Specific curriculum area standards can be found at the Michigan State Board of Education website, located at the above address. Links to the specific standards are found under the current curriculum frameworks with the PDFs specific goals within each educational category located on the page. The benchmark interpretations are those of the Dangerous Decibels® program and do not represent official state board of education interpretation or review. Note: No specific benchmarks relative to human anatomy/physiology were identified.

THE DANGEROUS DECIBELS PROGRAM is designed to reduce the incidence of noise induced hearing loss and tinnitus by changing knowledge, attitudes, and behaviors about sound exposures. Common underlying educational messages:
1. What are the sources of dangerous sounds
2. What are the consequences of dangerous sounds
3. How do I protect myself from dangerous sounds.

RATIONALE:
The Centers for Disease Control Division of Adolescent and School Health (DASH) recognizes noise induced hearing loss as a health risk for young people. http://www.cdc.gov/healthyyouth/noise/

The U.S. national health initiative; Healthy People 2020 has indicated three related health goals for the prevention of noise induced hearing loss in youth; http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicid=20 (Ear-Nose-Throat (ENT) and Educational and Community-Based Program (ECBP) Objectives

1. ENT-VSL-6: Increase the use of hearing protection devices
   a. ENT-VSL-6.2: Adolescents aged 12 to 19 years who have ever used hearing protection devices (earplugs, earmuffs) when exposed to loud sounds or noise.

2. ENT-VSL-7 Reduce the proportion of adolescents who have elevated hearing thresholds or audiometric notches, in high frequencies (3, 4, or 6 kHz) in both ears, signifying noise-induced hearing loss.

3. ECBP-3: Increase the proportion of elementary, middle, and senior high schools that have health education goals or objects that address the knowledge and skills articulated in the National Health Education Standards (high school, middle, elementary).
   a. ECBP-3.1: Comprehending Concepts related to health promotion and disease prevention (knowledge)
   b. ECBP-3.2: Accessing valid information and health promoting products and services (skills)
   c. ECBP-3.3: Advocating for personal, family, and community health (skills)
   d. ECBP-3.5: Practicing health-enhancing behaviors and reducing health risks (skills)
   e. ECBP-3.6: Using goal-setting and decision-making skills to enhance health (skills)
   f. ECBP-3.7: Using interpersonal communication skills to enhance health (skills)
4. **ECBP–4**: Increase the proportion of elementary, middle, and senior high schools that provide school health education to promote personal health and wellness in the following areas: hand washing or hand hygiene; oral health; growth and development; sun safety and skin cancer prevention; benefits of rest and sleep; ways to prevent vision and hearing loss; and the importance of health screenings and checkups.
   a. **ECBP-4.6**: Ways to prevent vision and hearing loss

**DANGEROUS DECIBELS (DD) PROGRAM CONTENT:**

**What is Sound?**

**DD Educational Objectives:** Students will know that:
1. Sound is a result of vibrations
2. Sound vibrations are called sound waves
3. You cannot have sound without vibrations
4. The energy in sound is what can cause damage to our ears

**Michigan Educational Benchmarks:**

A. **Science (K)**
   **Physical Science**
   - P.FM.E.3 Force is either a push or a pull. The motion of objects can be changed by forces. The size of the change is related to the size of the force
   - P.FM.00.31 Demonstrate pushes and pulls on objects that can move
   - P.FM.00.32 Observe that objects initially at rest will move in the direction of the push or pull
   - P.FM.00.33 Observe how pushes and pulls can change the speed or direction of moving objects

B. **Science (3)**
   **Physical Science**
   - P.FM.E.3 Force is either a push or a pull. The motion of objects can be changed by forces. The size of the change is related to the size of the force
   - P.FM.03.35 Describe how a push or a pull is a force
   - P.FM.03.36 Relate a change in motion of an object to the force that caused the change of motion
   - P.FM.03.37 Demonstrate how the change in motion of an object is related to the strength of the force acting upon the object and to the mass of the object
   - P.FM.03.42 Identify changes in motion
   - P.EN.E.1 Forms of energy- heat, electricity, light, and sound are forms of energy
   - P.EN.03.11 Identify light and sound as forms of energy
   - P.EN.E.3 Sound- Vibrating objects produce sound. The pitch of sound varies by changing the rate of vibration
   - P.EN.03.31 Relate sounds to their sources of vibrations
   - P.EN.03.32 Distinguish the effect of fast or slow vibrations as pitch

