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UNIT: **Scientific Investigations and Animal Classification** MAP LEVEL: 4

CONTACT: athompson@bridgeportedu.net or mcouncil@bridgeportedu.net

GRADE: 7

TIME FRAME: **1st Marking Period**

PERFORMANCE STANDARDS

27.1 SCIENCE - SCIENTIFIC INQUIRY (I)

27.1.1.6.1 Students will identify questions that can be answered through scientific investigation.

27.1.1.6.2 Students will read, interpret and examine the credibility of scientific claims in different sources of information.

27.1.1.6.3 Students will design and conduct appropriate types of scientific investigations to answer different questions.

27.1.1.6.4 Students will identify independent and dependent variables, and those variables that are kept constant, when designing an experiment.

27.1.1.6.5 Students will use appropriate tools and techniques to make observations and gather data.

27.1.1.6.6 Students will use mathematical operations to analyze and interpret the data.

27.1.1.6.7 Students will identify and present relationships between variables in appropriate graphs.

27.1.1.6.8 Students will draw conclusions and identify sources of error.

27.1.1.6.9 Students will provide explanations to investigated problems or questions.

27.1.1.6.10 Students will communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

27.3 SCIENCE - LIFE SCIENCE (V,VI,VII)

27.3.7.0.4 Students will describe the similarities and differences in the appearance and behaviors of plants, birds, fish, insects and mammals (including humans).

27.3.7.0.6 Students will describe characteristics that distinguish living from non-living things.

27.3.7.4.10 Students will describe how animals, directly or indirectly, depend on plants to provide the food and energy they need in order to grow and survive.

ESS/FOCUS QUESTIONS

1. What are the steps of the scientific method?
 2. How are observations made with or without scientific tools?
 3. What is an investigable question?
 4. What method should be used to design and conduct an experiment?
 5. How is scientific data collected and organized?
 6. What are the different types of variables?
 7. How are graphs constructed in order to organize and interpret data?
 8. How do scientists classify animals?
 9. What are the similarities and differences between the phyla of animals?
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CONTENT

Scientific Inquiry

-Search out, describe, explain, and predict natural phenomena.

Scientific Process Skills

-Questions, hypothesis, predictions, planning, observations, interpretations, and communication.

Scientific Literacy

-Speaking, listening, presenting, interpreting, reading, and writing about science.

SKILLS

-Explain each step of the scientific method.

-Explain what scientific inquiry involves.

-Differentiate between a scientific theory and law.

-Describe how to develop a hypothesis and design an experiment.

-Use laboratory equipment and computers with proficiency.

-Take accurate metric measurements.

-Collect, organize, interpret and graph quantitative data.

-Draw conclusions and communicate findings in oral and written form.

-Explain how animals are classified.

-Understand scientific rubrics and assessment sheets.

ASSURED EXPERIENCES

Students will conduct controlled scientific experiments, formulate a hypothesis, collect and interpret data, draw conclusions and communicate results.

Students will observe, infer, classify, measure, calculate, communicate and design an experiment.

Students will understand how to classify the thirty-five phyla of animals in Kingdom Animalia.

ASSESSMENTS

Pre and post tests

Lab Report

Research Papers

Embedded tasks

Student project

Portfolios

Rubric

Journal

OPTIONAL ACTIVITIES

- Generate computerized line, bar, and pie graphs.
- Lab Activity: Penny observations-A Close Up Look
- Lab Activity: Penny Drops!
- Student Self Reflection

RESOURCES

- United Streaming Videos
- "Scientific Method and Measurement"
- "Biology--The Science of Life: The World of Animals"

- The Nature of Science-Pearson Prentice Hall textbook
- Animals-Pearson Prentice Hall textbook

- Discovery Channel School
- Websites:
www.phschool.com

ADDITIONAL NOTES

- Students begin Science Fair Project Research
- Students select a Science Fair Project

VOCABULARY

Analyze	Hypothesis	Purpose
Application	Inference	Qualitative
Axis	Linear graph	Quantitative
Classify	Manipulated variable	Record
Communicate	Metric system	Responding variable
Conclusion	Observe	Results
Data	Origin	Scientific law
Data Point	Percent error	Theory
Estimate	Predict	Variable
Experiment	Problem	Vertical axis
Factual	Procedure	
Graph	Process	
Horizontal axis	Prototype	

UNIT: Heredity and Genetics

CONTACT: athompson@bridgeportedu.net or mcouncil@bridgeportedu.net

GRADE: 7

TIME FRAME: **2nd marking period**

PERFORMANCE STANDARDS

27.1 SCIENCE - SCIENTIFIC INQUIRY (I)

27.1.1.6.1 Students will identify questions that can be answered through scientific investigation.

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27.1.1.6.5 Students will use appropriate tools and techniques to make observations and gather data.

