MAGLEV Module 7th Grade Science	**Code**	**Prelab: How accurate is your measurement?**	**Newton's 1st Law Activity 1: Running the Gauntlet**	**Newton's 1st Law Activity 2: Graphing the Gauntlet**	**Newton's 2nd Law Activity 3: Caution 6% grade ahead**	**Newton's 2nd Law Activity 4: Graphing the Grade**	**Activity 5: Float like a butter fly, Sting like a bee**	
SCIENCE PROCESSES								
Develop an understanding that scientific inquiry and reasoning involves observing, questioning, investigating, recording, and developing solutions to problems.	**S.IP**							
Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.	**S.IP.M.1**							
Generate scientific questions based on observations, investigations, and research.	**S.IP.07.11**							
Design and conduct scientific investigations.	**S.IP.07.12**							
Use tools and equipment (spring scales, stop watches, meter sticks and tapes, models, hand lens, thermometer, models, sieves, microscopes, hot plates, pH meters) appropriate to scientific investigations.	**S.IP.07.13**							
Use metric measurement devices in an investigation.	**S.IP.07.14**							
Construct charts and graphs from data and observations.	**S.IP.07.15**							
Identify patterns in data.	**S.IP.07.16**							

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Inquiry Analysis and Communication								
Develop an understanding that scientific inquiry and investigations require analysis and communication of findings, using appropriate technology.	**S.IA**							
Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.	**S.IA.M.1**							
Analyze information from data tables and graphs to answer scientific questions.	**S.IA.07.11**							
Evaluate data, claims, and personal knowledge through collaborative science discourse.	**S.IA.07.12**							
Communicate and defend findings of observations and investigations.	**S.IA.17.13**							
Draw conclusions from sets of data from multiple trials of a scientific investigation to draw conclusions.	**S.IA.07.14**							
Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.	**S.IA.07.15**							
Reflection and Social Implications								

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Develop an understanding that scientific inquiry and investigations require analysis and communication of findings, using appropriate technology.	**S.RS**							
Reflecting on knowledge is the application of scientific knowledge to new and different situations. Reflecting on knowledge requires careful analysis of evidence that guides decision-making and the application of science throughout history and within society.	**S.RS.M.1**							
Evaluate the strengths and weaknesses of claims, arguments, and data.	**S.RS.07.11**							
Describe limitations in personal and scientific knowledge.	**S.RS.07.12**							
Identify the need for evidence in making scientific decisions.	**S.RS.07.13**							
Evaluate scientific explanations based on current evidence and scientific principles.	**S.RS.07.14**							
Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.	**S.RS.07.15**							
Design solutions to problems using technology.	**S.RS.07.16**							

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Describe the effect humans and other organisms have on the balance of the natural world.	**S.RS.07.17**							
Describe what science and technology can and cannot reasonably contribute to society.	**S.RS.07.18**							
Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.	**S.RS.07.19**							
PHYSICAL SCIENCE								
Energy								
Develop an understanding that there are many forms of energy (such as heat, light, sound, and electrical) and that energy is transferable by convection, conduction, or radiation. Understand energy can be in motion, called kinetic; or it can be stored, called potential. Develop an understanding that as temperature increases, more energy is added to a system. Understand nuclear reactions in the sun produce light and heat for the Earth.	**P.EN**							
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Waves and Energy-Waves have energy and transfer energy when they interact with matter. Examples of waves include sound waves, seismic waves, waves on water, and light waves.	**P.EN.M.3**							
Identify examples of waves, including sound waves, seismic waves, and waves on water.	**P.EN.07.31**							
Describe how waves are produced by vibrations in matter.	**P.EN.07.32**							
Demonstrate how waves transfer energy when they interact with matter (for example: tuning fork in water, waves hitting a beach, earthquake knocking over buildings).	**P.EN.07.32**							
Energy Transfer- Energy is transferred from a source to a receiver by radiation, conduction, and convection. When energy is transferred from a source to a receiver, the quantity of energy before the transfer is equal to the quantity of energy after the transfer.	**P.EN.M.4**							
Explain how light energy is transferred to chemical energy through the process of photosynthesis.	**P.EN.07.43**							
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Solar Energy Effects- Nuclear reactions take place in the sun producing heat and light. Only a tiny fraction of the light energy from the sun reaches Earth, providing Earth, providing energy to heat the Earth	**P.EN.M.6**							
Identify that nuclear reactions take place in the sun, producing heat and light.	**P.EN.07.61**							
Explain how only a tiny fraction of light energy from the sun is transformed to heat energy on Earth.	**P.EN.07.62**							

