Grade 6 Integrated Science

**Please note, this document does not represent the total number of science activities that constitute a Learning Period. Instead, you may find these activities and worksheets helpful in introducing a topic or assessing your child's understanding and mastery of the corresponding concepts or "I Can" Statements.

LP 1 Integrated Science Standards: Life Science

- **MS-LS1-1:** I can provide evidence that living things are made of cells. I can show that some things are made of one cell while others are made of many different numbers and types of cells.
- **MS-LS1-2:** I can construct a model of a cell that shows how all of the parts work together to help the cell function.

Activity	Standard(s) Covered
• View the Generation Genius Video: Multicellular Organisms • Complete the Discussion Questions: before video and after-video discussion questions with your leaning coach. • Complete this assignment: **Cell Differentiation Reading & Questions**	• **MS-LS1-1:** I can provide evidence that living things are made of cells. I can show that some things are made of one cell while others are made of many different numbers and types of cells.
• Choose (1) - build a model of either an animal cell or plant cell • ANIMAL CELL • PLANT CELL	• **MS-LS1-2:** I can construct a model of a cell that shows how all of the parts work together to help the cell function.

LP 2 Integrated Science Standards: Life Science

- **MS-LS1-3:** I can describe the body as a system. I can explain the subsystems that work together so that the body can function. I can discuss the relationships between cells, tissues, and organs.

- **MS-LS1-4:** I can explain how some animal behaviors help them to successfully reproduce. I can explain how some plant structures allow plants to successfully reproduce. I can back up my explanations with facts.

Activity	Standard(s) Covered
• View the video "Multicellular Organisms" from Generation Genius • Complete the Discussion Questions: before video and after-video questions with your learning coach. • Complete: Human Body Systems Review Sheet • Complete this assignment: **Nervous System Reading & Questions**	• **MS-LS1-3:** I can describe the body as a system. I can explain the subsystems that work together so that the body can function. I can discuss the relationships between cells, tissues, and organs.
• Complete this activity to build a model of a flower for a specific pollinator A Flower for Every Pollinator	• **MS-LS1-4:** I can explain how some animal behaviors help them to successfully reproduce. I can explain how some plant structures allow plants to successfully reproduce. I can back up my explanations with facts.

LP 3 Integrated Science Standards: Life Science

- **MS-LS1-5:** I can explain how environmental factors affect the growth of organisms. I can explain how genetic factors affect the growth of organisms. I can back up my explanations with facts.
- **MS-LS1-8:** I can demonstrate how our senses answer to stimuli by sending messages to the brain causing quick reactions or storage as memories.
- **MS-LS3-2:** I can explain why asexual reproduction results in offspring with identical genetic information. I can explain why sexual reproduction results in offspring with genetic variation. I can support my explanations with models.

Activity	Standard(s) Covered
• Read about environmental factors affecting plant growth. • Watch this video • Complete this worksheet	• **MS-LS1-5:** I can explain how environmental factors affect the growth of organisms. I can

	explain how genetic factors affect the growth of organisms. I can back up my explanations with facts.
• Refer to this link and look over the discussion questions prior to watching the video and then complete the Discussion questions on your own before looking at the answers. Refer to the reading material, the DIY lesson activity and compete this worksheet. assessment/quiz. Exit Ticket: See if you can answer the three exit ticket questions.	• **MS-LS1-8:** I can demonstrate how our senses answer to stimuli by sending messages to the brain causing quick reactions or storage as memories.
• Mendel's experiments in genetics • Pea Plants • Gregor Mendel: Great Minds	• **MS-LS3-2:** I can create models (Punnett squares, diagrams, etc.) to explain why asexual reproduction results in offspring with identical genetic information. I can explain why sexual reproduction results in offspring with genetic variation. I can support my explanations with models.
• Medel's Laws and what it means to be dominant • The law of segregation • Example cross • Mendel's Laws • VIDEO - Heredity: Crash Course Biology #9	• **MS-LS3-2:** I can create models (Punnett squares, diagrams, etc.) to explain why asexual reproduction results in offspring with identical genetic information. I can explain why sexual reproduction results in offspring with genetic variation. I can support my explanations with models.
• Probability and Punnett Squares • Genetics • Dominant traits • Punnett Squares • VIDEO - Gregor Mendel's Punnett Squares Punnett Square Worksheet	• **MS-LS3-2:** I can create models (Punnett squares, diagrams, etc.) to explain why asexual reproduction results in offspring with identical genetic information. I can explain why sexual reproduction results in

