ATTENTION! Certain kits have special circumstances such as large spaces required or extra supplies. Please read the lesson before reserving the kit.

* Special Circumstances

Acids & Bases
GLE 0507.9.1 Observe and measure the simple chemical properties of common substances
GLE 0807.9.9: Explain the basic differences between acids and bases

This kit allows students to explore the acidity and pH of various household objects. A baking soda vs. vinegar demonstration is included. The students are given well plates and small amounts of several different substances and told to measure the acidity of the liquid with several types of litmus paper.

Air Trolley Construction
Graphing data
GLE 0407.11.3 Investigate the relationship between the speed of an object and the distance traveled during a certain time
GLE 0507.11.1 Design an investigation, collect data, and draw conclusions about the relationship among mass, force and distance traveled.
GLE 0707.11.4 Investigate how Newton’s laws of motion explain an objects movement

This kit allows students to make propeller driven straws that glide along a string track. They will use this set up to calculate the distance of each flight and graph the data. This lab is excellent for practicing the scientific method and gathering and graphing data in a fun way.

Aluminum Foil Boat Engineering Challenge
GLE 0707.T/E.2 Know that the engineering design process involves an ongoing series of events that incorporate design constraints, model building, testing, evaluating, modifying, and retesting

This kit contains a STEM Engineering Challenge. Students will be given a set amount of aluminum foil and a time limit in which to try to design the boat to hold the most pennies.

Animal Adaptations for Survival
GLE 0507.5.1 Investigate physical characteristics associated with different groups of animals
GLE 0807.5.3 Analyze how structural, behavioral, and physiological adaptations within a population enable it to survive in a given environment.
This kit allows students to experience three different types of animal adaptations in a station format. Students will be able to explore what it's like to be able to have an insulating level of fat, webbed extremities, and lack of depth perception. This kit is very hands on and requires at least two people to run the lab.

**Balancing Chemical Equations**

**GLE 0807.9.8** Interpret the events represented by a chemical equation

This kit is a game that allows students to practice balancing chemical equation. There are ten sets of cards that have coefficients, reactants and products. The student uses the accompanying worksheet as a guide to visually rearrange and solve for a balanced equation.

**Biodiversity**

**GLE 0807.5.5** Describe the importance of maintaining the earth’s biodiversity

This kit consists of two non-consecutive day lessons. The first day the students tally up all of the differing flora and fauna in a quadrat cube in their schoolyard to show the diversity in a seemingly uniform schoolyard. On the second day students will quantify the diversity by learning how to calculate Simpson’s Reciprocal Index of diversity all while emphasizing the importance of biodiversity. The kit also contains a supplemental bacteria growth lab that can give students a further feel for biodiversity in a small sample by sampling the dirt in their quadrats.

**Bird Beaks**

**GLE 0407.5.1** Analyze physical and behavioral adaptations that enable organisms to survive in their environment

**GLE 0507.5.1** Investigate physical characteristics associated with different groups of animals

**GLE 0807.5.3** Analyze how structural, behavioral, and physiological adaptations affect organisms ability to survive in a particular environment

**GLE 0807.5.4** Explain why variation within a population can enhance the chances for group survival

This kit allows students to explore animal adaptations for survival. Students are given differing “beaks” such as spoons, chopsticks, clothespins, or water droppers and differing “foods” such as marbles, water, rice, and beans. The goal is to try all the differing combos of foods and beaks to see how different types of beaks are better suited for different types of food. This kit works best in stations and supplemented with a discussion.

**Blood Typing Game**

**GLE 0707.1.3** Describe the function of different organ systems and how collectively they enable complex multicellular organisms to survive.

This is a game that allows the students to visually see the mixing of blood types. They try to save patients by selecting the correct blood type that
the patient can accept or give. It uses colored water and well plates as the
game set up and a worksheet to follow along with.

