Amplify Science

Grades 6–8

INTEGRATED-SPECIFIC MODEL

Hands-on investigations in Amplify Science

Featured activities

authored by THE LAWRENCE HALL OF SCIENCE UNIVERSITY OF CALIFORNIA, BERKELEY

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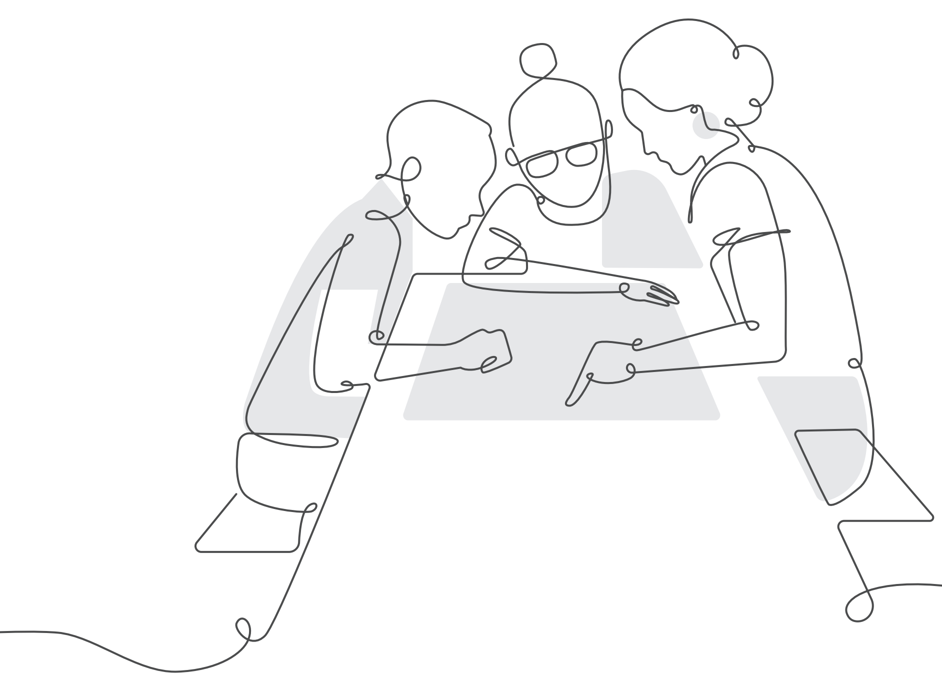

Amplify.

THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

Hands-on investigation

Hands-on learning is an essential part of Amplify Science, and is integrated into every unit. Students actively participate in science, acting like scientists and engineers as they gather evidence, think critically, solve problems, and develop and defend claims about the world around them. Every unit includes hands-on investigations which are critical to achieving the unit's learning goals.

This brochure will walk you through example activities from each of the Amplify Science 6–8 units. For complete materials lists please visit **amplify.com/science68**.

FLEX

Hands-on Flextensions

Hands-on Flextensions are additional, optional investigations that are included at logical points in the learning progression and give students an opportunity to dig deeper if time permits. These activities offer teachers flexibility to choose to dedicate more time to hands-on learning. These activities will be designated as *FLEX* in this brochure.

Materials referenced in Hands-on Flextension activities will either be included in the unit kit or easily sourced. Supporting resources such as student sheets will be included as downloadable PDF files.

All hands-on investigations included in the program are developed by UC Berkeley's Lawrence Hall of Science.

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Quantity and materials in each kit are subject to change. For current lists of all materials in each kit, please visit amplify.com/science.

FLEX

INTEGRATED-SPECIFIC MODEL | GRADE 6

Microbiome

Unit storyline

There is evidence to suggest that the approximately 100 trillion bacteria living on and in the human body may correlate to many different health conditions. Further, altering one's microbiome can result in altering one's health for better or worse. Most notably, a treatment known as a fecal transplant — a transplant that involves using microorganisms from one person's healthy gut microbiome to cure another person who is suffering from a potentially deadly infection — has been under review. Students take on the role of student researchers as they work to figure out why a fecal transplant cured a patient suffering from a C. difficile infection.

Featured activity: Microscope

Students first engage in a discussion about how they would know whether something is living or nonliving and what the expected differences might be between living and nonliving things at the microscopic scale. They then think about specific objects and whether they are living or not. Students observe a variety of objects under a microscope on slides that they have prepared, and that experience helps them identify characteristics of living things. Later, students bring objects from home so they can determine if there is microscopic evidence that shows whether these objects are living or nonliving.

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INTEGRATED-SPECIFIC MODEL | GRADE 6

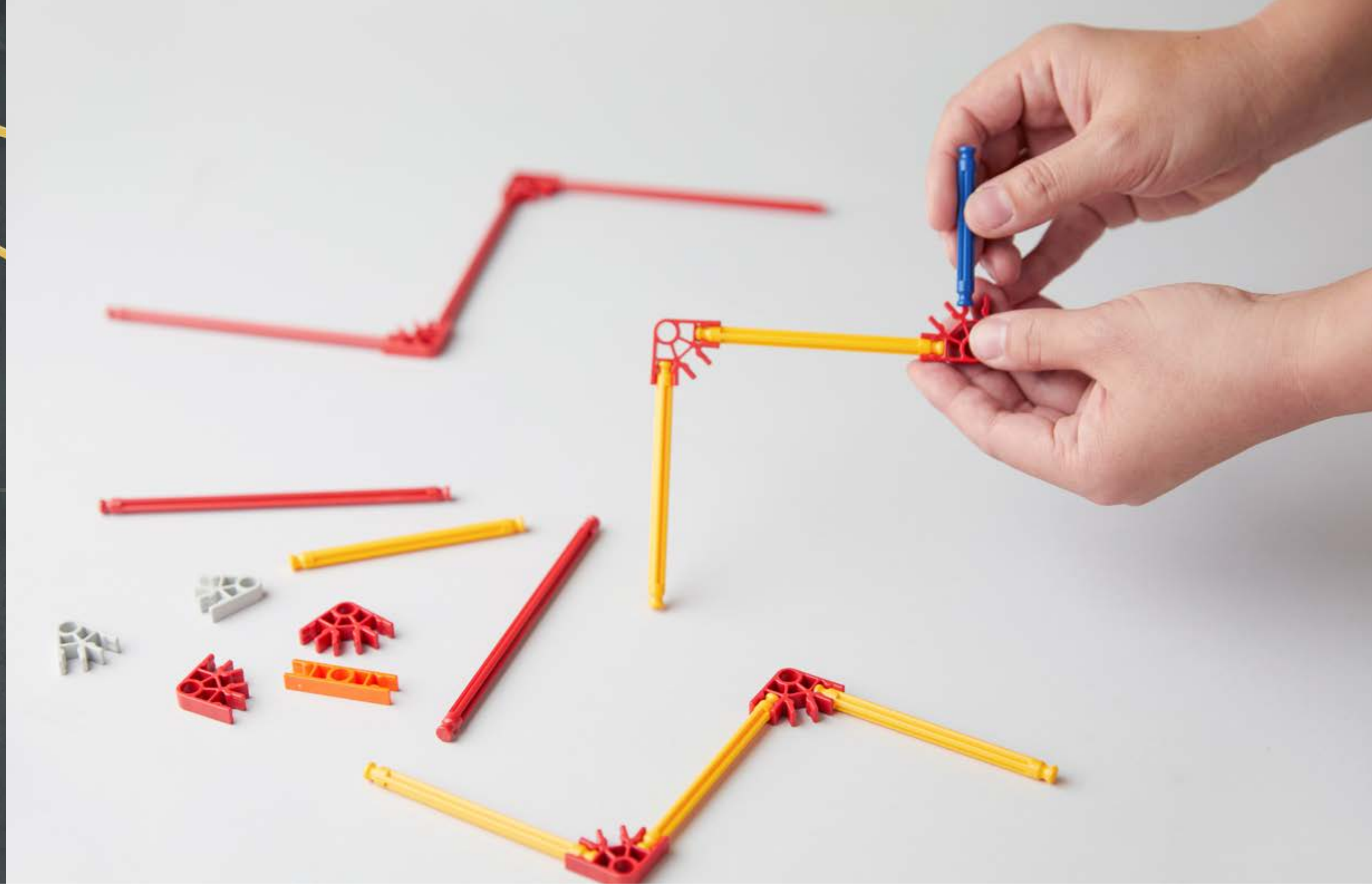
Metabolism

Unit storyline

Through inhabiting the role of medical students in a hospital, students are able to draw the connections between the large-scale, macro-level experiences of the body and the micro-level processes that make the body function as they first diagnose a patient and then analyze the metabolism of world-class athletes. They uncover how body systems work together to bring molecules from food and air to the trillions of cells in the human body.