Properties of Matter								
Develop an understanding that all matter has observable attributes with physical and chemical properties that are described, measured, and compared. Understand that states of elements, which are organized by common attributes and characteristics on the Periodic Table. Understand that substances can be classified as mixtures or compounds and according to their physical and chemical properties.	**P.PM**							
Chemical Properties- Matter has chemical properties. The understanding of chemical properties helps to explain how new substances are formed.	**P.PM.M.1**							
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Classify substances by their chemical properties (flammability, pH, acid-base indicators, reactivity).	**P.PM.07.11**							
Elements and Compounds- Elements are composed of a single kind of atom that are grouped into families with similar properties on the periodic table. Compounds are composed of two or more different elements. Each element and compound has a unique set of physical and chemical properties such as boiling point, density, color, conductivity, and reactivity.	**P.PM.M.2**							
Identify the smallest component that makes up an element.	**P.PM.07.21**							

Describe how the elements within the Periodic Table are organized by similar properties into families (highly reactive metals, less reactive metals, highly reactive nonmetals, and some almost completely non-reactive gases).	**P.PM.07.22**							
Illustrate the structure of molecules using models or drawings (water, carbon dioxide, salt).	**P.PM.07.23**							
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List examples of physical and chemical properties of elements and compounds (boiling point, density, color, conductivity, reactivity).	**P.PM.07.24**							
Changes in Matter								
Develop an understanding of changes in the state of matter in terms of heating and cooling, and in terms of arrangement and relative motion of atoms and molecules. Understand the differences between physical and chemical changes. Develop an understanding of the conservation of mass. Develop an understanding of products and reactants in a chemical change	**P.CM**							

Chemical Changes- Chemical changes occur when two elements and/or compounds react and produce new substances. These new substances have different physical and chemical properties than the original elements and/or compounds. During the chemical change, the number and kind of atoms in the reactants are the same as the number and kind of atoms in the products. Mass is conserved during chemical changes. The mass of the reactants is the same as the mass of the products.	**P.CM.M.2**							
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Identify evidence of chemical change through color, gas formation, solid formation, and temperature change.	**P.CM.07.21**							
Compare and contrast the chemical properties of a new substance with the original after a chemical change.	**P.CM.07.22**							
Describe the physical properties and chemical properties of the products and reactants in a chemical change.	**P.CM.07.23**							
LIFE SCIENCE								
Organization of Living Things								

Develop an understanding that plants and animals (including humans) have basic requirements for maintaining life which include the need for air, water and a source of energy. Understand that all life forms can be classified as producers, consumers, or decomposers as they are all part of a global food chain where food/energy is supplied by plants which need light to produce food/energy. Develop an understanding that plants and animals can be classified by observable traits and physical characteristics. Understand that all living organisms are composed of cells and they exhibit cell growth and division. Understand that all plants and animals have a definite life cycle, body parts, and systems to perform specific life functions.	**L.OL**							
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Cell Functions- All organisms are composed of cells, from one cell to many cells. In multicellular organisms, specialized cells perform specialized functions. Organs and organ systems are composed of cells, and function to serve the needs of cells for food, air, and waste removal. The way in which cells function is similar in all living organisms.	**L.OL.M.2**							
Recognize that all organisms are composed of cells (single cell organisms, multicellular organisms).	**L.OL.07.21**							
Explain how cells make up different body tissues, organs, and organ systems.	**L.OL.07.22**							

Describe how cells in all multicellular organisms are specialized to take in nutrients, which they use to provide energy for the work that cells do and to make the materials that a cell or organism needs.	**L.OL.07.23**							
Recognize that cells function in a similar way in all organisms.	**L.OL.07.24**							
Growth and Development- Following fertilization, cell division produces a small cluster of cells that then differentiate by appearance and function to form the basic tissue of an embryo.	**L.OL.M.3**							

