Name	School	Grade	Course/Subject	Number of Students	Interval of Instruction
		6	Science Performance Expectation		September 2018 to March 2019

Standards, Rationale, and Assessment Method

Name the content standards covered, state the rationale for how these standards are critical for the next level of the subject, other academic disciplines, and/or life/college/career. Name and briefly describe the format of the assessment method.

NEW JERSEY CORE CURRICULUM CONTENT STANDARDS – SCIENCE K-12

1) Students use data and conceptual models to understand how the environment and genetic factors determine the growth of an individual organism. They connect this idea to the role of animal behaviors in animal reproduction and to the dependence of some plants on animal behaviors for their reproduction. Students provide evidence to support their understanding of the structures and behaviors that increase the likelihood of successful reproduction by organisms. The crosscutting concepts of *cause and effect* and *structure and function* provide a framework for understanding the disciplinary core ideas. Students demonstrate grade-appropriate proficiency in *analyzing and interpreting data*, *using models*, *conducting investigations*, and *communicating information*. Students are also expected to use these practices to demonstrate understanding of the core ideas. Based on NGSS: MS-LS1-4 and MS-LS1-5.

- **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.** *[Clarification Statement: Examples of behaviors that affect the probability of animal reproduction could include nest building to protect young from cold, herding of animals to protect young from predators, and vocalization of animals and colorful plumage to attract mates for breeding. Examples of animal behaviors that affect the probability of plant reproduction could include transferring pollen or seeds, and creating conditions for seed germination and growth. Examples of plant structures could include bright flowers attracting butterflies that transfer pollen, flower nectar and odors that attract insects that transfer pollen, and hard shells on nuts that squirrels bury.]* **(MS-LS1-4)**
- **Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.** *[Clarification Statement: Examples of local environmental conditions could include availability of food, light, space, and water. Examples of genetic factors could include large breed cattle and species of grass affecting growth of organisms. Examples of evidence could include drought decreasing plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, and fish growing larger in large ponds than they do in small ponds.] [Assessment Boundary: Assessment does not include genetic mechanisms, gene regulation, or biochemical processes.]* **(MS-LS1-5**)

2) Students analyze and interpret data, develop models, construct arguments, and demonstrate a deeper understanding of the cycling of matter, the flow of energy, and resources in ecosystems. They are able to study patterns of interactions among organisms within an ecosystem. They consider biotic and abiotic factors in an ecosystem and the effects these factors have on populations. They also understand that the limits of resources influence the growth of organisms and populations, which may result in competition for those limited resources. The crosscutting concepts of *matter and energy*, *systems and system models*, *patterns*, and *cause and effect* provide a framework for understanding the disciplinary core ideas. Students demonstrate grade-appropriate proficiency in analyzing and interpret data, developing models, and constructing arguments. Students are also expected to use these practices to demonstrate understanding of the core ideas. Based on NGSS: MS-LS2-1, MS-LS2-2, and MS-LS2-3.

- Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. *[Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.]* (MS-LS2-1)
- Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. *[Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.]* (MS-LS2-2)
- Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. *[Clarification Statement: Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems, and on defining the boundaries of the system.] [Assessment Boundary: Assessment does not include the use of chemical reactions to describe the processes.]* (MS-LS2-3)

3) Students build on their understandings of the transfer of matter and energy as they study patterns of interactions among organisms within an ecosystem. They consider biotic and abiotic factors in an ecosystem and the effects these factors have on a population. They construct explanations for the interactions in ecosystems and the scientific, economic, political, and social justifications used in making decisions about maintaining biodiversity in ecosystems. The crosscutting concept of *stability and change* provide a framework for understanding the disciplinary core ideas. Based on NGSS: MS-LS2-4, MS-LS2-5, MS-ETS1-1, and MS-ETS1-3.

- Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. [Clarification Statement: Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations, and on evaluating empirical evidence supporting arguments about changes to ecosystems.] (MS-LS2-4)
- Evaluate competing design solutions for maintaining biodiversity and ecosystem services. * [Clarification Statement: Examples of ecosystem services could include water purification, nutrient recycling, and

prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.] (MS-LS2-5)

4) Students use *system and system models* and *stability and change* to understand ideas related to why some objects will keep moving and why objects fall to the ground. Students apply Newton's third law of motion to related forces to explain the motion of objects. Students also apply an engineering practice and concept to solve a problem caused when objects collide. The crosscutting concepts of *system and system models* and *stability and change* provide a framework for understanding the disciplinary core ideas. Students demonstrate proficiency in *asking questions*, *planning and carrying out investigations, designing solutions, engaging in argument from evidence*, *developing and using models,* and *constructing explanations and designing solutions*. Students are also expected to use these practices to demonstrate understanding of the core ideas. Based NGSS: MS-PS2-1, MS-PS2-2, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, and MS-ETS1-4.

- Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. * [Clarification Statement: Examples of practical problems could include the impact of collisions between two cars, between a car and stationary objects, and between a meteor and a space vehicle.] [Assessment Boundary: Assessment is limited to vertical or horizontal interactions in one dimension.] (MS-PS2-1)
- 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. [Clarification Statement: Emphasis is on balanced (Newton's First Law) and unbalanced forces in a system, qualitative comparisons of forces, mass and changes in motion (Newton's Second Law), frame of reference, and specification of units.] [Assessment Boundary: Assessment is limited to forces and changes in motion in one-dimension in an inertial reference frame and to change in one variable at a time. Assessment does not include the use of trigonometry.] (MS-PS2-2)

5) Students use *cause and effect*; *system and system models*; and *stability and change* to understand ideas that explain why some materials are attracted to each other while others are not. Students apply ideas about gravitational, electrical, and magnetic forces to explain a variety of phenomena including beginning ideas about why some materials attract each other while others repel. In particular, students develop understandings that gravitational interactions are always attractive but that electrical and magnetic forces can be both attractive and negative. Students also develop ideas that objects can exert forces on each other even though the objects are not in contact, through fields. Students are expected to consider the influence of science, engineering, and technology on society and the natural world. Students are expected to demonstrate proficiency in *asking questions*, *planning and carrying out investigations*, *designing solutions*, and *engaging in argument*. Students are also expected to use these practices to demonstrate understanding of the core ideas. Based on NGSS: MS-PS2-3, MS-PS2-4, and 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. [Clarification

Statement: Examples of this phenomenon could include the interactions of magnets, electrically-charged strips of tape, and electrically-charged pith balls. Examples of investigations could include first-hand experiences or simulations.] [Assessment Boundary: Assessment is limited to electric and magnetic fields, and is limited to qualitative evidence for the existence of fields.] (MS-PS2-5)

- Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. [Clarification Statement: Examples of devices that use electric and magnetic forces could include electromagnets, electric motors, or generators. Examples of data could include the effect of the number of turns of wire on the strength of an electromagnet, or the effect of increasing the number or strength of magnets on the speed of an electric motor.] [Assessment Boundary: Assessment about questions that require quantitative answers is limited to proportional reasoning and algebraic thinking.] (MS-PS2-3)
- Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. [Clarification Statement: Examples of evidence for arguments could include data generated from simulations or digital tools; and charts displaying mass, strength of interaction, distance from the Sun, and orbital periods of objects within the solar system.] [Assessment Boundary: Assessment does not include Newton's Law of Gravitation or Kepler's Laws.] (MS-PS2-4)

Rational

The NGSS identify assessable performance expectations (PEs), or what students should know and be able to do at the end of instruction. They represent the integration of three "dimensions" of science education: scientific and engineering practices, disciplinary core ideas (DCIs), and crosscutting concepts (CCCs). As such, both student learning and assessment around the NGSS should be "three dimensional".

Assessment

Authentic Assessments throughout the year will be used to measure students' growth (including Discovery Education assessments and other NGSS-aligned assessments). The assessments will consist of selected performance task and lab investigations that reflect higher levels of cognitive complexity.

Starting Points and Preparedness Groupings

Students will be tiered as determined by a data point systems the uses 2 points of data. Each tier group will be assigned a target level.

Data Measures used to Establish Baselines

2017-2018 Final Grade; weight (. 35)
Science Pre-Assessment; weight (.35)
Unit 1 Lab: weight (.30)

Preparedness Group	Baseline Score
Tier 1	< 0.35
Tier 2	0.35 – 0.55

Tier 3	0.55 – 0.75
Tier 4	>0.75

Student Growth Objective

By March 2019, 70% of students in each preparedness group will meet their assigned target command level for full attainment of the objective as shown in the scoring plan.

Preparedness Group (e.g. 1,2,3)	Number of Students in Each Group	Target Level of SGO Combined Assessments
Tier 1		2
Tier 2		3
Tier 3		4
Tier 4		4 or 5[1]

Scoring Plan

State the projected scores for each group and what percentage/number of students will meet this target at each attainment level. Modify the table as needed.

Preparedness Group	Student Target Command Level	Teacher SGO Score Based on Percent of Students Achieving Target Score			
		Exceptional (4) >80%	Full (3) 70-80%	Partial (2) 50-69%	Insufficient (1) <50%
Tier 1	2				
Tier 2	3				
Tier 3	4				
Tier 4	4 or 5[1]				

[1] **It is expected that students in Tier 4 maintain a level of strong command or grow to distinguished command.**

Approval of Student Growth Objective

Administrator approves scoring plan and assessment used to measure student learning.

Teacher _____ Signature_____	Date Submitted_____
Evaluator _____ Signature _____	Date Approved _____

Results of Student Growth Objective

Summarize results using weighted average as appropriate. Delete and add columns and rows as needed.

Preparedness Group	Students at Target Score	Teacher SGO Score	Weight (based on students per group)	Weighted Score	**Total Teacher SGO Score**
Tier 1					
Tier 2					
Tier 3					
Tier 4					

Notes Describe any changes made to SGO after initial approval, e.g. because of changes in student population, other unforeseen circumstances, etc.
Review SGO at Annual Conference Describe successes and challenges, lessons learned from SGO about teaching and student learning, and steps to improve SGOs for next year.
Teacher _____ Signature _____ Date _____ Evaluator _____ Signature _____ Date _____