27.1.1.6.6 Students will use mathematical operations to analyze and interpret the data.

27.3 SCIENCE - LIFE SCIENCE (V,VI,VII)

27.3.7.8.25 Students will explain the similarities and differences in cell division in somatic and germ cells.

27.3.7.8.26 Students will describe the structure and function of the male and female human reproduction system, including the process of egg and sperm production.

27.3.7.8.27 Students will describe the structure of the genes on chromosomes, and explain sex determination in humans.

ESS/FOCUS QUESTIONS

1. What is a cell?
2. What is the structure of an animal cell?
3. What is the structure of a plant cell?
4. How does the structure of a cell determine its function?
5. What is heredity?
6. What is a trait?
7. What controls the inheritance traits in organisms?
8. What is the relationship between chromosomes and genes?
9. How do geneticists use pedigrees?
10. How does a Punnett square predict phenotypes or genetic variability?
11. What are dominant traits?
12. What are recessive traits?
13. What is codominance?

CONTENT

Heredity and Genetics

-Reproduction is a characteristic of living systems and it is essential for the continuation of every species.

-Heredity is the passage of genetic information from one generation to another.

-Some of the characteristics of an organism are inherited and some result from interactions with the environment.

Scientific Process Skills

-Questions, hypothesis, predictions, planning, observations, interpretations and communications.

SKILLS

-Explain what scientific inquiry involves.

-Use microscope efficiently.

-Describe the phases of mitosis and meiosis.

-Create and describe Punnett squares.

-Compare and contrast bacteria, plant and animal cells.

-Understand respiration equation.

-Compare and contrast photosynthesis and cellular respiration.

-Explain sexual and asexual reproduction.

-Compare active and passive transport.

ASSURED EXPERIENCES

-Science Fair Project

-Participation in School Science Fair

-Skill Lab-"Take a Class Survey: Dominant and Recessive Genes"

-Discovery Activity-"What Do Fingerprints Reveal"

-Complete Punnett squares

-Discovery Activity-"All in the Family"

ASSESSMENTS

Pre and post tests

Rubric

Prentice-Hall Progress Monitoring

Lab reports

Research Papers

Embedded tasks

Portfolios

Science fair projects

Research Papers

OPTIONAL ACTIVITIES

- Skills Lab-"Take a Class Survey"- Dominant and Recessive Alleles

RESOURCES

United Streaming Videos

-TLC Elementary School: Life Cycles

-"Your Genes: Your Future"

-Cells and Heredity-Pearson Prentice Hall

-Science Court" Computer Lessons

-Discovery Channel School

VOCABULARY

Active transport	Endoplasmic reticulum	Interphase	Punctuated equilibria
Alleles	Gene	Karyotype	Punnett square
Animal cell	Gene therapy	Meiosis	Purebred
Autotroph	Genetic disorder	Microscope	Recessive allele
Carrier	Genetic engineering	Mitochondria	Replication
Cell	Genetics	Mitosis	Respiration
Cell cycle	Genome	Multiple alleles	Ribosome
Cell membrane	Genotype	Mutation	RNA
Cell wall	Heredity	Natural selection	Selective breeding
Chromosome	Heterotroph	Nucleic acid	Selectively permeable
Clone	Heterozygous	Nucleus	Trait
Codominance	Homologous structures	Osmosis	Transfer RNA
Cytoplasm	Homozygous	Passive transport	Vacuole
Diffusion	Hybrid	Pedigree	Variation
DNA	Hybridization	Phenotype	
Dominant allele	Inbreeding	Plant cell	

UNIT: **Cells and Organ Systems - Food Preservation**
CONTACT: Bridgeport Public Schools Science Department
TIME FRAME: **3rd marking period**

MAP LEVEL: 4
GRADE: 7

PERFORMANCE STANDARDS

27.1 SCIENCE - SCIENTIFIC INQUIRY (I)

27.1.1.6.1 Students will identify questions that can be answered through scientific investigation.

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27.1.1.6.7 Students will identify and present relationships between variables in appropriate graphs.

27.1.1.6.8 Students will draw conclusions and identify sources of error.

27.1.1.6.9 Students will provide explanations to investigated problems or questions.

27.1.1.6.10 Students will communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

27.1.1.6.6 Students will use mathematical operations to analyze and interpret the data.

27.3 SCIENCE - LIFE SCIENCE (V,VI,VII)

27.3.6.7.15 Students will describe the basic structures of an animal cell, including nucleus, cytoplasm, mitochondria and cell membrane, and how they function to support life.

27.3.6.7.16 Students will describe the structures of the human digestive, respiratory, and circulatory systems, and explain how they function to bring oxygen and nutrients to the cells and expel waste materials.

