Washington Township School District

The mission of the Washington Township Public Schools *is to provide a safe educational environment for all students to attain the skills and knowledge specified in the New Jersey Core Curriculum Content Standards at all grade levels so as to ensure their full participation in our global society as responsible, self-directed, and civic-minded citizens.*

Course Title:	Science
Grade Level(s):	6th

Duration:	*Full Year:*	X	*Semester:*		*Marking Period:*	
Course Description:	The Washington Township School District sixth grade science curriculum uses an integrated approach to general science that focuses with units on physical, life, and earth science. By using this approach, teachers are able to meet the needs of all students while aligning with the New Jersey Model Curriculum and the Next Generation Science Standards, also identified as the New Jersey Learning Standards for Science. Hands on activities are stressed and include student discovery, laboratory experiments, problem solving, model building, cooperative learning, computer usage, classroom discussion, teacher demonstrations, and writing opportunities for research and self-expression. Interdisciplinary subject areas are incorporated whenever possible. Students are introduced to the use of scientific tools and methods used for investigation. The course is designed to focus on development of a "scientific mind" through student use of scientific strategies. This process takes place within each unit of study via the students hypothesizing, researching, experimenting, observing and inferring. The major units of study for all grade six middle school students are: **Unit 1:** Introduction to Science **Unit 2:** Forces and Motion **Unit 3:** Types of Interactions **Unit 4:** Astronomy **Unit 5:** The Atmosphere and Weather **Unit 6:** Matter and Energy in Organisms and Ecosystems **Unit 7:** Growth, Development and Reproduction of Organisms					
Grading Procedures:	• Tests – 35% • Quizzes – 20% • Labs/Projects - 30% • Homework/Class work – 15%					

Primary Resources:	Pearson Realize 21st Century Learner Framework

Washington Township Principles for Effective Teaching and Learning

- Implementing a standards-based curriculum
- Facilitating a learner-centered environment
- Using academic target language and providing comprehensible instruction
- Adapting and using age-appropriate authentic materials
- Providing performance-based assessment experiences
- Infusing 21st century skills for College and Career Readiness in a global society

Designed by:	Tara Bartelt
Under the Direction of:	Dr. Patricia Hughes

Written: August 2016_____

Revised: _____

BOE Approval: _____

Unit Title: 1- Introduction to Science

Unit Description:

Students will be introduced to the world of science. Students will gain experience utilizing tools to measure, experiment and practice lab safety in a science classroom. Students will work through a hands-on inquiry approach to achieve curricular content learning goals.

Unit Duration: 14 day (about 3 weeks)

Desired Results

Standard(s):

MS-ETS1-1
MS-ETS1-2
MS-ETS1-3

Indicator(s):

ETS1.A: Defining and Delimiting Engineering Problems, ETS1.B Developing Possible Solutions, ETS1.C Optimizing the Design Solution

Understandings:

Students will ……

Using Scientific Inquiry

- Gather and synthesize information to identify skills scientists use to learn about the world.
- Construct an investigation based on evidence to describe what scientific inquiry is and how it involves posing questions and developing hypotheses.
- Develop and use a model to explain how to design an experiment using sound scientific principles.

Scientific Measurement

- Construct an explanation based on evidence for why scientists use a standard measurement system.
- Use mathematical representations for length, mass, volume, density, time and temperature.

Using Graphs in Science

- Use mathematical representations to explain what kinds of data graphs can display.
- Gather and synthesize information to identify different types of graphs and explain how each is used.

Safety in the science laboratory

Essential Questions:

Using Scientific Inquiry

- What are the skills of science?
- How do scientists explore the natural world?
- What do scientific investigations involve?
- What is scientific Inquiry?
- How do you design and conduct an experiment?
- What is a scientific explanation?

Scientific Measurement

- Why do scientists use a standard measurement system?
- What are some SI units of measure?

Using Graphs in Science

- How do scientists use graphs?
- What kinds of data do graphs display?
- How are different graphs used to display data?

Safety in the science laboratory

- Why prepare for a scientific investigation?
- What should you do if an accident occurs?

• Apply scientific ideas to explain why preparation is important in carrying out investigations in the lab and in the field. • Develop and use a model to describe what to do if an accident occurs.	

Assessment Evidence

Performance Tasks: (Expectation Activities)	**Other Evidence:**
• Demonstrate lab safety techniques • Create and explain and graph from laboratory data • Measure, with accuracy, using various metric methods	• Lab Safety Poster • Quiz on metrics • Test on Unit 1
Benchmarks: to be determined	

Learning Plan

Resource: SETS handbook (Science, Engineering and Technology Skills) in back of text.

Learning Activities:

Day(s)	Activities	Supplemental Materials
1-4 **Part 2, Lesson 5: Safety in the Science Laboratory**	• Inquiry Warm-up: "Is Science Safe?" • Introduce Lab safety procedures via notes • Safety Symbols (Appendix A) • Safety contracts • Quiz: lab safety • Project: Lab Safety Poster	• Planet Diary (set up for the year) Students can "decorate" cover with "What is Science?" pictures • Lab safety cartoon
5-6 **Part 1, Lesson 2: Scientific Thinking**	• Various observation vs. Inference demonstrations/activities	
7 **Part 1, Lesson 3: Answering Scientific Questions**	• Notes and reading in text	
8-14 **Part 2, Lesson 1: Measurement in Science**	• Measuring length, mass, volume, and density • Metric Length Lab: Measure various lengths of objects around room	*Labs can be done as stations

	• Mass Lab: Utilize triple beam balance to mass objects • Volume Lab: Utilize graduated cylinders • Density Lab: Density cubes, solve for the density of various objects • Quiz on metric measurement (intermittently) • Test Review • Unit test: Safety and Metrics	
Total Days: 14 (3 Weeks)	Assessments: 5 lab/project 2 Quizzes 1 Test	

Unit Learning Goal and Scale *(Level 2.0 reflects a minimal level of proficiency)*	
Standard(s): MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions (for example, precisely define a design task's criteria and constraints, including consideration of scientific principles and other relevant knowledge that limit possible solutions).	
4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions (for example, precisely define a design task's criteria and constraints, including consideration of scientific principles and other relevant knowledge that limit possible solutions).
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: consideration, constraint, criteria, design problem, design task, environment, impact, limitation, possible, potential, precise, precision, principle, relevant, solution, sufficient. • Describe the problem to be solved. • Describe scientific principles that are relevant to the problem. • Describe potential impacts on people and the natural environment.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**

0.0	**Even with help, no success**

Standard(s): MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	
4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. (For example: use systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem, to evaluate competing solutions.**)**
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: competing, constraint, criteria, design solution, determine, evaluate, problem, process, solution, systematic. • Describe the constraints and criteria of a problem. • Describe the systematic process used for evaluating solutions.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Standard(s): MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solution to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success	
4.0	**Students will be able to:** • In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Analyze data from tests to determine similarities and differences among several design solution to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success (For example: during the redesign process, identify the characteristics of the design that preformed the best in each test – even if one design does not perform the best across all tests – to determine which characteristics should be incorporated into a new design or combined to create a solution that is better than any of the predecessors)
2.0	**Students will be able to:**

	• Recognize or recall specific vocabulary: characteristic, combine, criteria, data, design, design solution, determine, difference, identify, incorporate, perform, predecessor, redesign process, similarity, solution. • Describe similarities and differences of design solutions.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Unit Modifications for Special Population Students	
Advanced Learners	Enrichment Worksheets and Scenario Investigations
Struggling Learners	Use L1 Differentiated Instruction Activities
English Language Learners	Use ELL Support Activities from lesson as needed.
Special Needs Learners	Follow IEP modifications and work with special education teacher to make modifications and use L1 Differentiated Instruction Activities.

