



*The Living*  
**BODY**

FILMS FOR THE  
HUMANITIES &  
SCIENCES®



# Skin Deep

## Summary

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This program introduces the special properties of skin and the senses of smell, taste, and touch. The surface of the skin is explored through magnifying photography, while the workings of its specialized sensory cells and internal structures are illustrated by means of animation, X-rays, and simulations.



The skin is more than just packaging for the insides: it protects the body, helps regulate body temperature, and relays sense messages from the outside world. Measuring two square yards, it is the largest organ in the body, weighs eight times as much as the liver, and receives about one-third of all blood pumped from the heart.

The most obvious characteristic of human skin is its color. Black, brown, and yellow skin get their color from granules of black or yellow pigment. Pigment protects skin from the sun's harmful rays—the darker the pigment, the more protection. Skin color reflects the amount of protection from the sun needed by one's ancestors in whatever region of the world they lived. Another visible feature of skin is hair. The primary function of hair is to protect the body by shielding it from the direct rays of the sun, and insulating it from the cold by trapping a layer of warm air.

The olfactory sense is located in patches of sensitive cells in the nasal passages. The many tiny hairs covering these patches are specialized to detect smells. Covered with mucus, they constantly sweep back and forth. As molecules pass through the nose, some are dissolved by the mucus, thus stimulating the hairs to send impulses to the brain, which then interprets them as familiar or unfamiliar smells. One possible explanation for the ability to differentiate between smells is that there are sockets on these tiny hairs that only respond to molecules of a certain shape.

Taste is also a localized, chemical sense. Tastes are detected by specialized cells on the tongue and down the back of the throat. As food is broken up in the mouth, the molecules are dissolved in saliva and carried into small pits on the tongue where they come into contact with taste receptor cells. It is probably a chemical property of food molecules that triggers the impulse to the brain: their shape or electrical charge stimulates cells deep within the tastebud.

Touch—the recognition of pressure, pain, temperature, and wetness—is distributed unevenly over the body. The back has no need to discriminate fine details, and has only one or two touch detectors per square inch; but there are many more in the fingertips. Touch receptors respond to changes in sensation rather than to constant contact. Thus people are not constantly aware of their clothing or of the bed on which they are sleeping. The most urgent sensation detected is pain, which is picked up by raw nerve endings.

## Objectives

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1. To introduce the basic qualities and functions of the skin, from its outward appearance to internal structures.
2. To explore the senses of smell, taste, and touch embedded in the skin.
3. To examine the role of skin pigment and hair in protecting the body from weather hazards.
4. To explain how the senses receive and transmit sensory messages to the brain.

## Recall Questions

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1. What role does the brain play in the functioning of our senses?
2. Why do we cease to smell substances to which we are continuously exposed?
3. What is the purpose of tastebuds?
4. Why does it hurt to have a hair pulled out?

## Interpretive Questions

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1. How do the senses located in the skin add to the pleasure and pain of life?
2. Why are our senses impaired when we have a cold?
3. A dog's nose has seventy times the number of scent detectors of a human nose. Why do you think this is so?
4. Why do you think our sense of touch is generalized over the entire surface of the body, not localized like smell and taste?

## Vocabulary Required for Effective Viewing

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- cell
- insulation
- molecule
- pigment
- receptor
- stimulate



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