

Basic Human Anatomy

A&P1™

PROFESSIONAL KINESIOLOGY PRACTICE

Activities to consolidate your skill and understanding:

The purpose of this Activities Journal is to enable you to review your new knowledge and have it assessed before you sit the online exam on the website or app.

Please note, some sections of the Homestudy Manual are not assessed in this Activities Journal.

It is almost a certainty that if you do well in these reviews, you will also do well in the online exam. Do not panic about the online exam. It is a similar series of questions to those in this Activities Journal. The only difference is that we will give you several answers to choose from. You just pick the right one.

The online exam is done on the ICPKP website or Kinesiology app and consists of just 20 multi-choice questions. These are chosen randomly from a pool, so you may not get one from each of the 20 sections of the course (although the pool has questions from each section).

Marking Guide - Guidelines for Markers

This guide is for TFH Instructors offering PKP's Home Study A&P1 Course who have taken the course and achieved an 80% pass rate in both the Student Activities Journal and the Online Test..

Most people marking our A&P1 Activities Journals do them in groups of 2 - 4 at a time because they find it quicker and easier.

Make sure to mark Journals with a contrasting colour, typically red.

In this marking guide, the correct answers are in blue and any notes for markers are in red. Where students are required to draw/shade muscles, bones etc, we have used the correct colours requested in the Journal. Notes may include alternative acceptable answers or other guidance.

ICPKP recommends that every correct answer be marked clearly with a tick. Where an answer is incorrect, please provide/indicate the correct answer as appropriate.

In our experience, the more detail you provide in your marking the more likely a student is to continue their studies with you. Providing a thoughtfully marked Journal is a great way to show students you really care about their success.

Basic Human Anatomy

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Put simply, this means among other things:

'Do not borrow bits, photocopy it or scan it into your computer or retype or revise or print it under your name'.

Dedication

Dedicated to all our students, for whom PKP™ Professional Kinesiology Practice has become a way to achieve high-level wellness and vitality: to Learn, Grow in knowledge and wisdom & Embrace life to the fullest in this world of dis-ease and dis-illusion.

Special Note #1

The procedures and techniques described in this manual are solely for information purposes. The authors and the International College of Professional Kinesiology Practice are not directly nor indirectly presenting any part of this work as a diagnosis or prescription for any reader or student, nor even recommending these natural procedures or any of the ideas reported. Persons using the evaluations and balances reported here, do so entirely at their own risk.

Special Note #2

Always ask your teacher if you do not understand or need help to do any class activity. Performing techniques incorrectly or not following instructions can lead to problems.

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How to get the best out of A&P1

Locating Structures

As far as you can, locate each body part on yourself and, if it's appropriate, on a friend. Look for landmarks, such as bones, that help to pinpoint locations of other structures.

You'll probably find that the various activities will help to consolidate your understanding.

Technical terms

For some people, technical words can be very off-putting when they are first encountered. To make new words easier to spot in the study notes, the first time a technical term appears it is usually in bold print. Some words, especially muscle names, are followed by their derivation in brackets.

If you can pronounce a word, you are well on the way to 'owning' it. So give every new word a pronunciation, even if you're not sure that it's the correct one.

You may choose to create your own dictionary of anatomy for handy reference.

Three possible ways to use the Activities Journal - you can choose which works best for you

1. **If you are doing the course to prepare for a tertiary course:**

You may want to complete the Activities Journal without referring to the Homestudy Manual to test yourself.

Then use the Homestudy Manual to check your work. Make any corrections.

2. **If you are doing the course for interest only:** you may prefer to complete the Activities Journal with the Homestudy Manual in front of you.

and

3. **Here's the way for PKP Practitioner Certification students (and those studying kinesiology):**

- a. Read the Homestudy Manual notes for a section right through.
- b. Read through the Activities for that section without writing anything, but mentally filling the gaps.
- c. Read the Homestudy Manual notes again, thinking about the answers you made mentally.
- d. Read the Marieb Reading relating to that section.
- e. Complete the Activities for that section (without the help of study notes or Marieb).
- f. Use the Homestudy Manual and Marieb to check your work.

Online exam:

Once you have completed this Activities Journal and had it marked successfully, you can sit the online exam on the ICPKP website or Kinesiology app. (The platform you use will depend on which system your college uses for their enrolments.) There are 20 multi-choice questions to answer and no time-limit.

The system will mark your exam immediately after you complete it and give you your mark. The pass mark is 70%.

Note: If you score less than 70% the system will give you 24 hours to review the material before you can try again.

3. The Human Organism

Tissues and cells

1. What type of connective tissue prevents muscles from pulling away from bones during contraction? (Circle which)
 - a. Dense connective
 - b. Hyaline cartilage
 - c. Loose connective
 - d. Areolar.
2. Name **three** types of muscle tissue and describe where each are found in the body.
 - a. Skeletal muscle is found in the muscles which attached to the skeleton
 - b. Cardiac muscle is found in the heart
 - c. Smooth muscle is found in the walls of hollow organs e.g. digestive, reproductive, urinary tracts, tubes such as blood vessels and airways and in other locations, e.g. the inside of the eye.
3. What is the function of connective tissue?

Support & connect e.g. sheath surrounding muscle cells, tendons attaching muscles to bones.
 Protection - protects delicate organs e.g. fibrous capsules and bones
 Defence - from microorganisms that enter the body via specialised connective tissue cells
 Transport - fluid, nutrients, waste, e.g. fluid connective tissues such as blood and lymph
 Fat storage - adipose cells store surplus energy as fat, contribute to thermal insulation of the body.
4. What are the different types of connective tissue?

cartilage, bone, collagen fibers, reticular fibers, elastic fibers, blood, lymphatic, adipose tissue, bone marrow, and lymphoid tissue
5. What is the function of the epithelial tissues?

Forms boundaries between different environments i.e. an interface tissue.
 Protection for underlying tissues from radiation, desiccation, toxins, and physical trauma.
 Absorption of substances in the digestive tract lining.
 Regulation and excretion of chemicals between underlying tissues and body cavity.
 Secretion of hormones into the blood system.
 Secretion of sweat, mucus, enzymes
 The detection of sensation.
6. Name the four elements that make up the build of living matter.
 - a. Hydrogen
 - b. Oxygen
 - c. Carbon
 - d. Nitrogen
7. Describe the function of the plasma membrane.