Unit Title:2 - Forces and Motion

Unit Description:

Students will be introduced to Newton's Laws. They will learn to calculate various types of motion. This unit is a hands-on approach to learning, where students will demonstrate each of Newton's Laws in a laboratory setting. Students will explain how forces work in relation to one another.

Unit Duration: 18 days (approx. 4 weeks)

Desired Results

Standard(s):

MS-PS2-1

MS-PS2-2

MS-PS2-4

Indicators:

PS2.A: Forces and Motion

PS2.B: Types of Interactions

Understandings:	**Essential Questions:**
Students will …… • Apply scientific principles to explain acceleration. • Gather and synthesize information to describe force.	• What is acceleration? • How are forces described? • How do forces affect motion? • What factors affect friction? • What factors affect gravity?

• Use graphical displays to describe how balanced and unbalanced forces are related to the motion of an object. • Use graphical displays to describe friction between two objects. • Apply scientific principles to identify the factors that affect the gravitational force between two objects. • Apply scientific principles to describe Newton's First Law of Motion. • Use mathematical representations to describe Newton's Second Law of Motion. • Develop and use models to describe Newton's Third Law of Motion. • Use mathematical representations to explain how momentum is determined and conserved.	• What is Newton's First Law of Motion? • What is Newton's Second Law of Motion? • What is Newton's Third Law of Motion? • What is an object's momentum?

Assessment Evidence

Performance Tasks: (Expectation Activities) • Calculating speed and velocity • Demonstrating the three laws of motion	**Other Evidence:** Quizzes: • Speed, velocity, and acceleration Labs: • Measuring Average Speed Lab • Friction Lab Tests • Unit Test *Additional or alternate performance assessments may be used.

Benchmarks: Measuring Average Speed Lab

Learning Plan

Resources: **Chapter 1 (online in Forces and Energy Book)

Learning Activities:

Chapter 1: Forces and Energy (Online)

Day(s)/Lesson	Activities	Supplemental Materials
1 **Lesson 1: Describing Motion**	• Untamed Science: Adventures of Velocity Girl video • Notes and reading in text	
2-5 **Lesson 2: Speed and Velocity**	• Notes and reading in text • Speed/velocity formulas • Measuring Average Speed Lab	Speed/velocity practice worksheets
6-7	• Notes, calculations	

Lesson 3: Acceleration	• Quiz: Speed, velocity, and acceleration	

Chapter(s): 5 Forces and Motion (text)
Pages: 194-225

Days	Activities	Supplemental/extras
8 **Lesson 1: Nature of Force**	• Untamed Science video • Notes and reading in text	
9-10 **Lesson 2: Friction and Gravity**	• Notes and reading in text • Friction Lab: Pulling blocks over multiple surfaces	
11-18 **Lesson 3: Newton's Laws of Motion**	• Notes and reading in text • Lab activities for Newton's Laws: see side notes • Test Review • Unit test (includes lesson from online text and actual text)	- L1: Quick Lab, (Page 221) -"Crash Dummies" -Tennis ball in box -Inertia with quarter and cup -Balloon rocket lab
Total Days: 18 **(3.5 Weeks)**	Assessments: 3 lab/project 1 Quiz 1 Test	

Unit Learning Goal and Scale *(Level 2.0 reflects a minimal level of proficiency)*	
Standard(s): MS-PS2-1: Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	
4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught. • Apply concepts by designing or conducting a lab to demonstrate the effect of Newton's Third Law in everyday situations, i.e. seat belts.
3.0	**Students will be able to:** • Explain how 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 (Newton's Third Law). (MS-PS2-1)

2.0	**Students will be able to:** • Describe recall specific vocabulary including: motion, collision, equal and opposite reaction, impact, Isaac Newton, Newton's Third Law of Motion, opposite force, force • Describe Newton's Third Law of Motion
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Standard(s): MS-PS2-2: Plan an investigation to 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.	
4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught. • Connect your investigation to a real world situation by showing how acceleration is affected by mass and/or force.
3.0	**Students will be able to:** • Plan an investigation to 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.
2.0	**Students will be able to:** • Describe specific vocabulary including: control (variable), independent variable, sum, variable, Newton's First Law and Newton's Second Law. • Describe effects of: force, change in motion, comparison of forces, constant speed, deceleration, direction of a force, direction of a motion, force strength, balanced forces, unbalanced Forces, mass, inertia. • Describe how a change in an objects motion depends on the sum of the forces on the object and the mass of the object. • Make qualitative observations of the forces acting on an object.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Standard(s): **MS-PS2-4 Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and dependent on the masses of interacting objects**	
4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and dependent on the masses of interacting objects. (For example, use data generated from digital simulations or

	charts displaying mass, strength of interaction, distance from the sun, and orbital periods of objects within the solar system to defend the claim that gravitational interactions are attractive and dependent on the masses of interacting objects.)
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: attractive, direction of force, direction of motion, distance, gravitational force, gravitational interaction, interact, mass, orbital period, strength. • Describe the effects of gravitational interactions • Describe the role of mass in gravitational interactions.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Unit Modifications for Special Population Students	
Advanced Learners	Enrichment Worksheets and Scenario Investigations
Struggling Learners	Use L1 Differentiated Instruction Activities
English Language Learners	Use ELL Support Activities from lesson as needed.
Special Needs Learners	Follow IEP modifications and work with special education teacher to make modifications and use L1 Differentiated Instruction Activities.

Unit Title: 3 - Types of Interactions

Unit Description:

Students will explore and discover the relationship between magnetic forces and electricity. Students will be using a hands-on approach to learning about magnets through manipulating them to demonstrate magnetic fields through demonstrations. In addition, students will create an electromagnetic force in a hands-on application.

