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**SUGGESTED**

**INSTRUCTIONAL PLANNING GUIDE**

*for the Mississippi College- and Career-Readiness Standards*

**q SCIENCE**

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| **GRADE 6** |

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**INTRODUCTION**

The unprecedented, nationwide school closures in the spring of 2020 due to the COVID-19 pandemic have created a shift in how districts plan for school re-entry. Instead of the traditional brick-and-mortar planning, administrators are now identifying models that will support a variety of instructional delivery scenarios as they plan for school reopening. The traditional methods of planning and delivery are nearly impossible to implement as a stand-alone model; instead, innovative educators are developing and identifying strategies and resources to support a variety of distance learning scenarios as part of their plans. When using new models of delivery, it is important to recognize that the traditional approach to remediation—providing work better suited for earlier grades—may be insufficient. Instead, the conventional approach to remediation will likely compound the problem educators are trying to correct. According to a 2018 study, ***The Opportunity Myth***[[1]](#footnote-2), the approach of “meeting students where they are”, while often well-intended, only widens the achievement gap. Instead of remediation, teachers and administrators are encouraged to look toward acceleration methods to support student growth and close the gaps.

**PURPOSE**

The purpose of the Suggested Mississippi College- and Career-Readiness Standards Instructional Planning Guide is to provide teachers with an assistive tool for planning units of instruction. This tool will provide suggested standards grouping that should facilitate a coherent and logical delivery of related science concepts. Suggested planning sources and tools are included to assist teachers with curating instructional materials, designing and implementing effective lessons and activities, and building content knowledge and pedagogical practices. This tool encourages instructors to maintain a focus on preparing students to master skills and acquire knowledge at their current grade level.

**DEVELOPMENT**

The following suggested Instructional Planning Guide was developed with a focus on the subsequent key areas, Conceptual Connections, Real-World Connections and Phenomena, Embedded Science and Engineering Practices and Crosscutting Concepts, and Core Vocabulary. The standards are grouped into suggested units based on their underlying conceptual relationships. A list of real-world connections and/or phenomena is associated with each unit group. Their purpose is to give teachers and students researchable opportunities that lead to an in-depth and authentic quest for conceptual understanding. The embedded Science and Engineering Practices (SEPs) and Crosscutting Concepts (CCCs) are extracted from the grouped performance objectives and should encourage students to act and think like scientists. The included list of SEPs and CCCs does not indicate that other SEPs and CCCs are not relevant to the respective standard and performance objectives. Core vocabulary terms are included to emphasize terminology that is essential to the conceptual understandings captured in the standards and performance objectives. It is suggested that instructors pace themselves based on student assessment performance and demonstration of skills mastery and knowledge comprehension.

**RESOURCES for CONSIDERATION**

The resources listed below may be referenced to support classroom teachers in the development of lesson plans and instruction at the local level.   This list is not meant to be exhaustive, rather it represents consultative resources that align with the Units/Themes provided in the Instructional Planning Guides.   Educators are encouraged to use these resources in addition to those curriculum materials that meet the needs of the students they serve.

