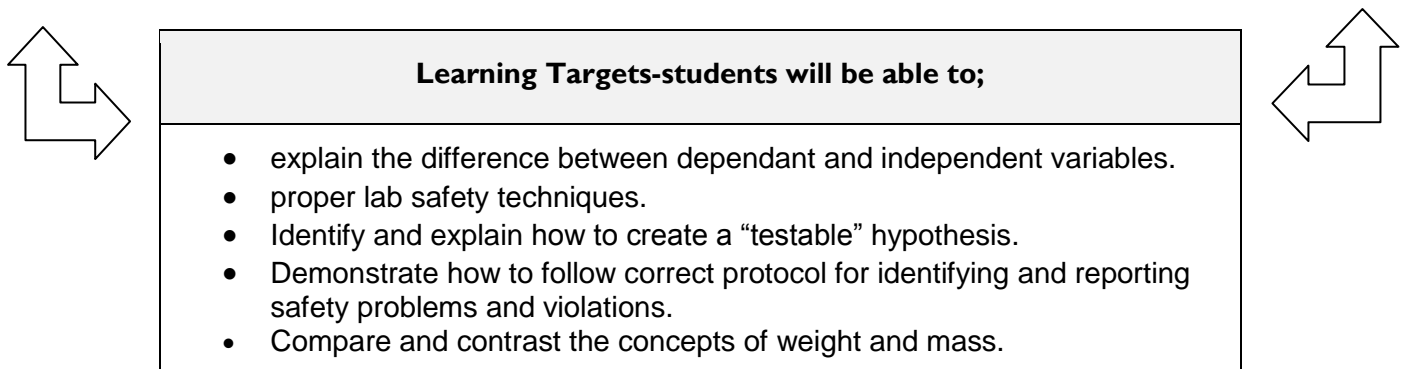
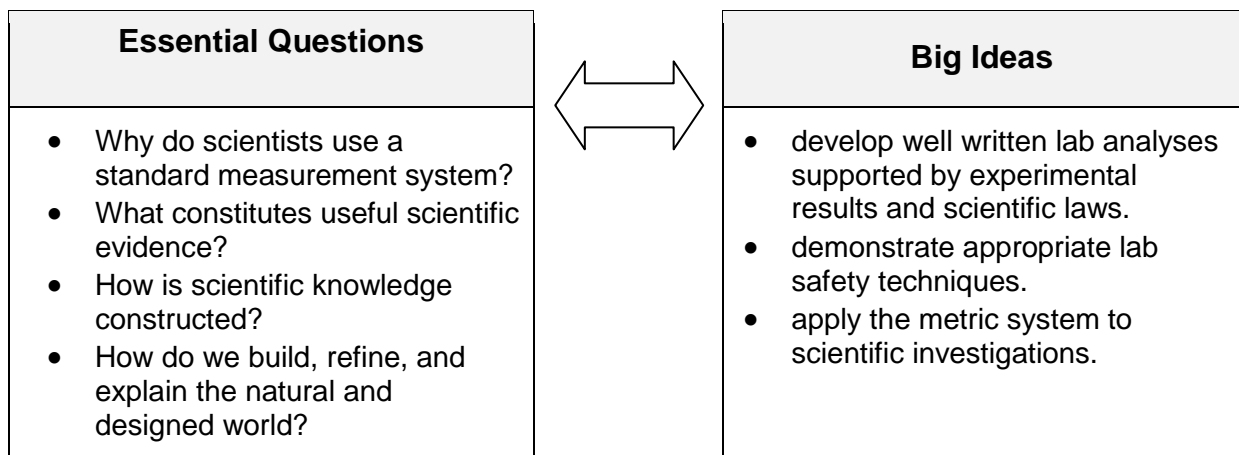


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|--|---|
| Unit Title | 7.1 Introduction to the World of Life Science and the Metric System |
| Time frame | 2-3 Weeks |
| 21 st Century Themes | Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Productivity and Accountability Leadership and Responsibility |
| Interdisciplinary focus and technology integration | Technology Math |



| | |
|------------------------|----------------------------|
| Assessment | |
| Rubrics | Teacher-created Assessment |
| Lab Reports | Classroom Participation |
| Homework completion | Group Participation |
| Differentiation | |
| Hands-on Activities | |

Diagnostic Assessment
 Kinaesthetic
 Re-teaching
 Enrichment Activities
 Cooperative Learning
 Peer Tutoring
 Tiered Instruction
 Alternative Assessment

Content Standards

What state content standards are to be addressed?