Featured activity:
Body System Model (Lesson 2.1)

In Lesson 2.1 of the *Metabolism* unit, students participate in a classroom-sized model of the human body in which students play the roles of body systems delivering molecules (represented by pipe cleaners) to cells. Students who play the digestive system take starch and protein molecules from the environment and break them down into glucose and amino acid molecules; they then transport them to the circulatory system through the villi in the small intestine. Students who play the respiratory system take oxygen molecules from the environment and transport them to the circulatory system through the alveoli in the lungs. Students who play the circulatory system take the oxygen, glucose, and amino acid molecules to the cells. This kinesthetic experience demonstrates the important role that each body system plays in bringing necessary molecules to the body's cells.



INTEGRATED-SPECIFIC MODEL | GRADE 6

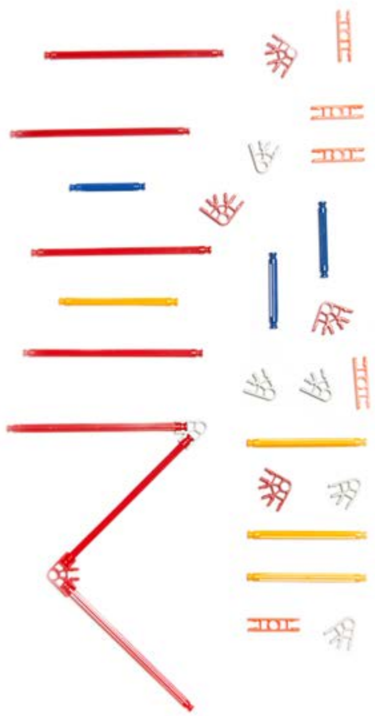
Traits and Reproduction

Unit storyline

Scientists and engineers are investigating possible ways spider silk can be used for medical purposes, such as for artificial tendons. Students act as student geneticists to investigate what causes variation in spider silk traits. Specifically, they explain why parent spiders have offspring with widely varied silk flexibility traits. They uncover the roles of proteins and genes and the way that genes are inherited.

Featured activity:
Gathering Evidence About Genes (Lesson 2.2)

In Lesson 2.2 of the *Traits and Reproduction* unit, students gather evidence that will help them figure out how organisms make different protein molecules for a particular feature. Students participate in a model in which printed instructions represent genes and connected K'NEX pieces are models of protein molecules. Students, playing the roles of ribosomes, follow the instructions in order to construct the protein molecules. By participating in this model, students conclude that each gene version provides a unique instruction to make a specific protein molecule. This hands-on activity also reinforces the idea that the genes themselves do not build the protein molecules. Students then receive changes to the instructions and rebuild their molecule models. These new instructions represent mutations, which allows students to see how mutations can result in changes to proteins.



INTEGRATED-SPECIFIC MODEL | GRADE 6

Thermal Energy

Unit storyline

In their roles as student thermal scientists, students work with the principal of a fictional school, Riverdale School, in order to help the school choose a new heating system. They compare a system that heats a small amount of water with one that uses a larger amount of cooler groundwater. Students discover that observed temperature changes can be explained by the movement of molecules, which facilitates the transfer of kinetic energy from one place to another. As they analyze the two heating system options, students learn to distinguish between temperature and energy, and to explain how energy will transfer from a warmer object to a colder object until the temperature of the two objects reaches equilibrium.

Featured activity:
Investigating Hot and Cold (Lesson 1.2)

In Lesson 1.2 of the *Thermal Energy* unit, students begin thinking about which heating system is better by investigating how something is different when it is warmer or cooler. They add food coloring to cup of hot water and a cup of cold water to observe how the coloring spreads in each cup. They see that the food coloring spreads faster in warmer water than it does in colder water, which helps them see the connection between temperature and movement and begin to understand temperature in terms of molecular motion.

INTEGRATED-SPECIFIC MODEL | GRADE 6

Ocean, Atmosphere, and Climate

Unit storyline

Students act as student climatologists helping a group of farmers near Christchurch, New Zealand, figure out the cause of significantly colder air temperatures in New Zealand during the El Niño climate event. To solve the puzzle, students investigate what causes regional climates. They learn about energy from the sun and energy transfer between Earth's surface and atmosphere, ocean currents, and prevailing winds.

Featured activity:
What Determines the Direction of Ocean Currents? (Lesson 3.2)

In Lesson 3.2 of *Ocean, Atmosphere, and Climate*, students continue to gather evidence about the Investigation Question: What determines the direction of ocean currents? Working in groups, students use a tank of water and straws to make water move in different directions and at different speeds. Students visualize the direction and speed of the water using pepper which floats on top of the water. Students observe and gather first-hand evidence for how wind (air blown through straws) and continents (sides of the tank) affect currents. The hands-on investigation helps students conclude that prevailing winds and the position of continents determine the direction of ocean currents and prepares them to think about how a change to prevailing winds can affect how much energy is brought toward or away from a location.

INTEGRATED-SPECIFIC MODEL | GRADE 6

Weather Patterns

Unit storyline

Weather is a complex system that affects our daily lives. Understanding how weather events, such as severe rainstorms, take place is important for students to conceptualize weather events in their own community. Students play the roles of student forensic meteorologists as they discover how water vapor, temperature, energy transfer, and wind influence local weather patterns in a fictional town called Galetown. They use what they have learned to explain what may have caused rainstorms in Galetown to be unusually severe in recent years.

Featured activity: Investigating Condensation (Lesson 1.3)

In Lesson 1.3, students investigate why and when condensation happens by making a model air parcel in a plastic baggie. After blowing air into two baggies, students leave one baggie at room temperature and put the other baggie in a cooler of ice. Students observe that more condensation happens when the air outside of the baggie is colder. This first-hand investigation is one way that students gather evidence to conclude that when water vapor in an air parcel cools, it can condense into liquid water which can form a cloud and fall as rain.

FLEX

INTEGRATED-SPECIFIC MODEL | GRADE 6

Earth's Changing Climate

Unit storyline

In the role of student climatologists, students investigate what is causing ice on Earth's surface to melt in order to help the fictional World Climate Institute educate the public about the processes involved. Students consider claims about changes to energy from the sun, to the atmosphere, to Earth's surface, or in human activities as contributing to climate change.

Featured activity: Tree Measurements

In the role of student climatologists, students investigate what is causing ice on Earth's surface to melt in order to help the fictional World Climate Institute educate the public about the processes involved. Students consider claims about changes to energy from the sun, to the atmosphere, to Earth's surface, or in human activities as contributing to climate change. Students measure the height of trees (by triangulation) and the circumference of trees and use these measurements to calculate estimates of the amount of carbon stored in the trees. They then relate these amounts to the amount of carbon dioxide produced by the human activities of an average American in a year.

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INTEGRATED-SPECIFIC MODEL | GRADE 6

Earth's Changing Climate: Engineering Internship

Unit storyline

Students act as civil engineering interns to design a plan to modify a city's roofs in order to reduce the city's impact on climate change. These plans must meet three design criteria: One, reducing impact on the climate; two, preserving the city's historic character; and three, minimizing costs. Students focus on the practice of isolating variables in planning and conducting tests to deepen their understanding of climate change; students also learn about the cause-and-effect mechanisms involved as changes to albedo and changes to combustion of fossil fuels affect climate.

Featured activity:
Exploring Albedo (Day 1)

In this lesson, students take on the roles of climate change interns and predict, then test the relative albedo (the amount of light reflected) of a variety of surfaces. As part of this activity, students use light meters to measure the albedo percentages of various surfaces, such as black felt, aluminum foil, and cardboard. Students will later apply their findings to what they learned about roof modifications and how they can help reduce the impact on the climate.

INTEGRATED-SPECIFIC MODEL | GRADE 7

Geology on Mars

Unit storyline

In their roles as student planetary geologists working to investigate the planet Mars, students investigate whether a particular channel on Mars was caused by flowing water or flowing lava. Along the way, students engage in the practices and ways of thinking particular to planetary geologists, and learn to consider a planet as a system of interacting subsystems.