Unit Duration: 11 days (2+ weeks)

Desired Results

Standard(s):

MS-PS2-3

MS-PS2-4

MS-PS2-5

Indicators:

PS2.B: Types of Interactions

Understandings *Students will ……* <u>What is magnetism?</u> • Gather and synthesize information to identify and describe the properties of magnets. • Apply scientific principles to explain how magnetic poles interact. <u>Magnetic fields</u> • Utilize graphical displays to describe a magnetic field. • Gather and synthesize information to describe Earth's magnetic field. <u>Electromagnetic Force</u> • Conduct an investigation to explain how electric current is related to magnetism. • Gather and synthesize information to identify some characteristics of magnetic field produced by a current. <u>Electricity, magnetism and motion</u> • Conduct an investigation to explain how electrical energy can be transformed into mechanical energy. • Construct a scientific explanation based on evidence to describe how galvanometers work. • Apply scientific principles to explain how electric motors work.	**Essential Questions.** <u>What is magnetism?</u> • What are properties of magnets? • How do magnetic poles interact? <u>Magnetic fields</u> • What is a magnetic fields shape? • What is earth's magnetic field like? <u>Electromagnetic Force</u> • How are electric currents and magnetic fields related? • What is a magnetic field produced by a current like? <u>Electricity, magnetism and motion</u> • How is electrical energy transformed into mechanical energy? • How does a galvanometer work? • What does an electric motor do?
Assessment Evidence	
Performance Tasks (Expectation Activities) • Creating Natural Magnetics with compasses • Demonstrate magnetic fields using magnets and iron filings • Complete an electromagnetic circuit through a virtual lab	**Other Evidence:** • Magnetic field (lesson 2) Quiz • Unit Test
Benchmarks: to be determined	
Learning Plan	

Resources:
Chapter(s): Chapter 7 Magnetism and Electromagnetism
Page(s): 268-293

Learning Activities

Day(s)/Lesson	Activities	Supplemental Materials
1-2 **Lesson 1: What is Magnetism?**	• Untamed Science video • Inquiry Warm-up Lab: "Natural Magnets" (using compasses to detect magnetic rocks) • Notes and reading in text	
3-5 **Lesson 2: Magnetic Fields**	• Inquiry Warm-up Lab: "Predict the Field" (iron filings in petri dish over various-sized magnets) • Notes and reading in text *Omit "Spinning Circles" • Quiz: Magnetism	
6-7 **Lesson 3: Electromagnetic Force**	• Notes and reading in text • Quick Lab: L1- "Electromagnet"	
8-11 **Lesson 4: Electricity, Magnetism, Motion**	• Notes and reading in text • Virtual Lab (online) • Test review • Unit test : Electromagnetism	
Total Days: 11 (2+ weeks)	Assessments: 3 lab/project 1 Quiz 1 Test	

Unit Learning Goal and Scale
(Level 2.0 reflects a minimal level of proficiency)

Standard(s): MS-PS2-3 Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.

4.0	**Students will be able to:** • In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. (for example, investigate data – such that the effect

	of the number of turns of wire on the strength of an electromagnet or the effect of multiple magnets or magnets of varying strengths on the speed on an electric motor-and ask questions about them to determine which factor effects the strength of electric and magnetic forces in devices like electromagnets, electric motors or generators)
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: effect, electric force, electric motor, electromagnet, factor, generator, magnetic force, speed, strength. • Describe the effects of electric and magnetic forces. • Describe how certain devices use electric and magnetic forces.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Standard(s): **MS-PS2-4 Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and dependent on the masses of interacting objects**	
4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and dependent on the masses of interacting objects. (For example, use data generated from digital simulations or charts displaying mass, strength of interaction, distance from the sun, and orbital periods of objects within the solar system to defend the claim that gravitational interactions are attractive and dependent on the masses of interacting objects.)
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: attractive, direction of force, direction of motion, distance, gravitational force, gravitational interaction, interact, mass, orbital period, strength. • Describe the effects of gravitational interactions. • Describe the roll of mass in gravitational interactions.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Standard(s): MS-PS2-5 Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact

4.0	**Students will be able to:** • In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact. (for example, investigate first hand experiences or simulations about objects that exert forces on each other, even when they are not in physical contact-such as the interactions of magnets, electrically charged strips of tape, or electrically charges pith balls-and use the results to give qualitative evidence for the existence of electric and magnetic fields)
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: contact, electric field, electrically charged, exert, field, force, interaction, magnet, magnetic field. • Describe the effects of electric and magnetic fields on the forces of objects.
1.0	**With help, partial success at level 2.0 content and level 3.0 content:**
0.0	**Even with help, no success**

Unit Modifications for Special Population Students	
Advanced Learners	Enrichment Worksheets and Scenario Investigations
Struggling Learners	Use L1 Differentiated Instruction Activities
English Language Learners	Use ELL Support Activities from lesson as needed.
Special Needs Learners	Follow IEP modifications and work with special education teacher to make modifications and use L1 Differentiated Instruction Activities.

Unit Title: 4 - Astronomy

Unit Description:

Students will be introduced to the solar system. Students will explore the origins of the moon phases and how the moon got its shape. They will explore factors causing the change of seasons. The importance of the sun (light intensity and angle) in the process of seasonal change will be discussed. The concept of gravity will be explored in more depth. Students will calculate the force of gravity. Students will complete a creative and informational project to jigsaw the following parts of the solar system to one another: the inner planets, the outer planets, small objects in the solar system.

Unit Duration: 24 days (about 5 weeks)

Desired Results

Standard(s):

MS-ESS1-1
MS-ESS1-2
MS-ESS1-3

Indicator(s):

ESS1.A: The Universe and Its Stars
ESS1.B: Earth and the Solar System

Understandings:

Students will ……

Earth in Space

- Develop and use a model to describe how Earth moves in space.
- Apply scientific principles to explain what causes the cycle of seasons on Earth.

Gravity and Motion

- Apply scientific principles to identify what determines the strength of the force of gravity between two objects.
- Use graphical displays to describe factors that keep the moon and Earth in orbit.

Phases and Eclipses

- Gather and synthesize information to explain what causes the moons phases.
- Apply scientific principles to explain solar and lunar eclipses.

Earth's moon

Essential Questions:

Earth in Space

- How does Earth move?
- What causes seasons?

Gravity and Motion

- What determines Gravity?
- What keeps objects in orbit?

Phases and Eclipses

- What causes the moon's phases?
- What are eclipses?

Earth's moon

- What is the moon like?

Introducing the solar system

- What makes up the solar system?
- How did the solar system form?

The sun

- What is the structure of the sun?
- What features can you see on the sun?

