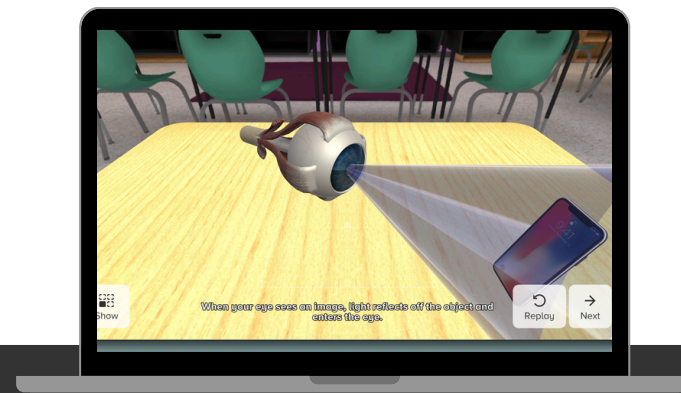
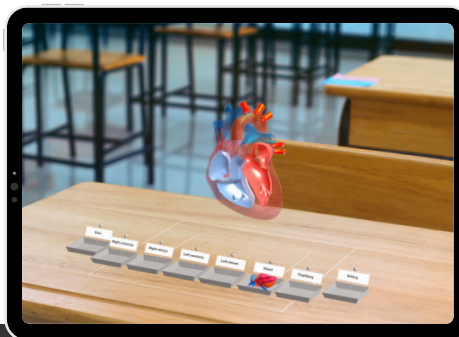


MCGRAW HILL AR ALIGNMENT TO NEXT GEN SCIENCE STANDARDS (NGSS)



ACTIVITY	NGSS
Simple Machines	NGSS 3-PS2-1: Motion and Stability: Forces and Interactions: Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. 3-PS2-2: Motion and Stability: Forces and Interactions: Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
Human Eye	NGSS 4-PS4.B Electromagnetic Radiation: An object can be seen when light reflected from its surface enters the eyes allows objects to be seen. MS-PS4-2: Waves and Their Applications in Technologies for Information Transfer: Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
Bird Beak Bonanza	NGSS 3-LS4-3: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. NGSS 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
Big Dig	NGSS 3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. NGSS 4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.
Circulatory System	NGSS MS-LS1-3: Interacting Body Systems: In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions.
Respiratory System	NGSS MS-LS1-3: Interacting Body Systems: In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions.
Photosynthesis	NGSS MS-LS1-6 (PS3.D): Energy in Chemical Processes & Everyday Life: The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon-based organic molecules and release oxygen. MS-LS1-7.C: Organization for Matter and Energy Flow in Organisms: Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy. MS-LS1-7 (PS3.D): Energy in Chemical Processes & Everyday Life: Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials.
Glacier	NGSS MS-ESS2-1.A: Earth's Materials and Systems: All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. MS-ESS2-2.A: Earth's Materials and Systems: The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future. MS-ESS2-2.C The Roles of Water in Earth's Surface Processes: Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations.
Tornado Factory	NGSS MS-ESS2-5: Earth's Systems: Collect data to provide evidence for how motions and complex interactions of air masses result in changes in weather conditions. MS-ESS3-2: Earth & Human Activity: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform development of technologies to mitigate their effects.
Fibonacci Forest Quest	NGSS MS-LS1-4 From Molecules to Organisms: Structures and Processes: Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. MS-LS1-5: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. MS-LS4-6 Biological Evolution: Unity and Diversity: Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

ACTIVITY	NGSS
Sonic Shapes	NGSS MS-PS4-1: Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. MS-PS4-2: Waves & Their Applications in Technologies for Information Transfer: Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
Seismic Shake	NGSS MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment. NGSS MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. NGSS MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution. NGSS MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
Animal Cell Lab	NGSS MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. NGSS MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. NGSS MS-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
v8 Engine	NGSS HS-PS3-4: The Second Law of Thermodynamics: Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics). HS-PS3-4.B: Conservation of Energy and Energy Transfer: Energy cannot be created or destroyed, but it can be transported from one place to another and transferred between systems. Uncontrolled systems always evolve toward more stable states—toward more uniform energy distribution (e.g., water flows downhill, objects hotter than their surrounding environment and cool down.)
Periodic Table	NGSS HS-PS1-1: Matter and its Interactions: Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy shell of atoms. HS-PS1.A: Structure and Properties of Matter: The periodic table orders elements horizontally by the number of protons in the atom's nucleus and places those with similar chemical properties in columns. The repeating patterns of this table reflect patterns of outer electron states.
Law of Reflection	NGSS PS4.B: Electromagnetic Radiation: When light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light. PS4-2: Waves and their Applications in Technologies for Information Transfer: The path that light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path bends.
Fireworks Factory	NGSS HS-PS1-1: Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms. NGSS HS-PS1-3: Plan & conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles. NGSS HS-PS1-4: Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.
Electric Escape	NGSS HS-PS3-2: Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects). NGSS HS-PS3-3: Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. NGSS HS-PS3-5: Energy: Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.