5.2.8.A
 5.2.8.B
 5.1A-D

Approaches to Learning

Observation skills- observing and communicating data in a lab report
Analyzing skills – recognizing relationships
Evaluation skills- developing criteria for judging their own work
Scientific Inquiry Skills – formulate questions, hypothesize and conduct experiments
Inquiry skills – formulate questions, hypothesize and conduct experiments

Learning Experiences

- “Review lab safety procedures and lab equipment.
- Review Scientific Method.
- Introduce unit conversions in the metric system and practice metric to metric conversions.
- Metric Measurement Labs (Practice measuring mass, length, volume, temperature) and create appropriate graphs.
- Students design and develop a class lab with a “testable hypothesis”.
- Develop well written lab report.

Teaching Strategies

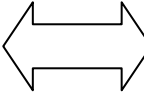
- Evaluation of lab reports, rubrics to assess writing, written assessment
- Peer/group discussion, lecture, board work, evaluations, discussion of lab work, use of technology
- Utilization of key terms

Resources

Prentice Hall Science Explorer: Physical Science, 2009

Grade 7 Science

| | |
|--|--|
| Unit Title | 7.2 Exploring Life/ Microscopes and Cells |
| Time frame | 10 weeks |
| 21 st Century Themes | Critical Thinking and Problem Solving Communication and Collaboration Initiative and Self-Direction Productivity and Accountability |
| Interdisciplinary focus and technology integration | Technology Math Art |

| Essential Questions |  | Big Ideas |
|--|---|---|
| <ul style="list-style-type: none"> • What are the common characteristics and needs of living things? • How are the structure and function of cells similar to that of the whole organism? • How did the invention of the microscope lead to the discovery of cells? | | <ul style="list-style-type: none"> • Cells are the basic unit and structure of living things. • All living organisms and their component cells have identifiable characteristics that allow for survival. • All animals are made of specialized cells, tissues, and organs that are organized into systems. • The invention of the microscope allowed for the discovery of cells and an increased understanding of the living world |

| Learning Targets-students will be able to; |
|--|
| <ul style="list-style-type: none"> • Distinguish between living and non-living things • Name and describe the cell part locations • Recognize structure and functions of cells parts • List the difference between plant/animal cells • Name and describe the different types of cell transport • Produce a wet mount slide • Name and describe the parts of a microscope • Use a microscope appropriately |

Assessment

- Formal and Informal Teacher Observations
- Tests / Quizzes
- Diagrams and Models
- Student Projects
- Study Island Assignments
- Supplemental NJ ASK Practice Questions from NJ ASK Workbooks
- Experiment/Investigation

Differentiation

- Hands-On Activities
- Diagnostic Assessment
- Kinaesthetic Activities
- Re-teach and Enrichment Activities
- Cooperative Learning (Flexible Grouping)
- Peer Tutoring
- Tiered Activities

Content Standards

5.1.8.A.1- Core scientific concepts and principles represent the conceptual basis for model-building and facilitate the generation of new and productive questions.

5.1.8.A.2- Results of observation and measurement can be used to build conceptual-based models and to search for core explanations.

5.1.8.A.3- Predictions and explanations are revised based on systematic observations, accurate measurements, and structured data/evidence.

Life Science

5.3.8.A.1: Compare the benefits and limitations of existing as a single-celled organism and as a multicellular organism.

5.3.8.A.2

Relate the structures of cells, tissues, organs and systems to their functions in supporting life.

5.3.6.A.2

Model and explain ways in which organelles work together to meet the cell's needs.