C. **Science (4)**
   **Physical Science**
   - P.EN.E.1 Forms of energy- heat, electricity, light, and sound are forms of energy

D. **Science (5)**
   **Physical Science**

- P.FM.M.4 Motion can be described by a change in position relative to a point of reference. The motion of an object can be described by its speed and the direction it is moving.

E. Science (6)
   Physical Science
   - P.EN.M.4 Energy is transferred from a source to a receiver by radiation, conduction, and convection. When energy is transferred from one system to another, the quantity of energy before the transfer is equal to the quantity of energy after the transfer.
   - P.EN.06.41 Explain how different forms of energy can be transferred from one place to another by radiation, conduction, or convection.

F. Science (7)
   Physical Science
   - P.EN.M.3 Waves have energy and transfer energy when they interact with matter. Examples of waves include sound waves, seismic waves, waves on water, and light waves.
   - P.EN.07.31 Identify examples of waves, including sound waves, seismic waves, and waves on water.
   - P.EN.07.32 Describe how waves are produced by vibrations in matter.
   - P.EN.07.33 Demonstrate how waves transfer energy when they interact with matter.
   - P.EN.M.4 Energy is transferred from a source to a receiver by radiation, conduction, and convection. When energy is transferred from one system to another, the quantity of energy before the transfer is equal to the quantity of energy after the transfer.

G. Physics (High School)
   Energy Transfer
   - P4.1 Moving objects and waves transfer energy from one location to another. They also transfer energy to objects during interactions.
   - P4.1B Explain instances of energy transfer by waves and objects in everyday activities.

   Wave Characteristics
   - P4.4 Waves are described by their wavelength, amplitude, frequency, and speed.
   - P4.4A Describe specific mechanical waves in terms of wavelength, amplitude, frequency, and speed.
   - P4.4B Identify everyday examples of transverse and compression waves.
   - P4.4C Compare and contrast transverse and compression waves in terms of wavelength, amplitude, and frequency.

   Wave Characteristics - Calculations
   - P4.5C Provide evidence to support the claim that sound is energy transferred by a wave, not energy transferred by particles.
   - P4.5D Explain how waves propagate from vibrating sources and why the intensity decreases with the square of the distance from a point source.
   - P4.5E Explain why everyone in a classroom can hear one person speaking, but why an amplification system is often used in the rear of a large concert auditorium.

How Do We Hear?

DD Educational Objective:
Students will have a general understanding of how sound waves and vibrations travel through the parts of the ear to enable hearing.
Michigan Educational Benchmarks:
A. Science (K)
   Physical Science
   • P.FM.E.3 Force is either a push or a pull. The motion of objects can be changed by forces. The size of the change is related to the size of the force
   • P.FM.00.31 Demonstrate pushes and pulls on objects that can move
   • P.FM.00.32 Observe that objects initially at rest will move in the direction of the push or pull
B. Science (3)
   Physical Science
   • P.FM.E.3 Force is either a push or a pull. The motion of objects can be changed by forces. The size of the change is related to the size of the force
   • P.FM.03.35 Describe how a push or a pull is a force
   • P.FM.03.37 Demonstrate how the change in motion of an object is related to the strength of the force acting upon the object and to the mass of the object
   • P.FM.03.42 Identify changes in motion
   • P.EN.E.1 Forms of energy- heat, electricity, light, and sound are forms of energy
   • P.EN.03.11 Identify light and sound as forms of energy
   • P.EN.E.3 Sound- Vibrating objects produce sound. The pitch of sound varies by changing the rate of vibration
   • P.EN.03.31 Relate sounds to their sources of vibrations
   • P.EN.03.32 Distinguish the effect of fast or slow vibrations as pitch
C. Science (4)
   Physical Science
   • P.EN.E.1 Forms of energy- heat, electricity, light, and sound are forms of energy
D. Science (7)
   Physical Science
   • P.EN.M.3 Waves have energy and transfer energy when they interact with matter. Examples of waves include sound waves, seismic waves, waves on water, and light waves
   • P.EN.07.31 Identify examples of waves, including sound waves, seismic waves, and waves on water
   • P.EN.07.32 Describe how waves are produced by vibrations in matter
   • P.EN.07.33 Demonstrate how waves transfer energy when they interact with matter

How Do We Damage Our Hearing?

