

EGG HARBOR TOWNSHIP PUBLIC SCHOOLS
CURRICULUM

**MEDICAL SCIENCE ACADEMY: Sports Medicine and Athletic Injury
High School**

Length of Course: Full Year

Elective / Required: Refer to Program of Studies

Schools: High School

Student Eligibility: Grade 12

Credit Value: 5 credits

Date Submitted: September 2014

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DISTRICT MISSION STATEMENT

Our mission in the Egg Harbor Township School District is to partner with the student, family, school, and community to provide a safe learning environment that addresses rigorous and relevant 21st Century standards and best practices which will develop academic scholarship, integrity, leadership, citizenship, and the unique learning style of students, while encouraging them to develop a strong work ethic and to act responsibly in their school community and every day society.

SCIENCE – PHILOSOPHY

We believe that ALL students regardless of race, ethnicity, socio-economic status, religious background, and/or any other classification are deserving of a holistic science education. This holistic approach would include an education that will allow them to fully discover themselves, their strengths and weaknesses, and benefit from science instruction.

Scientific literacy assumes an increasingly important role in the context of globalization. The rapid pace of technological advances, access to an unprecedented wealth of information, and the pervasive impact of science and technology on day-to-day living require a depth of understanding that can be enhanced through quality science education. In the 21st century, science education focuses on the practices of science that lead to a greater understanding of the growing body of scientific knowledge that is required of citizens in an ever-changing world (NJCCCS-Science).

Science curricula are designed to reinforce 21st Century Learning, to maximize rigor, relevance, and relationships, and to engage students individually through differentiated instruction.

SCIENCE - STATEMENT OF PURPOSE

Education exists for the purpose of enabling each individual to realize and maintain her/his full potential. Scientifically literate students possess the knowledge and understanding of scientific concepts and processes required for personal decision-making, participation in civic and cultural affairs, and economic productivity.

Science, engineering, and technology influence and permeate every aspect of modern life. Some knowledge of science and engineering is required to engage with the major public policy issues of today as well as to make informed everyday decisions, such as selecting among alternative medical treatments or determining how to invest public funds for water supply options. In addition, understanding

science and the extraordinary insights it has produced can be meaningful and relevant on a personal level, opening new worlds to explore and offering lifelong opportunities for enriching people's lives. In these contexts, learning science is important for everyone, even those who eventually choose careers in fields other than science or engineering (NJSLS-Science)

All students engage in science experiences that promote the ability to ask, find, or determine answers to questions derived from natural curiosity about everyday things and occurrences. The underpinning of the revised standards lies in the premise that science is experienced as an active process in which inquiry is central to learning and in which students engage in observation, inference, and experimentation on an ongoing basis, rather than as an isolated a process. When engaging in inquiry, students describe objects and events, ask questions, construct explanations, test those explanations against current scientific knowledge, and communicate their ideas to others in their community and around the world. They actively develop their understanding of science by identifying their assumptions, using critical and logical thinking, and considering alternative explanations (NJCCCS-Science).

Our school district provides an extensive science program, which will enable students to succeed and compete in the global marketplace using the New Jersey Student Learning Standards in Science as well as the Next Generation Science Standards.

INTRODUCTION

The most precious resource teachers have is time. Regardless of how much time a course is scheduled for, it is never enough to accomplish all that one would like. Therefore, it is imperative that teachers utilize the time they have wisely in order to maximize the potential for all students to achieve the desired learning.

High quality educational programs are characterized by clearly stated goals for student learning, teachers who are well-informed and skilled in enabling students to reach those goals, program designs that allow for continuous growth over the span of years of instruction, and ways of measuring whether students are achieving program goals.

THE EGG HARBOR TOWNSHIP SCHOOL DISTRICT CURRICULUM TEMPLATE

The Egg Harbor Township School District has embraced the backward-design model as the foundation for all curriculum development for the educational program. When reviewing curriculum documents and the Egg Harbor Township curriculum template, aspects of the backward-design model will be found in the stated enduring *understandings/essential questions*, *unit assessments*, and *instructional activities*. Familiarization with backward-design is critical to working effectively with Egg Harbor Township's curriculum guides.

GUIDING PRINCIPLES: WHAT IS BACKWARD DESIGN? WHAT IS UNDERSTANDING BY DESIGN?

“Backward design” is an increasingly common approach to planning curriculum and instruction. As its name implies, “backward design” is based on defining clear goals, providing acceptable evidence of having achieved those goals, and then working ‘backward’ to identify what actions need to be taken that will ensure that the gap between the current status and the desired status is closed.

Building on the concept of backward design, Grant Wiggins and Jay McTighe (2005) have developed a structured approach to planning programs, curriculum, and instructional units. Their model asks educators to state goals; identify deep understandings, pose essential questions, and specify clear evidence that goals, understandings, and core learning have been achieved.

Programs based on backward design use desired results to drive decisions. With this design, there are questions to consider, such as: What should students understand, know, and be able to do? What does it look like to meet those goals? What kind of program will result in the outcomes stated? How will we know students have achieved that result? What other kinds of evidence will tell us that we have a quality program? These questions apply regardless of whether they are goals in program planning or classroom instruction.

The backward design process involves three interrelated stages for developing an entire curriculum or a single unit of instruction. The relationship from planning to curriculum design, development, and implementation hinges upon the integration of the following three stages.

Stage I: Identifying Desired Results: Enduring understandings, essential questions, knowledge and skills need to be woven into curriculum publications, documents, standards, and scope and sequence materials. Enduring understandings identify the “big ideas” that students will grapple with during the course of the unit. Essential questions provide a unifying focus for the unit and students should be able to answer more deeply and fully these questions as they proceed through the unit. Knowledge and skills are the “*stuff*” upon which the understandings are built.