Featured activity:
Observing the Flowing Water Model (Lesson 2.2)

In Lesson 2.2, the class uses a Flowing Water Model — a stream table with water flowing over sand — to gather evidence about whether landforms remain on Mars after the geologic processes that formed them stop happening. Students can then apply what the parts of the model represent in the real geologic process on Earth in which water flows across the land.

FLEX

INTEGRATED-SPECIFIC MODEL | GRADE 7

Plate Motion

Unit storyline

Students play the roles of geologists working for the fictional Museum of West Namibia to investigate Mesosaurus fossils found both in southern Africa and in South America. They learn that the surface of the Earth has changed dramatically over the Earth's history, with continents and ocean basins changing shape and arrangement due to the motion of tectonic plates. As the Earth's surface changes, fossils that formed together may be split apart.

Featured activity: Plate Modeling

Students develop their own physical models showing how plate motion can create mountain ranges. Students compare the models they create to how the *Plate Motion* sim shows mountains forming during plate motion. Next, students apply their understanding by exploring locations near plate boundaries in Google Earth™. Students choose one location and write a short argument about the type of plate boundary they think is at that location, based on landforms they observe.

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INTEGRATED-SPECIFIC MODEL | GRADE 7

Plate Motion: Engineering Internship

Unit storyline

Students act as mechanical engineering interns to design a tsunami warning system for the Indian Ocean region. These warning systems must meet three design criteria: one, giving people as much warning time as possible to move to safety; two, causing as few false alarms as possible; and three, minimizing cost as much as possible. Students communicate like engineers and scientists do as they use their understanding of plate motion and patterns in data to create and justify their designs.

Featured activity:
Modeling a Tsunami Wave (Day 2)

In this lesson, students explore tsunami waves through a physical tsunami tank model. Using the model, they compare the effects of normal, wind-driven waves, and a tsunami wave caused by underwater plate motion. Students begin by setting up buildings on the shore of the tsunami tank before each test, and then take turns testing how to generate each wave type.

INTEGRATED-SPECIFIC MODEL | GRADE 7

Rock Transformations

Unit storyline

Taking on the roles of student geologists, students investigate a geologic puzzle: two rock samples, one from the Great Plains and one from the Rocky Mountains, look very different but are composed of a surprisingly similar mix of minerals. Did the rocks form together and somehow get split apart? Or did one rock form first, and then the other rock form from the materials of the first rock? To solve the mystery, students learn about how rock forms and transforms, driven by different energy sources.

Featured activity:
Energy's Role in Forming Rocks (Lesson 2.3)

In Lesson 2.3 of *Rock Transformations*, students return to hard candy rock models they made earlier in the unit to investigate whether both sedimentary and igneous rock can turn into sediment. Students simulate weathering by shaking candy models of sedimentary rocks (made in an earlier lesson) and igneous rock (whole pieces of candy) in a jar. Students discover that both sedimentary and igneous rock can become sediment through weathering.

INTEGRATED-SPECIFIC MODEL | GRADE 7

Phase Change

Unit storyline

Taking on the roles of student chemists working for the fictional Universal Space Agency, students investigate the mystery of a disappearing methane lake on Titan. One team of scientists at the Universal Space Agency claims that the lake evaporated while the other team of scientists claims that the lake froze. The students' assignment is to determine what happened to the lake. They discover what causes phase changes, including the role of energy transfer and attraction between molecules.

Featured activity:
Dry Ice

Students explore dry ice, frozen carbon dioxide, which is unusual in that it changes phase directly from solid to gas without passing through a liquid phase. Students then design and conduct investigations to gather evidence about their own questions about dry ice.

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INTEGRATED-SPECIFIC MODEL | GRADE 7

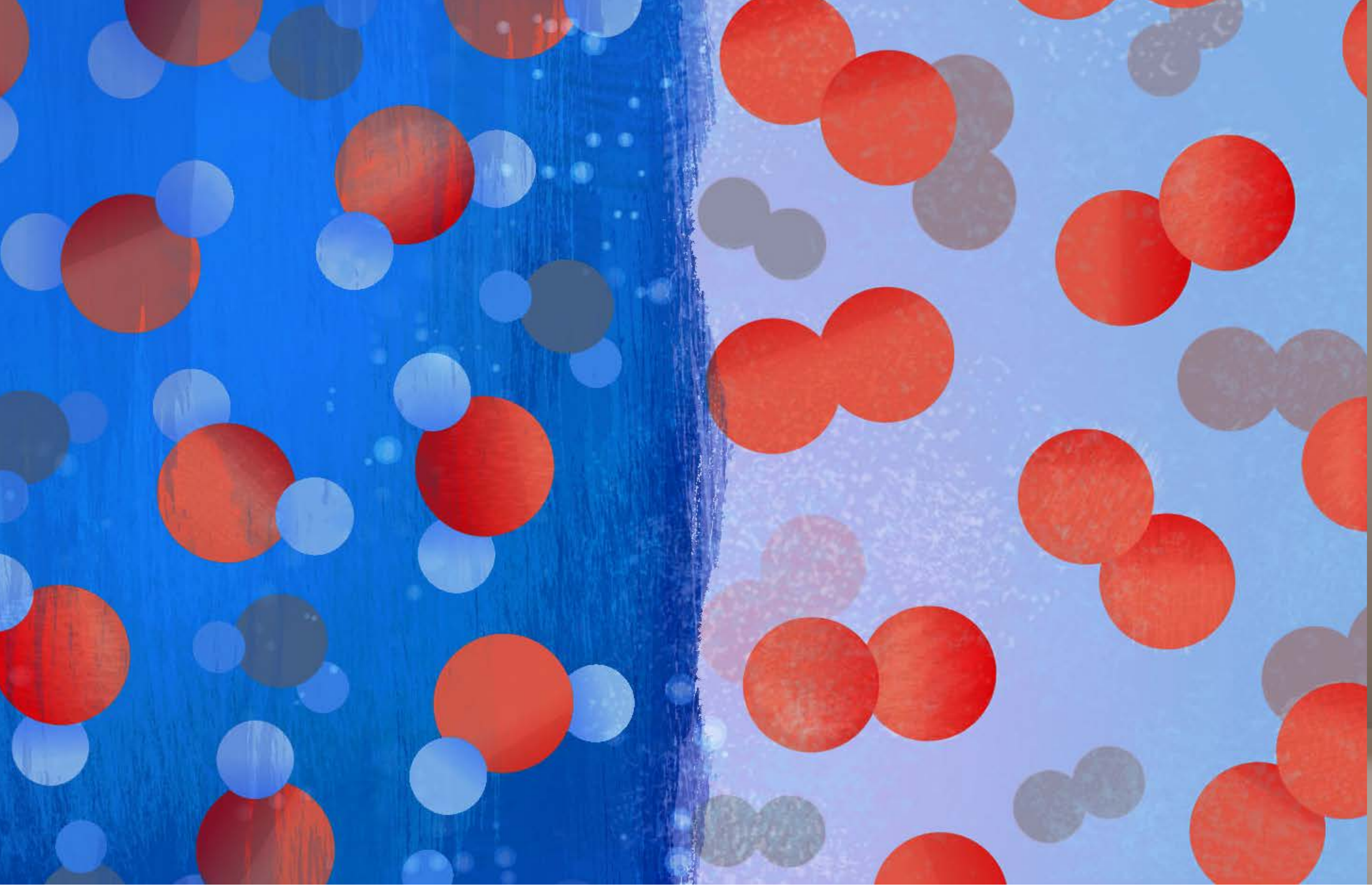
Phase Change: Engineering Internship

Unit storyline

Students act as chemical engineering interns to design an incubator for low-birthweight babies. Phase change materials (PCMs) are substances that store and release large amounts of energy during the phase changes of melting and freezing. Since they can easily be reused, PCMs are useful for everyday situations that require temperature control. Students select a combination of PCMs and an insulating lining material, applying concepts about phase change and energy transfer. These plans must meet three design criteria: One, keeping the baby's average temperature as close as possible to 37°C; two, minimizing the time the baby spends outside the healthy temperature range; and three, minimizing costs so as many babies can be helped as possible. Students focus on the practice of using models while designing solutions to deepen their understanding of phase change; students also consider the flow of energy and how it affects the matter in their designs.