The inner planets

• Gather and synthesize information to describe the features and characteristics of the moon. **Introducing the solar system** • Use graphical displays to identify the objects that make up the solar system. • Develop and use models to describe the role of gravity in the formation of the solar system. **The sun** • Develop and use models to identify the layers of the sun's interior and atmosphere. • Interpret evidence to describe features that form on or above the sun's surface. **The inner planets** • Develop and use models to describe common characteristics of the inner planets. • Interpret evidence that identifies the main characteristics that distinguish each of the inner planets. **The outer planets** • Develop and use models to describe common characteristics of the outer planets. • Interpret evidence that identifies the main characteristics that distinguish each outer planet. **Small solar system objects** • Develop and use models to explain how scientist classify small bodies in the solar system.	• What do the inner planets have in common? • What are the characteristics of the inner planets? **The outer planets** • What do the outer planets have in common? • What are the characteristics of each outer planet? **Small solar system objects** • How do scientist classify small bodies in the solar system?

Assessment Evidence	
Performance Tasks: (Expectation Activities) • Lab Inquiry – Graphing Gravity • Project – L3 Differentiated Instruction (p 423) Origin of Full Moon names • Inquiry Warm up – Moon Crater activity • Modeling the distance of planets • Project on Solar System: including similarities, differences and other characteristics	**Other Evidence:** Quizzes: • Lesson 2-3 Seasons & Gravity • Lesson 4 Phases & Eclipses Test : • Chapter 10 Earth/Moon/Sun
Benchmarks: to be determined	
Learning Plan	
Resource: Ch 10 & 11	

Learning Activities:

Chapter 10 Earth, Moon and Sun

Day	Activities	Supplemental/extras
1-3 **Lesson 2: Earth in Space**	• Untamed Science Video • Lesson 2 notes and reading - Earth in Space • Inquiry Warm up - (Day and Night) • Continue notes • Demonstration – Differentiated Instruction model (L1 p 413) • Elaborate L1 • Seasons – L1 & L3 Differentiated Instruction (assign each group a different place on the globe • HW – Earth & Space Review and Reinforce	
4-7 **Lesson 3: Gravity & Motion**	• Lab Inquiry – Graphing (create graph for students) • Notes and reading in book • Teacher Demonstration – Inertia • HW "Do the Math" • Quiz – Seasons & Gravity	
8-10 **Lesson 4: Phases & Eclipses**	• Notes and reading in book • Demonstration – Students showing rotation and revolving using 3 sized balls • Project – L3 Differentiated Instruction (p 423) Origin of Full Moon names • Quiz: Phases & Eclipses	
11-14 **Lesson 6: The Moon**	• Notes and Reading in book • Inquiry Warm up - Crater activity (Use google to find lab: Flour in gift box covered in coffee – drop various-sized balls) • Test review • Test - Earth/Moon/Sun	
Total Days: 14 (3 Weeks)	Assessments: 3 lab/project 2 Quizzes 1 Test	

Chapter 11: Solar System

Day	Activities	Supplemental/extras
1-3 **Lesson 2: Introducing the Solar System**	• Untamed Science Video • Inquiry Warm up: Size of Sun vs. Earth • Notes and reading • Demonstration/Activity (In book): Model distance of planets (1au = 1 meter)	Skype with NASA?

	• Complete notes and reading	
4-10 **Lessons 3-6: Sun, Inner & Outer Planets, & Small objects**	• Project: "Creative" In class with partner • Produce an outline/fact sheet on assigned topic (uploaded to be copied and distributed to class) • Research topic in depth • Present to class/Take notes on presentations • (Packet of supplemental activities – if needed)	Project ideas: Brochure, Blend Space, Prezi, 3D Model, Tri-fold, Infomercial, Comic strip, Children's story, etc.
Total days: 10 (2 weeks)	Assessments: 1 lab/project	

Unit Learning Goal and Scale

(Level 2.0 reflects a minimal level of proficiency)

Standard(s): MS-ESS1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system (for example, create and use a physical model [such as an analogy of distance along a football field or a computer visualization of elliptical orbits] or a conceptual model [such as a mathematical proportion relative to the size of a familiar object such as a student's school or state] to explain that gravity is the force that holds together the solar system and the Milky Way galaxy and that gravity controls the orbital motions within both.
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: asteroid movements pattern, comet, comet movement pattern, elliptical orbit, force, galaxy, gravity, meteor movement pattern, Milky Way, motion, orbit, orbital motion, planet orbit, solar system. • Describe the role of gravity in the motions within galaxies and the solar system.
1.0	**With help, partial success at level 2.0 content and level 3.0 content.**
0.0	**Even with help, no success**

Standard(s): MS-ESS1-1 – Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and season

4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Develop and use a model of the Earth-Sun-Moon System to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and season: for example, create and use a physical, graphical, or conceptual, model, to describe the cycling of lunar phases, solar and lunar eclipses, and the seasons.
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: cycle, cyclic, Earth-sun-moon system, eclipse, lunar eclipse, lunar phase, motion, motion, pattern, season, solar eclipse. • Describe the lunar phases. • Describe solar and lunar eclipses. • Describe how the seasons are created.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Standard(s): MS-ESS1-3- Analyze and interpret data to determine scale properties of objects in the solar system	
4.0	**Students will be able to:** • In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Analyze and interpret data to determine scale properties of objects in the solar system: for example, analyze and interpret statistical information, drawings, photographs, and models from Earth-based instruments, space-based telescopes, and spacecrafts to determine similarities and differences based on scale properties among solar system objects, such as the sizes of an object's orbital radius, its' volcanoes and other surfaces, and its' crust, atmosphere, and other layers.
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: atmosphere, crust, Earth-based, instrument, layer, orbital radius, planet composition, planet orbit, planet size, scale property, solar system, space-based, spacecraft, surface feature, telescope. • Describe the scale properties of various objects in the solar system.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**

0.0	**Even with help, no success**

Unit Modifications for Special Population Students	
Advanced Learners	Enrichment Worksheets and Scenario Investigations
Struggling Learners	Use L1 Differentiated Instruction Activities
English Language Learners	Use ELL Support Activities from lesson as needed.
Special Needs Learners	Follow IEP modifications and work with special education teacher to make modifications and use L1 Differentiated Instruction Activities.

Unit Title: 5 - The Atmosphere and Weather

Unit Description:

Students will be introduced to the earth's atmosphere, winds, clouds, factors affecting weather formation, how to predict weather and what we can learn from weather. Forms of precipitation will be discussed. Students will determine how heat and energy are transferred from the sun to earth and also among systems within the Earth's atmosphere. Students will learn to read weather maps and use them along with their knowledge of air pressure and trends to predict the weather. Students will determine what types of conditions create storms and what to do to stay safe.

Unit Duration: 40 days (about 8 weeks)

Desired Results

Standard(s):

MS-ESS2-4
MS-ESS2-5
MS-ESS2-6
MS-ETS1-4

Indicator(s):

ESS2.C: The Roles of Water in Earth's Surface Processes
ESS2.D: Weather and Climate
ETS1.B: Developing Possible Solutions
ETS1.C: Optimizing the Design Solution

Understandings:	Essential Questions:
Students will …… **The air around you**	**The air around you** • What is the composition of the atmosphere?

