



SCIENCE PARENT NEWSLETTER

SIXTH GRADE

UNIT 1

PHYSICAL SCIENCE

IN SCHOOL...

Students in Sixth Grade use the middle school standards which develop understanding of four core ideas in the physical sciences. The middle school performance expectations in the Physical Sciences build on the K – 5 ideas and capabilities to allow learners to explain phenomena central to the physical sciences but also to the life sciences and earth and space science.

STUDENTS WILL KNOW...

- Motion and Stability: Forces and Interactions
- Newton's Third Law of Motion
- There are gravitational, electrical, and magnetic forces to explain a variety of phenomena
- Gravitational interactions are always attractive but that electrical and magnetic forces can be both attractive and negative
- Objects can exert forces on each other even though the objects are not in contact, through fields
- The interactions of objects can be explained and predicted using the concept of transfer of energy from one object or system to another
- Total change of energy in any system is always equal to the total energy transferred into or out of the system.
- Objects that are moving have kinetic energy and that objects may also contain stored (potential) energy
- There is a difference between energy and temperature

STUDENTS WILL BE ABLE TO...

- Develop a model to predict and/or describe phenomena
- Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication, and describe how they are supported or not supported by evidence
- Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim.
- Apply scientific ideas or principles to design an object, tool, process or system.
- Construct and interpret graphical displays of data to identify linear and nonlinear relationships.

AT HOME...

ASK YOUR STUDENTS...

- How are energy transformations applied in today's world?
- Why do some objects fall to the ground?
- Why are some objects attracted to each other while others are not?

ENGAGE YOUR STUDENTS...

- Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.
- Newton's third law
- The motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change.
- Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and forces at different scales.
- Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy and matter flows within systems.
- The uses of technologies and any limitations on their use
- Motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed.

IN THE COMMUNITY...

- Watch how a human walks. How does Newton's 3rd laws apply to how a human walks or plays a sport like swimming?
- Think about an everyday machine like a car. How does the car function and how was Newton's 3rd Law applied to the car so that it would function?

STEM Expo

- **Ball Bounce Experiment**
<http://www.metrofamilymagazine.com/July-2012/Simple-Science-Experiments-Newtons-First-Law-of-Motion/>
- **Penny on a card Experiment**
<http://www.metrofamilymagazine.com/July-2012/Simple-Science-Experiments-Newtons-First-Law-of-Motion/>
- **5 Minute Rocket** <http://www.popsci.com/diy/article/2008-08/5-minute-rocket>