Featured activity:
Modeling Thermal Energy Transfer (Day 2)

In this lesson, explore thermal energy transfer through a hands-on activity with hand warmers. In this activity, hand warmers serve as a model that helps interns see how thermal energy is transferred out of PCMs during a change from liquid to solid, and transferred into PCMs during a change from solid to liquid.



INTEGRATED-SPECIFIC MODEL | GRADE 7

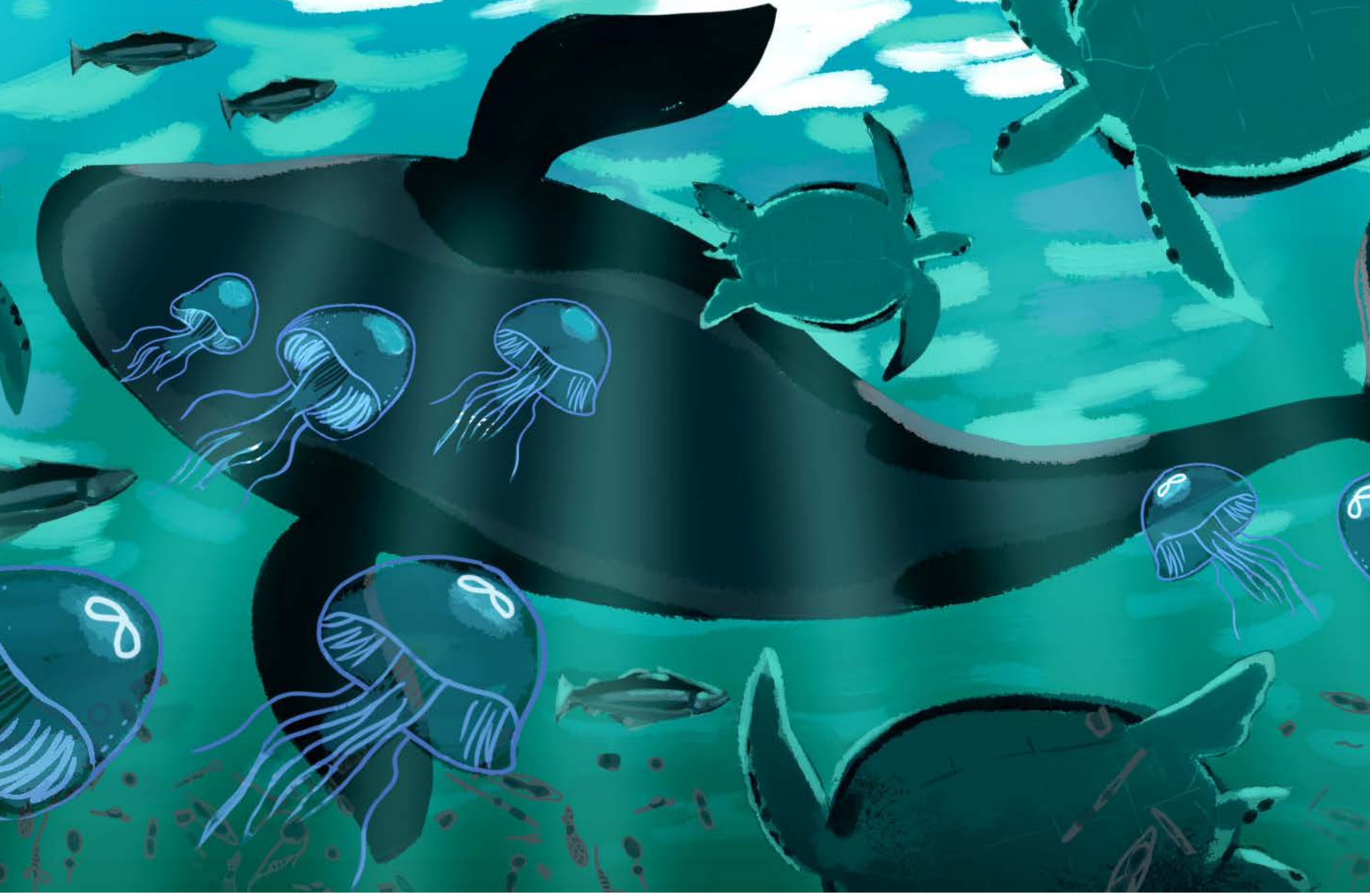
Chemical Reactions

Unit storyline

In the roles of student chemists, students explore how new substances are formed as they investigate a problem with the water supply in the fictional town of Westfield. They analyze a reddish-brown substance that is in the water, the iron that the town's pipes are made of, and a substance from fertilizer found to have contaminated the wells that are the source of the town's water, and use their findings to explain the source of the contaminating substance.

Featured activity: Investigating Substance Changes (Lesson 2.1)

In Lesson 2.1 of *Chemical Reactions*, students gather evidence by observing the chemical reaction that is produced when two substances — calcium chloride ($CaCl_2$) and sodium carbonate (Na_2CO_3) — are mixed together. First, students mix these substances and observe them, recording the change in properties that occurs. Then, students are introduced to Laboratory A mode of the *Chemical Reactions* sim, which they explore before using it to recreate the same chemical reaction between calcium chloride and sodium carbonate. This sim activity allows students to observe the changes that occur at the atomic scale. By the end of these activities, students should have enough evidence to conclude that substances can change into different substances.



INTEGRATED-SPECIFIC MODEL | GRADE 7

Populations and Resources

Unit storyline

Glacier Sea has seen an alarming increase in the moon jelly population. In the roles of student ecologists, students investigate reproduction, predation, food webs, and indirect effects to discover the cause. Jellyfish population blooms have become common in recent years and offer an intriguing context to learn about populations and resources.

Featured activity:
Energy Storage Molecules (Lesson 2.2)

In Lesson 2.2 of *Populations and Resources*, students gain firsthand experience with the relationship between energy storage molecules and an organism's ability to release energy for reproduction. Students give yeast different amounts of sugar (an energy storage molecule). Students observe that the more sugar the yeast gets the more bubbles they produce. Student use this as evidence that the more energy storage molecules an organism has the more energy they can release for reproduction.

FLEX

INTEGRATED-SPECIFIC MODEL | GRADE 7

Matter and Energy in Ecosystems

Unit storyline

Students examine the case of a failed biodome, an enclosed ecosystem that was meant to be self-sustaining but which ran into problems. In the role of ecologists, students discover how all the organisms in an ecosystem get the resources they need to release energy. Carbon cycles through an ecosystem due to organisms' production and use of energy storage molecules. Students build an understanding of this cycling — including the role of photosynthesis — as they solve the mystery of the biodome collapse.

Featured activity:
Biodome

Students apply their understanding of ecosystems to planning and building a miniature biodome that can sustain living organisms. After reviewing the components of a healthy ecosystem, students evaluate the available materials and select the best prospects for building a successful biodome. Working together, student groups plan and build their biodomes, and over the next few weeks, they observe the biodomes on a regular basis. Students assess their level of success and critique how well they were able to sustain a model ecosystem within the sealed environment. They suggest possible design changes if they were given a future chance to create another model ecosystem.