Surrounds cells/physically separates cytoplasm from extracellular fluid.
 Protects components of cell from outside environment.
 Allows separate activities to occur inside/outside the cell.
 Structural support and gives shape to the cell.
 Selectively permeable i.e. only certain molecules can pass through.
 Endocytosis/exocytosis - allows passage of molecules in and out of the cell
 Facilitates communication/signaling between cells via various proteins /carbohydrates in the membrane

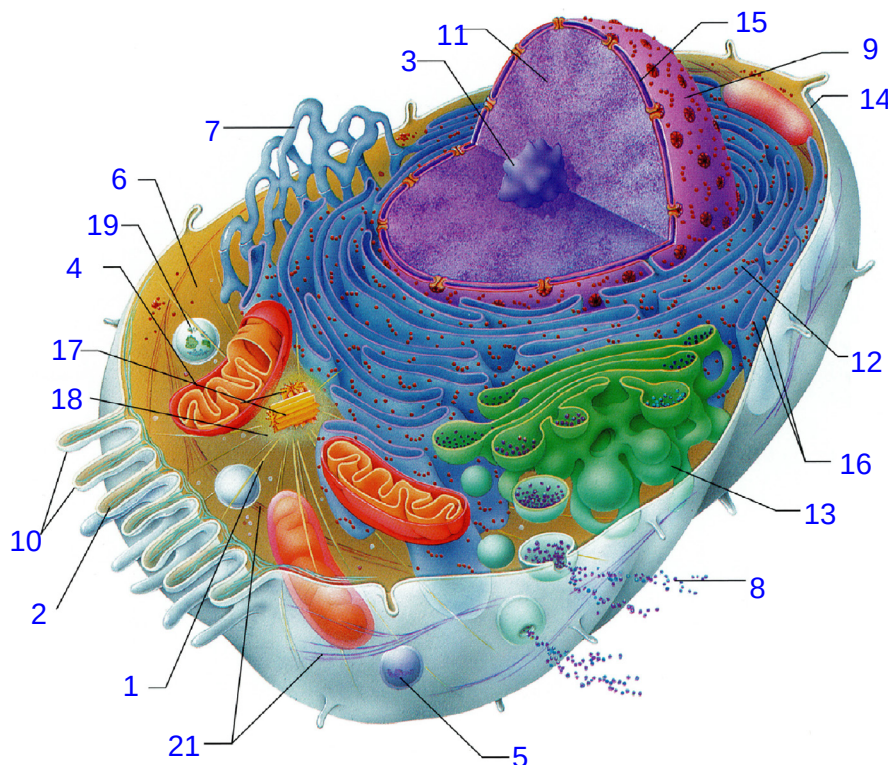
3. The Human Organism - cont.

Tissues and cells

Not all words in the list have been used

1. Microtubules
2. Microfilament
3. Nucleolus
4. Mitochondrion
5. Peroxisome
6. Cytosol
7. Smooth endoplasmic reticulum
8. Secretion being released
9. Nucleus
10. Microvilli
11. Chromatin
12. Rough endoplasmic retic.
13. Golgi apparatus
14. Plasma membrane
15. Nuclear envelope
16. Ribosome
17. Centriole
18. Centrosomal matrix
19. Lysosome
20. Basal body
21. Intermediate filaments

Write the correct number against each line on the parts of a typical cell.



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State the function of each of the following.

Microtubules:

help support and shape the cell

Microfilament:

involved in cell motility and in producing changes in cell shape

Nucleolus:

helps in protein synthesis and production of subunits which form ribosomes in the cell

Mitochondrion:

to produce energy for the body through ATP synthesis; to help maintain proper concentration of calcium ions within the compartments of the cell; take part in apoptosis.

Peroxisome:

involved in lipid metabolism, detoxification and conversion of free radicals into safer molecules like water and oxygen

3. The Human Organism - cont.

Tissues and cells

State the function of each of the following (*continued*)

Cytosol:

functions as the site of most metabolic processes, transports metabolites, involved in chemical messaging within the cell, helps shape the cell by its volume, suspends other cellular elements

Smooth endoplasmic reticulum:

involved in synthesis of cholesterol and phospholipids, detoxification of lipid soluble drugs

Nucleus:

is the control centre and directs cell activity and is necessary for reproduction

Microvilli:

to increase areas for absorption

Chromatin:

made of DNA and proteins, it is the packaging material for DNA, helps in the expression and replication of DNA, forms chromosomes

Rough endoplasmic reticulum:

primarily concerned with the synthesis, folding and modification of proteins,

Golgi apparatus:

involved in the modification and packaging of proteins

Nuclear envelope:

a double membrane layer that separates the contents of the nucleus from the rest of the cell and protects the cell's genetic material from the chemical reactions that take place outside the nucleus.

Ribosome:

the sites of protein synthesis within the cell

Centriole:

directs the formation of the mitotic spindle in cell division

Centrosome matrix:

a network of small fibres that surround the centriole and help in cell division

Lysosome:

digests worn out or non useable cell structures and most foreign substances that enter the cell

3. The Human Organism - cont.

Cells and Biochemistry

1. What is the primary function of carbohydrates in the body?

to provide an easily useable source of food energy for the body

2. Define:

- a. monosaccharides

the simplest form of carbohydrates that are present in nature which can bind to form larger and more complex carbohydrates; known as single (simple) sugars such as glucose, fructose, galactose

- b. disaccharides

double sugars (formed by 2 monosaccharides) e.g. cane sugar (glucose + fructose), lactose or milk sugar (glucose + galactose) and maltose (glucose + glucose) that are broken down into single sugars for use by the body

- c. polysaccharides

long branching chains of simple sugars that are large, insoluble and ideal storage products. plants use starch as their storage carbohydrate (grains/potatoes etc), glycogen is the storage carbohydrate of humans and animals, found in the muscles and liver

3. Give **two** examples of each.

- a. monosaccharides

glucose and fructose

- b. disaccharides

maltose and lactose

- c. polysaccharide.

starch, glycogen

4. Define an enzyme.

a functional protein that acts as a biological catalyst

5. What is the main action of an enzyme?

to increase the rate of a chemical reaction without becoming part of the product or being changed

3. The Human Organism - cont.

Cells and Biochemistry

6. Why are nucleic acids important to the body?

they carry the genetic blueprint of a cell and carry instructions for the functioning of the cell so that the cells can maintain themselves, grow, create more cells and perform any specialised functions they might have. They control the information directs growth and development. Nucleic acids are the only way a cell has to store information about its own processes and to transmit that information to new cells.

7. Important functions of water include: (circle those below that are true)

- ☒ (a.) reducing temperature fluctuations
- ☒ (b.) cushioning
- ☒ (c.) transport medium
- ☒ (d.) participating in chemical reactions
- ☒ (e.) solvent for sugars, salts and other solutes.

8. Name the 3 types of lipids in the body. Each have important functions - what are they?

1. Name: **phospholipids**

Function: **allows cells to be selective about what enters or leaves through the cell wall**

2. Name: **steroid molecules**

Function: **to make Vitamin D, sex hormones and bile salts**

3. Name: **triglycerides**

Function: **to be a concentrated and useable source of energy for the body, contribute to the structure of the cell membrane, provide insulation under the skin**

9. Name parts of the body where protein is used (structurally and functionally).

Structural use - bones, tendons, hair and nails.