Stage II: Determining Acceptable Evidence: Varied types of evidence are specified to ensure that students demonstrate attainment of desired results. While discrete knowledge assessments (e.g.: multiple choice, fill-in-the-blank, short answer, etc...) will be utilized during an instructional unit, the overall unit assessment is performance-based and asks students to demonstrate that they have mastered the desired understandings. These culminating (summative) assessments are authentic tasks that students would likely encounter in the real-world after they leave school. They allow students to

demonstrate all that they have learned and can do. To demonstrate their understandings students can explain, interpret, apply, provide critical and insightful points of view, show empathy and/or evidence self-knowledge. Models of student performance and clearly defined criteria (i.e.: rubrics) are provided to all students in advance of starting work on the unit task.

Stage III: Designing Learning Activities: Instructional tasks, activities, and experiences are aligned with stages one and two so that the desired results are obtained based on the identified evidence or assessment tasks. Instructional activities and strategies are considered only once stages one and two have been clearly explicated. Therefore, congruence among all three stages can be ensured and teachers can make wise instructional choices.

At the curricular level, these three stages are best realized as a fusion of research, best practices, shared and sustained inquiry, consensus building, and initiative that involves all stakeholders. In this design, administrators are instructional leaders who enable the alignment between the curriculum and other key initiatives in their district or schools. These leaders demonstrate a clear purpose and direction for the curriculum within their school or district by providing support for implementation, opportunities for revision through sustained and consistent professional development, initiating action research activities, and collecting and evaluating materials to ensure alignment with the desired results. Intrinsic to the success of curriculum is to show how it aligns with the overarching goals of the district, how the document relates to district, state, or national standards, what a high quality educational program looks like, and what excellent teaching and learning looks like. Within education, success of the educational program is realized through this blend of commitment and organizational direction.

INTENT OF THE GUIDE

This guide is intended to provide teachers with course objectives and possible activities, as well as assist the teacher in planning and delivering instruction in accordance with the New Jersey Core Curriculum Content Standards. The guide is not intended to restrict or limit the teacher's resources or individual instruction techniques. It is expected that the teacher will reflectively adjust and modify instruction and units during the course of normal lessons depending on the varying needs of the class, provided such modified instruction attends to the objectives and essential questions outlined below.

N.J.A.C. 6A:8-3.1 Required Curriculum Components

| Code Language | Evident in Curriculum YES/NO | Comments |
|--|---|--|
| Interdisciplinary Connections | Yes | Via lab activities. STEM units in development 1 per marking period |
| A pacing guide | Yes | By Unit approximately 2-4 units per marking period |
| A list of core instructional materials, including various levels of text at each grade level | Yes | Suggested Activities Labs |
| Benchmark assessments | Yes | Teacher-developed and common via pre/post and benchmark assessments |
| Modifications for special education students, for ELLs in accordance with N.J.A.C. 6A:15, and for gifted students. (As appropriate) – See Appendix A | Yes | As directed by student’s Individual Education Plan |

Unit Name: Organization, Administration, and Careers
Time Frame: 8 weeks

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **MSA SPORTS MEDICINE AND ATHLETIC INJURY** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY

This unit will provide foundational concepts and necessary terminology for understanding sports medicine and athletic injury. The unit is composed of 6 chapters that collectively explore the different careers in the sports medicine realm, legal and ethical concerns, and prevention of injury. The unit continues by providing students with the terms and responsibilities they need to be familiar with.

UNIT RESOURCES

- Textbook – Sports Medicine Essentials (2007) Jim Clover; Chapters 1, 2, 3, 4, 5, and 7
- Supplemental text-Introduction to Sports Medicine and Athletic Training, (2009) Robert C. France; Chapters 1,2,3,and 4
- Studyware online
- Powerpoint presentations
- Lab Manuals and materials
- NATA Journal and other periodicals

Internet Resource Links:

- *Discovery:* www.unitedstreaming.com
- *NBC Learn Videos:* www.nbclearn.com
- *eLibrary science:* <http://science.bigchalk.com/sciweb/science/do/search>
- <http://www.nata.org>
- http://www.safetycaltech.edu/manuals/emergency_action_plan_template.pdf

- Case studies - <http://sciencecases.lib.buffalo.edu/cs/>

STAGE ONE

GOALS AND STANDARDS

Next Generation Science Standards and Disciplinary Core Ideas

HS. Structure and Function

Students who demonstrate understanding can:

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

- Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

- Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.

ENDURING UNDERSTANDINGS

- Sports medicine is a multidisciplinary approach to health care for those seriously involved in exercise and sport.
- Physicians assistants work with a physician to aid in patient care
- Athletic training was recently recognized as an allied health profession and the ATC works in cooperation with other health personal
- There are many skills and task required of an Athletic trainer
- The athlete's bill of rights sets standards and expectations for the fair treatment of any individual involved.
- Common equipment includes first aid supplies, various splints, crutches, and tape
- Three general modalities are used; mechanical, thermal, and electrical

ESSENTIAL QUESTIONS

- What is Sports medicine?
- What are the legal responsibilities of the sports medicine team?
- What are the educational paths of employment opportunities for athletic trainers, physical therapists, business opportunities in health care, and other sports medicine fields?
- What are the outcomes needed in each career to be successful?
- What are the differences between subjective and objective evaluation?
- What are team ethics and organizations in place to ensure that ethical concerns are enforced?