Approaches to Learning

Observation skills- observing and communicating data in a lab report

Analyzing skills – recognizing relationships

Evaluation skills- developing criteria for judging their own work

Scientific Inquiry Skills – formulate questions, hypothesize and conduct experiments

Inquiry skills – formulate questions, hypothesize and conduct experiments

Learning Experiences

Suggested activities

Teaching Strategies

| | |
|--|---|
| <p>Labs –Wet Mount-plant and animal cell</p> <p>Assessments – Parts and Techniques of Microscope Use Plant/Animal Cell Diagrams</p> <p>Chapter Outlines/Notes</p> <p>Notebook Tests</p> <p>Presentations</p> <p>Project: cell model-build a cell</p> | <ul style="list-style-type: none"> •Direct Instruction •Differentiated Instruction •Interdisciplinary Activities •Cooperative Learning Activities •Reinforcement and Remediation |
|--|---|

Resources

Text: PRENTICE HALL, LIFE SCIENCE, SCIENCE EXPLORER

Nonfiction trade books

Videos

Internet

Equipment

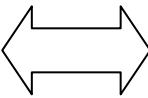
Posters

Pictures

Models

Grade 7 Science

| | |
|-------------------|---------------------------------------|
| Unit Title | 7.3 Diversity of Living Things |
| Time frame | 3 weeks |

| | | |
|--|--|---|
| 21 st Century Themes | Critical Thinking and Problem Solving Communication and Collaboration Initiative and Self-Direction Productivity and Accountability | |
| Interdisciplinary focus and technology integration | Technology Math Art | |
| Essential Questions |  | Big Ideas |
| <ul style="list-style-type: none"> • What are the similarities and differences between the six kingdoms? • How and why do we classify living things? • What do all living things have in common? • What defines a species? | | <ul style="list-style-type: none"> • All organisms belong to a kingdom based on their characteristics. |

| | |
|--|--|
| Learning Targets-students will be able to; | |
| <ul style="list-style-type: none"> • Describe the characteristics of the six kingdoms • Identify classification as a tool that humans use to give sense and order to the world • Using classification we can see that living things share common characteristics and requirements • Classify living things into one of the six kingdoms of life based on their characteristics • Use Linnaean methods of classification to classify organisms | |

| |
|--|
| Assessment |
| <ul style="list-style-type: none"> • Formal and Informal Teacher Observations • Tests / Quizzes • Diagrams and Models • Student Projects • Study Island Assignments • Experiment/Investigation |
| Differentiation |
| <ul style="list-style-type: none"> • Hands-On Activities • Diagnostic Assessment • Kinaesthetic Activities • Re-teach and Enrichment Activities • Cooperative Learning (Flexible Grouping) • Peer Tutoring |

- Tiered Activities

Content Standards

- 5.1.8. A.1-** Core scientific concepts and principles represent the conceptual basis for model-building and facilitate the generation of new and productive questions.
- 5.1.8. A.2-**Results of observation and measurement can be used to build conceptual-based models and to search for core explanations.
- 5.1.8. A.3-**Predictions and explanations are revised based on systematic observations, accurate measurements, and structured data/evidence.
- 5.3.6. B.1** Describe the sources of the reactants of photosynthesis and trace the pathway to the products.
- 5.3.6. D.3** Distinguish between inherited and acquired traits/characteristics.
- 5.3.6. E.1 Describe the impact on the survival of species during specific times in geological history when environmental conditions changed.
- 5.3.8. A.1** Compare the benefits and limitations of existing as a single or multi-cellular organism.
- 5.3.8A.2** Relate the structures of cells, tissues, organs and systems to their functions in supporting life.
- 5.3.8. B.1** Relate the energy and nutritional needs of organisms in a variety of life stages and situations, including stages of development and periods of maintenance.
- 5.3.8. B.2** Analyze the components of a consumer’s diet and trace them back to plants and plant products.
- 5.3.8. E.1** Organize and present evidence to show how the extinction of a species is related to an inability to adapt to changing environmental conditions using quantitative and qualitative data.
- 5.3.8. E.2** Compare the anatomical structures of a living species with fossil records to derive a line of descent.