Functional use - antibodies, hormones and enzymes

4. Nervous System Review

Complete these sentences.

The Central Nervous System consists of the brain and spinal cord.

The Peripheral Nervous System consists mainly of nerves.

Another name for a nerve cell is a neuron.

Sensory or afferent nerves convey impulses **to** the CNS.

motor or efferent nerves convey impulses **from** the CNS.

Most nerves are mixed nerves.

The servicing of a body part by a nerve is called innervation.

Information is gathered by sensory receptors.

The two parts of the Motor Division of the Peripheral Nervous System are the

somatic or voluntary nervous system and

the autonomic or involuntary nervous system.

There are 12 pairs of cranial nerves.

The cranial nerves emerge through openings in the skull.

There are 31 pairs of spinal nerves: 8 cervical; 12 thoracic; 5 lumbar; 5 sacral; 1 coccygeal.

Spinal nerves are named according to the spinal vertebra at their point of exit from the spinal cord.

Spinal nerves in general emerge through an intervertebral foramen.

Spinal nerves are grouped in the neck area to form the cervical plexus.

The lumbosacral plexus is made up of the lumbar and sacral plexuses.

An area of skin innervated by a single sensory nerve is called a dermatome.

The common name for a cerebrovascular accident (CVA) is a stroke.

Your “funny bone” is the result of jarring the ulnar nerve at the elbow.

Using the diagram of dermatomes, say which spinal nerves may be involved if there is

- numbness in the big toe: anterior and medial surface L4; plantar surface L4.
- numbness in the middle finger C7.

4. Nervous System - Brain Review

Complete the sentences **using the list of terms in the box**. Write the **correct term** on the lines provided. Each term **may be used more than once**. (There are more sentences on the following the page.)

The 4 principal structures of the brain are cerebrum, diencephalon,
brain stem, cerebellum.

The 4 lobes of the brain are frontal, parietal,
temporal, occipital.

The left and right cerebral hemispheres are linked by the corpus callosum.

The outer 'rind' of the cerebrum is the cerebral cortex.

The 3 major functional areas of the cortex are the motor,
sensory, and association areas.

Body areas requiring the most precise muscular control are allocated the greatest / least? space in the motor cortex. (Circle which one.)

The visual cortex is situated in the occipital lobe.

The auditory cortex is situated in the temporal lobe.

The general integration area lies across the temporal,
parietal and occipital lobes.

Wernicke's area is concerned with written and spoken language.

New ideas are generated in the pre-frontal cortex.

Each term may be used more than once.

Not all terms are used on this page. (There are **more** sentences to complete on the next page.)

1. arachnoid
2. brain stem
3. cerebellum
4. cerebrum
5. corpus callosum
6. cortex
7. diencephalon
8. dura mater
9. frontal
10. gyrus
11. longitudinal fissure
12. medulla oblongata
13. midbrain
14. occipital
15. parietal
16. pia mater
17. pons
18. motor
19. sensory
20. temporal
21. sub arachnoid
22. meningitis
23. epithalamus
24. hypothalamus
25. thalamus
26. Wernicke's
27. hydrocephalus
28. limbic
29. association
30. left
31. right
32. pre-frontal

4. Nervous System - Brain Review - cont.

Complete the sentences **using the list of terms in the box**. Write the **correct term** on the lines provided. Each term **may be used more than once**. (There were more sentences on the previous page.)

The principal structures of the diencephalon are the thalamus,

hypothalamus and epithalamus.

The brain stem contains the mid brain, pons and

medulla oblongata.

The cerebellum lies inferior to the occipital lobe.

The 3 meninges are the dura mater, pia mater and

arachnoid.

Cerebrospinal fluid flows in the sub arachnoid space.

meningitis is inflammation of the meninges.

Excessive accumulation of CSF is termed hyhydrocephalus.

In most people the left hemisphere is dominant.

The 'emotional brain' is in the limbic system.

Each term may be used more than once.

Not all terms are used on this page. (The are **more** sentences to complete on the previous page.)

1. arachnoid
2. brain stem
3. cerebellum
4. cerebrum
5. corpus callosum
6. cortex
7. diencephalon
8. dura mater
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11. longitudinal fissure
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13. midbrain
14. occipital
15. parietal
16. pia mater
17. pons
18. motor
19. sensory
20. temporal
21. sub arachnoid
22. meningitis
23. epithalamus
24. hypothalamus
25. thalamus
26. Wernicke's
27. hydrocephalus
28. limbic
29. association
30. left
31. right
32. pre-frontal

5. Musculoskeletal System

Human Skeleton Review

Fill in the missing words:

- The spine consists of 24 vertebrae, of which there are 7 cervical vertebrae, 12 thoracic vertebrae and 5 lumbar vertebrae.
- The uppermost bone of the spine is called the atlas.
- The bone that connects the shoulder girdle to the ribcage is the clavicle.
- The first 10 ribs are connected to the sternum by the costal cartilage.
- The eleventh and twelfth ribs are called floating ribs.
- The 3 sections of the pelvis are the ilium, ischium and pubis.
- The pelvis is attached to the sacrum at the sacroiliac joint.
- The thigh bone is the femur.
- The bones of the forearm are the radius and ulnar.
- Each toe bone and each finger bone is called a phalanges.
- The surface of bones is lined with cartilage at joints.
- The lower jaw bone is the mandible.
- Bones serve as a storehouse for calcium.
- The place where 2 bones meet is called a joint.
- Free-moving joints are synovial joints.
- At joints the bones are held together by muscles and ligaments.
- Synovial joints hold a lubricant called synovial fluid.
- Two examples of a hinge joint are knees and elbows.

5. Musculoskeletal System - cont.

Human Skeleton Review

Write the **common name for each bone** or group of bones. Use the skeleton picture to help you, if necessary.

Anatomical Term	Common Name
Scapula	shoulder blade
Clavicle	collar bone
Metacarpals	hand
Carpals	wrist
Humerus	upper arm
Radius & ulna	forearm

Anatomical Term	Common Name
Sternum	breast bone
Phalanges	fingers
	toes
Femur	thigh
Patella	knee cap
Tibia	shin

In the space below, **trace an outline of your hand. Draw in** and **label** (name) as many individual bones as you can.

Note for markers: The sample drawing includes the ulna and radius for context. These are optional and labeling these bones is not required.