	offspring with genetic variation. I can support my explanations with models.
• What is DNA • Nucleotides • Genetic Code • Chromosomes • Base-Pairing • Messenger RNA • DNA • VIDEO - DNA Structure and Function • DNA Structure and Replication • VIDEO - DNA Replication • RNA • VIDEO - Three Types of RNA	• **MS-LS3-2:** I can create models (Punnett squares, diagrams, etc.) to explain why asexual reproduction results in offspring with identical genetic information. I can explain why sexual reproduction results in offspring with genetic variation. I can support my explanations with models.
• Building proteins • Protein synthesis • Gene expression • Protein Synthesis • VIDEO - Protein Synthesis	• **MS-LS3-2:** I can create models (Punnett squares, diagrams, etc.) to explain why asexual reproduction results in offspring with identical genetic information. I can explain why sexual reproduction results in offspring with genetic variation. I can support my explanations with models.
• Transcription • Constructing mRNA molecules from DNA • Transcription • VIDEO - Transcription and Translation • How cells translate a message • Translation • VIDEO - Translation Made Easy	• **MS-LS3-2:** I can create models (Punnett squares, diagrams, etc.) to explain why asexual reproduction results in offspring with identical genetic information. I can explain why sexual reproduction results in offspring with genetic variation. I can support my explanations with models.
• Mutations • Permanent changes in the sequence of DNA • Point mutations • Chromosomal mutations • Causes of mutations	• **MS-LS3-2:** I can create models (Punnett squares, diagrams, etc.) to explain why asexual reproduction results in offspring

• Mutation • VIDEO - Mutations: The Potential Power of a Small Change	with identical genetic information. I can explain why sexual reproduction results in offspring with genetic variation. I can support my explanations with models.
• Review this lesson, which addresses two standards. Refer to this video link and look over the discussion questions on Generation Genius prior to watching this video. Refer to the reading material, the DIY lesson activity, and finally take the assessment/quiz. Exit Ticket: See if you can answer the three exit ticket questions. **Exit Ticket** Level 1: What is a mutation? Level 2: Can mutations be good, bad or have no effect? Explain. Level 3: What activities could increase your chances of having mutations in your body.	• **MS-LS3-2:** I can create models (Punnett squares, diagrams, etc.) to explain why asexual reproduction results in offspring with identical genetic information. I can explain why sexual reproduction results in offspring with genetic variation. I can support my explanations with models.

LP 4 Integrated Science Standards: Earth & Space Science

- **MS-ESS2-4:** I can describe the water cycle. I can explain the role of the energy from the sun and the force of gravity in the water cycle.
- **MS-ESS2-5:** I can describe how the movement of air masses from region to region causes weather. I can describe how sudden weather can occur when different air masses collide.
- **MS-ESS2-6:** I can use a model to demonstrate how the heating and rotation of Earth contribute to patterns that determine climates in different areas. I can describe the Coriolis effect.

Activity	Standard(s) Covered
• Water Cycle, Energy and Forces-worksheet • The Water Cycle educational video • Making Clouds: How to make a water cycle model	• **MS-ESS2-4:** I can describe the water cycle. I can explain the role of the energy from the sun and the force of gravity in the water cycle.

• Brainpop lesson	• **MS-ESS2-5:** I can describe how the movement of air masses from region to region causes weather. I can describe how sudden weather can occur when different air masses collide
• What is a climate model?	• **MS-ESS2-6:** I can use a model to demonstrate how the heating and rotation of Earth contribute to patterns that determine climates in different areas.
• The Coriolis Effect • **Demonstrate your learning: choose 1 or both of the following:** • 1. Hands-on Coriolis effect activity. If you choose this hands-on activity, be ready to discuss your observations with your HST at your next LP meeting. • 2. “Coriolis Effect”isWork Sample: Write a paragraph or a list of 5 facts, about what it is and how it affects weather and/or what you learned.	• **MS-ESS2-6:** I can describe the Coriolis effect.

LP 5 Integrated Science Standards: Earth & Space Science

- **MS-ESS3-3:** I can describe the impact that humans have on the environment. I can brainstorm ways that humans can limit water usage, land usage, and pollution. I can determine if these solutions are reasonable.
- **MS-ESS3-5:** I can discuss the different factors that have caused a rise in global temperatures over the past century.

