

GRADE 8 SCIENCE

Key Features

Focus Areas

- forces and motion,
- wave properties,
- heredity and variation of traits,
- biological evolution, and
- Earth's place in the universe.

By the end of Grade 8, students can

- Apply Newton's third law to design a solution to a problem involving the motion of two colliding objects.
- Provide evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects and the distance between them.
- Communicate information to support the claim that digital devices are used to improve our understanding of how waves transmit information.
- Describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.
- Describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.
- Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth. Also include evidence relating to anatomical features of modern and fossil organisms to infer ancestral relationships.
- Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, tides, and seasons.
- Describe the role of gravity in the motion of galaxies and solar system objects.

Home to School Connections

Questions you can ask your learner could include:

- What makes an object's motion change?
- How do we use waves in our daily life?
- What is an example of a trait that is passed down from the parent?
- Why do we have seasons like winter and summer here on Earth?
- What information about objects in the solar system can be gathered by telescopes and spacecraft?

Questions you can ask your learner's teacher could include:

- What labs will be completed in this course?
- How is the learning in this course connected to learning opportunities available in high school and beyond?

Activities and learning you can do outside of the classroom to support your learner could include:

- Observe a variety of bridges and discuss the tension and compression forces of each type. Identify how this leads to increased or decreased stability of the bridge.
- Research electric motors and generators. Provide examples of how we use these to improve our daily lives. Discuss how these work and factors that can affect the speed of the electric motor.
- Compare the weight of a person on Earth versus the weight on other planets. This information can be looked up online, and there are websites that will complete the calculations for you. Talk about the factors that affect the gravitational pull on each of the planets.
- Identify how waves are used in your daily life to transmit information. Examples: fiber optic cables to transmit light pulses, radio wave pulses in Wi-Fi devices and conversion of stored binary patterns to make sound or text on a computer screen.
- Identify local environmental conditions such as the availability of food, light, space, and water. Explain how

drought or flooding affects plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, and fish growing larger in large ponds than they do in small ponds.

- Polydactyly is when an animal is born with one or more extra digits (fingers or toes). This is a dominant trait that can occur due to a mutation or passed down from a parent. Look up information on Hemingway's polydactyl cats to gather further information on how the polydactyl trait is passed down through genes.
- Explore the trees in your neighborhood. Look at leaf shape, leaf arrangement, fruits, and flowers. Group the different trees based on relatedness. Related trees are similar because they share traits from a common ancestor.
- Observe the movement of the sun and moon over the course of several days, then predict their future movement.
- Observe the motion of tides in person or by watching a video. Explain how the Earth-Sun-Moon system causes tides.

Resources

- Biology4Kids (<http://biology4kids.com/>)
- Chem4Kids (<http://www.chem4kids.com>)
- CK-12 Foundation (<https://www.ck12.org/student/>)
- Discus (<https://www.scdiscus.org/>)
- Geography4Kids (<http://www.geography4kids.com/>)
- Khan Academy (<https://www.khanacademy.org/>)
- PBS LearningMedia (<https://scetv.pbslearningmedia.org/>)
- Physics4Kids (<http://physics4kids.com/>)
- SC Department of Natural Resources (<https://www.dnr.sc.gov/>)
- The Weather Channel (<https://weather.com/>)