• Gather and analyze information to describe the composition of the atmosphere. • Construct a scientific explanation based on evidence to describe the atmosphere as a system. **Layers of the atmosphere** • Develop and use models to identify the four main layers of the atmosphere and describe their characteristics. • Gather and synthesize information to describe the characteristics of the atmospheres layers. **Heat transfer** • Construct a scientific explanation to describe how temperature is measured. • Apply scientific principles to describe how heat is transferred. **Energy in Earth's atmosphere** • Gather and synthesize information to describe the form energy travels in from the sun to Earth. • Use graphical displays to explain what happens to the sun's energy in the atmosphere and at Earth's surface. **Air Pressure** • Gather and synthesize information to identify properties of air. • Apply scientific principles to describe how barometers can be used to measure air pressure. • Construct a scientific explanation based on evidence to explain how altitude affects air pressure and density. **Winds** • Gather and synthesize information to explain how scientists describe winds. • Apply scientific principles to distinguish between local winds and global winds and identify major global wind belts. **Water in the atmosphere** • Develop and use models to describe how mater moves to and from the atmosphere during the water cycle. • Construct a scientific explanation based on scientific evidence to describe humidity and how it is measured. **Precipitation**	• How is the atmosphere as a system? **Layers of the atmosphere** • What are the four main layers of the atmosphere? • What are the characteristics of the layer of the atmosphere? **Heat transfer** • How is temperature measured? • How is heat transferred? **Energy in Earth's atmosphere** • How does energy from the Sun travel to Earth? • What happens to the sun's energy when it reaches Earth? **Air Pressure** • What are some properties of air? • What instruments measure air pressure? • How does altitude affect air pressure and density? **Winds** • What causes wind? • How do local winds and global winds differ? **Water in the atmosphere** • How does water move through the atmosphere? • What is the relative humidity and how is it measured? **Precipitation** • What are common types of precipitation? • What are the causes and effects of floods and droughts? **Air Masses** • What are the major air masses? • What are the main types of fronts? • What weather do cyclones and anticyclones bring? **Storms** • How do the different types of storms form? **Predicting the weather** • How do you predict the weather? • What can you learn from weather maps?

• Gather and synthesize information to identify the common types of precipitation. • Investigate the effects of floods and droughts. **Air Masses** • Gather and synthesize information to identify the major air masses that affect the weather in North America and describe how they move. • Develop and use models to describe the main types of fronts. • Apply scientific principles to explain the types of weather that are associated with cyclones and anticyclones. **Storms** • Develop and use models to identify the main kinds of storms and explain how they form. **Predicting the weather** • Investigate how weather forecasters use observations, data and technology to predict the weather. • Analyze and interpret data to describe what can be learned from information shown on weather maps.	

Assessment Evidence	
Performance Tasks: (Expectation Activities) Ch 8.5 - Convection Lab: Red ice cubes in tap water Ch 8.2 - Inquiry Warm up - Mass empty and full balloon to determine if air has mass. Ch 8.6 - "Heating Earth's Surface" Lab Ch 9.1 - Find the Dew Point Ch 9.3 - "Form a Cloud" Ch 9.6 - Lab: "Reading a Weather Map"	**Other Evidence:** Quizzes • Ch 8.3: The Atmosphere • Ch 8.4: Heat and Energy • Ch 9.4: Precipitation & Air Masses Tests • Ch 8: Atmosphere • Ch 9: Weather
Benchmarks: "Heating Earth's Surface" Lab	

Learning Plan

Resource: Interactive Science Ch 8 & 9

Learning Activities:

Chapter 8: The Atmosphere

Day	Activities	Supplemental/extras
1-2.5 **Lesson 1:** **The Air Around You**	• Background Knowledge: Properties of matter (General Review) (PowerPoint to show animation of particle movement) • Untamed Science Video • Inquiry Warm up - "How Long Will the Candle Burn?" • Notes and reading: gases in the atmosphere • Demonstration – Quick Lab: "Breath in Breath out"	
2.5-6 **Lesson 3:** **Layers of the Atmosphere**	• Reading and Notes • Quick Lab – Layers of the Atmosphere • Atmospheric Layers – Map and label • HW – assess you understanding • Lab - Quick Lab: "Calculating Temperature Changes" • Quiz: The Atmosphere	
7-10 **Lesson 5:** **Heat**	• Demo: Hand boilers • Notes and reading • Convection lab: Red ice cubes in tap water (Show how cold water goes to or stays on bottom) • Enrichment worksheet "Heat Transfer"	
11-14 **Lesson 4:** **Energy**	• Inquiry warm up Demonstration - "Does a Plastic Bag Trap Heat?" (Set up at start of period and check data at end of period) • Reading and Notes • HW - "Apply It" • (p 284) Finish reading and notes • Enrichment worksheet - "Energy in the Earth's Atmosphere" • Quiz – Heat and Energy	
15-18 **Lesson 2:** **Air Pressure**	• Inquiry Warm up - "Does Air Have Mass" (Mass empty and full balloon) • Reading and notes • Demonstration – Elaborate: Density squares: students stand in measured spaces (p. 289) • Discuss – barometer measures air pressure • Altitude reading and notes • Scenario Investigation: "Mile-High Baseball" (located at start of chapter)	

19-22 **Lesson 6:** **Wind**	• Reading and Notes • Lab/Activity: Differentiated Instruction L3- Airline Flight Time (search for additional resources) (Omit Wind Belts) • Demonstration –Pinwheel over lightbulb L1 (p. 297) Test to see if/how long it takes to spin • Lab/Benchmark "Heating Earth's Surface" • Test Review • Test - Atmosphere	Optional Lab: Quick Lab "Build a Wind Vane"
Total days: 22 **(4.5 weeks)**	Assessments: 4 lab/project 2 Quizzes 1 Test	

Chapter 9: Weather

Day	Activities	Supplemental/extras
1-3 **Lesson 1:** **Weather in the Atmosphere**	• Untamed Science Video • Demonstration: Water Cycle-Boiling water, cover with beaker showing condensation and eventually precipitation • Reading and notes • Demonstration Quick Lab- "Water in the Air" • Continue Reading and Notes: Humidity • Quick Lab - "Find the Dew point"	
3-5 **Lesson 3:** **Precipitation**	**First two pages of lesson 2:" How Clouds Form" • Inquiry or quick lab activity: "Form a Cloud"-(Ice on top of bottle containing hot water or cool aluminum pan on beaker containing hot water) • Reading and notes: Types of precipitation • Discuss the terms flood and drought • HW – Review & Reinforce worksheet	Activity: Snowflake Bentley Read children's book and do "Snow Crystal" activity in additional resources
6-9 **Lesson 4:** **Air Masses**	• Notes and Reading: Air Masses • Teacher Demonstration - "Front Formation" (take notes) • Continue notes and Reading: Cyclones • Teacher Model – Differentiated instruction L1 "Cyclones" • Quiz – Precipitation & Air Masses (use Review and Reinforce worksheet p 331E)	
10-13	• Inquiry Warm up - "Can You Make a Tornado?" • Reading and Notes: Storms	Students will jigsaw one of the following

