

Study Guide — HBS Unit 2: Research Ready (Mid-Unit Test)

Human Body Systems · Unit 2 — Research Ready · Modeled on the PLTW Guided Review format

Vocabulary to know cold

Term	Definition
Epithelial tissue	Tightly packed cells on a basement membrane that cover surfaces and line cavities, glands, and tubes.
Connective tissue	Cells scattered in abundant extracellular matrix; includes bone, blood, fat, cartilage, tendons.
Muscle tissue	Contractile tissue that produces movement; skeletal, cardiac, and smooth types.
Nervous tissue	Neurons and supporting cells that generate and conduct electrical impulses.
Epidermis	Outermost skin layer (epi- = upon); makes keratin and melanin, forms the barrier.
Dermis	Middle skin layer with blood vessels, nerves, glands, and hair follicles.
Hypodermis	Deepest subcutaneous layer (hypo- = below), mostly fat for insulation and cushioning.
Keratin	Tough, waterproofing protein in the epidermis made by keratinocytes.
Melanin	Pigment made by melanocytes that absorbs UV radiation and colors skin/hair.
derm/o	Combining form for skin (dermatology = study of skin).
epi-	Prefix meaning upon or above (epidermis).
-cyte	Suffix meaning cell (keratinocyte, melanocyte).
hist/o	Combining form for tissue (histology = study of tissues).

Worked examples (follow the reasoning)

Example 1. Decode the word 'dermatitis' into parts and give its meaning.

- Find the root: dermat/o = skin.
- Find the suffix: -itis = inflammation.
- Combine: skin + inflammation.

Answer: Dermatitis = inflammation of the skin.

Example 2. A slide shows tightly packed cells sitting on a thin membrane, with almost no space between cells. Identify the tissue type and explain how its structure fits its job.

- Tightly packed cells with little matrix on a basement membrane → epithelial tissue.
- Tight packing creates a continuous sheet.
- A continuous sheet forms a barrier and a lining for protection and absorption.

Answer: Epithelial tissue; its tightly packed sheet structure lets it cover and protect surfaces.

Practice questions (with reasoning)

1. Which protein gives the epidermis its waterproof toughness?

- A. Collagen
- B. Keratin
- C. Melanin
- D. Hemoglobin

Answer: B. Keratin waterproofs and toughens the epidermis.

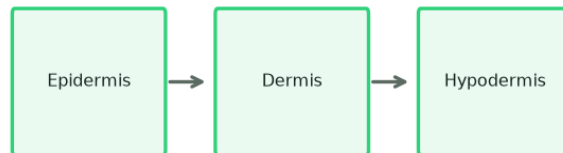
2. The suffix '-cyte' in 'melanocyte' means:

- A. Inflammation
- B. Cell
- C. Study of
- D. Tissue

Answer: B. -cyte means cell; a melanocyte is a pigment-producing cell.

3. Which skin layer is deepest and made mostly of insulating fat?

Skin layers (surface → deep)



- A. Epidermis
- B. Dermis
- C. Hypodermis
- D. Basement membrane

Answer: C. The hypodermis is the deepest layer and is mostly fat.

4. Bone and blood are examples of which tissue type?

- A. Epithelial
- B. Connective
- C. Muscle
- D. Nervous

Answer: B. Bone and blood are connective tissues with abundant matrix.