STATE OF OREGON

Specific curriculum area standards can be found at the Oregon 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.

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
**State of Oregon: Dangerous Decibels Educational Benchmarks: 2012.11**

http://www.ode.state.or.us/teachlearn/real/standards/

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

**Oregon Educational Benchmarks:**

A. **Science (K)**

   - A. Examine the way different things move
     - Observe that way that sound particles vibrate. (K.2P.1)

K.3 Scientific Inquiry: Science explores the natural world through observation
   - B. Make observations about the natural world
     - Investigate that things move in different ways, such as fast, slow, etc. (K.3S.2)

B. **Science (1)**

1.2 Interaction and Change: Living and non-living things interact
   - A. Describe the motion of objects when a force is applied
     - Demonstrate that the way to change the motion of an object is by applying a push or a pull. (1.2P.1)

C. **Science (3)**

3.2 Interaction and Change: Living and non-living things interact with energy and forces
   - A. Describe how forces cause changes in an object’s position, motion, and speed
     - Demonstrate the way to change an object’s position by exerting a push or a pull. (3.2P.1)

3.4 Engineering Design: Engineering design is a process that uses science to solve problems or address needs or aspirations.
   - A. Give examples of inventions that enable scientists to observe things that are too small or too far away
     - Demonstrate anatomy of the ear and how it can be viewed. (3.4D.3)

D. **Science (4)**

4.1 Structure and Function: Living and non-living things can be classified by their characteristics and properties
   - A. Describe the properties of forms of energy and how objects vary in the extent to which they absorb, reflect, and conduct energy
     - Observe and describe some basic forms of energy, including light, heat, sound, electrical, and the energy of motion (4.1P.1)

4.2 Interaction and Change: Living and non-living things undergo changes that involve force and energy
- A. Describe physical changes in matter and explain how they occur
  - Demonstrate the changes that energy can undergo such as sound, light, and heat energy. (K.2P.1)

E. Science (6)
6.1 Structure and Function: Living and non-living systems are organized groups of related parts that function together and have characteristics and properties
- A. Describe physical and chemical properties of matter and how they can be measured
  - Demonstrate how properties of matter can be measured. (6.1P.1)
- B. Compare and contrast the characteristic properties of forms of energy
  - Describe properties of sound energy. (6.1P.2)

6.2 Interaction and Change: The related parts within a system interact and change
- A. Describe and compare types and properties of waves and explain how they interact with matter
  - Demonstrate a sound wave and explain how it interacts with matter. (6.2P.1)

F. Science (8)
8.2 Interaction and Change: Systems interact with other systems
- A. Explain how energy is transferred, transformed, and conserved
  - Demonstrate how sound, heat, electrical energy is transferred, transformed, and conserved. (8.2P.2)

G. Science (9-12)
H.2 Interaction and Change: The components in a system can interact in dynamic ways that may result in change.
- A. In systems, changes occur with a flow of energy and/or transfer of matter
  - Apply the laws of motion and gravitation to describe the interaction of forces acting on an object and the resultant motion. (H.2P.4)
- B. Explain how energy and chemical elements pass through systems
  - Demonstrate how sound energy travels. (H.2L.1)

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

Oregon Educational Benchmarks:
A. Science (K)
K.2 Interaction and Change
- A. Living and non-living things move
- B. Examine the way things move
  - Observe that things that make sound vibrate. (K.2P.1)

K.3 Scientific Inquiry
- A. Science explores the natural world through observation
- B. The motion of objects can be changed by forces
  - Investigate that things move in different ways, such as fast, slow, etc. (K.3S.2)
B. Science (1)
   1.2 Interaction and Change
   - A. Energy is involved in all physical processes and is a unifying area in many areas of science
   - B. Energy exists in many forms and has the ability to do work or cause a change
     - Demonstrate that the way to change the motion of an object is by applying a push or a pull. (1.2P.1)

C. Science (3)
   3.2 Interaction and Change
   - A. Energy is involved in all physical processes and is a unifying area in many areas of science
   - B. Energy exists in many forms and has the ability to do work or cause a change
     - Describe how forces cause changes in an object’s position, motion, and speed (3.2P.1)

3.4 Engineering Design
   - A. Give examples of inventions that enable scientists to observe things that are too small or too far away
     - Demonstrate anatomy of the ear and how it can be viewed. (3.4D.3)

D. Science (4)
   4.1 Structure and Function
   - A. Energy is involved in all physical processes and is a unifying area in many areas of science
   - B. Energy exists in many forms and has the ability to do work or cause a change
     - Describe the properties and forms of energy and how objects vary in the extent to which they absorb, reflect, and conduct energy. (4.1P.1)

4.2 Interaction and Change
   - A. Living and non-living things undergo changes that involve force and energy
     - Describe the changes that occur and how they happen. (4.2P.1)

E. Science (6)
   6.1 Structure and Function
   - A. Living and non-living systems are organized groups of related parts that function together and have characteristics and properties
     - Describe properties of matter and how they can be measured. How can sound be measured? (6.1P.1)
   - B. Compare and contrast the characteristic properties of forms of energy
     - Describe characteristics of sound, heat, light, etc. energy. (6.1P.2)

6.2 Interaction and Change
   - A. The related parts within a system interact and change
     - Describe and compare types and properties of waves and explain how they interact with matter. (6.2P.1)
   - B. Describe the relationships and interactions between and among cells, tissues, organs, and organ systems
     - Describe how different systems can be damaged. (6.2L.1)

F. Science (8)
   8.2 Interaction and Change
A. Systems interact with other systems
   - Explain how energy is transferred, transformed, and conserved. (8.2P.2)

G. Science (9-12)
   H.2 Interaction and Change
   - A. The components in a system can interact in dynamic ways that may result in change. In systems, changes occur with a flow of energy and/or a transfer of matter
     - Apply the laws to describe interaction of forces acting on an object. (H.2P.4)
   - B. Explain how energy and chemical elements pass through systems
     - Describe waves of energy and how they move. (H.2L.1)

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.