**Chomper Challenge**
GLE 0407.11.3 Investigate the relationship between the speed of an object and the
distance traveled during a certain time period.
GLE 0(5/7)07.Inq.3 Organize data into appropriate tables, graphs, drawings, or
diagrams.
GLE 0507.11.1 Design an investigation, collect data and draw conclusions about the
relationship among mass, force, and distance traveled.
GLE 0707.11.3 Distinguish between speed and velocity.

_This kit allows the students to begin to explore velocity and speed. Students will chew gum for differing periods of time and count the number of chomps in a minute. They will then answer questions about how much could they chew in longer time periods and about how the chews relate to real world speed on the ground._

**Chemistry in a Ziploc Baggie**
GLE 0507.9.1 Observe and measure the simple chemical properties of common
substances
GLE 0807.9.3 Interpret data from an investigation to differentiate between physical
and chemical changes
GLE 0807.9.8 Interpret the events represented by a chemical equation

_This kit allows students explore chemical reactions. The students will perform a simple reaction in a Ziploc bag and record the results. The students will then redo the reaction several times eliminating one of the possible reactants each time in order to find out how the reaction works. 8th Grade students can then review the chemical formula of the reaction._

**Chromatography**
GLE 0807.9.4 Distinguish among elements, compounds and mixtures

_This kit allows students to explore the concepts of chromatography. They learn how to separate the colors in a pen into its separate components from the mixture. The students are then given a short mystery to solve by testing different pens to match the criminal to the pen._

**Crazy Traits**
GLE 0507.4.1 Describe how genetic information is passed from parent to offspring
during reproduction
GLE 0507.4.2 Recognize that some characteristics are inherited while others result
from interactions with the environment
GLE 0707.4.4 Predict the probable appearance of offspring based on the genetic
characteristics of the parents

_This is a game that allows the students to create a crazy alien creature based on traits that were determined by rolling genes from both the father and mother. Students will be able to see how similar or identical starting genes can_
lead to very different creature. The kit includes a card game to play with the traits of the class’ creature.

CSI Nashville
GLE 0707.7.1 Describe the physical properties of minerals
This kit allows students to look at sediment samples under a microscope. They will look at five different properties of the sediment samples in the context of a crime scene. They will look at an original sample found in a fake skeleton and then compare it to sediment at possible murder locations.

Density Cubes*
SPI 0807.9.7 Apply an equation to determine the density of an object based on its mass and volume
This kit allows students to explore the concept of density. Students will measure the volume and mass of cubes of different material to figure out the density. They will then determine the density of water and make predictions about if the cubes will float. Note: Teachers MUST provide balances.

Effervescent Launchers
Scientific Method
Graphing Data
GLE 0507.11.1 Design an investigation, collect data, and draw conclusions about the relationship among mass, force and distance traveled.
GLE 0707.11. 4 Investigate how Newton’s laws of motion explain an object's movement
This kit allows students to explore the ideas behind trajectory vs. distance, basic graphing and data interpretation, and projectile motion. This kit also allows students to discover the scientific process and begin inquiry-based learning. Students use adjustable PVC pipe launcher stands and water and Alka-Seltzer filled film canisters to launch the caps off of the film canisters. The kit contains measuring tape and marking chips to measure and graph how far the caps flew at each angle. The goal is for students to first do the lab exactly as laid out and then to ask questions about what could be changed and re-do the experiment with their proposed changes.

Electric Cell Game
GLE 0507.1.1 Distinguish between the basic structures and functions of plant and animal cells.
This is a game that allows the students to practice their knowledge of cell organelles. There are three animal cell and three plant cell paper games. There are holes cut out next to the organelles and a column of holes with labeled parts next to it on each board. Students use an open-ended circuit with a light bulb to play the game. They try to match the organelle picture to the name and if they put the ends of the wire on the correct holes the light bulb will light up. This is a short activity and not a full lesson. Best used as part of stations or review.
Electrical Conductivity
GLE 040.12.3 Explain of electricity in a simple circuit requires a complete loop through which current can pass.
GLE 0607.12.2 Explain how simple electrical circuits can be used to determine which materials conduct electricity

This kit allows students to explore electrical conductivity through simple circuits. Students construct an LED circuit with a portion of the connection missing and insert materials of differing conductivity to complete the circuit and turn on the LED. Conclusions about the types of materials that allow the circuit to flow are drawn.