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| **High-Quality****Instructional Material** **(HQIM)** | **Planning and Instruction Resources** | **Assessment** **Resources** | **Professional Development** **Resources** |
| * [Adopted Science Texts](https://mdek12.org/OEER/Caravan)
* [STEM Teaching Tools](http://stemteachingtools.org/)
 | * [5 E Science Instructional Model](http://nextgenerationscience.weebly.com/5-es-of-science-instruction.html)
* [The Concord Consortium](https://concord.org/ngss/)
* [PBS Learning Media](https://mpb.pbslearningmedia.org/standards/0/)
* [Teacher Tube](https://www.teachertube.com/)
* [Next Generation Science Standards](https://www.nextgenscience.org/)
* [Phenomena for Next Generation Science](https://www.ngssphenomena.com/)
* [Khan Academy](https://www.khanacademy.org/)
* [OpenSciEd](https://www.openscied.org/)
* [Science Buddies](https://www.sciencebuddies.org/)
* [PhET Interactive Simulations](https://phet.colorado.edu/)
* [Phenomenal GRC Lessons](https://sites.google.com/3d-grcscience.org/going3d/home?authuser=0)
 | * [MS MAAP Program](https://mdek12.org/OSA/MAAP)
* [MS MAAP-A Program](https://mdek12.org/OSA/SP/MAAP-A)
* [Access for All Guidance](https://mdek12.org/sites/default/files/documents/OAE/OAE/2019-access-for-all-guide.pdf)
* [Problem-Attic](https://www.problem-attic.com/)
* [EDInformatics](https://www.edinformatics.com/testing/testing.htm)
* [STEM Teaching Tools for Assessments](http://stemteachingtools.org/tgs/Assessment)
* [Next Generation Science Assessment](http://nextgenscienceassessment.org/) (Middle Focus)
 | * [MDE Professional Development](https://www.mdek12.org/OPD/home)
* [The Teaching Channel](https://www.teachingchannel.com/)
* [California Academy of Sciences](https://www.calacademy.org/)
* [Teacher Tube](https://www.teachertube.com/)
* [Knowles Teacher Short Courses](https://knowlesteachers.org/knowles-academy/short-courses)
* [STEM Teaching Tools OER PD](http://stemteachingtools.org/pd)
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| **GRADE 6 SCIENCE****THEME: Structure and Function** |
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| **UNIT OF STUDY**(REAL-WORLD CONNECTIONS and PHENOMENA)**q** | **SCIENCE FOUNDATION STANDARDSq** | **SCIENCE AND ENGINEERING PRACTICES SCIENCE CROSSCUTTING CONCEPTS** **q** | **VOCABULARY TERMS**CORE ACADEMIC **q** |
| **COURSE INTRODUCTION**Grade 6 students need concrete opportunities to engage with natural phenomena. The integration of Earth and space, life, and physical sciences gives students many opportunities to explore the relationship of structure and function in the world around them. By analyzing the macro- and microscopic world, the role of cells in life functions, the interdependence in ecosystems, the diversity of life on Earth, the relationshipbetween force and motion, and the organization and interactions of objects in the universe, Grade 6 students can make claims and provide evidence about structure-function relationships in different scientific domains. | **FOUNDATION STANDARDS*** Identify and select appropriate science and engineering tools to collect, analyze, and communicate science and engineering data and information.
* Demonstrate effective questioning and observation skills
* Communicate science and engineering data using appropriate SI units of measurement
* Identify and discuss science and engineering practices
* Identify and discuss Crosscutting Concepts
 | **SCIENCE and ENGINEERING PRACTICES*** Ask Question and Define Problems
* Develop and Use Models
* Analyze and Interpret Data
* Plan and Conduct Investigations
* Use Mathematical and Computational Thinking
* Engage in Scientific Argument from Evidence
* Construct Explanations and Design Solutions
* Obtain, Evaluate, and Communicate Information

**SCIENCE CROSSCUTTING CONCEPTS*** Patterns
* Cause and Effect *(Mechanism and Explanation)*
* Scale, Proportion, and Quantity
* Systems and System Models
* Energy and Matter *(Flows, Cycles, Conservation)*
* Structure and Function
* Stability and Change
 | Argument ChangeConcepts DataDependent Variable Engineering Evaluate Evidence Gram Independent Variable InterpretInvestigationLiter Meter Observation Patterns QuantityScience  SI Units of Measurement Stability  |

| **TERM 1** |
| --- |
| **UNIT OF STUDY**(REAL-WORLD CONNECTIONS and PHENOMENA)**q** | **MS CCR STANDARDSq** | **SCIENCE AND ENGINEERING PRACTICES SCIENCE CROSSCUTTING CONCEPTS** **q** | **VOCABULARY TERMS**CORE ACADEMIC **q** |
| **HIERARCHIAL ORGANIZATION:****Cell Theory****REAL-WORLD CONNECTIONS and PHENOMENA*** Research and discuss differences between viruses and bacteria.
* Research and discuss the impact of ribosomal mutations on the emergence of drug resistant bacteria.
 | **L.6.1 Students will demonstrate an understanding that living things range from simple to complex organisms, are organized hierarchically, and function as whole living systems**. **L.6.1.1** Use argument supported by evidence to distinguish between living and non-living things, including viruses and bacteria. **L.6.1.2** Obtain and communicate evidence to support the cell theory. **L.6.1.3** Develop and use models to explain how specific cellular components (cellular organelles) function together to support the life of prokaryotic and eukaryotic organisms to include plants, animals, fungi, protists, and bacteria (not to include biochemical function of cells or cell part). | **EMBEDDED SCIENCE and ENGINEERING PRACTICES*** Ask Questions and Define Problems
* Develop and Use Models
* Engage in Scientific Argument from Evidence