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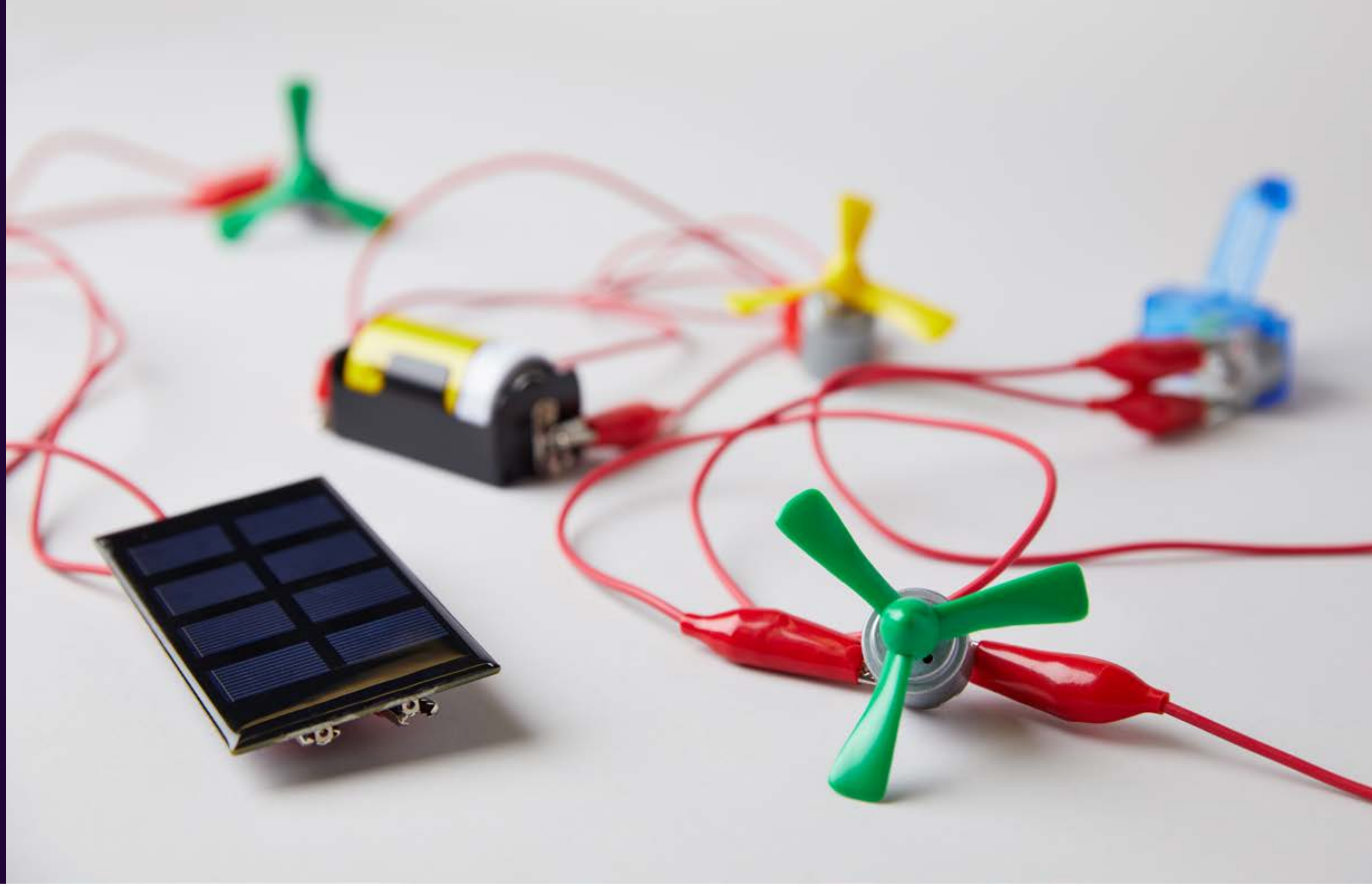


INTEGRATED-SPECIFIC MODEL | GRADE 8

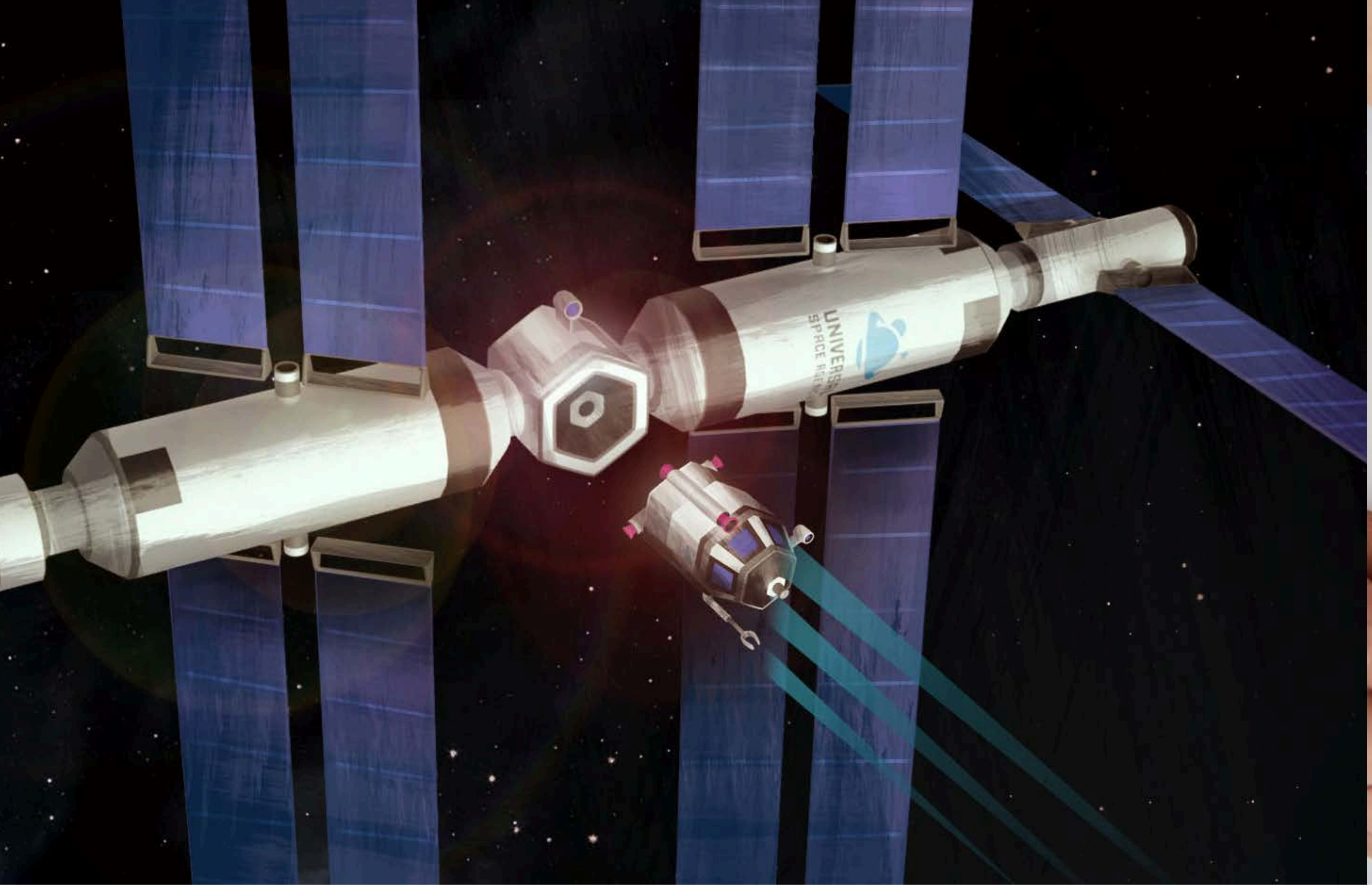
Harnessing Human Energy

Unit storyline

Energy-harvesting backpacks, rocking chairs, and knee braces are just a few of the devices that have been created to capture human energy and use it to power electrical devices. Students assume the role of student energy scientists in order to help a team of rescue workers find a way to get energy to the batteries in their equipment during rescue missions. To do so, students learn about potential and kinetic energy, energy conversions, and energy transformations.

Featured activity: Investigating Energy Systems (Lesson 1.2)

In Lesson 1.2 of *Harnessing Human Energy*, students conduct a hands-on investigation to answer the Investigation Question: How do you know something has energy? To do this, students build three systems that use, respectively, a hand-crank generator, a battery, and a solar cell to make a fan spin and gather evidence about whether each system has energy.



INTEGRATED-SPECIFIC MODEL | GRADE 8

Force and Motion

Unit storyline

In this unit, students engage in authentic work as they take on the roles of student physicists working for the fictional Universal Space Agency (USA). They are called upon to assist in the investigation of one recent mishap. Students apply their developing knowledge of force and motion to explain why a space pod failed to dock at the space station as planned. This mystery serves as the anchor phenomenon for the unit. As they investigate, students will learn about the relationship between force, change in velocity, mass, and the equal and opposite forces exerted during collisions.

Featured activity:
Exploring Mass, Force, and Velocity (Lesson 2.1)

Students use physical materials to plan and conduct an investigation about how exerting the same force affects objects of different mass. For example, students use a launcher to exert the same force on a golf ball and table tennis ball, and time how long it takes each ball to travel one meter.