Electromagnetism
GLE 0807.12.1 Investigate the relationship between magnetism and electricity
GLE 0807.12.2 Design an investigation to change the strength of an electromagnet

This kit allows students to explore the topic electromagnetism. Students will first be introduced to magnets and electricity. They will then build an electromagnet and observe how to vary its strength. This lab is about exploration and observation of electromagnetism

Elements, Compounds, and Mixtures
GLE 0807.9.2 Understand that all matter is made up of atoms
GLE 0807.9.4 Distinguish among elements, compounds, and mixtures

This kit allows students practice differentiating between elements, compounds, and mixtures. The kit contains about 30 numbered vials that are filled with different substances that are elements, compounds, or mixtures. The students will try to determine which of the three it is and write what they think next to the corresponding number.

Elements, Compounds, and Mixtures Wet Lab*
GLE 0807.9.1 Understand that all matter is made up of atoms.
GLE 0807.9.4 Distinguish among elements, compounds, and mixtures.
GLE 0807.9.6 Use the periodic table to determine the characteristics of an element.

This kit allows students to learn the practice wet chemistry to distinguish among elements compounds and mixtures. There are two worksheet activities to help introduce or review the difference between elements, compounds, and mixtures. Then the student completes a wet lab separating various mixtures. Another wet lab is included which allows the student to explore combining an element and a compound.

Endothermic and Exothermic Reactions Wet Lab*
GLE 0807.Inq.1 Design and conduct open-ended scientific investigations.
GLE 0807.Inq.2 Use appropriate tools and techniques to gather, organize, analyze, and interpret data.

This kit allows students to learn the practice wet chemistry to learn about endothermic and exothermic reactions. Students will make a
This lab uses somewhat dangerous supplies, so please only for advanced groups.

Evidence of Chemical Reactions
GLE 0507.9.1 Observe and measure the simple chemical properties of common substances
GLE 0807.9.3 Interpret data from an investigation to differentiate between physical and chemical changes

This kit allows students to learn the different indicators of chemical reactions by performing several different reactions that produce a precipitate, release gas, or change color. Students will use dropper bottles to perform the reactions in a well plate.

Floating Paperclip*
GLE 0607.Inq.1 Design and conduct open-ended scientific investigations.
GLE 0807.Inq.2 Use appropriate tools and techniques to gather, organize, analyze, and interpret data
SPI 0807.12.3 Distinguish among the Earth’s magnetic field, a magnet, and the fields that surround a magnet and an electromagnet.

The purpose of this lab is to determine what types of objects would attract a magnet and break a magnetic field between a magnet and suspended paperclip. We will use this to analyze what it means for an object to be magnetic or have magnetic properties. There are three different versions of this lab, cookbook, guided inquiry, and full inquiry.

Flower Dissection*
GLE 0707.4.2 Demonstrate an understanding of sexual reproduction in flowering plants

This kit allows students to learn the parts of a plant. Groups of students will make detailed dissection notes and illustrations of a flower they dissect by peeling off the layers.

Fossils
GLE 0507.5.2 Analyze fossils to demonstrate the connection between organisms and the environments that existed in the past and those that currently exist.
GLE 0807.5.6 Investigate fossils in sedimentary rock layers to gather evidence of changing life forms

This kit allows students to explore fossil formation. Students can make models of sedimentary rock, trace fossils, and true fossils using clay or plaster of Paris and glue.

Genetics: Edible Chromosomes & Mitosis
GLE 0707.4.3 explain the relationship among genes, chromosomes, and inherited traits

This kit allows students to create chromosomes using gummy worms, marshmallows, and toothpicks. There is a lesson review on chromosomes and mitosis before the building activity. Once students build their own
chromosomes they will walk their models through the phases of mitosis on a placemat and illustrate the results on the worksheet.

