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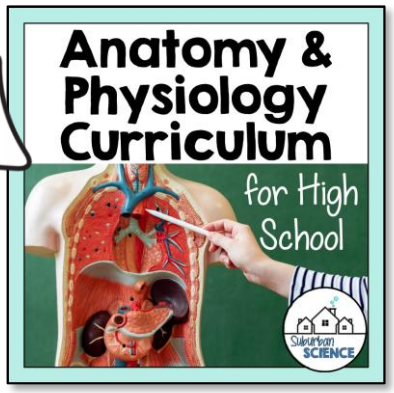

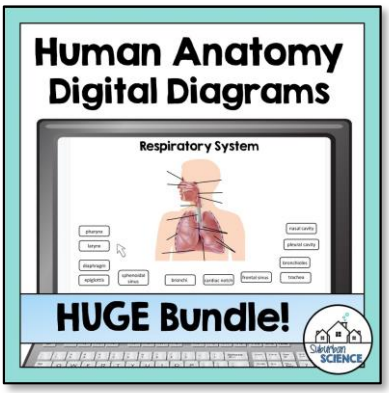

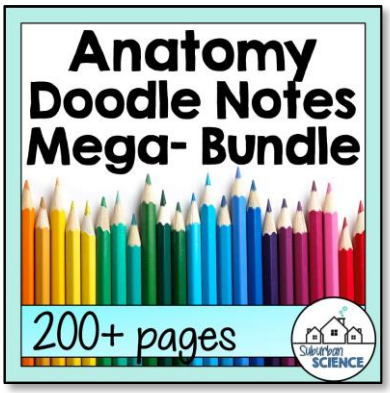

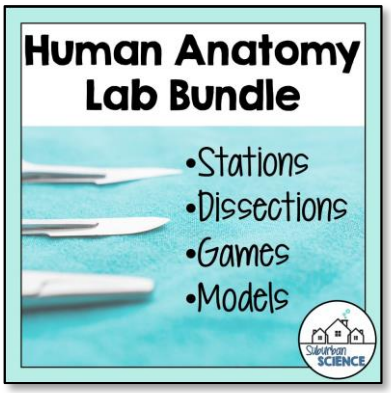

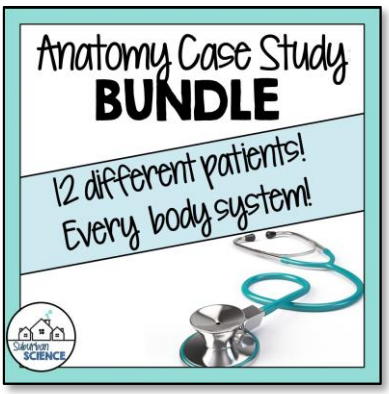

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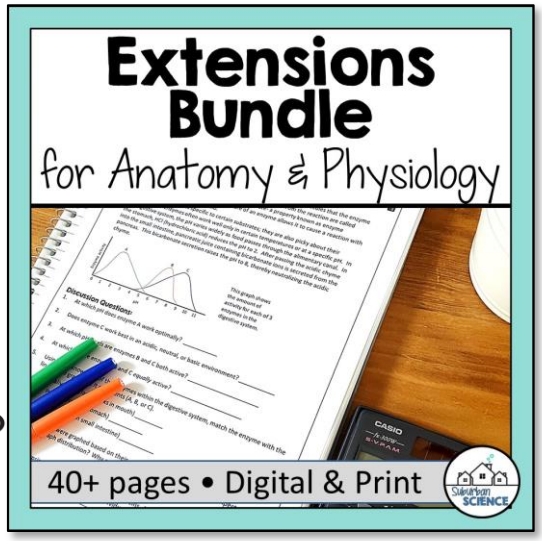


Wound Lab

A wound is any type of damage or breakage of the epithelium. They can be caused by accidents like burns and cuts or by an underlying skin disorder like psoriasis or eczema.

Types of Wounds:

Wounds can be internal or external. External wounds involve a break in the epidermis and are also known as open wounds. The four types of open wounds are classified by their cause. Research the 4 types of open wounds and list them here:

Type of Wound	Description

Burns:

Burns are categorized by their severity, which is determined by the depth of the burned tissue. The deeper the tissue damage, the more severe the burn.

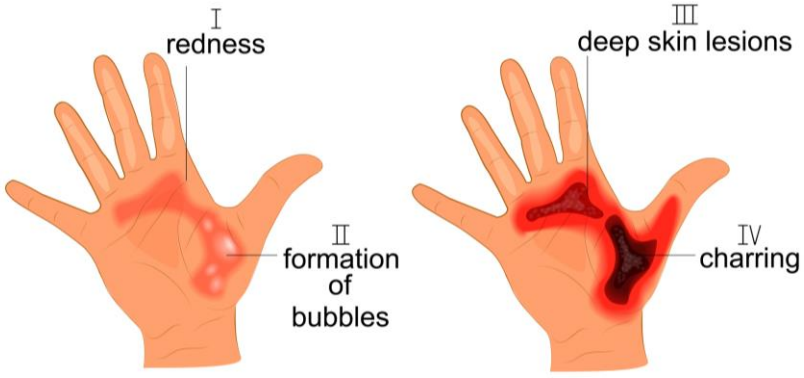
First degree burn- Only superficial epidermis is damaged. Skin is red and uncomfortable.