Approaches to Learning

- Notes and Examples
- Homework Practice
- Cumulative Review Exercises
- Test Prep Questions
- Hands-on Activities and Use of Manipulatives
- Problem Solving Activities/Experiments

Learning Experiences

Suggested Activities

- “Is fire alive” demo
- Notes/ Discussion on 6 characteristics that all living things have in common
- Using classification we can see that living things share common characteristics and requirements
- Demo/discuss the use of a dichotomous key to classify living things
- Dichotomous Key Activity to classify living things based on characteristics

Teaching Strategies

- Direct Instruction
- Differentiated Instruction
- Interdisciplinary Activities
- Cooperative Learning Activities
- Reinforcement and Remediation

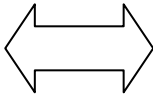
Resources

Text: PRENTICE HALL, LIFE SCIENCE, SCIENCE EXPLORER
 Nonfiction trade books

Videos
Internet
Equipment
Posters
Pictures
Models

Grade 7 Science

| | |
|---------------------------------|--|
| Unit Title | 7.4 Viruses and Bacteria |
| Time frame | 3 weeks |
| 21 st Century Themes | Critical Thinking and Problem Solving Communication and Collaboration Initiative and Self-Direction Productivity and Accountability |

| | | |
|--|---|---|
| Interdisciplinary focus and technology integration | Technology Math Art | |
| Essential Questions |  | Big Ideas |
| <ul style="list-style-type: none"> • How do bacteria and viruses impact our lives in both negative and positive ways? • What characteristics distinguish living and non-living things? | | <ul style="list-style-type: none"> • viruses are non-living things. They have a major potential for impact on the living world. • Bacteria and viruses have profound impact on our bodies |

| | |
|--|--|
| Learning Targets-students will be able to; | |
| <ul style="list-style-type: none"> • Explain why viruses are nonliving. • Describe how an active virus enters a cell and causes the cell to immediately make new viruses. • Describe most bacteria are beneficial or benign to humans. • Compare and contrast the three basic shapes of bacteria | |

| |
|---|
| Assessment |
| <ul style="list-style-type: none"> • Formal and Informal Teacher Observations • Tests / Quizzes • Diagrams and Models • Student Projects • Study Island Assignments • Experiment/Investigation |
| Differentiation |
| <ul style="list-style-type: none"> • Hands-On Activities • Diagnostic Assessment • Kinaesthetic Activities • Re-teach and Enrichment Activities • Cooperative Learning (Flexible Grouping) • Peer Tutoring • Tiered Activities |
| Content Standards |
| <p>5.1.A 5.1.B 5.1.C 5.1.D</p> |

5.3.A
5.3.B
5.3.C
5.3.D
5.3.E

Approaches to Learning

- Notes and Examples
- Homework Practice
- Cumulative Review Exercises
- Test Prep Questions
- Hands-on Activities and Use of Manipulatives
- Problem Solving Activities/Experiments

Learning Experiences

Suggested Activities

- Preview the essential questions and connect to the learning throughout the unit.
- Computer use: Internet research on viruses
- Describe how viruses reproduce, grow and cause disease.
- Describe some helpful uses of viruses.
- Explain how vaccines fight viral infections.
- Explain some ways that bacteria are helpful and harmful, with attention to disease and the nitrogen cycle.
- Bacterial Culture Lab
- Glo-Germ Lab

Teaching Strategies

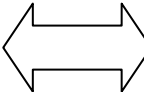
- Direct Instruction
- Differentiated Instruction
- Interdisciplinary Activities
- Cooperative Learning Activities
- Reinforcement and Remediation

Resources

Text: PRENTICE HALL, LIFE SCIENCE, SCIENCE EXPLORER
Nonfiction trade books
Videos
Internet
Equipment
Posters
Pictures
Models

