

Study Guide — PBS Unit 1: Medical Investigation (End-of-Unit Test)

Principles of Biomedical Science · Unit 1 — Medical Investigation · Modeled on the PLTW Guided Review format

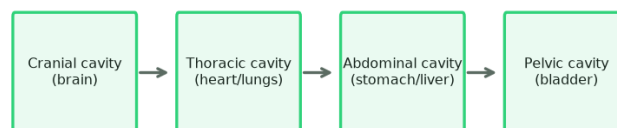
Vocabulary to know cold

Term	Definition
Directional terms	Superior/inferior, anterior(ventral)/posterior(dorsal), medial/lateral, proximal/distal, superficial/deep.
Midsagittal (median) plane	Sagittal plane at the midline that divides the body into equal left and right halves.
Transverse plane	Horizontal plane dividing the body into superior (top) and inferior (bottom).
Body cavity order	Superior to inferior: cranial, thoracic, abdominal, pelvic.
ABO antigens	A = A antigen; B = B antigen; AB = both; O = neither (universal red-cell donor).
Platelets (thrombocytes)	Cell fragments that trigger clotting to stop bleeding.
Algor / Rigor / Livor mortis	Cooling / stiffening / blood-pooling after death; together estimate time of death.
Vital signs	Temperature, pulse, respiration, blood pressure — basic indicators of body function.
Integumentary system	Skin, hair, and nails; largest organ system; source of fingerprints and skin-cell DNA.
Nervous system	Brain, spinal cord, and nerves; controls and coordinates body activities.
Hypothesis	A testable, proposed explanation that an experiment is designed to test.
Universal precautions	Treating all blood and body fluids as potentially infectious; requires PPE such as gloves.
Nucleus	Cell structure that stores most of the cell's DNA; needed for DNA fingerprinting.

Worked examples (follow the reasoning)

Example 1. List the four major ventral body cavities from superior to inferior and name one organ in each.

Body cavities top to bottom



- Start at the head: cranial cavity holds the brain.
- Move down to the chest: thoracic cavity holds the heart and lungs.
- Below the diaphragm: abdominal cavity holds the stomach, liver, and intestines.
- At the base of the trunk: pelvic cavity holds the bladder and reproductive organs.

Answer: Cranial (brain), thoracic (heart/lungs), abdominal (stomach/liver), pelvic (bladder).

Example 2. A questioned bloodstain agglutinates with anti-A and anti-B. A suspect is known to be type O. Could the stain be the suspect's blood? Explain.

- Agglutination with anti-A means A antigen is present.
- Agglutination with anti-B means B antigen is present.
- Both antigens present = type AB.
- The suspect is type O (no A or B antigen), which cannot produce these reactions.

Answer: No. The stain is type AB, but the suspect is type O, so the blood is not the suspect's.

Example 3. Decode the directional phrase 'the wound is on the posterior, inferior, medial aspect of the right leg.'

- Posterior = back surface.
- Inferior = lower part (toward the feet).
- Medial = toward the midline (inner side).
- Combine for the right leg.

Answer: The wound is on the back, lower, inner side of the right leg.

Practice questions (with reasoning)

1. Which directional term pair is correctly matched?

- A. Proximal = farther from the trunk
- B. Superficial = deep inside the body
- C. Lateral = away from the midline
- D. Inferior = toward the head

Answer: C. Lateral correctly means away from the midline; the other three are reversed.

2. A pathologist makes a cut that separates the head from the neck horizontally. This cut is in the:

- A. Sagittal plane
- B. Frontal plane
- C. Transverse plane
- D. Median plane

Answer: C. A horizontal cut producing superior and inferior parts is in the transverse plane.

3. Which choice lists only vital signs?

- A. Temperature, pulse, respiration, blood pressure
- B. Blood type, DNA profile, pulse, weight
- C. Height, weight, blood glucose, temperature
- D. Respiration, blood type, BP, hemoglobin

Answer: A. The four standard vital signs are temperature, pulse, respiration, and blood pressure.

4. Why are mature red blood cells a poor source of DNA for fingerprinting?

- A. They are too small
- B. They lack a nucleus, where DNA is stored
- C. They contain too much DNA
- D. They dissolve in plasma

Answer: B. Mature red blood cells have no nucleus, so they carry essentially no nuclear DNA.

5. The term 'cardiomegaly' means:

- A. Inflammation of the heart
- B. Enlargement of the heart
- C. Removal of the heart
- D. Study of the heart

Answer: B. Cardi/o = heart and -megaly = enlargement, so cardiomegaly is an enlarged heart.