**EMBEDDED CROSSCUTTING CONCEPTS*** Structure and Function
* Scale, Proportion, Quantity
* System and System Models
* Cause and Effect
 | BacteriaCell MembraneCell WallChloroplastEndoplasmic ReticulumEukaryoteGolgi BodiesMitochondriaProkaryoteRibosomesVacuoleViruses |
| **HIERARCHIAL ORGANIZATION:****Cellular Differentiation****REAL-WORLD CONNECTIONS and PHENOMENA*** Examine and discuss the roles of unicellular organisms in the bread and alcohol industry.
* Evaluate information concerning ethical concerns of stem-cell applications.
 | **L.6.1 Students will demonstrate an understanding that living things range from simple to complex organisms, are organized hierarchically, and function as whole living systems**. **L.6.1.4** Compare and contrast different cells to classify them as a protist, fungus, plant, or animal. **L.6.1.5** Provide evidence that organisms are unicellular or multicellular. **L.6.1.6** Develop and use models to show relationships among the increasing complexity of multicellular organisms (cells, tissues, organs, organ systems, organisms) and how they serve the needs of the organism. | **EMBEDDED SCIENCE and ENGINEERING PRACTICES*** Ask Questions and Define Problems
* Develop and Use Models
* Engage in Scientific Argument from Evidence
* Construct Explanations and Design Solutions

**EMBEDDED CROSSCUTTING CONCEPTS*** Structure and Function
* Scale, Proportion, Quantity
* System and System Models
* Cause and Effect
 | ProtistFungusUnicellularMulti-CellularOrganismTissueOrgan System |
| **ECOLOGY and INTERDEPENDENCE: Characteristics of Ecosystems****REAL-WORLD CONNECTIOINs and PHENOMENA*** Discuss the impact of changing climates on ecosystems and the survival of organisms.
* Research and discuss how the introduction of a new species into an ecosystem changes the dynamic of that ecosystem.
 | **L.6.3** **Students will demonstrate an understanding of the relationships among survival, environmental changes, and diversity as they relate to the interactions of organisms, populations, and the environment.** **L.6.3.1** Use scientific reasoning to explain differences between biotic and abiotic factors that demonstrate what living organisms need to survive. **L.6.3.2** Develop and use models to describe the levels of organization within ecosystems (species, populations, communities, ecosystems, and biomes).  | **EMBEDDED SCIENCE and ENGINEERING PRACTICES*** Ask Questions and Define Problems
* Analyze and Interpret Data
* Develop and Use Models
* Plan and Conduct Investigations
* Engage in Scientific Argument from Evidence
* Conduct Explanations and Design Solutions

**EMBEDDED CROSSCUTTING CONCEPTS*** Cause and Effect
* Scale, Proportion, and Quantity
* Systems and System Models
* Stability and Change
 | AbioticBiomeBiosphereBioticCommunityDeforestationDiversityEcosystemLimiting Factor*Long-Term Environmental Change*Population*Short-Term Environmental Change*Species |

| **TERM 2** |
| --- |
| **UNIT OF STUDY**(REAL-WORLD CONNECTIONS and PHENOMENA)**q** | **MS CCR STANDARDSq** | **SCIENCE AND ENGINEERING PRACTICES SCIENCE CROSSCUTTING CONCEPTS** **q** | **VOCABULARY TERMS**CORE ACADEMIC **q** |
| **ECOLOGY and INTERDEPENDENCE: Environmental Interactions****Real World Connections*** Research and discuss the benefits and consequences of volcanic eruptions to a local ecosystem.
* Research and discuss parasites in the MS River ecosystem.
 | **L.6.3** **Students will demonstrate an understanding of the relationships among survival, environmental changes, and diversity as they relate to the interactions of organisms, populations, and the environment.****L.6.3.3** Analyze cause and effect relationships to explore how changes in the physical environment (limiting factors, natural disasters) can lead to population changes within an ecosystem. **L.6.3.4** Investigate organism interactions in a competitive or mutually beneficial relationship (predation, competition, cooperation, or symbiotic relationships). **L.6.3.5** Develop and use food chains, webs, and pyramids to analyze how energy is transferred through an ecosystem from producers (autotrophs) to consumers (heterotrophs, including humans) to decomposers. | **EMBEDDED SCIENCE and ENGINEERING PRACTICES*** Ask Questions and Define Problems
* Analyze and Interpret Data
* Cause and Effect”
* Energy and Matter: Flows
* Plan and Conduct Investigations
* Engage in Scientific Argument from Evidence

