# The Integumentary System { Notes

#### Note Expectations:

No side conversations.
You are taking the notes.
You are helping the people at your table to answer the questions.
You are prepared to answer the questions.

### &I can identify the three layers of skin.

I can describe the function of the different layers of skin.
I can list the structures found in each layer of skin.
I can identify the structures found in the skin.

What is the main organ in the integumentary system?
What else would make up the integumentary system?
What is the purpose of the integumentary system?

### &Integument is Latin for cover.

The integumentary system is made of skin, hair, nails, and glands.
 Its main job is to protect.

Brainstorm with your group ways in which the skin helps to protect you. The integumentary system provides protection in several different ways.

øServes as a barrier against infection.

 Protects internal organs from mechanical, chemical, and thermal damage.

### @Prevents desiccation (drying out)

©Protects against UV radiation

&In addition to protection, the skin also provides these vital functions: &Synthesizes (produces) Vitamin D & Temperature regulation & Excretes small amounts of waste & Sensory reception (touch, temperature, pressure, pain, etc.)

Predict how the skin helps to maintain homeostasis. The skin plays an important role in homeostasis.

Homeostasis is the ability to maintain a stable internal environment.

The skin helps to maintain body temperature and helps remove wastes. & The Skin <u>ø</u>The skin is the largest organ. *It is about 5 mm thick.* øWe lose between 30,000 and 50,000 skin cells a minute.

### &Dust is made mostly of skin cells.

The skin accounts for about 7% of your body weight.
The skin regenerates every 25-45 days.

The skin contains several sensory receptors.
Sensations like pressure, heat, cold and pain are felt by the skin.

The skin is made of three main layers.
They are the epidermis, dermis, and subcutaneous layer.



## The Epidermis {

#### Note Expectations:

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&I can identify the three layers of skin.

&I can list the structures found in each layer of skin.

What are the three layers of skin?
What order do you think they go in from top to bottom?

The epidermis is the top layer of skin.

The prefix epi- means above.
The suffix –dermis means skin or tissue.

&It is made of sheets of epithelial cells.

The cells are keratinized stratified squamous epithilium.

&Its layers are mostly dead cells.

Epidermis

The epidermis is avascular, which means that it has no blood vessels, and that is the reason why a small scratch will not cause bleeding to occur.

Epidermis

### There are two main cells found in the epidermis:

- A) Keratinocytes that produce keratin.
- B) Melanocytes that produce melanin.

#### Cells of the Epidermis

### &Predict what you think melanin is. &What is its function?

Melanin is a yellow, brown, or black pigment.

Both light and dark skinned people have about the same number of melanocytes.

#### Melanin

»The difference in skin color is caused by the amount of melanin produced and distributed. The amount of melanin produced depends on: *<sup>ø</sup>*Heredity 

Epidermis

### © Predict what you think UV rays do to DNA.

Melanin is important for protection because it absorbs UV radiation from the sun.

& Melanin protects DNA from UV rays.

&UV radiation can mutate DNA, causing skin cancer, like melanoma.

Epidermis

& Keratin is a tough, fibrous protein. &Keratin producing cells are called keratinocytes. Remember that –cyte means cell. & As keratinocytes die, they form a tough, flexible, waterproof covering on top of the skin.

Keratin

### There are five layers of the epidermis.

Predict which layer (the top or bottom) undergoes mitosis to produce new cells.

#### Layers of the Epidermis

The very bottom most layer of the epidermis is the stratum basale. &Stratum means layer. The prefix bas- means bottom. &It is composed of a single layer of stem cells called basal cells. & These cells undergo rapid cell division and receive nutrients from the dermis. Stratum Basale

### The basal cells are the stem cells for keratinocytes.

In addition to the basal cells, the basal layer also contains melanocytes.
 As the cells continue to divide, older cells are pushed toward the top.

#### Stratum Basale

The next layer is the stratum spinosum or spiny layer.
 The cells in this layer are keratinocytes.

©Cells in this layer begin to make keratin.

Keratin will replace the internal contents of the epidermal cells.

Stratum Spinosum

The next layer of the epidermis is the stratum granulosum. &In this layer, cells become flatter. & Cells fill with keratin. &Water resistant glycolipids fill the spaces between cells. The prefix glyc- means sweet.

Stratum Granulosum

& The next layer of the epidermis is the stratum lucidum. <sup>k</sup>It is made of clear, flat, dead cells. This layer composes the thick layer on the palms of the hands, fingertips, and the soles of the feet. &It is only found where there is thick skin.

#### Stratum Lucidum

The top layer of the epidermis is called the stratum corneum. <sup>k</sup>It's job is to protect against abrasion, water loss, and covers the body. &It is 20-30 cells thick. **<u>kIts cells are filled with keratin and</u>** shingle-like dead cells. &A thickening of this layer of skin causes a callus. Stratum Corneum

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#### **Epidermal Layer**



Describe what happens to skin cells as they move through the layers of the epidermis.

- & What cells make keratin?
- & What is the purpose of keratin?
- & What cells make melanin?
- & What is the purpose of melanin?
- & What layer of the epidermis undergoes rapid cell division?
- & What are the stem cells for keratinocytes?
- & What layer of the epidermis is only found where skin is thick?
- & What layer of the epidermis protects against water loss and abrasion?

#### **Review Questions**