KNOWLEDGE AND SKILLS

Vocabulary:

Chiropractor, National Academy of Sports Medicine, National Athletic Trainers Association (NATA) Physical therapist, sports nutritionist, central training room, electrical modality, mechanical modality, Occupational Safety and Health Administration (OSHA), thermal modality, Health Maintenance Organizations (HMOs), Board of Certification (BOC), Anatomy, physiology, anatomical position, frontal plane, sagittal plane, transverse plane, homeostasis, metabolism, negative feedback, positive feedback, assumption of risk, liability, Health Insurance and Portability and Accountability Act, negligence, tort, muscle contraction, recovery heart rate, muscular endurance, emergency action

Skills:

- Reflect on and revise observations as new evidence emerges
- Apply data representations and new models to revise predictions and explanations.
- Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences
- Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams

- Define homeostasis and explain its importance to life.
- Know the educational paths and employment opportunities for athletic trainers, physical therapists, strength and conditioning specialists, business opportunities in health care and other fields related to sports medicine and training.
- Understand the personal characteristics, time involved, and education required for careers in sports medicine.
- Be able to complete an initial assessment of an athlete/patient

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Online reading
- Online homework assignments
- Online test/quizzes
- Online activities
- Constructed response
- Graphic organizers or models
- Guest speakers in the various sports medicine fields
- Research project on one sports medicine profession and their role in athletics today
- Create a pathway to follow to obtain and sport medicine certification that interests you
- Watch a sporting event and write down responsibilities you see of the athletic trainer
- Pick a modality to research and determine the effectiveness of that modality

- Go to the NATA web site and look at the injury break downs of two different sports. Summarize your findings and discuss how they could be prevented
- Evaluate your own fitness level. This includes heart rate, blood pressure, body comp, pulse recovery test, and sports related skills

OTHER EVIDENCE

- In Class activity “Simon Says” using anatomical terms.
- Objective review questions that demonstrate understanding of concepts and diagrams.
- Chapter outlines
- Creating original questions for quizzes to administer to classmates
- Vocabulary Quizzes
- Think/Pair/Share explanation of concepts to partner or small group.
- Homework:
 - Vocabulary flash cards or map (word, picture, sentence, example)
 - Section Review Questions
- Exit tickets (answers to daily objective questions)
- Do-nows
- Individual, small, and large group work
- Homework
- Guided practice

STAGE THREE

LEARNING PLAN

Activities, experiences, and lessons:

- PowerPoint presentation of material using key concepts, pictures, diagrams.
- Group discussion
- Think, pair, share (read assigned section of text individually, discuss with a partner, present material in pairs to class – use PowerPoint as a reference)
- Flashcards and/or drill and practice
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Video examples of injuries and sports medicine professionals

LEARNING Activities

- Foldables – organization of different sports medicine fields
- Simon Says – with partners, use anatomical terms to describe body parts and vice versa.
- Student developed quizzes to use with partners or small groups.

Misconceptions/Teaching Tips:

- Encourage students to adopt the use of flash cards to retain large amounts of information (ie. vocabulary words, medical terms, etc.)
- Encourage students to use supplemental resources
- Students often think they can “cram” for tests but are often surprised by the amount of information that is covered which can be overwhelming. Students are encouraged and reminded to keep up with material and review in small increments.
- Use student examples and ideas to explain difficult concepts

- Use flow charts particularly with tissue chapter to show relationships and division of concepts.

This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit and reinforce concepts drawn from anatomy. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all MSA Sports Medicine Students.

Unit Name: Roles and Responsibilities

Time Frame: 8 Weeks

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **MSA SPORTS MEDICINE AND ATHLETIC INJURY** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY

This unit includes 4 chapters and will provide details about the roles and responsibilities of the professionals in the field. This unit addresses emergency planning, preseason conditioning assessment and evaluation of sports injuries. They will also learn basic First Aid, CPR, emergency protocol, how to take vital signs and assess for injury on site. Concussion pre and post tests will be discussed in this unit. These topics form the foundation of what an athletic trainer needs to know to help the athlete prepare and stay healthy.

UNIT RESOURCES

- Textbook – Sports Medicine Essentials (2007) Jim Clover; Chapters 9, 11, 12, and 13
- Supplemental text-Introduction to Sports Medicine and Athletic Training, (2009) Robert C. France; Chapters 5,6, and 7
- Studyware online
- Powerpoint presentations
- Lab Manuals and materials
- NATA Journal and other periodicals

Internet Resource Links:

- *Discovery:* www.unitedstreaming.com
- *NBC Learn Videos:* www.nbclearn.com
- *eLibrary science:* <http://science.bigchalk.com/sciweb/science/do/search>
- *American College of Sports Medicine* <http://www.acsm.org>

STAGE ONE

GOALS AND STANDARDS

Next Generation Science Standards and Disciplinary Core Ideas

HS. Structure and Function

Students who demonstrate understanding can:

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

- Systems of specialized cells within organisms help them perform the essential functions of life.
- Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

- Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.
- Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

- Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.
- Scientific inquiry is characterized by a common set of values that include: logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and ethical reporting of findings.

ENDURING UNDERSTANDINGS

- A written emergency action plan is important because it sets a systematic approach to be followed in an emergency and helps avoid mistakes
- The pre-participation physical examination is needed to help identify athletes at risk of specific types of injuries

- Isometric, dynamic, and isokinetic exercises are all important for different outcomes in rehabilitation
- Stretching and flexibility decreases the risk of injury
- Assessment and evaluation is the compilation of subjective and objective data related to presenting signs and symptoms of a particular injury or disease
- Always use HOPS when performing your assessment
- Concussion pre and posttest are very important

ESSENTIAL QUESTIONS

- What are the differences between an assessment, an evaluation, and a diagnosis?
- What is HOPS?
- Give one example each of passive and active motion?
- Explain the difference between a primary and a secondary survey?
- What are the directional terms associated with the body?
- What is CPR?
- What is an AED?
- What are vital signs?
- What are the universal precaution guidelines?