DD Educational Objective:
Students will know how loud sounds create strong vibrations that can permanently damage hair cells in the cochlea.

Michigan Educational Benchmarks:
A. Health Education (K)
   Strand 3 Safety
   • 3.11 Apply strategies to avoid personally unsafe situations
B. Health Education (1)
  Strand 3 Safety
  • 3.6 Describe situations that are dangerous, destructive, and disturbing and that need to be reported to an adult
  • 3.7 Practice escaping unsafe situations by getting away, leaving, and telling an adult

C. Health Education (2)
  Strand 3 Safety
  • 3.7 Describe dangerous, destructive, and disturbing situations that need to be reported to an adult
  • 3.8 Analyze environments to determine whether they are safe places

D. Health Education (3)
  Strand 3 Safety
  • 3.7 Describe dangerous, destructive, and disturbing situations that need to be reported to an adult
  • 3.8 Analyze environments to determine whether they are safe places

E. Health Education (4)
  Strand 3 Safety
  • 3.12 Apply strategies to avoid personally unsafe situations

F. Health Education (5)
  Strand 3 Safety
  • 3.7 Apply strategies to avoid personally unsafe situations

G. Health Education (6)
  Strand 3 Safety
  • 3.7 Analyze environments and situations, including those where weapons may be present to determine whether they are safe
  • 3.8 Describe strategies to avoid unsafe situations

H. Health Education (7, 8)
  Strand 3 Safety
  • 3.8 Demonstrate skills and strategies for avoiding or escaping potentially dangerous situations

I. Health Education (High School)
  Strand 3 Safety
  • 3.2 Describe the characteristics of situations which are dangerous, and those that must be reported to the authorities
  • 3.7 Apply strategies to avoid and report dangerous situations

What’s that Sound?

DD Educational Objectives:
1. Students will understand one of the consequences of being exposed to dangerous sound levels.
2. Students will understand what it is like to try to identify sounds with a high frequency hearing loss.

Michigan Educational Benchmarks:
A. Health Education (K)
  Strand 3 Safety
  • 3.9 Apply a rule and demonstrate actions to use in hypothetical situations when danger exists
State of Michigan: Dangerous Decibels Educational Benchmarks: 2013.03 retrieved from 
http://www.michigan.gov/mde/0,4615,7-140-28753_33232---,00.html for K-8 and 
http://www.michigan.gov/mde/0,1607,7-140-38924---,00.html for High School students

B. Health Education (3)
Strand 3 Safety
- 3.7 Describe dangerous, destructive, and disturbing situations that need to be reported to an adult
- 3.8 Analyze environments to determine whether they are safe places

C. Health Education (4)
Strand 3 Safety
- 3.1 Describe safety hazards

D. Health Education (5)
Strand 3 Safety
- 3.6 Analyze situations to predict safety hazards when home alone and in public places
- 4.8 Describe the characteristics of people who can help make decisions and solve problems
- 4.10 Demonstrate making a decision or solving a problem using criteria to evaluate solutions

E. Health Education (6)
Strand 3 Safety
- 3.7 Analyze environments and situations to determine whether they are safe

F. Health Education (7, 8)
Strand 3 Safety
- 3.9 Recognize warning signs of potential danger in relationships

G. Health Education (High School)
Strand 3 Safety
- 3.2 Describe the characteristics of situations which are dangerous, and those that must be reported to the authorities

Strand 4 Social and Emotional Health
- 4.7 Apply decision-making and problem-solving steps to generate alternative solutions regarding social situations that could place one's health or safety at risk
- 4.8 Predict the potential short- and long-term effects of each alternative on self and others, and defend the healthy choices

How Loud is Too Loud?