Oregon Educational Benchmarks:
A. Health Education (K-3)
   Benchmark 1
   - Acquire knowledge and skills necessary to be safe at home, on the move, at school, at work, and in the community and how to get help in case of injury
     - Identify safe behaviors (HE.03.IP.01)
     - Use a decision making model to plan ahead to avoid dangerous situations and injuries (HE.03.IP.02)
     - Explain how helpful and hurtful messages in media can affect an individual’s behavior. (HE.03.VS.02)

B. Health Education (6-8)
   Benchmark 3
   - Unintentional Injury Prevention
     - Identify rules and laws intended to prevent injuries. (HE.08.IP.02)
     - Demonstrate personal responsibility to follow safety-related laws (HE.08.IP.03)
   - Prevention and control of disease
     - Demonstrate personal health care practices that prevent the spread of communicable disease. (HE.08.DI.02)

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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
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http://www.ode.state.or.us/teachlearn/real/standards/

high frequency hearing loss.

Florida Educational Benchmarks:
A. Health Education (K-3)
   Benchmark 1
   • Unintentional Injury Prevention
     o Identify safe behaviors when traveling to and from school and in the community. (HE.03.IP.01)
     o Use a decision making model to plan ahead to avoid dangerous situations and injuries on the way to and from school. (HE.03.IP.02)
     o Explain how helpful and hurtful messages in media can affect an individual’s behavior. (HE.03.VS.02)

B. Health Education (6-8)
   Benchmark 3
   • Unintentional Injury Prevention
     o Identify rules and laws intended to prevent injuries. (HE.08.IP.02)
     o Demonstrate personal responsibility to follow safety-related laws. (HE.08.IP.03)
   • Prevention and control of disease
     o Demonstrate personal health care practices that prevent the spread of communicable disease. (HE.08.DI.02)

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.

Oregon Educational Benchmarks:
A. Health Education (K-3)
   Benchmark 1
   • Unintentional Injury Prevention
     o Identify safe behaviors (HE.03.IP.01)
     o Use decision making strategies (HE.03.IP.02)
     o Identify the relationship between healthy behaviors and personal health. (HE.4.C.1.1)
     o Explain how helpful and hurtful messages in media can affect an individual’s behavior. (HE.03.VS.02)

B. Health Education (6-8)
   Benchmark 3
   • Unintentional Injury Prevention
     o Identify rules and laws intended to prevent injuries. (HE.08.IP.02)
     o Demonstrate personal responsibility to follow safety-related laws. (HE.08.IP.03)
   • Prevention and control of disease
State of Oregon: Dangerous Decibels Educational Benchmarks: 2012.11
http://www.ode.state.or.us/teachlearn/real/standards/

- Demonstrate personal health care practices that prevent the spread of communicable disease. (HE.08.DI.0)

**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.

**Oregon Educational Benchmarks:**
A. Health Education (K-3)
   Benchmark 1
   - Unintentional Injury Prevention
     - Identify safe behaviors (HE.03.IP.01)
     - Use decision making strategies (HE.03.IP.02)
     - Identify the relationship between healthy behaviors and personal health. (HE.4.C.1.1)
     - Explain how helpful and hurtful messages in media can affect an individual’s behavior. (HE.03.VS.02)

B. Health Education (6-8)
   Benchmark 3
   - Unintentional Injury Prevention
     - Explain ways to reduce risk of injuries while traveling to and from school and in the community. (HE.08.IP.01)
     - Identify rules and laws intended to prevent injuries. (HE.08.IP.02)
     - Demonstrate personal responsibility to follow safety-related laws. (HE.08.IP.03)
   - Prevention and control of disease
     - Demonstrate personal health care practices that prevent the spread of communicable disease. (HE.08.DI.02)

**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.
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.

Florida Educational Benchmarks:
A. Health Education (K-3) Benchmark 1
   - Unintentional Injury Prevention
     - Identify safe behaviors (HE.03.IP.01)
     - Use decision making strategies (HE.03.IP.02)
     - Identify the relationship between healthy behaviors and personal health. (HE.4.C.1.1)
     - Explain how helpful and hurtful messages in media can affect an individual’s behavior. (HE.03.VS.02)

B. Health Education (6-8) Benchmark 3
   - Unintentional Injury Prevention
     - Identify rules and laws intended to prevent injuries. (HE.08.IP.02)
     - Demonstrate personal responsibility to follow safety-related laws. (HE.08.IP.03)
   - Prevention and control of disease
     - Demonstrate personal health care practices that prevent the spread of communicable disease. (HE.08.DI.02)