KNOWLEDGE AND SKILLS

Vocabulary:

Active range of motion, ashen, assessment, auscultate, clammy, coma, distended, edema, cyanosis, emergency action plan, emergency medical services, HOPS, inspiration, isolated injury assessment, log roll, mechanism of injury, mucus, orientation, paralysis, passive range of motion, PERL, primary survey, secondary survey, stoma, baseline, pathogen, universal precautions, aseptic, AIDS, hepatitis A, hepatitis B, core temperature, blood pressure, homeostasis, pulse, respiration, vital signs, automated external defibrillator (AED), Chest compressions, head-tilt, full arrest, obstructed airway maneuver, ligamentous laxity, and functional activity

Skills:

- Accurately measure and record the four vital signs
- Describe proper procedure for dealing with an unconscious athlete
- Identify body secretions for which Universal Precautions must be used

- Identify several abnormal respiratory patterns
- Recognize the signs of shock
- Name and describe the steps involved in CPR
- Explain and demonstrate the three-person log roll
- Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences
- Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Establish a written action plan for an athletic team in the school
- Act out an emergency scenario
- Interview someone recovering from a sports-related injury. Use their experience write out what you would have done differently in regards to emergency protocol
- Practice taking 5 class mates vital signs
- Practicing CPR and AED scenarios
- Concussion testing practice on each other
- Concussion simulated blood lab and prevention

OTHER EVIDENCE

- Concussion awareness– research concussions including current research

- Web quest –emergency protocol
- Homework:
 - Vocabulary flash cards or map (word, picture, sentence, example)
 - Section Review Questions
- Exit Cards (answer to daily objective questions)
- Do nows
- Individual, small, and large group work
- Homework
- Guided practice
- Study Guide Packets
- Visual Quiz

STAGE THREE

LEARNING PLAN

Activities, experiences, and lessons:

- PowerPoint presentation of material
- Group discussion
- Mini-quizzes – develop and submit questions about topics that are redistributed to class.
- Comparison charts
- Flow charts or concept maps
- Think/know/want to know
- Think, pair, share (read assigned section of text individually, discuss with a partner, present material in pairs to class – use PowerPoint as a reference)
- Flashcards and/or drill and practice
- Lecture with note taking or guided notes
- Whole and small group discussions

- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models and simulators

LEARNING Activities

- Foldables – organization of material (scientific method & features of living things)
- Student created case studies
- Emergency protocol practical –use appropriate steps in situation given
- Concussion and AED practical –use appropriate steps in situation given
- Coloring/labeling worksheets.

Misconceptions/Teaching Tips:

- Frequently use partners to have students explain concepts in their own words. This is useful both in teaching the information to others and learning it for themselves.
- Encourage students to ask each other questions for clarification.
- Remind students to use different diagrams (including online resources) to learn anatomy terms. This helps them learn the actual names and locations of anatomical parts as opposed to just memorizing one specific diagram.
- Use student examples and ideas to plan experiments as a class
- Relate concepts in class to students' own experiences as often as possible.

This unit is sequenced to draw from concepts learned in the previous unit and apply them to new topics. It begins by identifying information that is already known and addressing any misconceptions about possible new information. The unit chapters are first learned independently and ultimately integrated. Students will learn concrete blocks of new information while applying it to previous concepts to master the unit. Students will use this information to evaluate higher level problems. This unit will end with a formal assessment common to all MSA Sports Medicine students.

Unit Name: Control and Regulation

Time Frame: 5 weeks

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **MSA SPORTS MEDICINE AND ATHLETIC INJURY** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY

This unit will provide an understanding of the main modalities used in athletic training. The unit is comprised of 4 chapters. The first chapter focuses on injuries to the tissues and gives a brief review of the cellular components and the different type of tissue groups. The unit goes on to teach the different degrees of injury and how to identify and assess the severity. Injuries that affect the joints, muscles, and bones will be discussed in this unit. The second part of the unit goes on to teach rehabilitation tools that are used to prevent and treat injuries described earlier in the unit. The skills learned in this unit will be used in subsequent units when assess specific injuries.

UNIT RESOURCES

- Textbook – Sports Medicine Essentials (2007) Jim Clover; Chapters 14,21, 22, and 23
- Supplemental text-Introduction to Sports Medicine and Athletic Training, (2009) Robert C. France; Chapters 11,12, and 13
- Powerpoint presentations
- Lab Manuals and materials

Internet Resource Links:

- *American Physical Therapy Association* <http://www.apta.org>
- *National Athletic trainers Association* <http://www.nata.org>
- *Discovery:* www.unitedstreaming.com
- *NBC Learn Videos:* www.nbclearn.com
- *eLibrary science:* <http://science.bigchalk.com/sciweb/science/do/search>

STAGE ONE

GOALS AND STANDARDS

Next Generation Science Standards and Disciplinary Core Ideas

HS. Structure and Function

Students who demonstrate understanding can:

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

- Systems of specialized cells within organisms help them perform the essential functions of life.
- Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

- Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.
- Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

- Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.
- Scientific inquiry is characterized by a common set of values that include: logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and ethical reporting of findings.

ENDURING UNDERSTANDINGS

- Various levels of organization promote and maintain human life.