DD Educational Objectives:
1. Students begin to associate different sounds with decibel levels.
2. Students identify which method of hearing protection is the best to practice when exposed to dangerous decibels from different sources
3. Students identify and discuss the social norms and challenges associated with practicing hearing protection.

Michigan Educational Benchmarks:
A. Health Education (K)
Strand 3 Safety
- 3.8 Describe dangerous and destructive situations that need to be reported to an adult
- 3.9 Apply a rule and demonstrate actions to use in hypothetical situations
- 3.10 Generate examples of safe places one might go if feeling threatened
B. Health Education (1)
   Strand 3 Safety
   - 3.11 Apply strategies to avoid personally unsafe situations

C. Health Education (2)
   Strand 3 Safety
   - 3.7 Apply strategies to avoid personally unsafe situations

D. Health Education (3)
   Strand 3 Safety
   - 3.7 Describe dangerous, destructive, and disturbing situations that need to be reported to an adult
   - 3.8 Analyze environments to determine whether they are safe places

E. Health Education (4)
   Strand 3 Safety
   - 3.1 Describe safety hazards, including those related to fire, dangerous objects and weapons, being home alone, and using the internet
   - 3.12 Apply strategies to avoid personally unsafe situations
   Strand 4 Social and Emotional Health
   - 4.5 Explain the decision making and problem solving steps
   - 4.6 Apply the steps to make a decision or solve a problem, using criteria to evaluate solutions

F. Health Education (5)
   Strand 3 Safety
   - 3.6 Analyze situations to predict safety hazards when home alone and in public places
   - 3.7 Apply strategies to avoid personally unsafe situations
   - 3.9 Develop plans to stay safe when home alone and in public places
   Strand 4 Social and Emotional Health
   - 4.8 Describe the characteristics of people who can help make decisions and solve problems
   - 4.9 Explain the decision making and problem solving steps
   - 4.10 Demonstrate making a decision or solving a problem using criteria to evaluate solutions

G. Health Education (6)
   Strand 3 Safety
   - 3.7 Analyze environments and situations, including those where weapons may be present, to determine whether they are safe
   - 3.8 Describe strategies to avoid unsafe situations
   - 3.11 Demonstrate the ability to escape safety hazards in public places
   Strand 4 Social and Emotional Health
   - 4.6 Describe the decision making and problem solving steps
   - 4.7 Demonstrate the ability to make a decision or solve a problem using criteria to evaluate solutions

H. Health Education (7, 8)
   Strand 3 Safety
   - 3.8 Demonstrate skills and strategies for avoiding or escaping potentially dangerous situations

- 3.9 Recognize warning signs of potential danger in relationships

I. Health Education (High School)

Strand 3 Safety
- 3.2 Describe the characteristics of situations which are dangerous, and those that must be reported to the authorities
- 3.7 Apply strategies to avoid and report dangerous situations, including conflicts involving weapons and gangs.

Strand 4 Social and Emotional Health
- 4.7 Apply decision-making and problem-solving steps to generate alternative solutions regarding social situations that could place one’s health or safety at risk
- 4.8 Predict the potential short- and long-term effects of each alternative on self and others, and defend the healthy choices

J. Mathematics (1)

Number and Operations
- N.ME.01.02 Read and write numbers to 110 and relate them to the quantities they represent
- N.ME.01.03 Order numbers to 110; compare using phrases such as “same as”, “more than”, “greater than”, “fewer than”. Arrange small sets of numbers in increasing or decreasing order

K. Mathematics (2)

Measurement
- M.UN.03.01 Know and use common units of measurements in length, weight, and time

Measuring Decibels with Sound Level Meters

DD Educational Objectives:
1. Students will measure sound intensities with a sound level meter.
2. Students learn how effective walking away from dangerous sound levels can be to reduce their exposure to dangerous sound.