Grade 7 Science

| | |
|--|---|
| Unit Title | 7.5 Cell Process and Energy |
| Time frame | 6-8 Weeks |
| 21 st Century Themes | Critical Thinking and Problem Solving Communication and Collaboration ICT (Information, Communications and Technology) Literacy Flexibility and Adaptability Initiative and Self-Direction Productivity and Accountability Financial, Economic, Business and Entrepreneurial Literacy |
| Interdisciplinary focus and technology integration | Technology : internet Art: diagrams and pictures Math : measurement Lang Arts; reading for main idea and specific info History |

| Essential Questions |  | Big Ideas |
|--|--|-----------------------------------|
| <ul style="list-style-type: none"> • How are inorganic and organic compounds utilized within the cell? • How do molecules pass through the cell membrane? • What is the relationship between photosynthesis and cellular respiration? • How does energy cycle throughout the cell? | | All organisms make or use energy. |

Learning Targets-students will be able to;

- Define elements and compounds
- Describe how water is important to the function of cells
- List the main kinds of organic molecules in living things
- Compare and contrast the events and outcomes of cell respiration, photosynthesis, and fermentation
- Compare and contrast passive and active transport.
- Compare and contrast osmosis and diffusion and explain their impact on the cell.

Assessment

- Formal and Informal Teacher Observations
- Tests / Quizzes
- Diagrams and Models
- Student Projects
- Study Island Assignments
- Supplemental NJ ASK Practice Questions from NJ ASK Workbooks
- Experiment/Investigation

Differentiation

Observation skills- observing and communicating data in a lab report

Analyzing skills – recognizing relationships

Evaluation skills- developing criteria for judging their own work

Scientific Inquiry Skills – formulate questions, hypothesize and conduct experiments

Inquiry skills – formulate questions, hypothesize and conduct experiments

Content Standards

5.1.8. A.1- Core scientific concepts and principles represent the conceptual basis for model-building and facilitate the generation of new and productive questions.

5.1.8. A.2- Results of observation and measurement can be used to build conceptual-based models and to search for core explanations.

5.1.8. A.3- Predictions and explanations are revised based on systematic observations, accurate measurements, and structured data/evidence.

Life Science

5.3.8. A.1: Compare the benefits and limitations of existing as a single-celled organism and as a multicellular organism.

5.3.8.A.2

Relate the structures of cells, tissues, organs and systems to their functions in supporting life.

5.3.8.B.1

Relate the energy and nutritional needs of organisms in a variety of life stages and situations, including stages of development and periods of maintenance.

5.3.8.B2

Analyze the components of a consumer's diet and trace them back to plants and plant products.

5.3.6.A.1

Model the interdependence of the human body's major systems in regulating its internal environment.

5.3.6.A.2

Model and explain ways in which organelles work together to meet the cell's needs.

Approaches to Learning

Observation Skills

Analyzing Skills

Evaluation Skills

Scientific Inquiry Skills

Integrating and Summarizing Skills

Learning Experiences

Teaching Strategies

Suggested activities

- Preview the essential questions and connect to the learning throughout the unit.
- Nutrient Identification Lab
- Explain the function of a selectively permeable membrane.
- Research projects: Describe the processes of diffusion and osmosis. Compare and contrast active and passive transport.
- Computer use:
www.edtech.clas.pdy.edu/osmosis_tutorial:
- Lab osmosis and Diffusion.
- Diffusion demonstrations
- Diffusion balloons
- Carrot diffusion lab
- United streaming video: Maintaining equilibrium
- Teachersdomain.com
- Photosynthesis lab
- Cellular respiration lab
- Fermentation lab
- Cellsalive.com
- Mitosis drawings activity
- Mitosis models
Identify the stages of mitosis under a microscope

- Direct Instruction
- Differentiated Instruction
- Interdisciplinary Activities
- Cooperative Learning Activities
- Reinforcement and Remediation

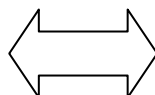
Resources

- : Textbook: Prentice Hall Science Explorer : Life Science
- Trade books
- Handouts
- Posters/Diagrams
- Internet
- Videos

Grade 7 Science

| | |
|--|--|
| Unit Title | 7.6 Cell Reproduction and Heredity |
| Time frame | 6-8 weeks |
| 21 st Century Themes | Critical Thinking and Problem Solving Communication and Collaboration Initiative and Self-Direction Productivity and Accountability |
| Interdisciplinary focus and technology integration | Technology Math Art |

Essential Questions



Big Ideas

- In what ways are organisms of the same kind different from each other?
-
- How does this help them reproduce and survive?
- How do organisms change as they go through their life cycle?