- Fractures can be classified by the degree of the injury to the bone. There are six types
- A strain is the result of twisting or pulling a muscle or tendon
- A sprain is an injury resulting from a fall or sudden twist that forces a joint out of its normal position
- There are 6 different types of joints
- There is proven effectiveness of physical modalities
- Electrical modalities achieve their effect by stimulating nerve tissue
- The primary purpose of taping and wrapping is to provide additional support, stability, and compression.
- Cellular communication is paramount to providing the foundational level of organization in the human body.

ESSENTIAL QUESTIONS

- List three key elements of follow-up treatments for fractures
- What are the different types of soft tissue injuries that can occur?
- What are the different symptoms of sprains, strains, dislocations, and fractures?
- How does structure relate to function of the nervous system at the cellular level?
- How do the levels of organization contribute to control and regulation of the human body?

KNOWLEDGE AND SKILLS

Vocabulary:

- Abrasion, anaphylactic shock, anatomy, articulation, avulsion, blister, bursitis, callus, cardiac muscle, cell, contusion, crepitation, dislocation, ecchymosis, fracture, hematoma, incision, joint laxity, laceration, ligament, myositis ossifans, organ, parenthesis, physiology, PRICE procedure, puncture wound, splint, sprain, strain, subluxation, synovitis, systemic reaction, tendon, tendonitis, tissue, bony prominences, ischemia, fasciitis, tension, stirrup, prognosis, cryotherapy, diathermy, electrical modality, electrical muscle simulation,

fluidotherapy, galvanic stimulation, hydrocollator, interferential stimulation (IFS), iontophoresis, transcutaneous electrical nerve stimulation (TENS), ultrasound therapy, vapo-coolant spray

Skills:

- Explain the function of at least four cellular components
- Name and describe the four types of tissue groups
- Describe the several types of joints in the body and their category
- Be able to distinguish the difference between a sprain, strain, dislocation, and fracture
- Explain the use and effectiveness of physical modalities
- Describe the various thermal modalities and their applications
- Explain and describe the use of therapeutic ultra sound
- Explain and describe the use of electrical modalities
- Describe the importance of taping and wrapping in athletics
- Describe the common supplies in taping and wrapping
- Perform the basic taping and wrapping techniques

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Injury Case studies-students will act out scenarios and have to treat the patient accordingly
- Modalities Lab
- Modality effectiveness research report

- Taping labs-Students will practice taping on a partner and have to memorize the techniques

OTHER EVIDENCE

- Webquest – characteristics of a tissue injury
- Homework:
 - Vocabulary flash cards or map (word, picture, sentence, example)
 - Section Review Questions
- Exit Cards (answer to daily objective questions)
- Do nows
- Individual, small, and large group work
- Homework
- Guided practice
- Study Guide Packets
- Visual Quiz
- Vocabulary Quiz
- Taping Quizzes

STAGE THREE

LEARNING PLAN

Activities, experiences, and lessons:

- PowerPoint presentation of material
- Group discussion

- Think, pair, share (read assigned section of text individually, discuss with a partner, present material in pairs to class – use PowerPoint as a reference)
- Flashcards and/or drill and practice
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models and simulators
- Drawing diagrams
- Webquests
- Reading for meaning – students read information and extract the most important points.
- Foldables – organization of material
- Concept maps
- Charts and tables – particularly with endocrine glands and hormones
- Objective packet review questions and diagrams.

Misconceptions/Teaching Tips:

- Students tend to view strains and sprains as the same injury this chapter should clarify the difference
- Continue to use student examples and explanations to explain difficult concepts to classmates.

This unit is sequenced to continue drawing from concepts learned in previous units and apply them to new topics. It begins by identifying information that is already known and addressing any misconceptions about possible new information. The unit chapters are

first learned independently and then integrated accordingly. Students will learn concrete blocks of new information while applying to previous concepts in order to master the unit. Students will use this information to evaluate higher level problems. This unit will end with a formal assessment common to all MSA Sports Medicine Students

Unit Name: Kinesiology and upper extremities
weeks

Time Frame: 8

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **MSA SPORTS MEDICINE AND ATHLETIC INJURY** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY

This unit will start out by reviewing the anatomy and kinesiology of the upper extremity. Students all had anatomy last year so should be able to recall information and build on the prior knowledge. They will then learn about the common injuries of the shoulder, elbow, wrist, hand, and chest. For each part they will learn how to perform manual muscle tests and special tests to diagnose the injury. They will also measure joint range of motion. By the end of this unit students should be able to correctly test and assess injuries of the upper extremity.

UNIT RESOURCES

- Textbook – Sports Medicine Essentials (2007) Jim Clover; Chapters 16 and 17
- Supplemental text-Introduction to Sports Medicine and Athletic Training, (2009) Robert C. France; Chapters 16, 17, and 21
- Muscle Testing-techniques of Manual Examination (2002) Daniels and Worthingham
- PowerPoint presentations
- Online assignments
- Lab Manuals and materials

Internet Resource Links:

- *Discovery:* www.unitedstreaming.com
- *NBC Learn Videos:* www.nbclearn.com
- *eLibrary science:* <http://science.bigchalk.com/sciweb/science/do/search>
- *Case studies -* <http://sciencecases.lib.buffalo.edu/cs/>
- <http://www.apma.org>

- <http://www.sportsinjuryclinic.net>

STAGE ONE

GOALS AND STANDARDS

Next Generation Science Standards and Disciplinary Core Ideas

HS. Structure and Function

Students who demonstrate understanding can:

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

- Systems of specialized cells within organisms help them perform the essential functions of life.
- All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

- Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

- Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.