**Genetics: Edible DNA Strand**
GLE 0707.4.3 explain the relationship among genes, chromosomes, and inherited traits

*This kit allows students to explore the features of DNA. The kit only includes material to create candy DNA with toothpicks, gummy bears, and Twizzlers. Any pre-lesson material needs to be designed by the teacher and fellow. There is a worksheet to accompany that asks about the model and some basic DNA questions.*

**Inclined Plane**
GLE 0707.11.1 Identify six types of simple machines
GLE 0707.11.2: Apply the equation for work in experiments with simple machines to determine the amount of force needed to do work.

*This kit allows students learn about simple machines and more specifically inclined planes. Students will measure the mechanical advantage of differently sloped inclined planes with spring scales.*

**Inflatable Planetarium***
GLE 0507.6.2 Recognize that charts can be used to locate and identify star patterns
GLE 0607.6.1 Analyze information about the major components of the universe

*This kit allows students to experience being inside a planetarium or simulates the night sky. This kit contains several different lessons that can be done together over a week or done ahead of time of the planetarium being set up. Students can do a research project about a constellation and in an ELA crossover create a constellation story of their own to go with it or do one unrelated. The planetarium is very large (50x25 ft) and needs indoor space and electricity to set up. It is not allowed to be set up outside or on rough concrete as the bottom is plastic and will easily tear.*

**Inheritance Patterns in Dragons**
GLE 0507.4.1 Describe how genetic information is passed from parent to offspring during reproduction
GLE 0507.4.2 Recognize that some characteristics are inherited while others result from interactions with the environment
GLE 0707.4.4 Predict the probable appearance of offspring based on the genetic characteristics of the parents

*This kit allows students to explore dominant and recessive genes and the traits that result from the differing combinations. Students will create a dragon by picking popsicle stick that represent dominant and recessive allele for different traits for their dragon. After the dragon is created students can compare how different they are.*
**KNEX Engineering**
GLE 0507.11.1 Design an investigation, collect data, and draw conclusions about the relationship among mass, force, and distance traveled
GLE 0707.11.4 Investigate how Newton's laws of motion explain an object's movement

*This kit allows students to learn about Newton's law of reactions through designing and modifying K'nex cars. Students build cars and propel them with balloons and then reevaluate their design to try to make them more efficient.*

**Leaning Tower of Pasta**
GLE 0707.07.T/E.2 Know that the engineering design process involves an ongoing series of events that incorporate design constraints, model building, testing, evaluating, modifying, and retesting

*This kit allows students to explore engineering principles by building a tower made of pasta. Students are given different pastas and mini marshmallows and tasked to make the tallest strongest structure. The structure must be able to hold a cup so that pennies can be added until collapse.*

**Making a Sedimentary Rock**
GLE 0707.7.1 Describe the physical properties of minerals
GLE 0707.7.2 Summarize the basic events that occur during the rock cycle

*This kit allows students to explore part of the rock cycle. Students will mix together many kinds of sediment along with "fossils" and create their own sedimentary rock.*

**Minerals**
GLE 0707.7.1 Describe the physical properties of minerals

*This kit allows students to explore the properties of different minerals. Students will run several different test such as a scratch test, acid test, and magnetism test on their given mineral and then try to determine which one they had at the end based on their results.*

**Oh, Deer**
GLE 0407.2.1 Analyze the effects of changes in the environment on the stability of an ecosystem
GLE 0507.2.1 Investigate different nutritional relationships among organisms in an ecosystem
GLE 0607.2.3 Draw conclusions from data about interactions between the biotic and abiotic elements of a particular environment
GLE 0807.5.3 Analyze how structural, behavioral, and physiological adaptations affect an organism's ability to survive in a particular environment
GLE 0807.5.4 Explain why variation within a population can enhance the chances for group survival

*This game will allow students to experience predator-prey dynamics. Students will play a kind of sharks and minnows game to get resources to survive. After each round, a tally of living predators and prey is taken. Students will be able to see trends of what happens if there is too many predators or prey. As an optional activity, teachers can introduce a disaster to show students what*
happens to populations.