Activity	Standard(s) Covered

Reading - Human Impacts on the Earth Human Impacts Lesson and Activity - Generation Genius Watch Human Impacts on the Environment - Generation Genius	• **MS-ESS3-3:** I can describe the impact that humans have on the environment. I can brainstorm ways that humans can limit water usage, land usage, and pollution. I can determine if these solutions are reasonable.
Watch Climate Change Video Complete Carbon Dioxide Worksheet	• **MS-ESS3-5:** I can discuss the different factors that have caused a rise in global temperatures over the past century.

LP 6 Integrated Science Standards: Physical Science

- **MS-PS3-3:** I can design, construct, and test a device that will either minimize or maximize thermal energy transfer.
- **MS-PS3-4:** I can conduct experiments to find out more about the relationships among energy transfer, matter, mass, and kinetic energy of the particles as measured by the temperature of the sample.
- **MS-PS3-5:** I can develop and present arguments to demonstrate that when the kinetic energy of an object changes, energy is transferred to or from the object.

Activity	**Standard(s) Covered**
Complete the Heat Transfer Thermal Energy Activity.	• **MS-PS3-3:** I can design, construct, and test a device that will either minimize or maximize thermal energy transfer.
Complete the Modeling Convection Activity	• **MS-PS3-3:** I can design, construct, and test a device that will either minimize or maximize thermal energy transfer.

Follow the Lesson Plan outlined in the Generation Genius PDF covering the topic of transferring thermal energy.	• **MS-PS3-4:** I can conduct experiments to find out more about the relationships among energy transfer, matter, mass, and kinetic energy of the particles as measured by the temperature of the sample.
Watch the video about Energy Transfer and complete the Energy Transfer Simulation Activity.	• **MS-PS3-5:** I can develop and present arguments to demonstrate that when the kinetic energy of an object changes, energy is transferred to or from the object.
Watch and complete the Temperature, Thermal Energy and Particle Motion video. Then complete a write up explaining the stages in the video.	• **MS-PS3-5:** I can develop and present arguments to demonstrate that when the kinetic energy of an object changes, energy is transferred to or from the object.

LP 7 Integrated Science Standards: Engineering Design

- **MS-ETS1-1:** I can develop a successful solution to a design problem using scientific principles. I can compare the pros and cons of my solution in order to determine if it is reasonable.
- **MS-ETS1-2:** I can test my design solutions to determine whether or not they will solve the problem.

Activity	**Standard(s) Covered**
Engineering Design Challenge: A Satellite to See Inside the Earth	• **MS-ETS1-1**
Engineering Design Challenge: Stop A Landslide!	• **MS-ETS1-1**

Engineering Design Challenge: Build a Model of a Hydroelectric Turbine	• **MS-ETS1-1**, **MS-ETS1-2:**

LP 8 Integrated Science Standards: Engineering Design

- **MS-ETS1-3:** I can use the data gathered from tests to determine which design solution will best solve the problem.
- **MS-ETS1-4:** Develop a model of the design that can be tested and modified to create a successful prototype.

Activity	**Standard(s) Covered**
• Science News Explores: Engineering Design: Students can choose a variety of articles to read and write a response to show the best solutions.	• **MS-ETS1-3:** I can use the data gathered from tests to determine which design solution will best solve the problem.
• Balance: The Ears Have It Lesson Plan that includes a teacher guide	• **MS-ETS1-3:** I can use the data gathered from tests to determine which design solution will best solve the problem.
• Engineering for Good PDF: Includes a pdf that guides students in an activity to make a marshmallow tower. Then students answer a series of questions that discuss ways to improve their design.	• **MS-ETS1-4:** Develop a model of the design that can be tested and modified to create a successful prototype.
• Balloon Car Engineering Design: Students will design, create a prototype, and conduct iterative testing to design and improve a balloon car	• **MS-ETS1-3:** I can use the data gathered from tests to determine which design solution will best solve the problem. • **MS-ETS1-4:** Develop a model of the design that can be tested and modified to create a successful prototype.

• Generation Design Video	• **MS-ETS1-3:** I can use the data gathered from tests to determine which design solution will best solve the problem.
• Optimizing Engineering Design Solutions by Loren Klein	• **MS-ETS1-3:** I can use the data gathered from tests to determine which design solution will best solve the problem. • **MS-ETS1-4:** Develop a model of the design that can be tested and modified to create a successful prototype.
• STEM Challenge: Build Your Own Wind Tunnel	• **MS-ETS1-3:** I can use the data gathered from tests to determine which design solution will best solve the problem. • **MS-ETS1-4:** Develop a model of the design that can be tested and modified to create a successful prototype.