ENDURING UNDERSTANDINGS

- Knowledge of the major bones, muscles, veins, and arteries frequently involved in upper extremity injuries
- Knowledge of the mobility of the shoulder joint and implications for injury
- Ability to recognize the signs and symptoms of shoulder, arm, and hand injuries
- Ability to explain the importance of the different special tests
- The cardiovascular system is essential for determining how each part of the body is supplied with the materials necessary to sustain life.

- Knowledge of the components and functions of the conducting system of the heart, including the cardiac cycle
- Ability to signs and symptoms associated with chest and the cardiothoracic system

ESSENTIAL QUESTIONS

- What type of injuries are common in the elbow and forearm
- Describe the signs and symptoms for tennis elbow?
- Why is an elbow dislocation a medical emergency?
- What is the importance of the radial, medial, and ulnar nerves?
- What are the three levels of severity of Volkmann's contractures?
- What muscles affect the movement of the shoulder?
- What protects the glenohumeral joint?
- What are the joints of the shoulder?
- What is the treatment for a chest contusion?
- What are signs and symptoms of a spleen injury?
- What mechanisms reduce blood loss after an injury?

KNOWLEDGE AND SKILLS

Vocabulary:

Acromioclavicular sprain test (AC), apprehension test, buttonhole deformity, compression test, drop arm test, empty can test, epicondylitis, Finkelstein's test, gamekeeper's thumb test, ganglion cyst, Hawkins-kennedy test, impingement, mallet finger, muscle rupture, percussion test, phalen's test, speeds test, sternoclavicular sprain test (SC), sulcus test, tenosynovitis, tinels sign, valgus stress test, varus stress test, volkman's contracture, winged scapula test, flail chest, hemothorax, coronary circulation, pulmonary circulation, and pneumothorax

Skills:

- Describe the general characteristics of joints of the upper extremity
- Identify commonly injured upper-extremity joints
- Name and describe, with respect to individual sports, disorders of the upper extremities to which athletes are most susceptible
- Know and be able to perform all special test

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Manual muscle tests performed on a partner
- Special tests performed on a partner
- Injury assessment-case study
- Develop a treatment plan

OTHER EVIDENCE

- Objective review questions that demonstrate understanding of concepts and special test
- Terminology matching worksheets.
- Mini case studies that draw on anatomical concepts and terminology.

- Think/Pair/Share explanation of concepts to partner or small group.
- Homework:
 - Vocabulary flash cards or map (word, picture, sentence, example)
 - Section Review Questions
- Exit tickets (answers to daily objective questions)
- Online assignments and independent work
- Do-nows
- Individual, small, and large group work
- Homework
- Guided practice
- Study Guide Packets
- Visual Quiz

STAGE THREE

LEARNING PLAN

Activities, experiences, and lessons:

- PowerPoint presentation of material using key concepts, pictures, diagrams.
- Group discussion
- Think, pair, share (read assigned section of text individually, discuss with a partner, present material in pairs to class – use PowerPoint as a reference)
- Flashcards and/or drill and practice
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion

LEARNING Activities

- Utilizing sporting events to look for and assess an injury
- Jeopardy review game
- Student developed quizzes to use with partners or small groups.

Misconceptions/Teaching Tips:

- Encourage students to adopt the use of flash cards to retain large amounts of information (ie. vocabulary words, special test, etc)
- Students often think they can “cram” for tests but are often surprised by the amount of information that is covered which can be overwhelming. Students are encouraged and reminded to keep up with material and review in small increments.
- Students are encouraged to keep up with the reading and to use the clinical note to make the material more applicable
- Use student examples and ideas to explain difficult concepts
- Use anatomy coloring sheets as study tools especially to review pathways of the blood

This unit will build on the student’s prior knowledge up to this point and in this class and will require those skills. They will have various vocabulary quiz checks, practical assessments i.e. identifying the muscles and components of the upper extremity and special tests performance. They will be expected to know all terms and clinical diagnosis dealing with injuries of the upper extremity. They will be asked to use this information to evaluate higher level problems when given case studies. They will also be expected to not only know and label every structure associated with the joints of the upper extremity but apply these terms to simulations of real cases. This unit will end with a formal assessment common to all MSA Sports Medicine students.

Unit Name: Hip and lower extremities

Time Frame: 6 Weeks

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **MSA SPORTS MEDICINE AND ATHLETIC INJURY** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY

This unit will start out by reviewing the anatomy and kinesiology of the hip and lower extremity. Students all had anatomy last year so should be able to recall information and build on the prior knowledge. They will then learn about the common injuries of the hip, knee, ankle, and foot. For each part they will learn how to perform manual muscle tests and special tests to diagnose the injury. They will also measure joint range of motion. By the end of this unit students should be able to correctly test and assess injuries of the lower extremity.

UNIT RESOURCES

- Textbook – Sports Medicine Essentials (2007) Jim Clover; Chapters 17 and 18
- Supplemental text-Introduction to Sports Medicine and Athletic Training, (2009) Robert C. France; Chapters 17,18, and 19
- Muscle Testing-techniques of Manual Examination (2002) Daniels and Worthingham
- Online assignments and book component
- PowerPoint presentations
- Lab Manuals and materials

Internet Resource Links:

- *Discovery:* www.unitedstreaming.com
- *NBC Learn Videos:* www.nbclearn.com
- *eLibrary science:* <http://science.bigchalk.com/sciweb/science/do/search>

- Web simulators: www.pHET.colorado.edu
- <http://www.getbodysmart.com/>
- <http://www.nhlbi.nih.gov/health/dci/animate/howlungswork.swf>
- Web Video Clips: www.Learning4mastery.com (Flipped Learning)
- McGraw-Hill Video Clips: <http://highered.mcgraw-hill.com/sites/>
- <http://www.apma.org>
- <http://www.sportsinjuryclinic.net>
- Case studies - <http://sciencecases.lib.buffalo.edu/cs/>

STAGE ONE

GOALS AND STANDARDS

Next Generation Science Standards and Disciplinary Core Ideas

HS. Structure and Function

Students who demonstrate understanding can:

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

- Systems of specialized cells within organisms help them perform the essential functions of life.
- Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

- Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.
- Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

- Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.
- Scientific inquiry is characterized by a common set of values that include: logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and Ethical reporting of findings.