Organisms produced by sexual reproduction inherit half their DNA from each parent. The new combination of DNA determines organism's traits.

Karyotyping, hybridization, cloning, genetic engineering, the Human Genome Project, and DNA fingerprinting are all science and technology applications that have advanced the study of genetics.

Learning Targets-students will be able to;

- List and describe the results of Mendel's experiments, or crosses
- Explain what controls the inheritance of traits in organisms
- Define probability and describe how it helps explain the results of genetic crosses through Punnett Squares
- Describe genotype and phenotype
- Define co-dominance, incomplete dominance, and traditional dominance
- Describe what role chromosomes play in inheritance
- Compare and contrast the stages on mitosis and meiosis as they impact cell reproduction
- Explain the relationship between chromosomes and genes
- Describe some patterns of inheritance in humans
- List and describe the functions of the sex chromosomes
- Explain the relationship between genes and the environment
- List two major causes of genetic disorders in humans
- Describe how geneticists trace the inheritance of traits
- Explain how genetic disorders are diagnosed and treated
- List and describe three ways of producing organisms with desired traits
- Identify the goal of the Human Genome Project

Assessment

- Formal and Informal Teacher Observations
- Tests / Quizzes
- Diagrams and models
- Student Projects
- Study Island Assignments
- Experiment/Investigation

Differentiation

- Hands-On Activities
- Diagnostic Assessment
- Kinaesthetic Activities
- Re-teach and Enrichment Activities
- Cooperative Learning (Flexible Grouping)
- Peer Tutoring
- Tiered Activities

Content Standards

5.1 Science Practices

5.3.8.D.1 Defend the concept that through reproduction , genetic traits are passed form one generation to the next using evidence collected form observations of inherited traits.

5.3.8.D.2 Explain the source of variation among siblings.

5.3.8.D.3 Describe the environmental conditions or factors that may lead to a change in a cell’s genetic information or to an organism’s development and how these changes are passed on.

5.3.8.E.1 Organize and present evidence to show how the extinction of a species is related to an inability to adapt to changing environmental conditions using quantitative and qualitative data.

Approaches to Learning

Observation skills- observing and communicating data in a lab report

Analyzing skills – recognizing relationships

Evaluation skills- developing criteria for judging their own work

Scientific Inquiry Skills – formulate questions, hypothesize and conduct experiments

Inquiry skills – formulate questions, hypothesize and conduct experiments

Learning Experiences

Suggested activities

- Preview the essential questions and connect to learning throughout the unit.
- Explain how traits are inherited and explain Mendel’s role in the history of genetics.
- Project: Use a Punnett square to predict the results of a cross.
- Explain the difference between genotype and phenotype.
- Explain incomplete dominance.
- Project: Compare multiple allele and polygenic inheritance, and give examples of both.
- Project: Explain two human genetic disorders.
- Explain the inheritance of sex-linked traits and the importance of genetic engineering.
- Project: Explain some advantages and disadvantages of genetic research.

Teaching Strategies

- Direct Instruction
- Differentiated Instruction
- Interdisciplinary Activities
- Cooperative Learning Activities
- Reinforcement and Remediation

Resources

Text: PRENTICE HALL, LIFE SCIENCE, SCIENCE EXPLORER

Internet

Videos

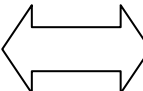
Equipment

Posters

Pictures

Models

Grade 7 Science

| | | |
|--|--|------------------|
| Unit Title | 7.7 Human Biology | |
| Time frame | 8-10 weeks | |
| 21 st Century Themes | Critical Thinking and Problem Solving Communication and Collaboration Initiative and Self-Direction Productivity and Accountability | |
| Interdisciplinary focus and technology integration | Technology Math Art | |
| Essential Questions |  | Big Ideas |

How do the systems of the human body work together?