INTEGRATED-SPECIFIC MODEL | GRADE 8

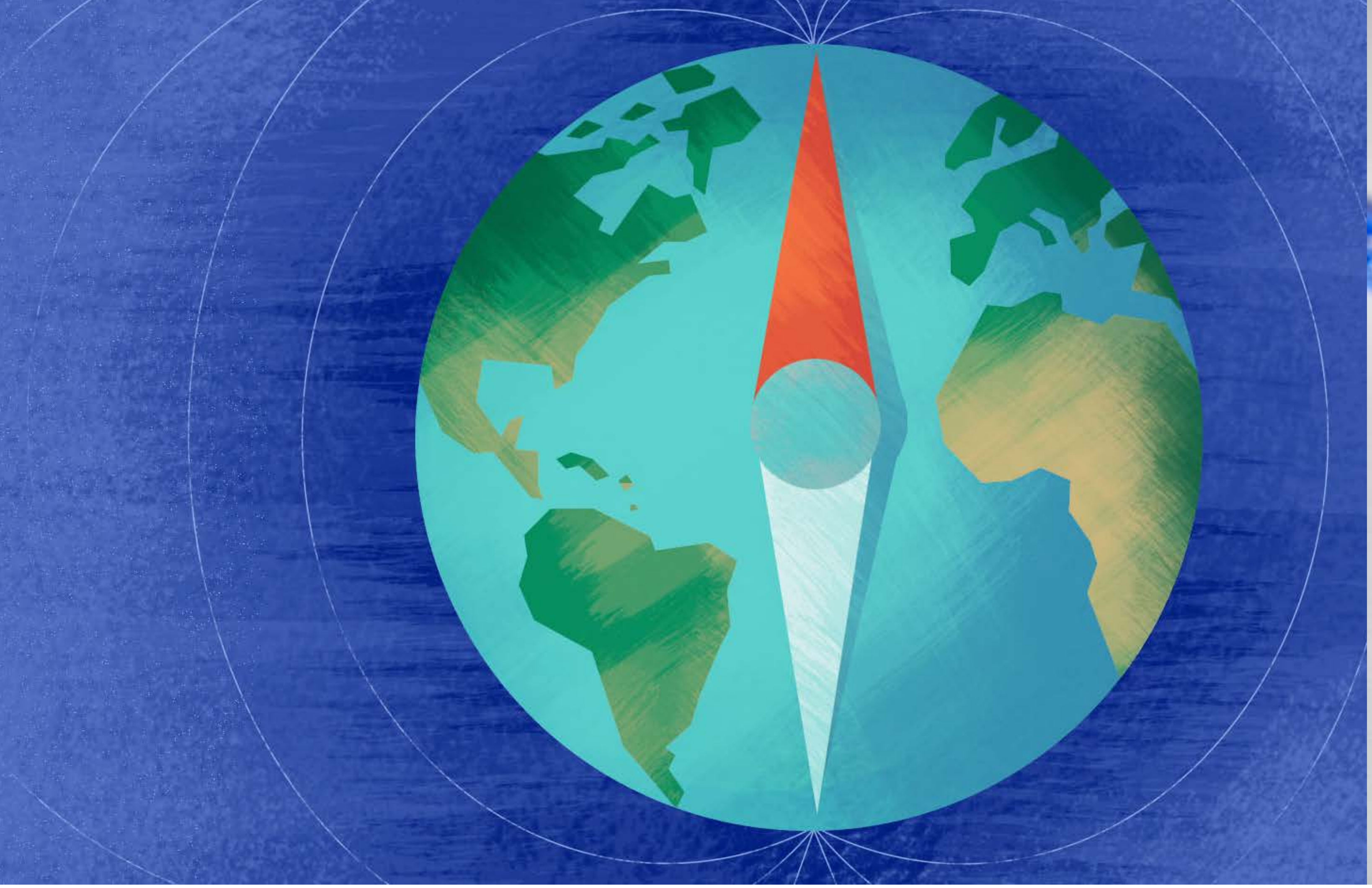
Force and Motion: Engineering Internship

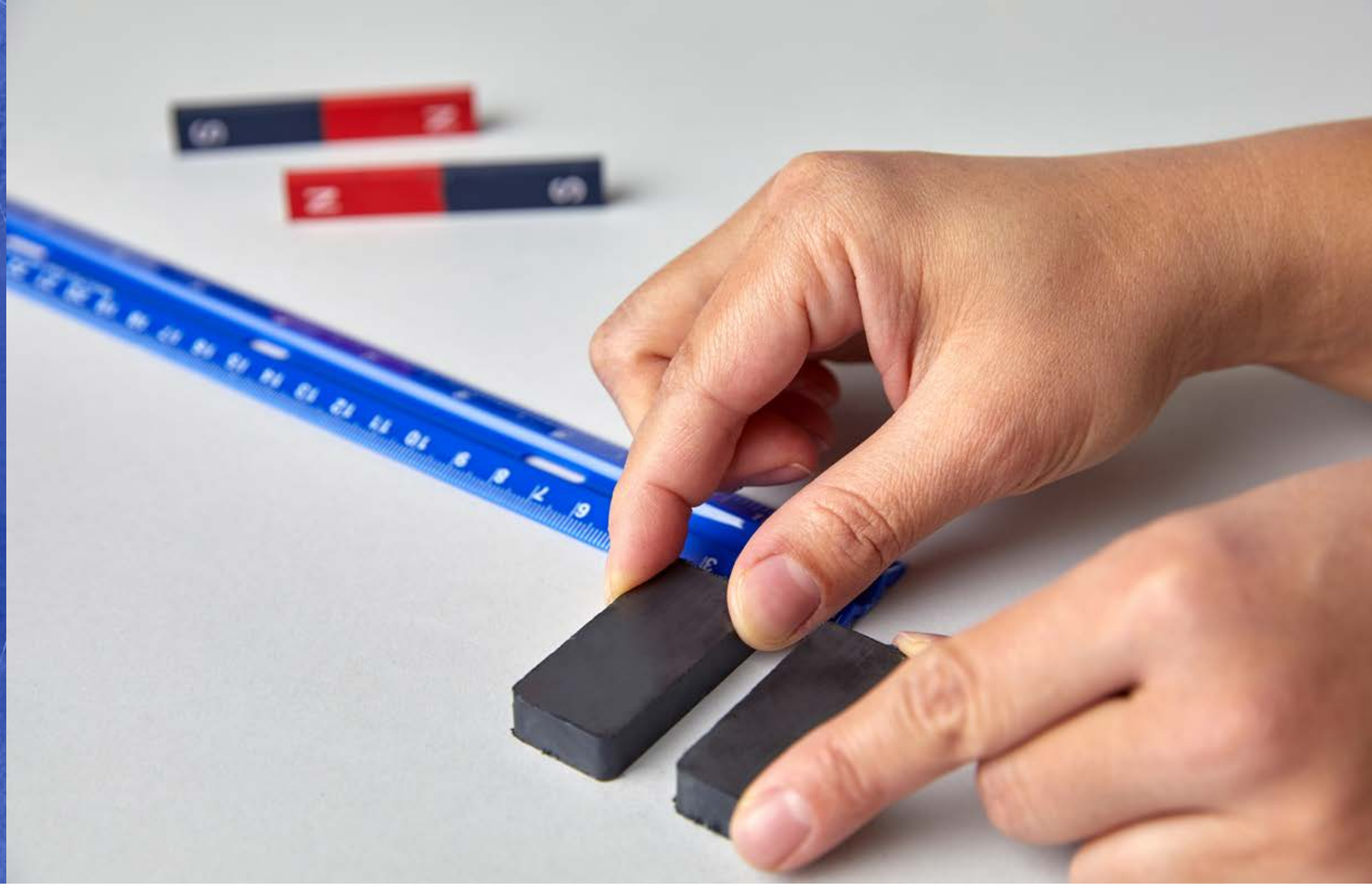
Unit storyline

In this unit, students work as mechanical engineering interns at Futura Engineering to design a supply pod that will deliver humanitarian aid packages to people in disaster-stricken locations. Specifically, they learn about engineering practices and deepen their understanding about collision forces. They explore how to manipulate mass and falling speed in the design process, using the SupplyDrop Design Tool to run iterative tests and collect data. They then focus on data analysis, noting the structure and function of different design features, in order to design a pod that survives the impact of colliding with the ground.

