|  |
| --- |
| **Science – Grade 8 Physical Science** |
| **SC.8.1 Forces and Interactions** | **Access Points** |
| **Standard / Indicator** | **Extension** |
| SC.8.1.1 Gather, analyze, and communicate evidence of forces and interactions. |   | **A** | **B** | **C** |
| SC.8.1.1.A Apply Newton’s Third Law to design a solutionto a problem involving the motion of two colliding objects.Assessment is limited to vertical or horizontal interactions in one dimension. | Participate in investigations to describe the cause-and-effect relationship between two colliding objects. | Participate in guided investigations to describe the relative motions (direction and speed) of two colliding objects. | Identify that the speed and/or direction of one object changes when two objects collide.  | Recognize that an object changes direction or speed when a moving object and a stationary object collide.  |
| SC.8.1.1.C Plan an investigationto provide evidence that the change in an object’s motion depends on the sum of the forces on the object and the mass of the object.Assessment is limited to forces and changes in motion in one-dimension in an inertial reference frame and to change in one variable at a time; does not include use of trigonometry. | Participate in investigations to explain that a change in the motion of a stationary object depends on the amount of force applied to the object and the mass of the object. | Participate in a guided investigation to explain that an object with a large mass requires more force to move than an object with a smaller mass. | Identify which object requires the least or most force to make it move when given objects of three different masses (small, medium, large).  | Recognize there is a difference in force to move a small object versus a large object.  |
| SC.8.1.1.D Ask questionsabout data to determine the factors that affect the strength of electrical and magnetic forces.Assessment about questions that require quantitative answers is limited to proportional reasoning and algebraic thinking. | Participate in investigations to describe factors that affect the attraction and/or repulsion of a magnetic or static electric force on an object across a distance.  | Participate in a guided investigation to describe how the pull or push of a magnetic or static electric force can be affected by the strength of the magnet or charge, the type of charge (positive/negative), or the distance between an object and the source of the attraction or repulsion. | Use a model to identify that changing the distance between the source of a magnetic or static electric force and an object affects the strength of the pull or push.  | Recognize that magnets pull on magnetic objects. |
| SC.8.1.1.E Construct and present argumentsusing evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.Assessment does not include Newton’s Law of Gravitation or Kepler’s Laws. | Use evidence to support the claim that each object on Earth is affected by the force of gravity and that the strength of the force is dependent on the object’s mass. | Use evidence to explain that each object on Earth is pulled toward the ground by the force of gravity and that the strength of the pull is dependent on the object’s mass. | Identify which of two objects with different masses experiences a stronger pull from gravity.  | Recognize that dropped objects fall down/toward the ground. |

|  |
| --- |
| **Science – Grade 8 Physical Science** |
| **SC.8.2 Waves and Electromagnetic Radiation** | **Access Points** |
| **Standard / Indicator** | **Extension** |
| SC.8.2.2 Gather, analyze, and communicate evidence of waves and electromagnetic radiation. |   | **A** | **B** | **C** |
| SC.8.2.2.A Use mathematical representationsto describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. Assessment does not include electromagnetic waves and is limited to standard repeating waves. | Use models to investigate the relationship between the amplitude of waves and the amount of energy in waves. | Use models to describe the relationship between the amplitude of waves and the energy of waves. | When given the amplitude of two or more waves, identify the wave that is the largest or has the most energy. | Recognize a wave.  |
| SC.8.2.2.B Develop and use a modelto describe that waves are reflected, absorbed, or transmitted through various materials. Assessment is limited to qualitative applications pertaining to light and mechanical waves. | Participate in investigations to identify when sound or light waves are reflected, absorbed, or transmitted through different materials.  | Participate in a guided investigation to identify whether sound or light waves are reflected, absorbed, or transmitted through different materials.  | When given an object or material, identify whether a sound or light wave is transmitted through or reflected by the object or material. | Recognize when light or sound passes through a material.  |
| SC.8.2.2.C Integrate qualitative scientific and technical informationto support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals. Assessment does not include binary counting. Assessment does not include the specific mechanism of any given device. | Use evidence to support the claim that information can be sent from one place to another using digital or analog signals (waves).  | Use evidence to explain that waves (analog or digital signals) can be used to send information across a distance. | Identify familiar forms of analog or digital communication used to send information across a distance. | Recognize a communication device. |

|  |
| --- |
| **Science – Grade 8 Physical Science** |
| **SC.8.4 Energy** | **Access Points** |
| **Standard / Indicator** | **Extension** |
| SC.8.4.3 Gather, analyze, and communicate evidence of energy. |   | **A** | **B** | **C** |
| SC.8.4.3.A Construct and interpret graphical displays of datato describe the relationships of kinetic energy to the mass of an object and to the speed of an object. | Use data to describe the relationships between kinetic (motion) energy and the mass and speed of an object. | Use data to describe that the speed and mass of a moving object affect the kinetic energy (motion) of the object. | Use data to identify that an object traveling at a greater speed will have more kinetic energy than an object with the same mass traveling at a slower speed.Use data to identify that an object with a greater mass will have more kinetic energy than an object with less mass that is traveling at the same speed.  | Recognize that an object with greater mass or greater speed has more kinetic energy. |
| SC.8.4.3.B Develop a modelto describe that when the arrangement of objects interacting at a distance changes, then different amounts of potential energy are stored in the system. Assessment is limited to two objects and electric, magnetic, and gravitational interactions. | Use data to describe the relationship between potential (stored) energy and the height of an object. | Use data to describe that the amount of potential (stored) energy in a stationary object increases with increasing height and decreases with decreasing height. | Use data to identify which object has more or less potential energy based on its distance from the bottom of a surface. | Recognize that an object has greater potential energy at a greater height. |