**Osmosis in Potato Slices**

GLE 0707.1.5 Observe and explain how materials move through simple diffusion

This kit allows students to explore the concepts of osmosis using potato slices soaked in differing salt solutions. There are three jars filled with potatoes soaked overnight, one in a solution of 40% salt water, one in a solution of distilled water, and one control of 1% salt solution. Students examine the slices for changes in firmness due to osmosis.

**Owl Pellet Dissection**

GLE 0407.3.2 Investigate different ways that organisms meet their energy needs
GLE 0507.2.1 Investigate different nutritional relationships among organisms in an ecosystem
GLE 0607.2.1 Examine the roles of consumers, producers, and decomposers in a biological community
GLE 0607.2.2 Describe how matter and energy are transferred through an ecosystem.

This kit allows students to explore the food chain by dissection owl pellets. Students will work in small groups to use forceps and probe to dissect an owl pellet. They will then use the included animal bone chart to sort the bones and see what animals the owl ate.

**Periodic Table**

GLE 0807.9.3 Interpret data from an investigation to differentiate between physical and chemical changes
GLE 0807.9.6 Use the periodic table to determine the characteristics of an element.

This kit allows students to see how elements in the same grouping of the periodic table can have similar properties. Students will perform a few different reactions in a well plate and answer questions about them.

**Polymers**

GLE 0407.9.2 Explore different types of physical changes in matter
GLE 0807.9.2 Explain that matter has properties that are explained by the structure and arrangement of its atoms

This kit introduces students to the concepts and properties of polymers and cross-linkers. A short physical demonstration is described for an introduction. Students then make gluey putty out of borax and glue and test different properties of it. There is also an optional phosphorescence lesson included by using glow in the dark paint. The properties explored are mainly liquid vs. solid in nature.

**Properties of Carbon Dioxide**

GLE 0407.9.2 Explore different types of physical changes in matter
GLE 0507.9.3 Investigate factors that affect the rate at which various materials freeze, melt, or evaporate

This kit allows students to explore the different properties of carbon dioxide and physical changes of matter through several mini-experiments or demos. Students will observe carbon dioxide inflate a plastic baggie, sublime in water, be created
through a vinegar baking soda reaction, and be created in a limestone vinegar reaction. Conclusions about changes of state and physical changes can be drawn.

Properties of Waves
GLE 0707.11.5 Compare and contrast the basic parts of a wave
GLE 0707.11.6 Investigate the types and fundamental properties of waves

This kit allows students to explore the properties of waves. Students will watch a few interesting demonstration and then perform an experiment on reflection. They will also investigate diffraction gratings.

Pulleys
GLE 0707.11.1 Identify six types of simple machines
GLE 0707.11.2: Apply the equation for work in experiments with simple machines to determine the amount of force needed to do work

This kit allows students to explore the mechanical advantage of the pulley. Students will use spring scales to run through different combinations of multiple pulleys to examine the mechanical advantage of each pulley set up.

Rates of Reactions
GLE 0507.9.1 Observe and measure the simple chemical properties of common substances
GLE 0807.9.3 Interpret data from an investigation to differentiate between physical and chemical changes

This kit allows students to explore the factors that limit the speed of chemical reactions. Students will look at how temperature, concentration, and surface area affect the rate at which reactions happen. There is also a demonstration of how a catalyst can help speed up a reaction.

Rock Cycle Game
GLE 0707.7.1 Describe the physical properties of minerals
GLE 0707.7.2 Summarize the basic events that occur during the rock cycle

This game helps students understand the rock cycle better. Students will be assigned to start at a certain place in the rock cycle and then roll probability dice to see which phase of the rock cycle they end up at next. Students keep track of their own progress through the cycle and then there is a discussion on the cycle afterwards.