Lesson 5: Storms	• Thunderstorms notes and reading • "Thunder & Lightening" Video to calculate storm distances • Hurricane and Tornado notes • Additional Activity: See notes on side	activities with their lab groups: Option 1: "Sequencing Tornado Formation": L1, "Storm Chasers" L3, "Hurricane Movement" L1 Option 2: Researching statistics on recent hurricane and tornado events
15-18 Lesson 6: Predicting the Weather	• Opening activity: Set up a forecast record chart for 3-5 days. (T-chart: forecast & actual weather) • Reading and notes: Meteorologists and tools • Video – Predicting weather & technology • Notes: Reading a weather map • Lab: "Reading a Weather Map" • Review/HW - Predicting Weather • Test Review • Test - Weather	Use National Geographic, Discovery or YouTube for video.
Total days: 18 (3.5 weeks)	Assessments: 3 lab/project 1 Quizzes 1 Test	

Unit Learning Goal and Scale *(Level 2.0 reflects a minimal level of proficiency)*	
Standard(s): MS-ESS2-4: Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	
4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. [Clarification Statement: Emphasis is on the ways water changes its state as it moves through the multiple pathways of the hydrologic cycle. Examples of models can be conceptual or physical.] [Assessment Boundary: A quantitative understanding of the latent heats of vaporization and fusion is not assessed.]

2.0	**Students will be able to:** • Recognize or recall specific vocabulary: evaporation, sublimation, deposition, vaporization, melting, freezing, condensation. • Describe the relationship between the parts of the Water Cycle and their relationship to the sun's energy and the force of gravity.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Standard(s): MS-ESS2-5: Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	
4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. (for example, use student-collected laboratory experiment data [such as weather maps, diagrams, and visualizations] as evidence for how weather can be predicted within probabilistic ranges; for instance, air masses flow from regions of high pressure to low pressure causing weather [defined by temperature, pressure, humidity, precipitation, and wind] as a fixed location to change over time, and sudden changes in weather can result when different air masses collide).
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: air mass, air mass circulation, collide, condensation, flow, high pressure, humidity, interaction, low pressure, motion, precipitation, predict, pressure, probabilistic, range, temperature, weather condition, weather map, wind. • Describe the relationship between weather conditions and the motions and interactions of air masses.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Standard(s): MS-ESS2-6: Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climate.

4.0	**Students will be able to:** • In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climate.(For example, create a diagram, map, globe, or digital representation to explain how patterns of atmospheric circulation[such as sunlight-driven latitudinal banding, the Coriolis effect, and resulting prevailing winds] and oceanic circulation [such as the transfer of heat by the global ocean convection cycle, which is constrained by the Coriolis effect and the outlines of continents] vary by latitude, altitude, and geographic land distribution).
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: altitude, atmospheric circulation, climate, climate pattern, constrain, continent, Coriolis effect, Earth's climate, geographic, global ocean convection cycle, heat, land distribution, latitude, latitude banding, oceanic circulation, prevailing, regional, rotation, sunlight-driven, unequal, unequal heating of air, unequal heating of land mass, unequal heating of oceans. • Describe the relationship between heating of the Earth, rotation of the Earth, and climates
1.0	**With help, partial success at level 2.0 content and level 3.0 content:**
0.0	**Even with help, no success**

Standard(s): MS-ETS1-4: Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	
4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. (For example, develop various kinds of models to test the most promising solutions, and modify the designs based off the test results to continually refine a design solution until an optimal iteration can be achieved).
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: data, design, design solutions, iteration, iterative process, iterative testing, model, modification, modify, optimal, promising, propose, refine, solution, test result.

	• Describe the purpose and need for iterative testing. • Describe the procedures for iterative testing.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Unit Modifications for Special Population Students	
Advanced Learners	Enrichment Worksheets and Scenario Investigations
Struggling Learners	Use L1 Differentiated Instruction Activities
English Language Learners	Use ELL Support Activities from lesson as needed.
Special Needs Learners	Follow IEP modifications and work with special education teacher to make modifications and use L1 Differentiated Instruction Activities.

Unit Title: 6 - Matter and Energy in Organisms and Ecosystems
Unit Description: Students will be introduced to various habitats and the characteristics that comprise them. Students will learn about population size and growth through hands-on lab experiences. Students will explore the interactions and relationships among organisms and the flow of energy that results from these interactions and relationships.
Unit Duration: 18 days (about 3.5 weeks)
Desired Results
Standard(s): MS-LS2-1 MS–LS2-2 MS–LS2–3
Indicator(s): **LS2.A: Interdependent Relationships in Ecosystems** **LS2.B: Cycle of Matter and Energy Transfer in Ecosystems**

Understandings: *Students will ……*	**Essential Questions:**
Living things and the environment • Gather and synthesize information to identify the needs that must be met by an organism's surroundings. • Use graphical displays to identify biotic and abiotic parts of a habitat. • Apply scientific ideas to describe the levels of organization within an ecosystem. **Populations** • Use mathematical representations to explain the causes of changes in population size. • Use graphical displays to identify factors that limit population growth. **Interactions among living things** • Construct a scientific explanation based on evidence for how adaptations help an organism survive. • Apply scientific ideas to describe competition and predation. • Gather and synthesize information to identify the three types of symbiosis. **Energy Flow in ecosystems** • Develop a model to name and describe the energy roles that organisms play in an ecosystem. • Use mathematical representations to describe how energy moves through an ecosystem. • Construct a scientific explanation based on evidence to explain how human activities may affect the balance in an ecosystem and thereby change the ecosystem.	**Living things and the environment** • What does an organism get from its environment? • What are the two parts of an organism's habitat? • How is an ecosystem organized? **Populations** • How does populations change in size? • What factors limit population growth? **Interactions among living things** • How do adaptations help an organism? • What are competition and predation? • What are three types of symbiosis? **Energy Flow in ecosystems** • What are the energy roles in an ecosystem? • How does energy move through an ecosystem? • How do human activities affect ecosystems?

