GLOSSARY

Chemoreceptors - a sensory receptor that transduces a chemical signal into an action potential

Dentin - is a calcified tissue of the body and is one of the four major components of teeth

Enamel - the hard mineralized surface of teeth

Magnetic resonance image (MRI) - a medical imaging technique used in radiology

Mandible - lower jaw or jawbone

Molars - the rearmost and most complicated kind of tooth

Plaque - a biofilm that builds up on teeth

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Show Me Science

The Wonders of Physiology

Anatomy & Functions of the Face

K4586DVD

***Advanced* Teachers Guide**

SYNOPSIS:

The face is our window to the world. Organs of the mouth take in food, start the digestive process and protect us from various hazards. The face is also used to communicate through expressions and other non-verbal signals that give people information about us. This program describes the anatomy and functions of different aspects of the face and mouth and what scientists have learned about universal beliefs related to facial symmetry.

CURRICULUM UNITS:

- Anatomy
- Animal Behavior
- Biology
- Ecology
- Evolution
- Physiology
- Psychology

CAREER OPPORTUNITIES:

- Dental technician
- Physiologist
- Dentist
- Psychologist
- Physician
- Sociologist

PROGRAM OVERVIEW:

This program explains the functions of the face and mouth. It opens with an illustration of how the head might have evolved from just an opening to the digestive system in the simplest organisms. It then discusses the development of chemoreceptors and light receptors to locate and taste food, and how these receptors may have evolved into what we know as the face and the mouth.

Illustrations and close-up photography explain the anatomy of the mouth. The program demonstrates how chemoreceptors identify food, how taste buds and olfactory cells are used to differentiate between thousands of foods and odors, and how the taste buds work only when molecules are in solution. This leads to a discussion of saliva's role in swallowing and getting food into the esophagus, causing molecules to dissolve into solution so they can be sensed by the taste buds, and providing protection against bacterial infection in the mouth.

The actions of the teeth, tongue and jaws are shown in the process of chewing and swallowing, and X-ray images illustrate how food is broken down, formed into a bolus, and passed into the esophagus. It shows how muscles in the mouth are used to make facial expressions that enable people to gauge our moods or attempt to read our behaviors.

The program also illustrates how facial expressions convey non-verbal information that can influence reactions in other people. It also discusses values that people place on facial appearance and what scientists have learned about perceived attractiveness and facial and body symmetry.

ISSUES & CRITICAL THINKING:

After showing the video, ask your students the following:

1. Design an experiment to see how many facial expressions a person exhibits in different situations.

2. Explain how it is possible for humans and chimpanzees to have the same kinds of facial expressions.

3. Gather pictures of faces of people from different parts of the world. Design an experiment to identify which faces are most attractive to one group of students. Have the same students take the set of pictures home to adults in their households to see how they rate the attractiveness of the faces. Compare the two groups' responses.

4. Design an experiment to compare the rate of decomposition of a tooth in a weak acid solution. Students can use teeth of different animals, vary the concentration of the acid on the same set of teeth, or compare the decomposition rate of different materials such as bone and muscle in the same concentration of acid.

5. Design an experiment to test the relationship between taste and smell. You can use blindfolds and clothespins to expose students to different conditions and see how well they can identify unknown foods.