Decays?Modeling Beta DecayDesigning Experiments Using Radioactive Tracers |  |
| 1. Atoms & Bonding
 |  |  |
| * Atoms, Bonding, and the Periodic Table
 | Quick Lab; Element Chemistry |  |
| * Ionic Bonds
 | Inquiry: How Do Ions Form?Ion FormationQuick Lab; How Do You Write Ionic Names and Formulas?Investigation; Shedding lights on Ions |  |
| * Covalent Bonds
 | Covalent BondsSharing ElectronsProperties of Molecular CompoundsAttraction Between Polar Molecules |  |
| 1. Chemical Reactions
 |  |  |
| * Observing Chemical Change
 | What Happens When Chemicals React?Observing ChangeWhere’s the Evidence? |  |
| * Describing Chemical Reactions
 | Quick lab: Information in a Chemical EquationQuick lab: Is Matter Conserved?Quick lab: Categories of Chemical Reactions |  |
| * Controlling Chemical Reactions
 | Inquiry: Can You Speed Up or Slow Down a Reaction?Modeling Activation EnergyEffect of Temperature on Chemical Reactions |  |
| 1. Acids, bases & Solutions
 |  |  |
| * Understanding Solutions
 | Inquiry: Mixture or SolutionQuick lab: Scattered LightInvestigation: Speedy Solution |  |
| * Concentration and Solubility
 | Does It Dissolve?Measuring ConcentrationPredicting Rates of Solubility |  |
| * Describing Acids and Bases
 | Inquiry: What Color Does Litmus Paper Turn?Properties of AcidsProperties of Bases |  |
| * Acids and Bases in Solution
 | What Can Cabbage Juice Tell You?pH-one HomeThe Antacid Test |  |

1. **Forces & Energy (Suggested Time Frame: Quarter 3)**

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| **Curriculum** | **List of Suggested Labs and Experiments (Wet & Dry)** | **Virtual** |
| 1. Motion
 | Identifying Motion: How fast and How far? |  |
| * Describing Motion
 | Stopping on a Dime *(Pre-Lab/Directed Inquiry/Open Inquiry)*VelocityMotion Graphs |  |
| * Speed and Velocity
 | Describing AccelerationGraphing Acceleration |  |
| * Acceleration
 | Will You Hurry Up?Describing AccelerationGraphing Acceleration |  |
| 1. Forces
 |  |  |
| * The Nature of Force
 | Quick Lab: What is ForceModeling Unbalanced Forces |  |
| * Friction and Gravity
 | Sticky Sneakers *(Pre-Lab/Directed Inquiry/Open Inquiry)*Calculating Friction & Gravity |  |
| * Newton’s Laws of Motion
 | What Changes Motion?Newton’s Second LawInterpreting Illustrations |  |
| * Momentum
 | How Pushy Is a Straw?Colliding Cars |  |
| * Free Fall and Circular Motion
 | What Makes an Object Move in a Circle?Which Lands First?Orbiting Earth |  |
| 1. Work & machines
 |  |  |
| * Work and Power
 | Pulling at an AngleWhat Is Work?Investigating Power |  |
| * Understanding Machines
 | Mechanical AdvantageFriction and Efficiency |  |
| * Inclined Planes and Levers
 | Angling for Access *(Pre-Lab/Directed Inquiry/Open Inquiry)*Modeling Levers |  |
| * Putting Machines Together
 | Building PulleysMachines in the Kitchen |  |
| 1. Energy
 |  |  |
| * What is Energy?
 | Can You Feel the Power?Mass, Velocity, and Kinetic Energy |  |
| * Forms of Energy
 | Determining Mechanical EnergySources of Energy |  |
| * Energy Transformations and Conservation
 | Soaring StrawsLaw of Conservation of Energy |  |
| 1. Thermal Energy & Heat
 |  |  |
| * Temperature, Thermal Energy, and Heat
 | Lab Investigation: Build your own ThermometerQuick Lab: Temperature and Thermal Energy |  |
| * The Transfer of Heat
 | Visualizing Convection Currents |  |
| * Thermal Properties
 | Frosty Balloons |  |
| 1. Electricity
 |  |  |
| * Electric Charge and Static Electricity
 | Can you move without touching it? Drawing ConclusionQuick Lab: Sparks are flying |  |
| * Electric Current
 | Investigation: Producing Electric CurrentConductors and InsulatorsModeling Potential Difference |  |
| * Electric Circuits
 | Quick Lab: Ohm’s LawLab Investigation: Build a Flashlight |  |
| * Electric Power and Safety
 | Calculating Electric Power and Energy UseElectric Shock and Short Circuit Safety |  |
| 1. Magnetism & Electromagnetism
 |  |  |
| * What Is Magnetism?
 | Lab Investigation: Detecting Fake CoinsQuick Lab: Magnetic Pole |  |
| * Magnetic Fields
 | Spinning in CirclesEarth’s Magnetic Field |  |
| * Electromagnetic Force
 | Electric Current and MagnetismMagnetic Fields From Electric CurrentElectromagnet |  |
| * Electricity, Magnetism, and Motion
 | Can a Magnet Move a Wire?How Galvanometers WorkParts of an Electric Motor |  |
| * Electricity From Magnetism
 | Inducing an Electric CurrentHow Generators WorkHow Transformers Work |  |