5. Musculoskeletal System - cont.

Human Skeleton Review

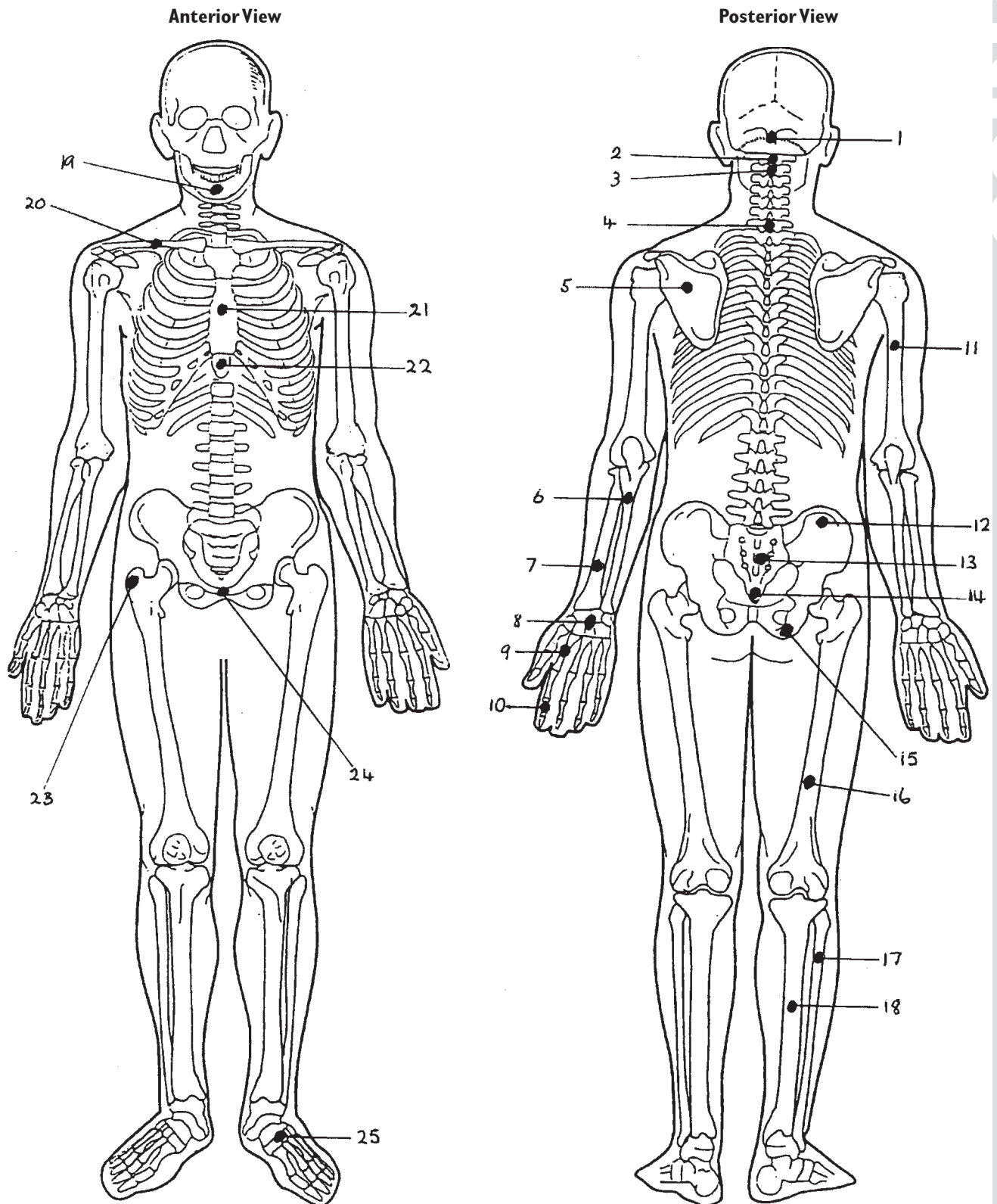
Study the **two** figures on the following page.

Write the **number** of each bone or bone-part against its name on the list below:

Atlas	<u>2</u>
Axis	<u>3</u>
Carpal	<u>8</u>
Clavicle	<u>20</u>
Coccyx	<u>14</u>
Femur	<u>16</u>
Fibula	<u>17</u>
Greater trochanter	<u>23</u>
Humerus	<u>11</u>
Ilium	<u>12</u>
Ischium	<u>15</u>
Mandible	<u>19</u>
Metacarpal	<u>9</u>
Occiput	<u>1</u>
Phalanx	<u>10</u>
Pubis	<u>24</u>
Radius	<u>7</u>
Sacrum	<u>13</u>
Scapula	<u>5</u>
Sternum	<u>21</u>
Tarsal	<u>25</u>
Tibia	<u>18</u>
Ulna	<u>6</u>
Vertebra prominens	<u>4</u>
Xiphoid process	<u>22</u>

5. Musculoskeletal System - cont.

Human Skeleton Review

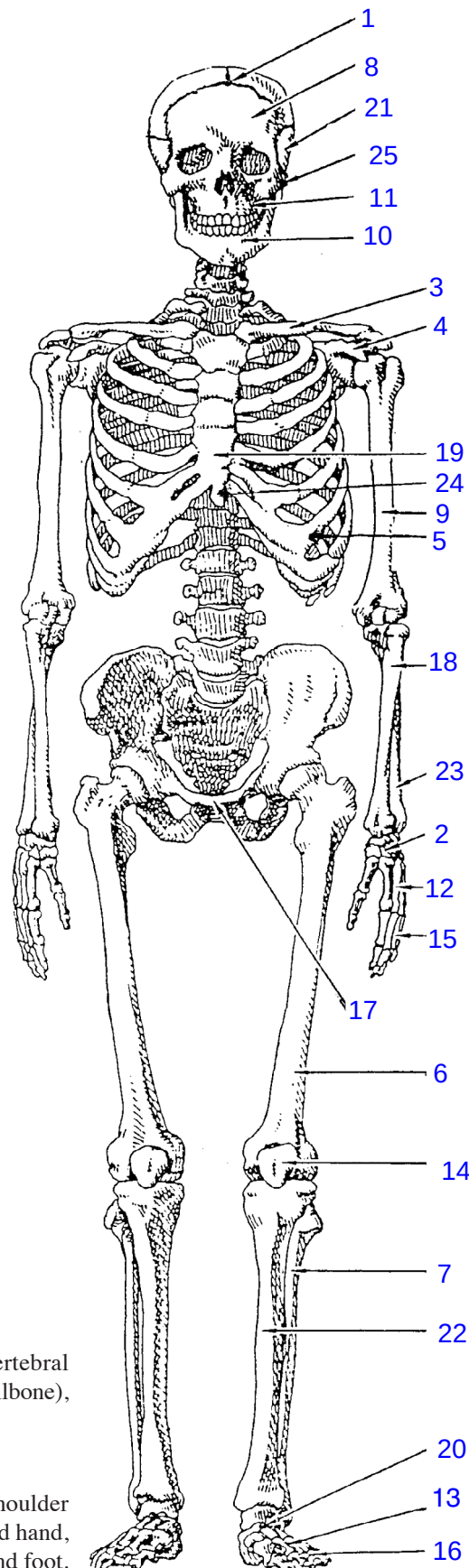


5. Musculoskeletal System - cont.

Human Skeleton Review

Write the correct **number** against each part of the skeleton, **using the numbered list**.