Michigan Educational Benchmarks:
A. Health Education (K)

Strand 3 Safety
- 3.8 Describe dangerous and destructive situations that need to be reported to an adult
- 3.9 Apply a rule and demonstrate actions to use in hypothetical situations
- 3.10 Generate examples of safe places one might go if feeling threatened
- 3.11 Apply strategies to avoid personally unsafe situations

B. Health Education (1)

Strand 3 Safety
- 3.6 Describe situations that are dangerous, destructive, and disturbing and that need to be reported to an adult
- 3.7 Practice escaping unsafe situations by getting away, leaving, and telling an adult

C. Health Education (2)

Strand 3 Safety
- 3.7 Apply strategies to avoid personally unsafe situations

D. Health Education (3)
Strand 3 Safety
- 3.7 Describe dangerous, destructive, and disturbing situations that need to be reported to an adult
- 3.8 Analyze environments to determine whether they are safe places

E. Health Education (4)
Strand 3 Safety
- 3.1 Describe safety hazards, including those related to fire, dangerous objects and weapons, being home alone, and using the internet
- 3.12 Apply strategies to avoid personally unsafe situations

Strand 4 Social and Emotional Health
- 4.5 Explain the decision making and problem solving steps
- 4.6 Apply the steps to make a decision or solve a problem, using criteria to evaluate solutions

F. Health Education (5)
Strand 3 Safety
- 3.6 Analyze situations to predict safety hazards when home alone and in public places
- 3.7 Apply strategies to avoid personally unsafe situations
- 3.9 Develop plans to stay safe when home alone and in public places

Strand 4 Social and Emotional Health
- 4.8 Describe the characteristics of people who can help make decisions and solve problems
- 4.9 Explain the decision making and problem solving steps
- 4.10 Demonstrate making a decision or solving a problem using criteria to evaluate solutions

G. Health Education (6)
Strand 3 Safety
- 3.7 Analyze environments and situations, including those where weapons may be present, to determine whether they are safe
- 3.8 Describe strategies to avoid unsafe situations
- 3.11 Demonstrate the ability to escape safety hazards in public places

Strand 4 Social and Emotional Health
- 4.6 Describe the decision making and problem solving steps
- 4.7 Demonstrate the ability to make a decision or solve a problem using criteria to evaluate solutions

H. Health Education (7, 8)
Strand 3 Safety
- 3.8 Demonstrate skills and strategies for avoiding or escaping potentially dangerous situations
- 3.9 Recognize warning signs of potential danger in relationships

I. Health Education (High School)
Strand 3 Safety
- 3.2 Describe the characteristics of situations which are dangerous, and those that must be reported to the authorities
- 3.7 Apply strategies to avoid and report dangerous situations, including conflicts involving weapons and gangs.

Strand 4 Social and Emotional Health
- 4.7 Apply decision-making and problem-solving steps to generate alternative solutions regarding social situations that could place one’s health or safety at risk
4.8 Predict the potential short- and long-term effects of each alternative on self and others, and defend the healthy choices

J. Mathematics (1)
   Number and Operations
   - N.ME.01.01 Count to 110 starting from any number in the sequence. Use ordinals to identify position in a sequence
   - N.ME.01.02 Read and write numbers to 110 and relate them to the quantities they represent
   - N.ME.01.03 Order numbers to 110; compare using phrases such as “same as”, “more than”, “greater than”, “fewer than”. Arrange small sets of numbers in increasing or decreasing order

How to use Earplugs

DD Educational Objectives:
1. Students will observe the proper technique and fitting of preformed earplugs
2. Optional: Students will have the opportunity to practice fitting earplugs in their ears.