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Describe growth and development in terms of increase of cell number and/or cell size.	**L.OL.07.31**							
Examine how through cell division, cells can become specialized for specific functions.	**L.OL.07.32**							
Photosynthesis- Plants are producers; they use the energy from light to make sugar molecules from the atoms of carbon dioxide and water. Plants use these sugars along with minerals from the soil to form fats, proteins, and carbohydrates. These products can be used immediately, incorporated into the cells of a plant as the plant grows, or stored for later use.	**L.OL.M.6**							
Recognize the need for light to provide energy for the production of carbohydrates, proteins and fats.	**L.OL.07.61**							
Explain that carbon dioxide and water are used to produce carbohydrates, proteins, and fats.	**L.OL.07.62**							
Describe evidence that plants make, use and store food.	**L.OL.07.63**							
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EARTH SCIENCE								

Earth Systems								
Develop an understanding of the warming of the Earth by the sun as the major source of energy for phenomenon on Earth and how the sun's warming relates to weather, climate, seasons, and the water cycle. Understand how human interaction and use of natural resources affects the environment.	**E.ES**							
Solar Energy- The sun is the major source of energy for phenomena on the surface of the Earth.	**E.ES.M.1**							
Demonstrate, using a model or drawing, the relationship between the warming by the sun of the Earth and the water cycle as it applies to the atmosphere (evaporation, water vapor, warm air rising, cooling, condensation, clouds).	**E.ES.07.11**							
Describe the relationship between the warming of the atmosphere of the Earth by the sun and convection within the atmosphere and oceans.	**E.ES.07.12**							
Describe how the warming of the Earth by the sun produces winds and ocean currents.	**E.ES.07.13**							
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Human Consequences- Human activities have changed the land, oceans, and atmosphere of the Earth resulting in the reduction of the number and variety of wild plants and animals sometimes causing extinction of species.	**E.ES.M.4**							

Explain how human activities (surface mining, deforestation, overpopulation, construction and urban development, farming, dams, landfills, and restoring natural areas) change the surface of the Earth and affect the survival of organisms.	**E.ES.07.41**							
Describe the origins of pollution in the atmosphere, geosphere, and hydrosphere, (car exhaust, industrial emissions, acid rain, and natural sources), and how pollution impacts habitats, climatic change, threatens or endangers species	**E.ES.07.42**							
Weather and Climate- Global patterns of atmospheric and oceanic movement influence weather and climate.	**E.ES.M.7**							
Compare and contrast the difference and relationship between climate and weather.	**E.ES.07.71**							
Describe how different weather occurs due to the constant motion of the atmosphere from the energy of the sun reaching the surface of the Earth.	**E.ES.07.72**							
Explain how the temperature of the oceans affects the different climates on Earth because water in the oceans holds a large amount of heat.	**E.ES.07.73**							
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Describe weather conditions associated with frontal boundaries (cold, warm, stationary, and occluded) and the movement of major air masses and the jet stream across North America using a weather map.	**E.ES.07.74**							

Water Cycle- Water circulates through the four spheres of the Earth in what is known as the "water cycle."	**E.ES.M.8**							
Explain the water cycle and describe how evaporation, transpiration, condensation, cloud formation, precipitation, infiltration, surface runoff, ground water, and absorption occur within the cycle.	**E.ES.07.81**							
Analyze the flow of water between the components of a watershed, including surface features (lakes, streams, rivers, wetlands) and groundwater.	**E.ES.07.82**							
Fluid Earth								
Develop an understanding that Earth is a planet nearly covered with water and that water on Earth can be found in three states, solid, liquid, and gas. Understand how water on Earth moves in predictable patterns. Understand Earth's atmosphere as a mixture of gases and water vapor.	**E.FE**							
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Atmosphere- The atmosphere is a mixture of nitrogen, oxygen and trace gases that include water vapor. The atmosphere has different physical and chemical composition at different elevations.	**E.FE.M.1**							
Describe the atmosphere as a mixture of gases.	**E.FE.07.11**							
Compare and contrast the composition of the atmosphere at different elevations.	**E.FE.07.12**							