**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 Molecules  Chromatography: Separating Mixtures |  |
| * Measuring Matter | Inquiry: Which has more mass?  Quick Lab: Calculating Volume  Investigation: Making Sense of Density |  |
| * Changes in Matter | Inquiry: Is a New Substance Formed?  What Is a Physical Change?  Demonstrating Tarnishing  Where Was the Energy? |  |
| 1. Solid, Liquid & Gas |  |  |
| * States of matter | Inquiry: What Are Solids, Liquids, and Gases?  Quick Lab: Modeling Particles  As thick as honey  How do particles in a gas move? |  |
| * Changes of State | Inquiry: What Happens When You Breathe on a Mirror?  Lab Investigation: Melting Ice  Quick Lab: Keeping Cool  Observing Sublimatiuon |  |
| * Gas Behavior | Inquiry; How Can Air Keep Chalk From Breaking?  Quick Lab: How Are Pressure and Temperature Related?  Quick Lab: Hot and Cold Balloons  Quick Lab; It’s a Gas |  |
| 1. Elements & the Periodic table |  |  |
| * Introduction to Atoms | What’s in the Box?  Visualizing an Electron Cloud  How Far Away Is the Electron? |  |
| * Organizing the Elements | Inquiry: Which Is Easier?  Quick lab: Classifying  Quick lab: Using the Periodic Table  Quick 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 Nonmetal  Finding Nonmetals |  |
| * Radioactive Elements | What Happens When an Atom Decays?  Modeling Beta Decay  Designing 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 Formation  Quick Lab; How Do You Write Ionic Names and Formulas?Investigation; Shedding lights on Ions |  |
| * Covalent Bonds | Covalent Bonds  Sharing Electrons  Properties of Molecular Compounds  Attraction Between Polar Molecules |  |
| 1. Chemical Reactions |  |  |
| * Observing Chemical Change | What Happens When Chemicals React?  Observing Change  Where’s the Evidence? |  |
| * Describing Chemical Reactions | Quick lab: Information in a Chemical Equation  Quick 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 Energy  Effect of Temperature on Chemical Reactions |  |
| 1. Acids, bases & Solutions |  |  |
| * Understanding Solutions | Inquiry: Mixture or Solution  Quick lab: Scattered Light  Investigation: Speedy Solution |  |
| * Concentration and Solubility | Does It Dissolve?  Measuring Concentration  Predicting Rates of Solubility |  |
| * Describing Acids and Bases | Inquiry: What Color Does Litmus Paper Turn?  Properties of Acids  Properties of Bases |  |
| * Acids and Bases in Solution | What Can Cabbage Juice Tell You?  pH-one Home  The 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)*  Velocity  Motion Graphs |  |
| * Speed and Velocity | Describing Acceleration  Graphing Acceleration |  |
| * Acceleration | Will You Hurry Up?  Describing Acceleration  Graphing Acceleration |  |
| 1. Forces |  |  |
| * The Nature of Force | Quick Lab: What is Force  Modeling 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 Law  Interpreting 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 Angle  What Is Work?  Investigating Power |  |
| * Understanding Machines | Mechanical Advantage  Friction and Efficiency |  |
| * Inclined Planes and Levers | Angling for Access *(Pre-Lab/Directed Inquiry/Open Inquiry)*  Modeling Levers |  |
| * Putting Machines Together | Building Pulleys  Machines in the Kitchen |  |
| 1. Energy |  |  |
| * What is Energy? | Can You Feel the Power?  Mass, Velocity, and Kinetic Energy |  |
| * Forms of Energy | Determining Mechanical Energy  Sources of Energy |  |
| * Energy Transformations and Conservation | Soaring Straws  Law of Conservation of Energy |  |
| 1. Thermal Energy & Heat |  |  |
| * Temperature, Thermal Energy, and Heat | Lab Investigation: Build your own Thermometer  Quick 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 Conclusion  Quick Lab: Sparks are flying |  |
| * Electric Current | Investigation: Producing Electric Current  Conductors and Insulators  Modeling Potential Difference |  |
| * Electric Circuits | Quick Lab: Ohm’s Law  Lab Investigation: Build a Flashlight |  |
| * Electric Power and Safety | Calculating Electric Power and Energy Use  Electric Shock and Short Circuit Safety |  |
| 1. Magnetism & Electromagnetism |  |  |
| * What Is Magnetism? | Lab Investigation: Detecting Fake Coins  Quick Lab: Magnetic Pole |  |
| * Magnetic Fields | Spinning in Circles  Earth’s Magnetic Field |  |
| * Electromagnetic Force | Electric Current and Magnetism  Magnetic Fields From Electric Current  Electromagnet |  |
| * Electricity, Magnetism, and Motion | Can a Magnet Move a Wire?  How Galvanometers Work  Parts of an Electric Motor |  |
| * Electricity From Magnetism | Inducing an Electric Current  How Generators Work  How 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 Waves  What Affects the Speed of a Wave? |  |
| * Interactions of Waves | Inquiry: How Does a Ball Bounce?  Lab Investigation: Making Waves  Wave Interference  Standing Waves |  |
| 1. Sounds |  |  |
| - The Nature of Sound | Inquiry: What Is Sound?  Understanding Sound  Ear to the sound |  |
| * Properties of Sound | Inquiry: How Does Amplitude Affect Loudness?  Investigation Lab: Changing Pitch  Listen to This  Pipe 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 Radio  How Cell Phones Work  How Does GPS Work? |  |
| 1. Light and Color |  |  |
| * Light and Color | Inquiry: How Do Colors Mix?  Quick Lab: Developing Hypotheses  Lab 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 Pencil  Looking 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! |  |