Michigan Educational Benchmarks:
A. Health Education (K)
   Strand 3 Safety
   - 3.9 Apply a rule and demonstrate actions to use in hypothetical situations
B. Health Education (1)
   Strand 3 Safety
   - 3.7 Practice escaping unsafe situations by getting away, leaving, and telling an adult
C. Health Education (2)
   Strand 3 Safety
   - 3.7 Apply strategies to avoid personally unsafe situations
D. Health Education (4)
   Strand 3 Safety
   - 3.12 Apply strategies to avoid personally unsafe situations
   Strand 4 Social and Emotional Health
   - 4.6 Apply the steps to make a decision or solve a problem, using criteria to evaluate solutions
E. Health Education (5)
   Strand 3 Safety
   - 3.7 Apply strategies to avoid personally unsafe situations
   Strand 4 Social and Emotional Health
   - 4.10 Demonstrate making a decision or solving a problem using criteria to evaluate solutions
F. Health Education (6)
   Strand 3 Safety
   - 3.11 Demonstrate the ability to escape safety hazards in public places
G. Health Education (High School)
   Strand 3 Safety

- 3.7 Apply strategies to avoid and report dangerous situations, including conflicts involving weapons and gangs

Strand 4 Social and Emotional Health
- 4.7 Apply decision-making and problem-solving steps to generate alternative solutions regarding social situations that could place one’s health or safety at risk

Rock Your World: Time to Act!

DD Educational Objectives:
1. To bring awareness to peer pressure that a person can encounter when practicing smart hearing.
2. Students practice making personal decisions on individual behavior in social settings and discuss their answers with the class and educator.

Michigan Educational Benchmarks:
A. Health Education (K)
   Strand 3 Safety
   - 3.8 Describe dangerous and destructive situations that need to be reported to an adult
   - 3.9 Apply a rule and demonstrate actions to use in hypothetical situations
   - 3.10 Generate examples of safe places one might go if feeling threatened
   - 3.11 Apply strategies to avoid personally unsafe situations

B. Health Education (1)
   Strand 3 Safety
   - 3.6 Describe situations that are dangerous, destructive, and disturbing and that need to be reported to an adult
   - 3.7 Practice escaping unsafe situations by getting away, leaving, and telling an adult

C. Health Education (2)
   Strand 3 Safety
   - 3.7 Apply strategies to avoid personally unsafe situations

D. Health Education (3)
   Strand 3 Safety
   - 3.7 Describe dangerous, destructive, and disturbing situations that need to be reported to an adult
   - 3.8 Analyze environments to determine whether they are safe places

E. Health Education (4)
   Strand 3 Safety
   - 3.1 Describe safety hazards, including those related to fire, dangerous objects and weapons, being home alone, and using the internet
   - 3.12 Apply strategies to avoid personally unsafe situations

Strand 4 Social and Emotional Health
- 4.5 Explain the decision making and problem solving steps
- 4.6 Apply the steps to make a decision or solve a problem, using criteria to evaluate solutions

F. Health Education (5)
   Strand 3 Safety

- 3.6 Analyze situations to predict safety hazards when home alone and in public places
- 3.7 Apply strategies to avoid personally unsafe situations
- 3.9 Develop plans to stay safe when home alone and in public places

Strand 4 Social and Emotional Health
- 4.8 Describe the characteristics of people who can help make decisions and solve problems
- 4.9 Explain the decision making and problem solving steps
- 4.10 Demonstrate making a decision or solving a problem using criteria to evaluate solutions

G. Health Education (6)
Strand 3 Safety
- 3.7 Analyze environments and situations, including those where weapons may be present, to determine whether they are safe
- 3.8 Describe strategies to avoid unsafe situations
- 3.11 Demonstrate the ability to escape safety hazards in public places

Strand 4 Social and Emotional Health
- 4.6 Describe the decision making and problem solving steps
- 4.7 Demonstrate the ability to make a decision or solve a problem using criteria to evaluate solutions

H. Health Education (7, 8)
Strand 3 Safety
- 3.8 Demonstrate skills and strategies for avoiding or escaping potentially dangerous situations
- 3.9 Recognize warning signs of potential danger in relationships

I. Health Education (High School)
Strand 3 Safety
- 3.2 Describe the characteristics of situations which are dangerous, and those that must be reported to the authorities
- 3.7 Apply strategies to avoid and report dangerous situations, including conflicts involving weapons and gangs.

Strand 4 Social and Emotional Health
- 4.7 Apply decision-making and problem-solving steps to generate alternative solutions regarding social situations that could place one’s health or safety at risk
- 4.8 Predict the potential short- and long-term effects of each alternative on self and others, and defend the healthy choices