Salt Water Density
SPI 0807.9.7 Apply an equation to determine the density of an object based on its mass and volume

This kit allows students to explore the concepts of density using salt water. There are several demonstrations that help students understand the concept of density. Salt water is denser than regular water and students will use this concept to separate beads. They will also use graphed data to figure out the density of the salt water.

Shrink 'ems
GLE 0407.9.2 Explore different types of physical changes in matter
GLE 0807.9.2 Explain that matter has properties that are explained by the structure and arrangement of its atoms

*This kit can be used to illustrate a type of polymer and how they react to heat. Students draw or trace designs with sharpies on a special type of plastic and then those designs are placed in a provided toaster oven for two minutes where they shrink and become thicker. This kit is well suited as a holiday activity as about half of the designs provided for tracing are holiday in nature. Students typically make ornaments, key chains, or necklaces form the provided plastic, sharpies, tracing designs, and toaster oven.*

**Sound and Resonance**
GLE 0707.11.5 Compare and contrast the basic parts of a wave
GLE 0707.11.6 Investigate the types and fundamental properties of waves

*This kit allows students to explore the concepts of sound and resonance by doing several different experiments. Students will learn about resonance and natural frequency with whistling tubes and balloons containing hex nuts. They will then find the resonance of different tubes using a tuning fork. Once the resonance is found they will play “Twinkle Twinkle little star” on the tubes.*

**Spectra Matching Game**
GLE 0607.6.1 Analyze information about the major components of the universe

*This kit will allow students to explore absorption spectra. Students will be shown different spectra on the projector and will use their four different elements spectra to determine the element(s) present in the shown sample. There is an included flash drive with the power point lesson and there are spectra cutout sets.*

**Stratigraphy**
GLE 0507.5.2 Analyze fossils to demonstrate the connection between organisms and environments that existed in the past and those that currently exist
GLE 0807.5.6 Investigate fossils in sedimentary rock layers to gather evidence of changing life forms

*This kit allows students to explore the concepts and science of stratigraphy. The instructor will model stratigraphic layers and review sedimentary rock. Students will then learn about using fossils to date and correlate layers of rock. They will then look at real pictures of national parks and point out correlations in the rock layers.*

**Straw Launchers**
GLE 0507.11.1 Design an investigation, collect data, and draw conclusions about the relationship among mass, force and distance traveled.
GLE 0707.11.4 Investigate how Newton’s laws of motion explain an objects movement

*This kit can be used to explain the concepts of angle of trajectory vs. distance and the horizontal/vertical components of projectile motion. Students will apply basic graphing and data interpretation skills to the physics of projectile motion. This projectile motion is achieved by launching straw rackets with rubber bands on a stand. Several different components of projectile motion are explored.*
**Strawberry DNA***
GLE 0507.4.2 Recognize that some characteristics are inherited while others result from interactions with the environment
GLE 0707.4.3 Explain the relationship among genes, chromosomes, and inherited traits.

>This kit can be used to help students visually see DNA so they can better grasp the concept of what it is and how it works. Strawberry are first crushed and mixed with a lysing agent then ethanol is carefully added to extract the DNA out of the mixture. Students will be able to see the DNA of strawberry floating on the top.

**Toilet Paper Solar System Model***
GLE 0607.6.2 describe the relative distance of objects in the solar system from earth. GLE 0707.Inq.5 Communicate scientific understanding using descriptions, explanations, and models

>This kit allows students to practice their math skills by scaling the solar system down to the unit of one piece of toilet paper. They will then calculate how many squares a planet is from the sun and place the toilet paper out along the hallway to make a scale model of the solar system.

**UV Light***
GLE 0707.11.6 Investigate the types and fundamental properties of waves

>This kit allows students to explore the properties of ultraviolet light. Students will learn what black light is in the introduction. They will then use black lights to explore different materials and their UV properties. Sunscreen effectiveness is also tested.