**EMBEDDED CROSSCUTTING CONCEPTS*** Cause and Effect
* Scale, Proportion, and Quantity
* Systems and System Models
* Stability and Change
 | AutotrophCommensalism CompetitionDecomposerEnergy PyramidHeterotrophLimiting FactorsMutualismMutually BeneficialParasitismPredationTertiary ConsumerTrophic Level |
| **ADAPTATION and DIVERSITY: Classification of Organisms****Real World Connections*** Using a plant detecting app such as *PlantSnap*, research various species of plants in local communities.
* Use an animal detecting app such as *iNaturalist* to identify various species of animals in local communities.
 | **L.6.4 Students will demonstrate an understanding of classification tools and models such as dichotomous keys to classify representative organisms based on the characteristics of the kingdoms: Archaebacteria, Eubacteria, Protists, Fungi, Plants, and Animals.****L.6.4.1** Compare and contrast modern classification techniques (e.g., analyzing genetic material) to the historical practices used by scientists such as Aristotle and Carolus Linnaeus.**L.6.4.2** Use classification methods to explore the diversity of organisms in kingdoms (animals, plants, fungi, protists, bacteria). Support claims that organisms have shared structural and behavioral characteristics.**L.6.4.3** Analyze and interpret data from observations to describe how fungi obtain energy and respond to stimuli (e.g., bread mold, rotting plant material). | **EMBEDDED SCIENCE and ENGINEERING PRACTICES*** Ask Questions and Define Problems
* Analyze and Interpret Data
* Develop and Use Models
* Plan and Conduct Investigations
* Engage in Scientific Argument from Evidence

**EMBEDDED CROSSCUTTING CONCEPTS*** Cause and Effect
* Scale, Proportion, and Quantity
* Systems and System Models
* Stability and Change
 | AdaptationArchaebacteriaDichotomous KeyDiversity EubacteriaKingdom AnimaliaKingdom ArchaeaKingdom BacteriaKingdom FungiKingdom PlantaeKingdom ProtistaKingdom SystemKingdomsStimuliTaxonomy |
| **ADAPTATION and DIVERSITY:** **Environmental Interactions****Real World Connections*** Research and explore good bacteria such as probiotics and discuss their benefits to humans.
* Research and discuss national responses to pandemics due to an outbreak of viral infections.
 | **L.6.4 Students will demonstrate an understanding of classification tools and models such as dichotomous keys to classify representative organisms based on the characteristics of the kingdoms: Archaebacteria, Eubacteria, Protists, Fungi, Plants, and Animals.****L.6.4.4** Conduct investigations using a microscope or multimedia source to compare the characteristics of protists (euglena, paramecium, amoeba) and the methods they use to obtain energy and move through their environment (e.g., pond water).**L.6.4.5** Engage in scientific arguments to support claims that bacteria (Archaebacteria and Eubacteria) and viruses can be both helpful and harmful to other organisms and the environment. | **EMBEDDED SCIENCE and ENGINEERING PRACTICES*** Ask Questions
* Plan and Conduct Investigations
* Construct Explanations
* Engage in Scientific Arguments from Evidence

**EMBEDDED CROSSCUTTING CONCEPTS*** Cause and Effect
* Energy and Matter
* Structure and Function
 | ArchaebacteriaBacteriaDomain EukaryaEubacteriaEuglenaFungiKingdom SystemKingdomsMulticellular OrganismParameciumProtistTaxonomyUnicellular Organism |