Assessment Evidence	
Performance Tasks: (Expectation Activities) • Estimating a Population Size Lab • Limiting Factors Lab • Use knowledge of animal interactions and camouflage to "Hide a Butterfly"	**Other Evidence:** • Quiz Chapter 3 Lesson 1 & 2 • Ecology Unit Test
Benchmarks: to be determined	
Learning Plan	
Resource: Chapter 3 Populations and Communities & **Chapter 4** Ecosystems and Biomes	

Learning Activities:

Day (s)	Activities	Supplemental/extras
1 **Lesson 1: Living Things and the Environment**	• Untamed Science Video p.456 • List Biotic/Abiotic Lab activity • Organization of Ecosystems notes/text • Enrich: Living Things and the Environment (p.467F) HW	
2-4 **Lesson 2: Populations**	• Scenario Investigation: "That Can't Possibly Work" (Estimating Population Lab) • Notes Population Size: Limiting factors • Limiting Factors Lab TBD • Quiz Lesson 1 & 2	
5-9 **Lesson 3 Interactions among Living Things**	• Warm-up lab "Can you Hide a Butterfly?" • Notes & discussions on lesson 3	
10-14 **Chapter 4: Lesson 1**	• Lesson 1 Energy Flow in Ecosystems	
15-18	• Review and Ecology Unit Test	
Total days: 18 (3.5 weeks)	Assessments: 2 lab/project 1 Quizzes 1 Test	

Unit Learning Goal and Scale
(Level 2.0 reflects a minimal level of proficiency)

Standard(s): MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations in an ecosystem. (for example, analyze and interpret data to support claims about the cause and effect relationships between resources, growth of individual organisms, and the numbers of organisms in an ecosystem during periods of abundant and scarce resources).

4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations in an ecosystem.

2.0	**Students will be able to:** • Recognize or recall specific vocabulary: abundant, cause, ecosystem, effect, environmental condition, growth, organism, population, relationship, resource, resource availability, scarce, carrying capacity, limiting factor. • Describe the effects of varying levels of resource availability on organisms and populations.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Standard(s): MS – LS2-2: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystem.	
4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught. • Research/Investigate and identify the five types of interactions involving human participation: mutualism, commensalism, predator/prey, parasitism, competition.
3.0	**Students will be able to:** • Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystem. (Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.)
2.0	**Students will be able to:** • Recognize and recall specific vocabulary: abiotic, competitive, component, ecological role, ecosystem, host, infection, interaction, mutualism, mutually beneficial, organism, parasite, predatory, relationship. • Describe patterns of interactions among organisms across multiple ecosystems.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Standard(s): MS–LS2–3: Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. (for example, create a model and use it to describe the conservation of matter and the flow of energy in and out of various ecosystems as well as to define the boundaries of the system)

4.0	**Students will be able to:** • In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. • Assess how humans can preserve the cycles of nature.
3.0	**Students will be able to:** • Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: boundary, conservation of matter, cycle, ecosystem, energy flow, living, matter, nonliving, organism, system. • State accurate information about the cycling of mater and flow of energy in organisms and ecosystems.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Unit Modifications for Special Population Students	
Advanced Learners	Enrichment Worksheets and Scenario Investigations
Struggling Learners	Use L1 Differentiated Instruction Activities
English Language Learners	Use ELL Support Activities from lesson as needed.
Special Needs Learners	Follow IEP modifications and work with special education teacher to make modifications and use L1 Differentiated Instruction Activities.

Unit Title: 7 - Growth, Development and Reproduction of Organisms
Unit Description: Students will be introduced to plants and animal behavior. Students will learn the parts of a plant, how plants grow and respond, the different types of plants and how different plants reproduce. Students will discover how animals produce both sexually and asexually and also how invertebrates care for their young. Students will be given many examples of plants, both live and preserved, in order to gain a more hand-on and visual experience. Students will be able to demonstrate their knowledge of plants by classifying them based on their characteristics.
Unit Duration: 26 days (about 5+ weeks)

Desired Results

Standard(s):

MS-LS1-4

MS-LS1-5

Indicator(s):

LS1.B: Growth and Development of Organisms

Understandings:

Students will ……

What is a plant?

- Gather and synthesize information to identify the characteristics that all plants share.
- Apply scientific principles to identify the things a plant needs to live successfully on land.

Classifying Plants

- Gather and synthesize information to identify the major characteristics of nonvascular plants.
- Gather and synthesize information to identify the major characteristics of seedless vascular plants.
- Gather and synthesize information to identify the major characteristics of seed plants.

Plant structures

- Construct a scientific explanation to describe how seeds become new plants.
- Gather and synthesize information to describe the structures of a flower.

Plant Reproduction

- Use graphical displays to describe how plants reproduce.

Plant Responses and Growth

- Gather and synthesize information to identify three stimuli that produce plant response.
- Apply scientific principles to describe how plants respond to seasonal change.

Animal Reproduction and Fertilization

- Apply scientific ideas to compare asexual and sexual reproduction in invertebrates and vertebrates.
- Construct a scientific explanation to compare and contrast internal fertilization and external fertilization.

Development and Growth

- Gather and synthesize information to describe how different invertebrates care for their young.

Essential Questions:

What is a plant?

- What characteristics do all plants share?
- What do plants need to live successfully on land?

Classifying Plants

- What are the characteristics of nonvascular plants?
- What are the characteristics of seedless vascular plants?
- What are the characteristics of seed plants?

Plant structures

- How do seeds become new plants?
- What are the structures of a flower?

Plant Reproduction

- How do plants reproduce?

Plant Responses and Growth

- What are three stimuli that produce plant response?
- How do plants respond to seasonal changes?

Animal Reproduction and Fertilization

- How to animals reproduce?
- How do external and internal fertilization differ?

Development and Growth

- How do animals care for their young?

Assessment Evidence

Performance Tasks: (Expectation Activities)	**Other Evidence:**
• Use a Microscope to identify types of leaves • Create a flower model showing all parts • Research and jig saw factors/adaptations that affect specific reproduction of different animals	**Quiz** : • Lesson 1 & 2 • Lesson 3 & 4 • Lesson 5 & 6 **Chapter Test**
Benchmarks: to be determined	

Learning Plan

Resource: Chapter 1 & 2

Learning Activities:

Chapter 1 Plants

Day (s)	Activities	Supplemental/extras
1-4 **Lesson 1: What is a Plant?**	• Untamed Science Video • Vocabulary preview • Plant notes/text: Plant cell parts • Elodea Microscope Lab • Teacher Demonstration-Set up Carnation Activity • Carnation/vocabulary • Apply it: Graph • "Leaf Lab"- Introduction • Notes/Text	
5-6 **Lesson 2: Classifying Plants**	• Notes/Text with Teacher Demo: p.257 Flowers and Fruits • Outline with visual handout: Terms • Non-vascular plants, Vascular Seedless plants, Vascular Seeded plants • Pollen • Gymnosperms, Angiosperm • Lesson 1 & 2 **Quiz**	
7-9 **Lesson 3: Plant Structures**	• Begin on (p. 264-267) How do seeds become new plants? • What are the Structures of Flowers? • Building Inquiry Lab L1 (Gladiolus Flower) • L2 Modeling Flowers	
10-11	• Begin on p. 270-271 How do Plants Reproduce? (Sexual and Asexual) • 274-275 Angiosperm = Flowers and Fruits	