ENDURING UNDERSTANDINGS

- Knowledge of the major bones, muscles, veins, and arteries frequently involved in lower extremity injuries
- Knowledge of the mobility of the hip joint and implications for injury
- Ability to recognize the signs and symptoms of hip, knee, and ankle injuries
- The knee is a complex and unstable joint
- Ability to explain the importance of the different special tests
- Ability to describe the different types of lower extremity joints and their functions
- There are five main ligaments in the ankle

ESSENTIAL QUESTIONS

- What are the six major components of the lower extremity?
- What is an injury that causes bleeding in the muscle tissue?
- What are the main symptoms of an ankle sprain?
- What are the special tests that would be performed if a knee injury was suspected?
- What are the bones that make up the knee joint?
- What are the muscles and ligaments associated with shin splints?
- What demands are placed on the lower extremity during exercise?

- Explain the different compartments of the lower leg

KNOWLEDGE AND SKILLS

Vocabulary:

- Anterior compartment syndrome, anterior draw test for the ankle, anterior draw for the knee, apley compression test. Athletes' foot, chondromalacia patellae (CMP) ,direct axial load, ingrown toenail, lachman test, meniscal tear, Osgood-schlatter disease, patella grind test, patellar tendon rupture test, pivot shift test, plantar fasciitis, posterior draw test for the knee, medial tibial stress syndrome, talar tilt test, tendon rupture, Thompson test

Skills:

- Describe the general characteristics of joints of the upper extremity
- Identify commonly injured upper-extremity joints
- Name and describe, with respect to individual sports, disorders of the upper extremities to which athletes are most susceptible
- Know and be able to perform all special tests

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Think, pair, share-read through sections and compare outlines with a partner
- Graphic organizers or models
- Manual muscle tests performed on a partner
- Special tests performed on a partner
- Injury assessment-case study

- Develop a treatment plan
- Foot print lab-to assess arch and gait

OTHER EVIDENCE

- Videos clips of knee and ankle injuries
- Modeling – create a model of a function lower extremity joint
- Homework:
 - Vocabulary flash cards or map (word, picture, sentence, example)
 - Section Review Questions
- Exit Cards (answer to daily objective questions)
- Do nows
- Individual, small, and large group work
- Homework
- Guided practice
- Study Guide Packets
- Visual Quiz

STAGE THREE

LEARNING PLAN

Activities, experiences, and lessons:

- PowerPoint presentation of material
- Group discussion
- Mini-quizzes – develop and submit questions about topics that are redistributed to class.
- Comparison charts
- Flow charts or concept maps

- Think/know/want to know
- Think, pair, share (read assigned section of text individually, discuss with a partner, present material in pairs to class – use PowerPoint as a reference)
- Flashcards and/or drill and practice
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models and simulators

LEARNING Activities

- Models – make and use to demo special tests
- Video clips of real injuries
- Case studies
- Coloring/labeling worksheets.
- Creating and labeling diagrams

Misconceptions/Teaching Tips:

- Frequently use partners to have students explain concepts in their own words. This is useful both in teaching the information to others and learning it for themselves.
- Encourage students to ask each other questions for clarification.
- Remind students to use different diagrams and models to learn the different components of the different joints
- Use student examples and ideas to plan experiments as a class
- Relate concepts in class to students' own experiences as often as possible.

This unit is sequenced to draw from concepts learned in the previous unit and apply them to new topics. It begins by identifying information that is already known and addressing any misconceptions about possible new information. The unit chapters are first learned independently and ultimately integrated. Students will learn concrete blocks of new information while applying it to previous concepts to master the unit. Students will use this information to evaluate higher level problems. This unit will end with a formal assessment common to all MSA Sports Medicine students.

Unit Name: Head ,Neck, and Spine

Time Frame: 2 weeks

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **MSA SPORTS MEDICINE AND ATHLETIC INJURY** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY

This unit will start out by reviewing the anatomy and kinesiology of the head, neck and spine. Students all had anatomy last year so should be able to recall information and build on the prior knowledge. They will then learn about the common injuries of the head, neck and spine. For each part they will learn how to perform manual muscle tests and special tests to diagnose the injury. They will also use knowledge given in the beginning of the course on concussions and treatments of emergency situations.

UNIT RESOURCES

- Textbook – Sports Medicine Essentials (2007) Jim Clover; Chapters 17 and 18
- Supplemental text-Introduction to Sports Medicine and Athletic Training, (2009) Robert C. France; Chapters 17,18, and 19
- Muscle Testing-techniques of Manual Examination (2002) Daniels and Worthingham
- Powerpoint presentations
- Lab Manuals and materials

Internet Resource Links:

- *Discovery:* www.unitedstreaming.com
- *NBC Learn Videos:* www.nbclearn.com
- *eLibrary science:* <http://science.bigchalk.com/sciweb/science/do/search>
- *Web simulators:* www.PHET.colorado.edu
- <http://www.apma.org>
- <http://www.sportsinjuryclinic.net>

- *Web Video Clips:* www.Learning4mastery.com(*Flipped Learning*)
- *McGraw-Hill Video Clips:* <http://highered.mcgraw-hill.com/sites/>
- *Case studies -* <http://sciencecases.lib.buffalo.edu/cs/>

STAGE ONE

GOALS AND STANDARDS

Next Generation Science Standards and Disciplinary Core Ideas

HS. Structure and Function

Students who demonstrate understanding can:

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

- Systems of specialized cells within organisms help them perform the essential functions of life.
- Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

- Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.
- Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

- Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.
- Scientific inquiry is characterized by a common set of values that include: logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and ethical reporting of findings.