Second degree burn- Epidermis and superficial portion of the dermis are damaged. Skin is red, painful, and blistered.

Third degree burn- Both epidermis and dermis are destroyed and possibly portions of the hypodermis, as well (known as full-thickness burns). Blisters and blackened skin is present, but the burns are not painful because the nerve endings have been damaged.

Fourth degree burn- Damaged tissue extends into deeper layers such as bone and muscle.

First and second degree burn leave some epithelial tissue intact, so regeneration is likely and scars usually don't develop. Third and fourth degree burns require skin grafts to recover the damaged area because epithelial tissue is no longer present for regrowth.

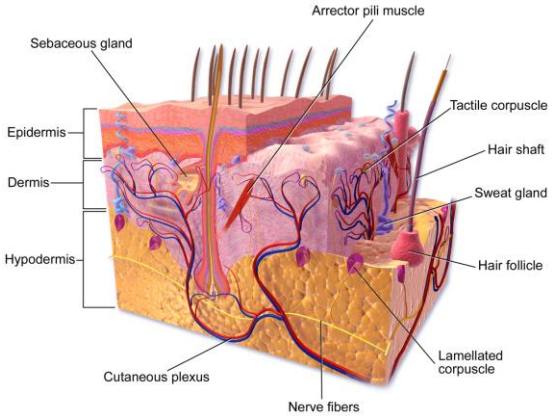


Questions:

1. Why are third and fourth degree burns not painful?

2. What types of burns require skin grafts? Why?

3. If a wound only breaks through the epidermal layer of the skin, would you expect bleeding? Why or why not?



The Components of the Integumentary System

4. If a wound was deep enough to affect all three layers of the skin, what underlying structures could be affected?

Wound healing:

Most wounds heal in a few stages. The larger and deeper the wound is, the longer it will take to heal.

1) Inflammation- blood vessels become more permeable, allowing immune cells to enter the wounded area and bringing clotting proteins to heal any broken blood vessels. Immune cells also aid in the removal of bacteria and debris that have entered the wound.
2) Proliferation- Granulation tissue begins to grow. This delicate pink tissue is filled with new capillaries and fibroblasts. These help to restore nutrients to the area and form the collagen fibers that eventually pull the wound closed.
3) Regeneration- The surface epithelium is restored. Depending on the severity of the wound, the scar will either be invisible or remain as a white line.

Questions:

5. Describe the role of each of the following body systems in wound healing:

- Lymphatic System (Immune System):

- Cardiovascular System:

- Integumentary System:

6. Dilation of blood vessels leads to redness and heat at the wound. Knowing that metabolic rates increase with temperature, why might heat be helpful in wound healing?

Make a Wound:

Using the materials provided (Vaseline, cocoa powder, red food coloring, 1-ply toilet paper, optional- lipstick, fake blood), create a wound somewhere on your body. The wound should represent one of the 4 wound types you researched.

Questions:

7. Which type of wound are you making?

8. Where is your wound located? Use at least 2 anatomical/directional terms to describe the location (ex: medial side of the forearm distal to the elbow).

9. Which layers of the skin does your wound likely affect?

10. Knowing the layers affected, how would your wound affect the following functions of the skin:

    a. Protection from infection

    b. Blood flow

    c. Protection from UV radiation

    d. Evaporation of bodily fluids

11. How should you treat your wound to reduce the detrimental effects you just described?

Teacher check:

❑Type of wound is correct, as described in question 7.

❑Wound location is correct, as described in question 8.

❑Worksheet questions are complete.

After getting your wound and worksheet checked by your teacher, please clean up your wound materials.

Wound Lab

A wound is any type of damage or breakage of the epithelium. They can be caused by accidents like burns and cuts or by an underlying skin disorder like psoriasis or eczema.

Types of Wounds:

Wounds can be internal or external. External wounds involve a break in the epidermis and are also known as open wounds. The four types of open wounds are classified by their cause. Research the 4 types of open wounds and list them here:

Type of Wound	Description
Abrasion	When skin rubs or scrapes against a rough or hard surface. Usually not much bleeding, but wound needs to be cleaned.
Laceration	Deep cut or tearing of skin. Bleeding can be rapid and extensive.
Puncture	Small hole caused by a long, pointy object. May not bleed much, but can be deep enough to cause internal damage.
Avulsion	Partial or complete tearing away of skin and tissue. Bleed heavily and rapidly.

Burns:

Burns are categorized by their severity, which is determined by the depth of the burned tissue. The deeper the tissue damage, the more severe the burn.