1. Anterior Fontanel
2. Carpals
3. Clavicle
4. Coracoid process
5. Costal cartilage
6. Femur
7. Fibula
8. Frontal bone
9. Humerus
10. Mandible
11. Maxilla
12. Metacarpals
13. Metatarsals
14. Patella
15. Phalanges (of hand)
16. Phalanges (of foot)
17. Pubis
18. Radius
19. Sternum
20. Tarsals
21. Temporal bone
22. Tibia
23. Ulna
24. Xiphoid process
25. Zygomatic bone



Colour the axial skeleton BROWN.

Colour the appendicular skeleton GREEN.

Axial Skeleton

The axial skeleton is comprised of the Skull, vertebral column (spine), including the sacrum and coccyx (tailbone), and the bony thorax (ribcage)

Appendicular Skeleton

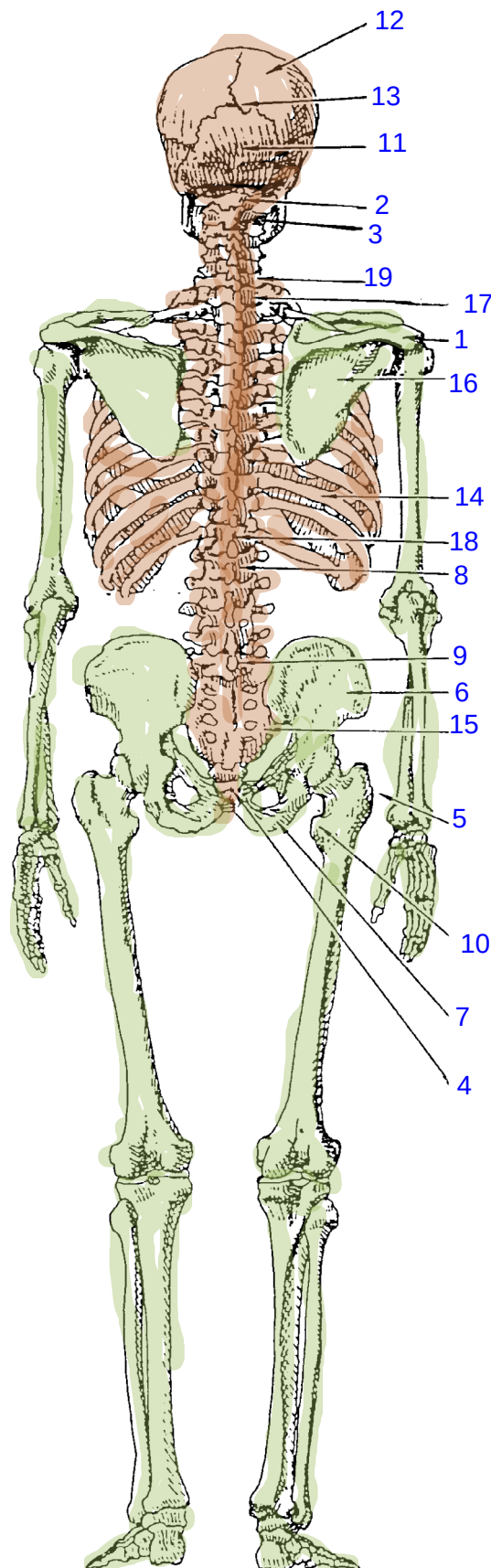
The appendicular skeleton is comprised of the shoulder girdle (clavicles and scapulae), bones of the arm and hand, the pelvic girdle (hip bones) and bones of the leg and foot.

5. Musculoskeletal System - cont.

Human Skeleton Review

Write the correct **number** against each part of the skeleton, **using the numbered list**.

1. Acromion process
2. Atlas – C1
3. Axis – C2
4. Coccyx
5. Greater Trochanter
6. Ilium
7. Ischium
8. L1
9. L5
10. Lesser Trochanter
11. Occipital plate
12. Parietal plate
13. Posterior Fontanel
14. Rib
15. Sacrum
16. Scapula
17. T1
18. T12
19. Vertebra Prominens – C7



Colour the axial skeleton BROWN.

Colour the appendicular skeleton GREEN.

5. Musculoskeletal System - cont.

Human Skeleton Review

Spine (Backbone or Vertebral Column)

On each figure below:

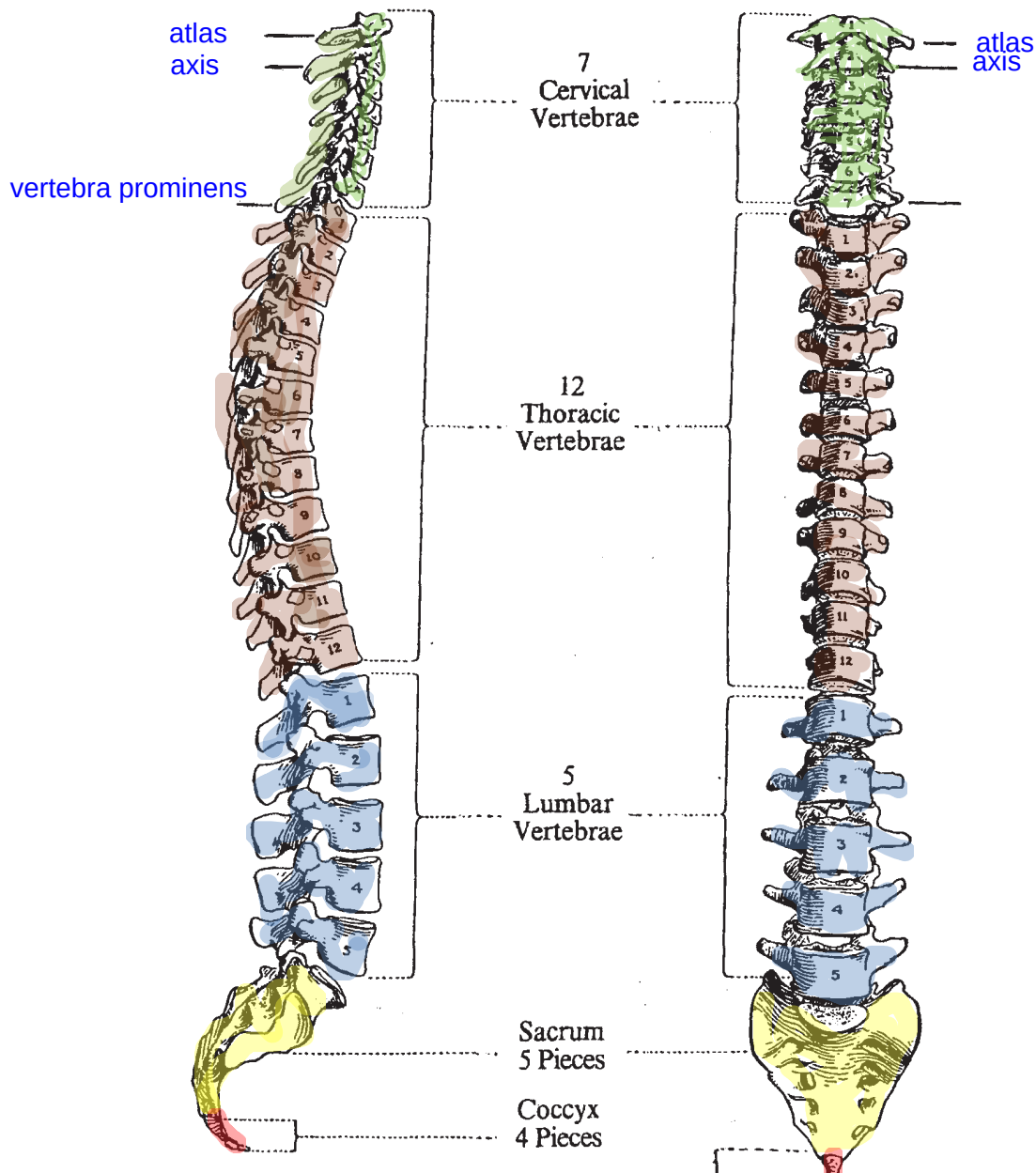
- Colour the cervical vertebrae GREEN
- Colour the thoracic vertebrae BROWN
- Colour the lumbar vertebrae BLUE
- Colour the sacrum YELLOW
- Colour the coccyx RED

On both figures: mark the Atlas & Axis.

On the side view: mark the Vertebra Prominens as well.

Spinal Curves

- Lordosis:* Excessive backwards curve in the lumbar spine.
- Scoliosis:* (S-bend) Sideways curve
- Kyphosis:* (Humpback, Dowager's Hump). Excessive forward curve in the thoracic spine.



5. Musculoskeletal System - cont.

Human Skeleton Review

Complete each sentence:

The body's hearing mechanism is housed in the temporal bone.

The smooth area between the eyes is the glabella.

The junction of 2 skull bones is a suture.

The junction of 2 sutures is a fontanel.

The only moveable skull bone is the mandible.

The bone that connects with all other cranial bones is the sphenoid.

The bone at the back of the skull is the occipital bone.

An opening in a bone is called a foramen.

An air-filled cavity in a bone is a sinus.

The sagittal suture is between the parietal bones.

The squamosal suture is between the temporal and parietal bones.

The junction of the coronal and sagittal sutures is the bregma or
anterior fontanel.

The large opening at the base of the occipital bone is the foramen magnum.

The styloid process is a needle-like projection of the temporal bone.

The hyoid bone is important in speaking and swallowing.

The 7 bones which contribute to the structure of the orbit are:

<u>zygomatic</u>	<u>maxilla</u>	<u>lacrymal</u>	<u>palatine</u>
<u>ethmoid</u>	<u>frontal</u>	<u>sphenoid</u>	

Try this:

Hold your finger tips just in front of your ears as you open and close your mouth. You should be able to feel the movement of the temporomandibular joint (TMJ).

Did you know:

Phrenology (*phrenos* = mind) is the study of the shape of the cranium in order to determine certain mental faculties.

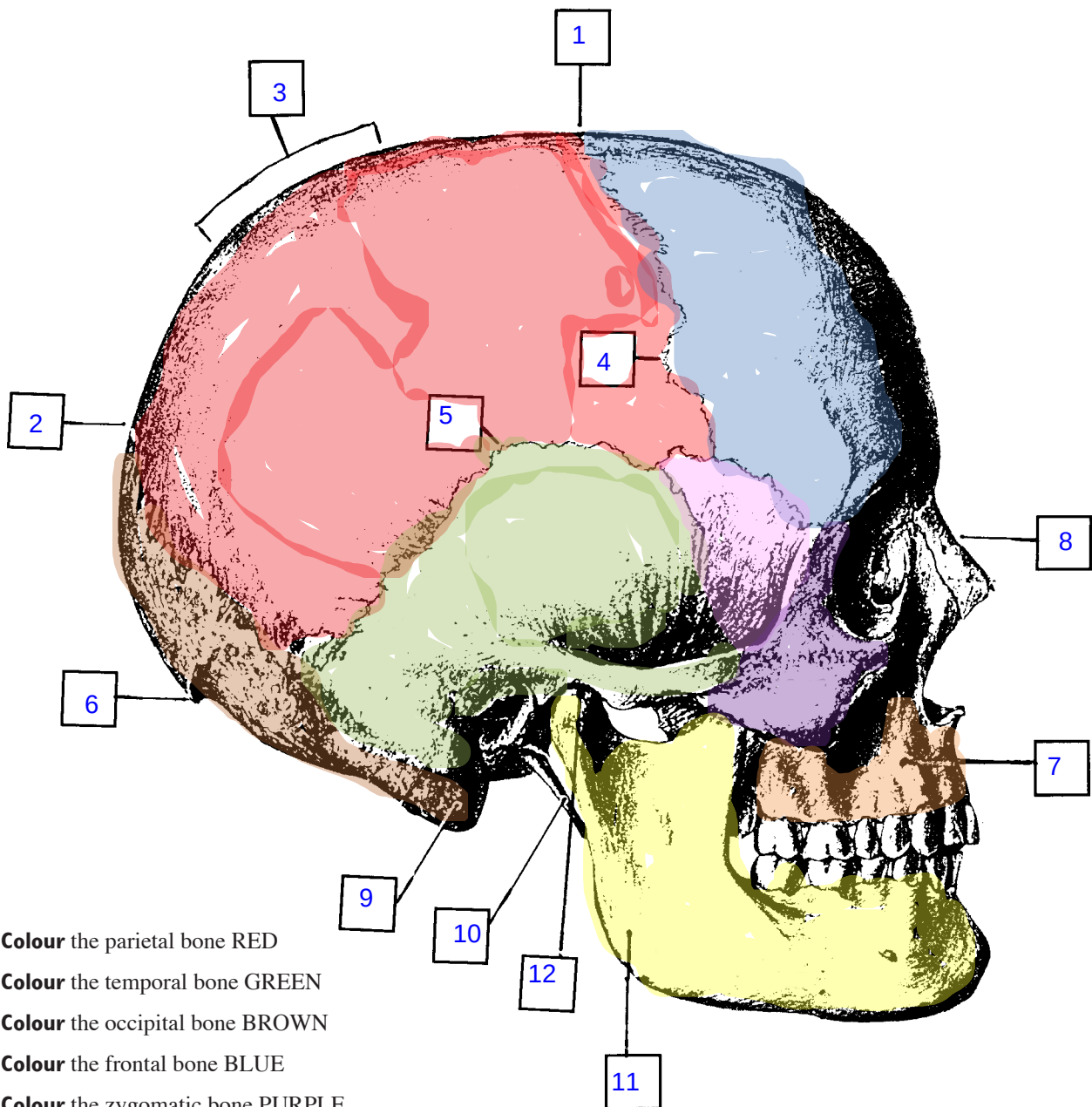
5. Musculoskeletal System - cont.