Featured activity:
Egg Drop Challenge (Day 2)

In this lesson, students deepen their research of collisions and impact forces by modeling the supply pods with a hands-on activity, the Egg Drop Challenge. Students design and build structures to surround and protect an egg. They weigh their structures and consider the effect of the mass on the impact it will experience. The Egg Drop Challenge spans two days, allowing time for student reflection and iteration.



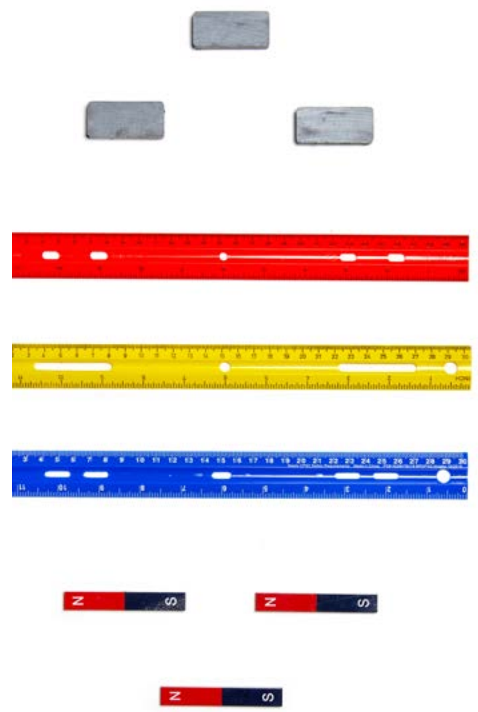


INTEGRATED-SPECIFIC MODEL | GRADE 8

Magnetic Fields

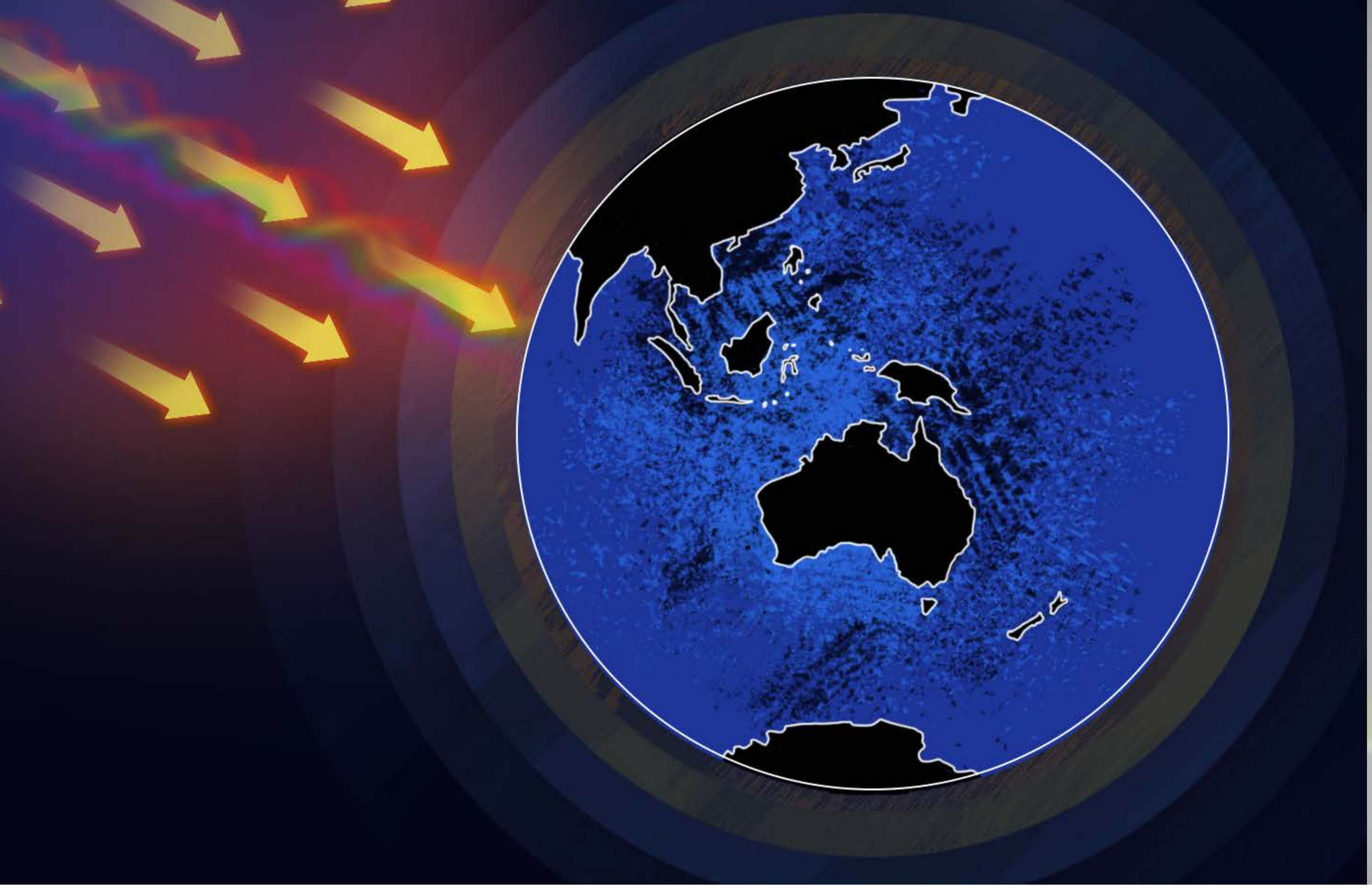
Unit storyline

In the roles of physicists working for the Universal Space Agency, a fictional agency that resembles NASA, students investigate the unexpected results from one test launch of a magnetic spacecraft. While scientists at the USA were testing the launch system, they found that the spacecraft in their third test traveled much faster than expected, and it's this unexpected outcome that serves as the anchor phenomenon for student investigations in the unit. Was there an error in magnet alignment? Was there an unexpected energy increase in the launcher system, or was there more magnetic force? Motivated to understand what affects the movement of magnets, students use the Magnetic Fields simulation, hands-on activities, and evidence from science articles to learn about magnetic force.



Featured activity:
Exploring Force and Potential Energy (Lesson 3.1)

In Lesson 3.1 of *Magnetic Fields*, students use magnets to test variables and gather data about magnetic force in a hands-on activity. This is an opportunity for students to plan an investigation using what they have learned about isolating variables. Students will create one experiment in which they isolate magnet strength and another in which they isolate the distance between magnets. They will then determine whether those variables affect the amount of potential energy that a system of magnets stores in the magnetic field.



INTEGRATED-SPECIFIC MODEL | GRADE 8

Light Waves

Unit storyline

Taking on the roles of student spectroscopists working for the fictional Australian Health Alliance, students investigate why Australia's cancer rate is so high, analyzing real data that scientists might consider. This problem serves as the anchor phenomenon that students focus on throughout the unit. Students use the *Light Waves* simulation, conduct hands-on activities, read articles, and watch videos to gather evidence about how light interacts with materials. The sim allows students to observe how light carries energy and how this energy causes materials to change when it is absorbed. Students can simulate manipulating the wavelength of light, observing that different types of light have different wavelengths and that different types of light can change a material in different ways.

Featured activity:
How Different Light Sources Change Materials

Students conduct a hands-on investigation, shining an incandescent flashlight and an ultraviolet flashlight on different materials, and then observing different changes. Partners discuss the evidence and determine that different light sources can emit different types of light.

