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| M. Angileri ♣  12-11-17 | **6th grade science** | | **Lesson Plans: Newton’s Third Law of Motion #1** | | | | |
| NGSS Standard | **MS-PS2-1. DCI:** **PS2.A**  S & E  CCC | | Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects  **Forces and Motion**♣ For any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction  **Asking Questions and Defining Problems**: Asking questions and defining problems in grades 6–8 builds from grades K–5 experiences and progresses to specifying relationships between variables, and clarifying arguments and models  **Systems and System Models**: Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy and matter flows within systems. | | | | |
| Vocabulary: | | **Energy:** The ability to work or cause change.  **Kinetic Energy:** The energy an object has due to its motion. Motion energy that is proportional to the mass of the moving object and grows with the square of its velocity. KE=1/2m x v squared  **Mass:** The amount of matter in an object.  **Motion:** The change in an objects position with respect to time and in comparison to the position of other objects used as a reference points. **Interacting Objects**: Objects that affect one another.  **Newton’s Third Law:** It states that for every action, there is an equal and opposite reaction, often referred to as Newton’s third law of motion  Net Force: The sum of all forces acting on an abject.  **Newton:** Unit of force needed to accelerate a mass of one kilogram at a rate of one meter per second squared.  **System**: a group of related parts that make up a whole; the whole system can do things that the individual parts within the system cannot  **Proportional relationship:** When two values exist in a constant ratio.  **Speed:** The Ratio of change of position with respect to time.  **Mechanical Energy:** Kinetic or potential energy associated with the motion or position of an object. The sum of the potential and kinetic energy in an object.  **Light Energy:** A form of energy that exhibits wave like behavior as it travels through space; part of the electromagnetic spectrum.  **Transfer:**  Moving from one place to another.  **Potential Energy:** Energy that is stored in a system or object.  **Thermal Energy:** Total kinetic energy of the tiny particles that make up matter. The faster the particles move, the warmer the matter becomes.  **Sound Energy**: Form of energy that is made by vibrations and requires a medium ( air, Water, or solids) in order to travel. | | | | | |
|  | | **MONDAY** | | **TUESDAY** | **WEDNESDAY 1/2 day** | **THURSDAY** | **FRIDAY** |
| Content Objective: | | SW Demonstrate comprehension of a what comprises a system by clarifying the related parts that make up a whole. | | SW Demonstrate application of Newton’s Third law by carrying out multiple investigations within their groups. | SW Demonstrate application of Newton’s Third law by carrying out multiple investigations within their groups. | SW Demonstrate Comprehension of Newton’s third law by paraphrasing information from the article into the graphic organizer. | SW Demonstrate application of Newton’s Third law by carrying out multiple investigations within their groups. |
| Language objective | | SW write to discuss elements of a system by answering questions with their group. | | SW write to explain how Newton’s Third law of motion related to the activities using complete sentences. | SW write to explain how Newton’s Third law of motion related to the activities using complete sentences. | SW write to summarize key elements for the article using content specific vocabulary. | SW write to explain how Newton’s Third law of motion related to the activities using complete sentences. |
| **Essential Question:** | | **Why will colliding objects change direction?** | | **Why will colliding objects change direction?** | **Why will colliding objects change direction?** | **Why will colliding objects change direction?** | **Why will colliding objects change direction?** |
| In class today | | Do 1 Activity: What is a system? | | Do 2 Activity: “Action-Reaction” Contact Forces | Do 2 Activity: “Action-Reaction” Contact Forces | STEMScopepedia Read and discuss  Graphic Organizer | Do 3 Activity: “Action-Reaction” Action – at – Distance Forces |
| Learning Target | |  | |  |  |  |  |

**The Verbs:** What should students be doing? **Construct an argument:** Say what you think and why.

**Use an argument:** Make use of what you think. **Present an argument:** Show and tell people about what you think.

**The Nouns**: What key terms are found in the standard? Motion energy: Kinetic energy

Kinetic energy: Energy of motion

Energy: Controls the amount of change that can occur within a system; without enough energy, change cannot occur

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