Human Skeleton Review

Study the numbered list of features.

Write the correct number in each box on the diagram.

- | | | |
|----------------------|-----------------------|---------------------------|
| 1. anterior fontanel | 2. posterior fontanel | 3. sagittal suture |
| 4. coronal suture | 5. squamosal suture | 6. Occipital protuberance |
| 7. maxilla | 8. nasal bone | 9. Mastoid process |
| 10. styloid process | 11. ramus of mandible | 12. TMJ |



Colour the parietal bone RED

Colour the temporal bone GREEN

Colour the occipital bone BROWN

Colour the frontal bone BLUE

Colour the zygomatic bone PURPLE

Colour the mandible YELLOW

Colour the maxilla ORANGE

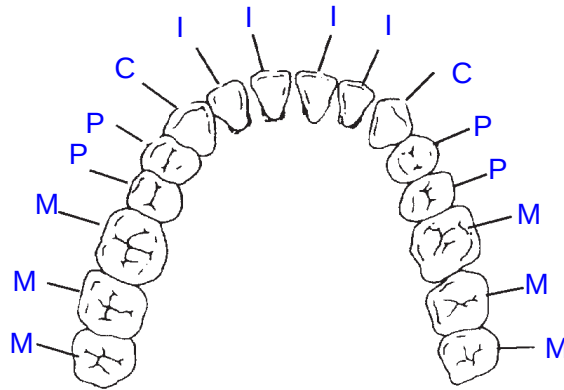
Colour the sphenoid bone PINK

5. Musculoskeletal System - cont.

Human Skeleton Review

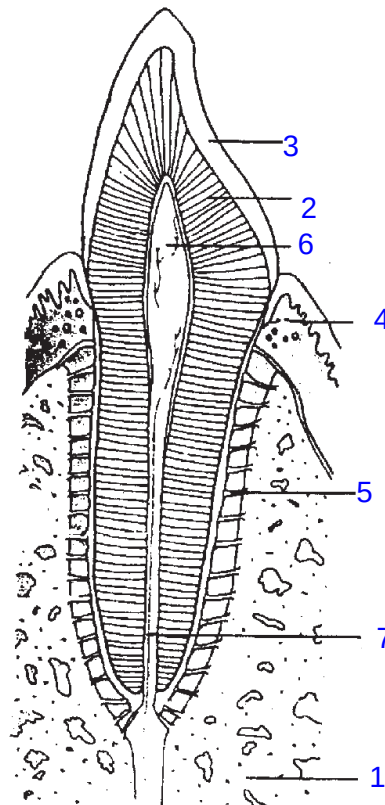
Study the diagram of permanent teeth.

At the end of each line **write either I, C, P or M** to indicate whether the tooth is an incisor, canine, premolar or molar.



Select the correct term from the box and write its **number** against the line of each indicated structure.

1. bone
2. dentin
3. enamel
4. gingiva
5. periodontal ligament
6. pulp cavity
7. root canal



Complete these statements:

The first teeth to erupt are the lower centra incisors.

canines are designed for tearing food.

pre molars and molars are designed for grinding.

The tooth-socket joint is called a gomphosis.

5. Musculoskeletal System - cont.

Joints Review

See how many free-moving (synovial) joints you can find on your body. There are more than you may think. Depending on your age, they may not all move as freely as you would like!

As you locate them, **write the number of joints** against each pair of bones. Remember to **include both left and right** sides.

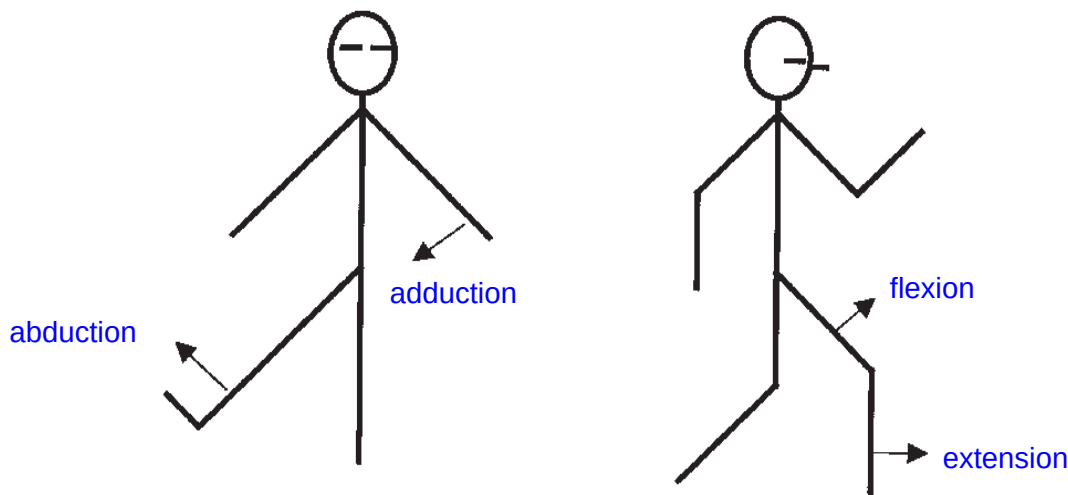
You may notice that sometimes two bones both articulate with a third bone, eg in the elbow joint, the radius and ulna both connect to the humerus.

	Between	Number of joints
Upper limb	sternum & clavicle	2
	clavicle & scapula	2
	scapula & humerus	2
	humerus & ulna / radius	4
	radius & carpals	4
	carpals & metacarpals	12
	metacarpals & phalanges	10
	phalanx & phalanx	18
Lower Limb	pelvis & femur	2
	femur & tibia	2
	tibia & tarsal	2
	tarsal & metatarsal	10
	metatarsal & phalanx	10
	phalanx & phalanx	18
Spine	cranium & atlas (C1)	2
	vertebrae & vertebrae	68
	vertebrae & sacrum	1
Jaw	cranium & mandible	2

5. Musculoskeletal System - cont.

Joints Review

Write **flexion**, **extension**, **adduction**, or **abduction** against each indicated movement



Write the **best term to complete** each sentence:

Ends of bones have a layer of smooth cartilage.