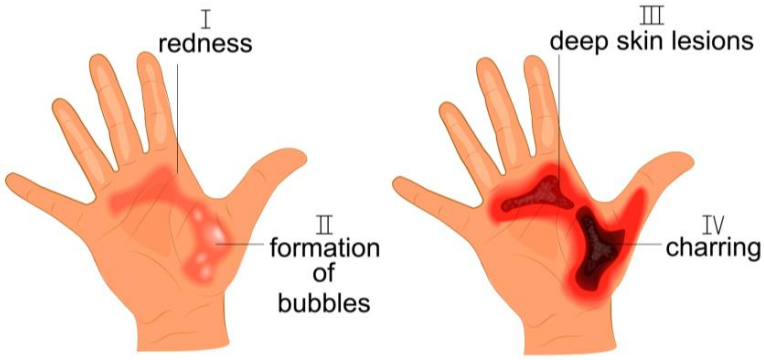
First degree burn- Only superficial epidermis is damaged. Skin is red and uncomfortable.

Second degree burn- Epidermis and superficial portion of the dermis are damaged. Skin is red, painful, and blistered.

Third degree burn- Both epidermis and dermis are destroyed and possibly portions of the hypodermis, as well (known as full-thickness burns). Blisters and blackened skin is present, but the burns are not painful because the nerve endings have been damaged.

Fourth degree burn- Damaged tissue extends into deeper layers such as bone and muscle.

First and second-degree burn leave some epithelial tissue intact, so regeneration is likely and scars usually don't develop. Third- and fourth-degree burns require skin grafts to recover the damaged area because epithelial tissue is no longer present for regrowth.

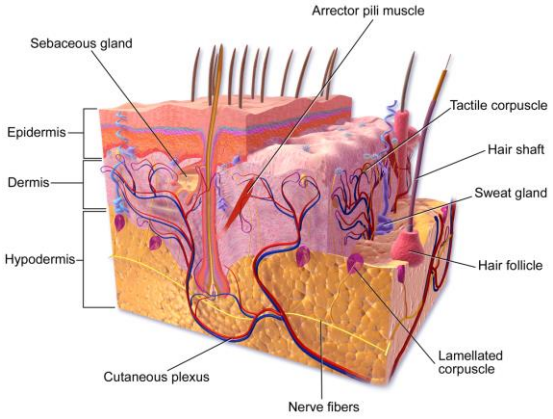


Questions:

1. Why are third and fourth degree burns not painful?
   Third- and fourth-degree burns aren't painful because the nerve endings have been damaged so they do not detect pain.

2. What types of burns require skin grafts? Why?
   Third- and fourth-degree burns require skin grafts because the epithelial tissue is not present for regrowth.

3. If a wound only breaks through the epidermal layer of the skin, would you expect bleeding? Why or why not?
   No. The epidermis does not contain blood vessels.



The Components of the Integumentary System

4. If a wound was deep enough to affect all three layers of the skin, what underlying structures could be affected?
   Muscles, bones, tendons, ligaments, possibly internal organs

Wound healing:

Most wounds heal in a few stages. The larger and deeper the wound is, the longer it will take to heal.

1) Inflammation- Blood vessels become more permeable, allowing immune cells to enter the wounded area and bringing clotting proteins to heal any broken blood vessels. Immune cells also aid in the removal of bacteria and debris that have entered the wound.
2) Proliferation- Granulation tissue begins to grow. This delicate pink tissue is filled with new capillaries and fibroblasts. These help to restore nutrients to the area and form the collagen fibers that eventually pull the wound closed.
3) Regeneration- The surface epithelium is restored. Depending on the severity of the wound, the scar will either be invisible or remain as a white line.

Questions:

5. Describe the role of each of the following body systems in wound healing:

- Lymphatic System (Immune System):
  Immune cells bring clotting proteins to heal broken blood vessels and remove bacteria and debris that have entered the body through the wound.

- Cardiovascular System:
  Blood vessels dilate and become more permeable to allow immune cells into tissues. Blood vessels clot. New capillaries form in healed tissue.

- Integumentary System:
  Granulation tissue restores nutrients to the wounded area and form collagen to close wound. Eventually, all layers of skin will be restored, either with scar tissue or functional tissue.

6. Dilation of blood vessels leads to redness and heat at the wound. Knowing that metabolic rates increase with temperature, why might heat be helpful in wound healing?
   Heat increases metabolism, meaning the cellular reactions occur more quickly. This will speed up the rate of healing.

Make a Wound:

Using the materials provided (Vaseline, cocoa powder, red food coloring, 1-ply toilet paper, optional- lipstick, fake blood), create a wound somewhere on your body. The wound should represent one of the 4 wound types you researched.

Questions:

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    a. Protection from infection

    b. Blood flow

    c. Protection from UV radiation

    d. Evaporation of bodily fluids

Student answers will vary on this page, based on the type of wound they choose.

11. How should you treat your wound to reduce the detrimental effects you just described?

Teacher check:

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❑Wound location is correct, as described in question 8.

❑Worksheet questions are complete.

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