ENDURING UNDERSTANDINGS

- Knowledge of the major bones, muscles, veins, and arteries frequently involved in head, neck and spine injuries
- Knowledge of the major parts and functions of the brain
- Ability to recognize the signs and symptoms of three common facial injuries and explanations of their treatments
- The nervous system is split into 2 systems and is essential in all functions in the body
- Ability to explain the importance of the different special tests
- Ability to describe the describe how to treat injuries to the head and spine

ESSENTIAL QUESTIONS

- What are the two major components of the central nervous system?
- What are injuries that are common to the head, neck, and spine?
- What is the most common injury to the ear?
- How do you treat a person that is injured, down and unconscious?
- What are signs and symptoms of a nasal and skull fracture?
- What are dermatomes and how are they helpful in diagnosing spinal cord injuries

KNOWLEDGE AND SKILLS

Vocabulary:

- Central nervous system, concussion, contact sports, disc, epistaxis, hemorrhage, posttraumatic amnesia, radiating pain, referred pain, second-impact syndrome, vertebrae, skull fracture

Skills:

- List and explain the major parts and functions of the brain
- Explain some common injuries to the head and describe their initial treatment guidelines

- Describe the symptoms of the three common facial injuries and explain their treatments
- Describe and label the composition of the spine
- Explain the purpose of the nervous system
- Discuss how to treat injuries to the head and the spine

STAGE TWO

PERFORMANCE TASKS

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Manual muscle tests performed on a partner
- Injury assessment-case study
- Develop a treatment plan
- Dermatome testing
- Spinal injury research report

OTHER EVIDENCE

- Webquest – concussion/spinal injury
- videos and case studies-students must be able to identify what to do in each situation
- Homework:
 - Vocabulary flash cards or map (word, picture, sentence, example)
 - Section Review Questions
- Exit Cards (answer to daily objective questions)
- Do nows

STAGE THREE

LEARNING PLAN

Activities, experiences, and lessons:

- PowerPoint presentation of material
- Group discussion
- Mini-quizzes – develop and submit questions about topics that are redistributed to class.
- Comparison charts
- Flow charts or concept maps
- Think/know/want to know
- Think, pair, share (read assigned section of text individually, discuss with a partner, present material in pairs to class – use PowerPoint as a reference)
- Flashcards and/or drill and practice
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models and simulators
- Final project

LEARNING Activities

- Students will create a final project including a lesson plan and activities on one injury learned through the year
- Case studies
- Coloring/labeling worksheets.

- Creating and labeling diagrams-brain and spinal cord
- Final practical which will test them on multiple skills

Misconceptions/Teaching Tips:

- Frequently use partners to have students explain concepts in their own words. This is useful both in teaching the information to others and learning it for themselves.
- Encourage students to ask each other questions for clarification.
- Remind students to use different diagrams and models to learn the different components of the respiratory and digestive tracts
- Use student examples and ideas to plan experiments as a class
- Relate concepts in class to students' own experiences as often as possible.

The purpose of this unit is to finish the last sections of the body and integrate all of the information learned throughout the year. Students are expected to apply their knowledge and skills from each unit while investigating and performing the final practical. They are also required to develop a lesson plan and activity to demonstrate their mastery of the material and ability to teach it to others.

Curriculum Resources - Differentiated Instruction

Special Education Interventions in General Education

Visual Supports

Extended time to complete tests and assignments

Graphic Organizers

Mnemonic tricks to improve memory

Study guides

Use agenda book for assignments

Provide a posted daily schedule

Use of classroom behavior management system

Use prompts and model directions

Use task analysis to break down activities and lessons into each individual step needed to complete the task

Use concrete examples to teach concepts

Have student repeat/rephrase written directions

Heterogeneous grouping

Resources:

Do to Learn:

<http://www.do2learn.com/>

Sen Teacher:

<http://www.senteacher.org/>

Intervention Central:

<http://www.interventioncentral.org/>

Learning Ally:

<https://www.learningally.org/>

English Language Learners Interventions in Regular Education

Resources:

FABRIC - Learning Paradigm for ELLs (NJDOE)

www.nj.gov/education/bilingual/pd/fabric/fabric.pdf

Guide to Teaching ELL Students

<http://www.colorincolorado.org/new-teaching-ells>

Edutopia - Supporting English Language Learners

<https://www.edutopia.org/blog/strategies-and-resources-supporting-ell-todd-finley>

Reading Rockets

<http://www.readingrockets.org/reading-topics/english-language-learners>

Gifted and Talented Interventions in Regular Education

Resources:

Who are Gifted and Talented Students

<http://www.npr.org/sections/ed/2015/09/28/443193523/who-are-the-gifted-and-talented-and-what-do-they-need>

Hoagies Gifted Education Page

<http://www.hoagiesgifted.org/programs.htm>

21st Century Learning

Resources:

Partnership for 21st Century Learning

<http://www.p21.org/>

Career Ready Practices (NJDOE)

<http://www.nj.gov/education/cte/hl/CRP.pdf>