27.3.6.7.17 Students will explain how the human muscular/skeletal system supports the body and allows movement.

27.5 SCIENCE - SCI & TECH IN SOCIETY (XI)

27.5.11.7.21 Students will describe how freezing, dehydration, pickling and irradiation prevent food spoilage caused by bacteria.

ESS/FOCUS QUESTIONS

1. What are the characteristics of living organisms?
2. What is the difference between meiosis and mitosis?
3. How is the human body organized?
4. What are the major organs in the human body?
5. What is an organ system?
6. How are organ systems interdependent?
7. What are the causes of food spoilage?
8. What methods are used in order to preserve food?
9. Why is food preservation important?

CONTENT

Many organisms, including humans, have specialized organ systems that interact with each other to maintain dynamic internal balance.

- All organisms are composed of one or more cells; each cell carries on life-sustaining functions.
- Multicellular organisms need specialized structures and systems to perform basic life functions.

SKILLS

- Explain what scientific inquiry involves.
- Identify the levels of organizations in the human body.
- Explain the structure and functions of cells.
- Describe the four types of tissues.
- Identify and explain the eleven organ systems.
- Describe freezing, dehydration, pickling and irradiation.
- Explain how technology allows us to improve food production and preservation.
- Describe how technology is improving our ability to meet nutritional needs.

ASSURED EXPERIENCES

- Embedded Performance Task: "Feel the Beat"
- Students will:
 - use microscope to examine cells and tissues.
 - compare and contrast plant and animal cells.
 - diagram and create a cell model.
 - design organ system models.
 - be able to explain the levels of organization in the human body.
 - perform food preservation experiments.

ASSESSMENTS

Pre and post tests
Rubric
Classroom lab activities
Lab reports
Research papers
Embedded tasks
Student projects
Journals
Portfolios
Prentice Hall Progress
Monitoring

OPTIONAL ACTIVITIES

- Student designed classroom laboratory experiments
- Student self assessment

RESOURCES

- United Streaming Videos:
 - "How to Use a Microscope"
 - "Introducing the Cell"
 - "The Basics of Biology: How Living Things are Structured"
 - "Your Genes: Your Future"
 - "Biology: The Science of Life: The Microscopic World"
 - "The Basics of Biology: The Human Body: Organ Systems Working Together"
 - "Human Body Systems"
- Lab activity-Pulse Rate
- Human Body and Health-Pearson Prentice Hall Textbook
- Discovery Channel School
- Website
www.phschool.com

VOCABULARY

Absorption	Cartilage	Epidermis	Large intestine
Alveoli	Cell	Epiglottis	Larynx
Antibiotic	Cell membrane	Epithelial tissue	Ligament
Antibody	Cerebellum	Epithelial tissue	Liver
Anus	Cerebrum	Esophagus	Lungs
Aorta	Cilia	Excretion	Lymph
Artery	Circulatory system	Follicle	Lymph node
Atrium	Compact bone	Gall bladder	Lymphatic system
Axon	Connective tissue	Heart	Marrow
Bile	Coronary artery	Hemoglobin	Melanin
Bladder	Cytoplasm	Homeostasis	Mucus
Blood pressure	Dendrite	Hormone	Muscle tissue
Brain	Dermis	Hypothalamus	Nephron
Brain stem	Diaphragm	Immune response	Nerve tissue
Bronchi	Digestion	Immunity	Neuron
Cancer	Digestive system	Inflammatory response	Nucleus
Capillary	Egg	Involuntary muscles	Organ
Cardiac muscle	Endocrine gland	Joint	Organ system
Cardiovascular	Enzyme	Kidney	Osteoporosis

Ovary
Pancreas
Peristalsis
Pharynx
Pituitary gland
Plasma
Platelet
Pore
Pulse
Rectum
Red blood cell
Reflex

Respiration
Respiratory system
Saliva
Skeletal muscle
Skeletal system
Skeleton
Small intestine
Smooth muscle
Sperm
Spinal cord
Spongy bone
Stimulus

Stomach
Stress
Striated muscle
Synapse
Tendon
Testes
Tissue
Trachea
Urea
Urethra
Urine
Vaccination

Valve
Vein
Ventricle
Vertebrae
Villi
Vocal chords
Voluntary muscles
White blood cell
Zygote fertilization

UNIT: **Ecosystems** MAP LEVEL: 4
CONTACT: athompson@bridgeportedu.net or mcouncil@bridgeportedu.net
GRADE: 7
TIME FRAME: **4th marking period**

PERFORMANCE STANDARDS

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- 27.1.1.6.10 Students will communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