How does the digestive system obtain nutrients for the body?

What are the major functions of the circulatory system?

What are the major functions of the respiratory and excretory system?

How does the human body fight disease?

Which organs and other structures enable the nervous system to function?

What role does the endocrine system play in reproduction?

Each body system plays an essential role in keeping the human body healthy.

Learning Targets-students will be able to;

Describe the levels of organization in the body and homeostasis.

Explain the functions of the skeleton?

Identify the types of muscles that are found in body.

Describe the functions and structure of skin and how to keep it healthy.

Explain how the six nutrients needed by the human body to help carry out essential processes.

Describe the functions carried out in the digestive system.

Describe the functions carried out in the urinary system.

Explain the functions of the cardiovascular system.

List and describe some diseases of the cardiovascular system and how to maintain cardiovascular health.

Describe the functions of the respiratory system.

List chemicals found in tobacco smoke and describe how tobacco smoke affects a person's health over time.

Explain the relationship between pathogens and infectious disease.

Describe how the body acquires active immunity and how passive immunity occurs.

Explain what causes allergies.

Describe the effects of cancer and diabetes on the body.

List and describe the functions of the nervous system.

Explain how your senses including sight, hearing, smell, touch, and taste work.

Describe how the endocrine system controls body processes.

Explain sexual reproduction.

Describe the stages of human development that occur before birth and from infancy to adulthood.

Assessment

- Formal and Informal Teacher Observations
- Tests / Quizzes
- Diagrams and Models
- Student Projects

| |
|---|
| <ul style="list-style-type: none"> •Experiment/Investigation |
| <p>Differentiation</p> |
| <ul style="list-style-type: none"> • Hands-On Activities • Diagnostic Assessment • Kinaesthetic Activities • Re-teach and Enrichment Activities • Cooperative Learning (Flexible Grouping) • Peer Tutoring • Tiered Activities |

Content Standards

5.1 Science Practices
5.3.6. A.1 Model the interdependence of the human body’s major systems in regulating its internal environment.
5.3.6. A.2 Model and explain ways in which organelles work together to meet the cell’s needs.
5.3.8. A.2 Relate the structures of cell, tissues, organs and systems to their functions in supporting life.

Approaches to Learning

Observation skills- observing and communicating data in a lab report
Analyzing skills – recognizing relationships
Evaluation skills- developing criteria for judging their own work
Scientific Inquiry Skills – formulate questions, hypothesize and conduct experiments
Inquiry skills – formulate questions, hypothesize and conduct experiments

| <p>Learning Experiences</p> <p>Suggested activities</p> | <p>Teaching Strategies</p> |
|---|---|
| <ul style="list-style-type: none"> • Describe the importance of the six classes of nutrients. • Explain the relationship between diet and health. • Distinguish between mechanical and chemical digestion. • Explain how homeostasis is maintained in digestion. • Smart Board Digestive System Activities • “Food into Fuel” video from Discovery Streaming • Frog dissection Laboratory • Discuss the three functions of the respiratory system. • Describe how oxygen and carbon dioxide are exchanged in the lungs and the | <ul style="list-style-type: none"> •Direct Instruction •Differentiated Instruction •Interdisciplinary Activities •Cooperative Learning Activities •Reinforcement and Remediation |

tissues.

- Project: Name three effects of smoking on the human body system.
- Compare arteries, veins, and capillaries.
- Trace the pathway of blood through the chambers of the heart and through the lungs.
- Describe pulmonary, systemic and coronary circulation.
- Describe the characteristics and the functions of the parts of blood.
- Explain the importance of checking blood types before a transfusion is given.
- Describe how the kidneys work.
- Describe the excretory functions of the skin and lungs.
- Explain what happens when the excretory organs do not work.

Resources

Text: PRENTICE HALL, LIFE SCIENCE, SCIENCE EXPLORER

Nonfiction trade books

Videos

Internet

Equipment

Posters

Models