| **TERM 3** |
| --- |
| **UNIT OF STUDY**(REAL-WORLD CONNECTIONS and PHENOMENA)**q** | **MS CCR STANDARDSq** | **SCIENCE AND ENGINEERING PRACTICES SCIENCE CROSSCUTTING CONCEPTS** **q** | **VOCABULARY TERMS**CORE ACADEMIC **q** |
| **EARTH and UNIVERSE:****System Formation and Structure****REAL-WORLD CONNECTIONS and PHENOMENA*** Research how the Earth’s orbit compares to other orbiting planets in our solar system.
* Research theories of the origins of the moon and its importance Earth.
 | **E.6.8** **Students will demonstrate an understanding of Earth’s place in the universe and the interactions of the solar system (sun, planets, their moons, comets, and asteroids)using evidence from multiple scientific resources to explain how these objects are held in orbit around the Sun because of its gravitational pull.****E.6.8.1** Obtain, evaluate, and summarize past and present theories and evidence to explain the formation and composition of the universe.**E.6.8.2** Use graphical displays or models to explain the hierarchical structure (stars, galaxies, galactic clusters) of the universe. | **EMBEDDED SCIENCE and ENGINEERING PRACTICES*** Ask Questions and Define Problems
* Analyze and Interpret Data
* Develop and Use Models
* Engage in Scientific Argument from Evidence
* Obtain, Evaluate, and Communicate Information

**EMBEDDED CROSSCUTTING CONCEPTS*** Cause and Effect
* Scale, Proportion, and Quantity
* Systems and System Models
* Stability and Change
 | AsteroidsCometGalaxyGravitational PullGravityMoonOrbitPlanetRelative PositionSolar SystemStarSunUniverse |
| **EARTH and UNIVERSE:****System Characteristics and Behaviors****REAL-WORLD CONNECTIONS and PHENOMENA*** Discuss how the use of high-powered telescopes have changed our view of space.
* Research tools used to predict phenomena such as the appearance of comets and lunar and solar eclipses.
 | **E.6.8** **Students will demonstrate an understanding of Earth’s place in the universe and the interactions of the solar system (sun, planets, their moons, comets, and asteroids)using evidence from multiple scientific resources to explain how these objects are held in orbit around the Sun because of its gravitational pull.****E.6.8.3** Evaluate modern techniques used to explore our solar system’s position in the universe.**E.6.8.4** Obtain and evaluate information to model and compare the characteristics and movements of objects in the solar system (including planets, moons, asteroids, comets, and meteors).**E.6.8.5** Construct explanations for how gravity affects the motion of objects in the solar system and tides on Earth | **EMBEDDED SCIENCE and ENGINEERING PRACTICES*** Ask Questions and Define Problems
* Analyze and Interpret Data
* Develop and Use Models
* Plan and Conduct Investigations
* Engage in Scientific Argument from Evidence
* Construct Explanations and Design Solutions
* Obtain, Evaluate, and Communicate Information

**EMBEDDED CROSSCUTTING CONCEPTS*** Cause and Effect
* Structure and Function
* Systems and System Models
* Stability and Change
 | Asteroid BeltCelestial ObjectsInner PlanetMeteorOrbital PathOuter Planet |
| **EARTH and UNIVERSE:****System Interactions****REAL-WORLD CONNECTIONS and PHENOMENA*** Research and discuss the role the moon plays in ocean tides in terms of gravitational forces.
* Explore various characteristics of Earth and space using mobile apps such as Google Earth.
 | **E.6.8** **Students will demonstrate an understanding of Earth’s place in the universe and the interactions of the solar system (sun, planets, their moons, comets, and asteroids)using evidence from multiple scientific resources to explain how these objects are held in orbit around the Sun because of its gravitational pull.****E.6.8.5** Construct explanations for how gravity affects the motion of objects in the solar system and tides on Earth.**E.6.8.6** Design models representing motions within the Sun-Earth-Moon system to explain phenomena observed from the Earth’s surface (positions of celestial bodies, day and year, moon phases, solar and lunar eclipses, and tides).**E.6.8.7** Analyze and interpret data from the surface features of the Sun (e.g., photosphere, corona, sunspots, prominences, and solar flares) to predict how these features may affect Earth. | **EMBEDDED SCIENCE and ENGINEERING PRACTICES*** Ask Questions and Define Problems
* Analyze and Interpret Data
* Develop and Use Models
* Plan and Conduct Investigations
* Engage in Scientific Argument from Evidence
* Construct Explanations and Design Solutions