INTEGRATED-SPECIFIC MODEL | GRADE 8

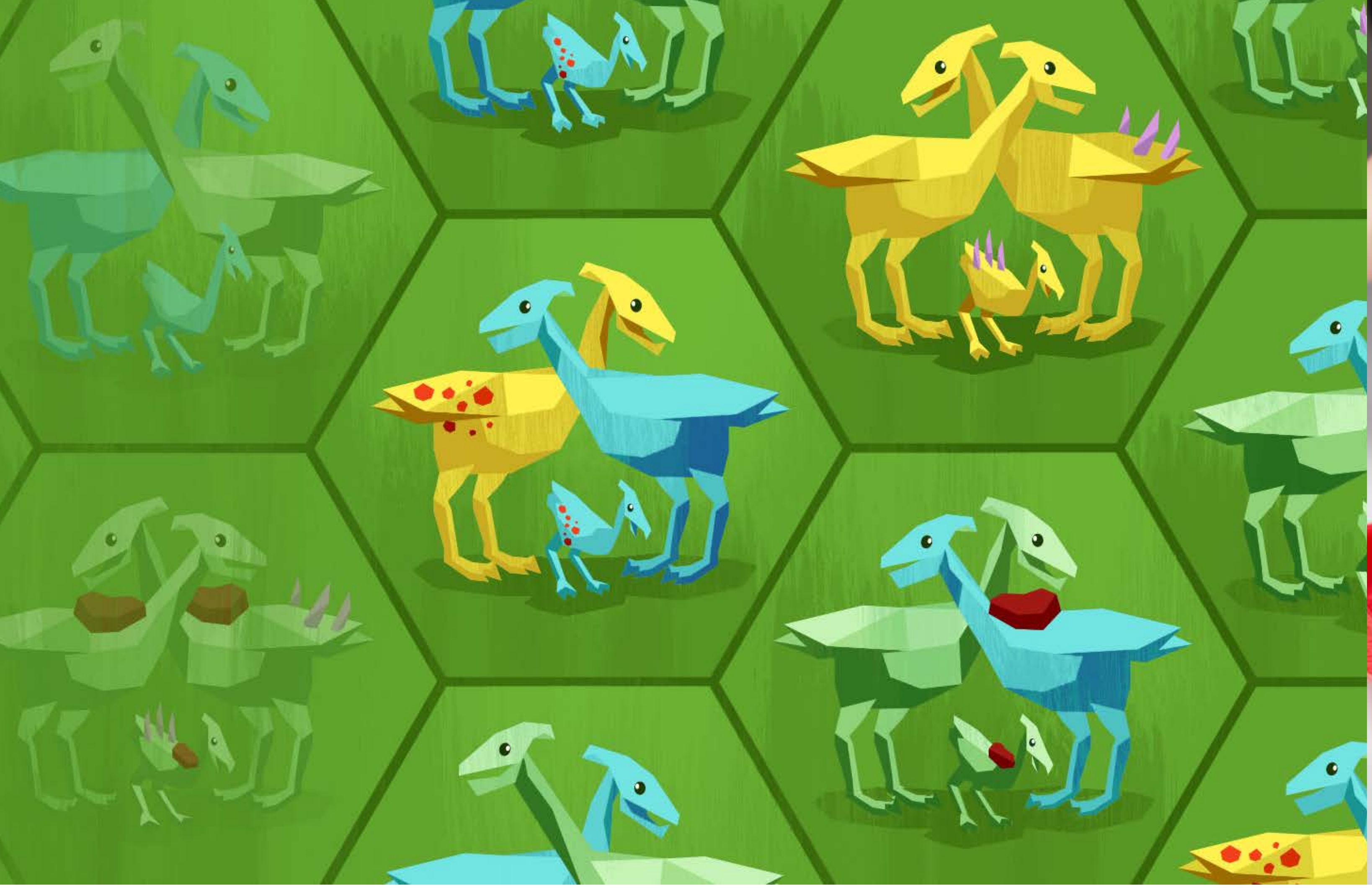
Earth, Moon, and Sun

Unit storyline

The *Earth, Moon, and Sun* unit begins as students take on the roles of student astronomers, tasked with advising an astrophotographer who needs to take photographs of the Moon for a fictional magazine called *About Space*. The astrophotographer can only take pictures of specific features on the Moon at certain times, and this serves as the anchor phenomenon for the unit. In order to provide advice about when to take photographs of the Moon as well as how to take photographs of a lunar eclipse, students will need to investigate where the Moon's light comes from, what causes the characteristic changes in the appearance of the Moon that we observe, and what conditions are required to view phenomena, such as particular moon phases and lunar eclipses. As students conduct these investigations, they will use a hands-on Moon Sphere Model, the digital *Earth, Moon, and Sun* simulation, and the *Earth, Moon, and Sun* Modeling Tool to gather and represent information about the movement of and light patterns on the Moon.

Featured activity:
Gathering Evidence from a Model (Lesson 2.2)

In Lesson 2.2, students use the Moon Sphere Model to gather evidence about why the Moon looks different to us from night to night. A light bulb is set up in the center of the classroom. Each student holds a sphere, and observes the appearance of the lighted part of the sphere as they orbit the sphere around themselves.



FLEX

INTEGRATED-SPECIFIC MODEL | GRADE 8

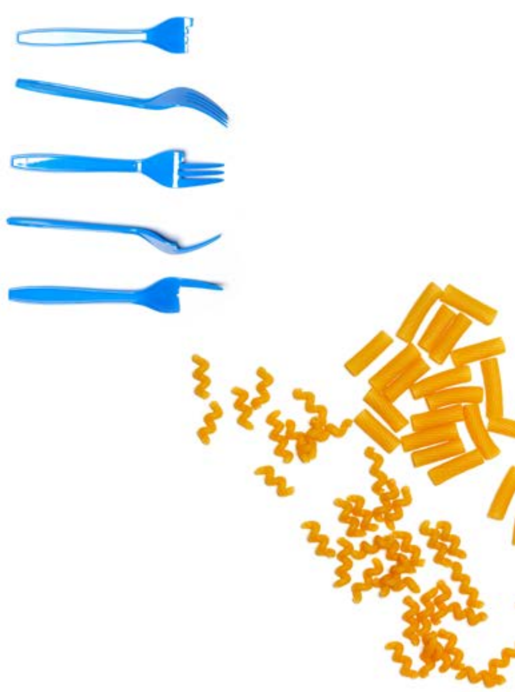
Natural Selection

Unit storyline

According to local legend around Oregon State Park, three unfortunate campers were found dead at their campsite and investigators found only one clue — a rough-skinned newt inside the coffee pot that the campers used to make their morning coffee. Student biologists investigate what caused the rough-skinned newts of Oregon State Park to become so poisonous. They uncover the mechanisms of natural selection, investigating variation in populations, survival and reproduction, and mutation.

Featured activity: Clawbeast Model

Each student plays the role of an individual in a population of fictional organisms called clawbeasts. One trait that varies in clawbeasts is the number of claws, and claws are used for getting food. With a recent natural disaster, this population no longer has a variety of food choices — there's only one type of plant available now, so students are able to step in and examine how the distribution of traits changes over multiple generations. They investigate claw traits in relation to this new food, based on individuals that either survive and reproduce (adaptive traits) or individuals that die and do not reproduce (non-adaptive traits). Students then think about and investigate what happens when the food source changes yet again.



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Natural Selection: Engineering Internship

Unit storyline

The Natural Selection Engineering Internship asks students to design a treatment that does not cause an increase in the malaria parasite population while considering three criteria: One, minimizing drug resistance in the malaria parasite population; two, minimizing patient side effects; and three, keeping costs low. Students use the MalariaMed Design Tool to collect and analyze data, complete iterative tests, and learn about optimizing designs. By the end of this unit, students can describe engineering practices and compose a written proposal that supports their optimal design for making a safe and effective malaria treatment, one that also manages trade-offs between the project criteria.

Featured activity:
Modeling Population Shifts (Day 2)

In this lesson, students engage in a hands-on activity that simulates mutations in a malaria parasite population when an antimalarial drug is introduced to the environment. The three colors of cubes represent malaria parasites with different levels of drug resistance: green cubes represent individuals with no resistance, blue cubes indicate some resistance, and purple cubes indicate high resistance.

FLEX

INTEGRATED-SPECIFIC MODEL | GRADE 8

Evolutionary History

Unit storyline

Students act as student paleontologists to discover the evolutionary history of a mystery fossil. Is this species more closely related to wolves or whales, and how did all three species change over time? Students learn how to interpret similarities and differences among fossils, they investigate how natural selection can lead to one population becoming two different species, and also investigate evolution over vast periods of time.

Featured activity: Owl Pellets

Students examine the bones in an owl pellet as an analogy for the ways in which paleontologists examine fossil bones. Students dissect an owl pellet and separate the bones found in the owl pellet. They compare the bones they find to the bones of different organisms, focusing on making careful observations to identify what organism the bone may have come from and what type of bone it might be. Students then organize their bones into a skeleton, again focusing on making careful and precise observations as they decide where to place each bone.

Some materials depicted are independently sourced by teachers and not included with the Amplify Science kits.

Notes

For more information on Amplify Science, visit **amplify.com/science**.

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THE LAWRENCE HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

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