Lesson 4: Plant Reproduction	• Notes/Outline • Label Diagrams of Angiosperm • Possible Time Lapse Video of Reproduction • Lesson 3 & 4 **Quiz**	
12-13 **Lesson 5: Plant Responses and Growth**	• Notes/Outline text • Observe plant responses	Possible idea: Grow sunflowers to demonstrate tropisms
14-17	• Review and Chapter Test	
Total Days: 17 days	Assessment: 2 Quizzes 2 Lab/Project 1 Test	

Chapter 2: Animal Life Processes

Day (s)	Activities	Supplemental/extras
1- 2 **Lesson 5: Animal Reproduction and Fertilization**	• How do Animals Reproduce? (p.335-347) • Asexual vs. Sexual Reproduction • Notes/outline/Read text compare and contrast • How do External and Internal Fertilization Differ? (p. 340-341) • Enrichment: Animal Reproduction and Fertilization (The Emperor Penguin p. 341E) • *Penguin Video	*Use YouTube, National Geographic or Pearson site for penguin video
3-4	• p.336 Teacher to Teacher : Different Organisms for each student-Research factors that affect the animal reproduction (jig saw results)	
5-6 **Lesson 6: Development and Growth**	• Introduction: My Planet Diary: Beware of Glass (p.342) • How Do Animals Care for Their Young? (p.349-351)	
7-8	• Possible Supplemental Materials on Animal Reproductive Adaptations/Project	
9	Lesson 5 & 6 **Quiz**	
Total Days: 9	Assessment: 1 Quiz 1 Lab/Project	

Unit Learning Goal and Scale *(Level 2.0 reflects a minimal level of proficiency)*	
Standard(s): MS-LS1-4: Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	
4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught.
3.0	**Students will be able to:** • Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. (for example, using empirical evidence and scientific reasoning, make and defend the claim that specific animal behaviors affect the probability of animal and plant reproduction[such as next building to protect young from cold, herding to protect young from predators, transferring pollen or seeds to create conditions for seed germination, or animal vocalization and colorful plumage to attract mates for breeding] and that specific plant structure affect the probability of successful plant reproduction[such as bright flowers attracting butterflies that transfer pollen, flower nectar and odors attracting insects that transfer pollen, and hard shells on nuts that squirrels bury]).
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: animal, animal behavior, attract, breed, characteristic, mate, nectar, plant, plant structure, pollen, probability, reproduction, reproductive capacity, reproductive system, specialized. • Describe animal behaviors that affect the probability of successful reproduction. • Describe plant structures that affect the probability of successful reproduction.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Standard(s): MS-LS1-5: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	
4.0	**Students will be able to:** • In addition to 3.0 performance, the student demonstrates in-depth interferences and applications that go beyond what was taught.

3.0	**Students will be able to:** • Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms (for example, use evidence [such as drought decreasing plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, and fish growing larger or smaller depending on habitat size] to explain how genetic factors and environmental factors [such as availability of food, light, space, and water] affect the growth of organisms).
2.0	**Students will be able to:** • Recognize or recall specific vocabulary: characteristics of life, drought, environmental, factor, fertilizer, genetic, growth, organism, soil fertility. • Describe environmental and genetic factors that influence the growth of organisms.
1.0	**With help, partial success at level 2.0 content and level 3.0 content**
0.0	**Even with help, no success**

Unit Modifications for Special Population Students	
Advanced Learners	Enrichment Worksheets and Scenario Investigations
Struggling Learners	Use L1 Differentiated Instruction Activities
English Language Learners	Use ELL Support Activities from lesson as needed.
Special Needs Learners	Follow IEP modifications and work with special education teacher to make modifications and use L1 Differentiated Instruction Activities.

Interdisciplinary Connections

Indicators:
ELA

- **Conduct a research Project to answer a question and drawing on several sources.**
- **Cite textual evidence to support analysis of science and technical texts.**
- **Write arguments focused on discipline content.**
- **Trace and evaluate the argument and specific claims that are supported by reasons and claims that are not.**
- **Determine the central ideas or conclusions of a text; provide and accurate summary of the text from prior knowledge and opinions.**
- **Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence and add interest.**

- **Write informative/explanatory texts to examine a topic and convey ideas, concepts and information through selection, organization and analysis of relevant content.**
- **Draw evidence from informational texts to support analysis, reflection and research.**
- **Gather relevant information from multiple and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.**

Math

- **Analyze the relationship between the dependent and independent variables using tables and graphs and relating this to an equation resulting from a real world problem that shows a change in a relationship between two variables.**
- **Understand that a set of data collected to answer a statistical question has a distribution, which can be described by its center, spread and overall shape.**
- **Summarize numerical data sets in relation to their content.**
- **Reason abstractly and quantitatively.**
- **Model with mathematics.**
- **Develop understanding of statistical variability.**

Integration of 21st Century Skills

Indicators:
To function in the 21st Century work place a variety of skills need to be developed and strengthened some of those would be:

- **Developing and Using Models**
- **Planning and Carrying Out Investigations [**supported in the science lab setting but useful in many aspects of life**]**
- **Constructing Explanations and Designing Solutions** [supporting explanations with research and experimentation]
- **Engaging in Argument from Evidence**
- **Analyzing and Interpreting Data** [collected during labs or proposed scenarios]
- **Creativity and Innovation** [brainstorm, collaborate and incorporate group ideas]
- **Critical Thinking and Problem Solving** [Follow the steps of the scientific method.]
- **Communication and Collaboration** [All types of communication are needed - oral, written and nonverbal communication in a variety of forms and contexts. It is also important to be able to listen effectively to decipher meaning, including knowledge, values, attitudes and intentions.]
- **Information Literacy** [Use information accurately and creatively for the issue or problem at hand.]
- **Media Literacy** [Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of media.]
- **ICT (Information, Communications and Technology) Literacy** [Use technology as a tool to research, organize, evaluate and communicate information.]
- **Flexibility and Adaptability** [Adapt to varied roles, jobs and responsibilities, schedules and contexts.]
- **Initiative and Self-Direction** [Set goals, balance short-term and long-term goals. Utilize time and manage workload efficiently. Monitor, define, prioritize, and complete tasks without direct oversight. Demonstrate commitment to learning as a lifelong process. Reflect critically on past experiences to continue to improve.]
- **Social and Cross-Cultural Skills** [Know when it is appropriate to listen and when to speak. Conduct themselves in a respectable manner. Learn and respect cultural differences and work effectively with people from a range of social and cultural backgrounds. Respond open-mindedly to different ideas and values.]

- **Productivity and Accountability** [Set and meet goals, even in the face of obstacles.]
- **Leadership and Responsibility** [Use interpersonal and problem-solving skills to influence and guide others toward a goal. Inspire others to reach their very best via example and selflessness. Demonstrate integrity and ethical behavior in using influence and power. Act responsibly with the interests of the larger community in mind.]