**EMBEDDED CROSSCUTTING CONCEPTS*** Cause and Effect
* Structure and Function
* Systems and System Model
* Stability and Change
 | High TideLow TideLunar CycleLunar EclipseNeap TidesSolar EclipseSpring TidesTides |

| **TERM 4** |
| --- |
| **UNIT OF STUDY**(REAL-WORLD CONNECTIONS and PHENOMENA)**q** | **MS CCR STANDARDSq** | **SCIENCE AND ENGINEERING PRACTICES SCIENCE CROSSCUTTING CONCEPTS** **q** | **VOCABULARY TERMS**CORE ACADEMIC **q** |
| **MOTIONS FORCES and ENERGY:****Newton’s Laws of Motion** **REAL-WORLD CONNECTIONS and PHENOMENA*** Using various media, observe an automobile accident and identify all forces involved in that system.
* Research how tires are designed to resist rapid breakdown due to friction.
 | **P.6.6 Students will demonstrate an understanding of Newton’s laws of motion using real-world models and examples.****P.6.6.2** Use mathematical computation and diagrams to calculate the sum of forces acting on various objects.**P.6.6.3** Investigate and communicate ways to manipulate applied/frictional forces to improve movement of objects on various surfaces (e.g., athletic shoes, wheels on cars).**P.6.6.1** Use an engineering design process to create or improve safety devices (e.g., seat belts, car seats, helmets) by applying Newton’s Laws of motion. Use an engineering design process to define the problem, design, construct, evaluate, and improve the safety device. \* **All SEPs and CCCs are applicable.** | **EMBEDDED SCIENCE and ENGINEERING PRACTICES*** Ask Question and Define Problems
* Plan and Conduct Investigations
* Use Mathematical and Computational Thinking
* Construct Explanations and Design Solutions
* Obtain, Evaluate, and Communicate Information

**EMBEDDED CROSSCUTTING CONCEPTS*** Cause and Effect
* Scale, Proportion, and Quantity
* System and System Models
* Energy and Matter *(Flows, Cycles, Conservation)*
* Stability and Change
 | Balance ForcesCollide/Collision ForceFrictionInertiaMotionNewton's Law of Action-ReactionNewton's Law of Force & AccelerationNewton's Law of InertiaReactionUnbalanced Forces |
| **MOTIONS FORCES and ENERGY:****Investigating Forces** **REAL-WORLD CONNECTIONS and PHENOMENA*** Research and discuss forces involved in successful and efficient aircraft operation.
* Research and discuss how advancements in helmet construction protect humans from potentially harmful forces.
 | **P.6.6 Students will demonstrate an understanding of Newton’s laws of motion using real-world models and examples.****P.6.6.4** Compare and contrast magnetic, electric, frictional, and gravitational forces.**P.6.6.5** Conduct investigations to predict and explain the motion of an object according to its position, direction, speed, and acceleration.**P.6.6.6** Investigate forces (gravity, friction, drag, lift, thrust) acting on objects (e.g., airplane, bicycle helmets). Use data to explain the differences between the forces in various environments. | **EMBEDDED SCIENCE and ENGINEERING PRACTICES*** Ask Question and Define Problems
* Plan and Conduct Investigations
* Analyze and Interpret Data
* Use Mathematical and Computational Thinking
* Construct Explanations and Design Solutions

**EMBEDDED CROSSCUTTING CONCEPTS*** Patterns
* Cause and Effect
* System and System Models
* Energy and Matter *(Flows, Cycles, Conservation)*
* Stability and Change
 | AccelerationDistanceDragElectrical ForceFrictionGravitational ForceInvestigateLift Magnetic ForceMagnetic AttractionNet ForceSpeedThrust |
| **MOTIONS FORCES and ENERGY:****Types of Energy****REAL-WORLD CONNECTIONS and PHENOMENA*** Discuss how amusement park ride creators manipulate the concepts of energy to design various thrill rides.
* Research and discuss the importance of proper thermal energy distribution in the design of cookware.
 | **P.6.6 Students will demonstrate an understanding of Newton’s laws of motion using real-world models and examples.****P.6.6.7** Determine the relationships between the concepts of potential, kinetic, and thermal energy. | **EMBEDDED SCIENCE and ENGINEERING PRACTICES*** Develop and Use Models
* Plan and Conduct Investigations
* Use Mathematical and Computational Thinking
* Construct Explanations and Design Solutions

**EMBEDDED CROSSCUTTING CONCEPTS*** Patterns
* Cause and Effect
* System and System Models
* Energy and Matter *(Flows, Cycles, Conservation)*
 | EnergyPotential EnergyKinetic EnergyThermal EnergyMechanical Energy |

1. https://tntp.org/assets/documents/TNTP\_The-Opportunity-Myth\_Web.pdf [↑](#footnote-ref-2)