27.3 SCIENCE - LIFE SCIENCE (V,VI,VII)

- 27.3.5.6.4 Students will describe how abiotic factors such as temperature, water and sunlight affect plants ability to create their own food through photosynthesis.
 - 27.3.5.6.5 Students will explain how populations are affected by predator-prey relationships.
 - 27.3.5.6.6 Students will describe common food webs in different Connecticut ecosystems
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ESS/FOCUS QUESTIONS

1. What needs must be met by an organism's surroundings?
2. What are the biotic and abiotic parts of a habitat?
3. What are the levels of organizations within an ecosystem?
4. What method is used to determine the size of population?
5. What are the causes of change in population size?
6. What are the factors that limit population growth?
7. How does an organism's adaptation help it survive?
8. What are the major kinds of interactions among organisms in an ecosystem?
9. What are the three types of symbiotic relationships?
10. What are the differences between primary and secondary succession?
11. What are the major ecological cycles?

CONTENT

An ecosystem is composed of all the populations that are living in a certain space and the physical factors with which they interact.

- Populations in ecosystems are affected by biotic factors, such as other populations, and abiotic factors, such as soil and water supply.
 - Populations in ecosystems can be categorized as producers, consumers and decomposers of organic matter.
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SKILLS

- Explain scientific inquiry.
 - Diagram and describe a food chain.
 - Diagram and explain a food web.
 - Prepare a flow chart that represents the water, oxygen, carbon and nitrogen cycles.
 - Explain how climate, habitat, food source, location, competition act as a limiting factor in relationship to population.
 - Make inferences to show limiting factors in population growth.
 - Analyze how environmental factors affect adaptation.
 - Prepare a graph that illustrates predator-prey relationships.
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ASSURED EXPERIENCES

- Lab Zone Activity: Weaving a Food Web
 - Discovery Activity: How Much Variety Is There?
 - Chapter Project: What's a Crowd?
 - Discovery Activity: What's the Population of Beans in a Jar?
 - Skills Lab-Counting Turtles
 - Science and Society: Animal Overpopulation You Decide Activity
 - Discovery Activity: How Are Plant Chemicals Separated?
 - Discovery Activity: Conserving Land and Soil-How Does Mining Affect the Land?
 - Teacher Demo: Making a Model of a Landfill
 - Lab Activity: Is There Tea There?
 - Lab Activity: Getting Clean
 - Discovery Activity: Air Pollution and Solutions: How Does the Scent Spread?
 - Analyzing data Activity: Chlorine Levels in the Atmosphere
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ASSESSMENTS

Pre and post tests
Rubric
Lab Activities
Lab reports
Research papers
Journals
Portfolios
Prentice Hall Progress Monitoring

OPTIONAL ACTIVITIES

- Skills Lab: A World in a Bottle
- Lab Zone: Carbon and Oxygen Blues
- Skills Lab: Tree Cookies Tales
- Lab Zone: How Acid is Your Rain?

RESOURCES

United Streaming Videos

- Science Investigations Life Science: Investigating Ecosystems and Biomes
- Biomes: Adapting to Deserts and Other Ecosystems
- Natural Focus with Laurie Sanders Series of Videos
- Cycle Series: The Nitrogen Cycle

-Environmental Science-Pearson Prentice Hall

-"Science Court" Computer Lessons

-Discovery Channel School

-Websites

www.phschool.com

www.discoveryschool.com

VOCABULARY

Adaptation	Consumer	Food chain	Mutualism
Aquaculture	Continental drift	Food web	Natural resource
Bedrock	Death rate	Geothermal	Natural selection
Biodiversity	Deciduous tree	energy	Neritic zone
Biogeography	Decomposer	Global warming	Niche
Biome	Desert	Grassland	Nitrogen cycle
Biotic factor	Desertification	Greenhouse effect	Nitrogen fixation
Birth rate	Dispersal	Ground water	Nonrenewable
Canopy	Drought	Habitat	resource
Captive breeding	Ecology	Herbivore	Nutrient depletion
Carbon cycle	Ecosystem	Host	Omnivore
Carnivore	Emigration	Hydrocarbon	Oxygen cycle
Carrying capacity	Endangered species	Immigration	Ozone
Climate	Energy pyramid	Intertidal zone	Parasite
Commensalism	Environmental science	Keystone species	Permafrost
Community	Erosion	Landfill	Photosynthesis
Competition	Estuary	Leachate	Poaching
Composting	Extinction	Limiting factor	Pollution
Coniferous tree	Fishery	Litter	Population

Precipitation

Predation

Predator

Prey

Primary succession

Producer

Recycling

Renewable resource

Scavenger

Secondary succession

Sediment

Sewage

Solar energy

Subsoil

Succession

Symbiosis

Taxol

Temperature

inversion

Topsoil

Tundra

Understory

Water cycle