1. **Sounds and Light (Suggested Time Frame: Quarter 4)**

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| **Curriculum** | **List of Suggested Labs and Experiments (Wet & Dry)** | **Virtual** |
| 1. Characteristics of waves
 |  |  |
| * What Are Waves?
 | What Causes Mechanical Waves?Three Types of Waves |  |
| * Properties of Waves
 | What Do Waves Look Like?Properties of WavesWhat Affects the Speed of a Wave? |  |
| * Interactions of Waves
 | Inquiry: How Does a Ball Bounce?Lab Investigation: Making WavesWave InterferenceStanding Waves |  |
| 1. Sounds
 |  |  |
| - The Nature of Sound | Inquiry: What Is Sound?Understanding SoundEar to the sound |  |
| * Properties of Sound
 | Inquiry: How Does Amplitude Affect Loudness?Investigation Lab: Changing PitchListen to ThisPipe sounds |  |
| * Music
 | Inquiry: What Is Music?How Can You Change Pitch? |  |
| * Hearing Sound
 | Inquiry: Hearing Sound Design and Build Hearing Protectors |  |
| * Using Sound
 | Inquiry: How Can You Use Time to Measure Distance?Designing Experiments |  |
| 1. Electromagnetic Waves
 |  |  |
| * The Nature of Electromagnetic Waves
 | Inquiry: How Fast Are Electromagnetic Waves?What Is an Electromagnetic Wave Made Of?Waves or Particles? |  |
| * Waves of the Electromagnetic Spectrum
 | Inquiry: What is White Light?Differences Between Waves Parts of the Electromagnetic Spectrum |  |
| * Wireless Communication
 | Inquiry: How Can Waves Change?Investigation: Build a Crystal RadioHow Cell Phones WorkHow Does GPS Work? |  |
| 1. Light and Color
 |  |  |
| * Light and Color
 | Inquiry: How Do Colors Mix?Quick Lab: Developing HypothesesLab Investigations: Changing Colors |  |
| * Reflection and Mirrors
 | How Does Your Reflection Wink?Observing: Mirror Images |  |
| * Refraction and Lenses
 | Inquiry: How Can You Make an Image Appear?Quick lab: Bent PencilLooking at Images |  |
| * Seeing Light
 | Inquiry: Can You See Everything With One Eye?Quick lab: True Color |  |
| * Using Light
 | How Does a Pinhole Camera Work?Quick lab: What a View! |  |