Bones are held together by ligaments and surrounding muscles.

Synovial fluid is contained within the fibrous capsule of the synovial joint.

In some joints, tendons are cushioned from wear by a bursa.

Write two examples of a hinge joint

knee elbow.

Select the best term from the list to match each descriptor:

Turning the hand palm up supination

Turning the hand palm down pronation

Upward movement of the foot dorsiflexion

Downward movement of the foot plantar flexion

Turning the sole of the foot outward eversion

dorsiflexion
eversion
inversion
plantar flexion
pronation
supination
circumduction.

6. Cardiovascular System Review

Study the names in the right hand column. Select the **correct number** for each descriptor in the left column and write it on the line.

- 11 Carries blood from the heart to the lungs.
- 8 Pumps blood to the systemic circulation.
- 7 Part of the heart that receives oxygenated blood.
- 12 Part of the heart that receives oxygen-poor blood.
- 4 Smallest blood vessels.
- 3 Carry blood between arteries and capillaries.
- 15 Carry blood between capillaries and veins.
- 1 Network of arteries serving a specific body part.
- 5 Amount of blood pumped by the heart in one minute.
- 9 Heart muscle tissue.
- 14 Pressure that occurs on the heart's pumping stroke.
- 6 Pressure that occurs between heart strokes.
- 2 Large artery that first receives blood from the left ventricle.
- 10 Protective covering of the heart.
- 13 Instrument for measuring blood pressure.

- 1. Anastomosis
- 2. Aorta
- 3. Arterioles
- 4. Capillaries
- 5. Cardiac output
- 6. Diastolic
- 7. Left atrium
- 8. Left ventricle
- 9. Myocardium
- 10. Pericardium
- 11. Pulmonary artery
- 12. Right atrium
- 13. Sphygmomanometer
- 14. Systolic
- 15. Venules

Fill in the spaces to complete each sentence.

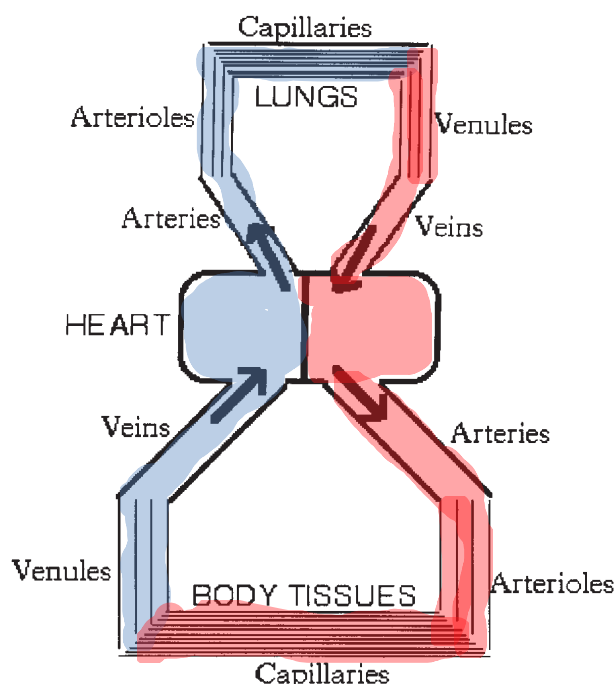
- 1. Red blood cells contain large amounts of haemoglobin.
- 2. white blood cells are called leukocytes.
- 3. In an average adult the cardiac output is about 5 litres a minute.
- 4. Red blood cells comprise about 45 % of blood volume.
- 5. In the heart, blood is received in each atrium and is discharged by each ventricle.
- 6. Interruption of oxygen flow to the heart may result in a myocardial ischemia.
- 7. The blood pressure of the heart's pumping stroke is the systolic pressure.
- 8. platelets help to plug a damaged blood vessel.
- 9. The medical term for high blood pressure is hypertension.
- 10. Pulse points can be used to control bleeding.
- 11. Total blood volume in an adult is about 5 litres.
- 12. The smallest blood vessels are capillaries.
- 13. Hypertension is generally defined as a blood pressure reading of 140/90 or higher.
- 14. Hypotension is generally defined as a systolic pressure of 100 mm Hg or less.
- 15. The right ventricle pumps blood to the lungs.

6. Cardiovascular System Review - cont.

On the diagram:

Colour RED the parts containing oxygen-rich blood.

Colour BLUE the parts containing oxygen-poor blood.



Try this:

Wrap a rubber band around one finger tip. Then, roll it down to the base of the finger.

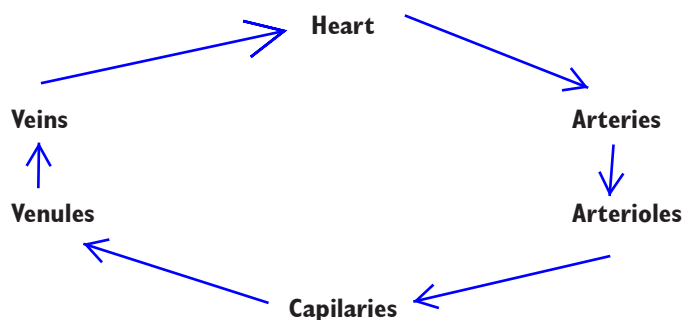
What did you notice?

the tip swells, changes colour and I can feel my pulse

Why does this happen?

the elastic band stops the blood from returning normally to the finger

Put arrows between the words to make a diagram that shows the direction of blood flow:



6. Cardiovascular System Review - cont.

1. Define:
 - a. hypotension = low blood pressure showing a systolic pressure of 100 or less
 - b. hypertension. = high blood pressure showing a sustained BP or 140/90 or more
2. What is a normal blood pressure value for a healthy person. 120/80
3. Define a pulse.

the alternating expansion and recoil of the arterial walls with every heart beat
4. Where are pulse points found?

the temple, at the side of the neck, in the crook of the elbow, in the wrist below the thumb, in the groin, behind the knee, the front of the foot.
5. Did you find them on yourself easily? (Yes / No) Which were the most difficult to find?

most are easy to find. The pulse behind the knee is more difficult to locate
3. Describe the blood flow throughout the heart from the left atrium, to the body and back through the heart to the aorta.

Oxygenated blood from the left atrium moves into the left ventricle.
 Blood is pumped into the aorta, which carries oxygenated blood around the body.
 Deoxygenated blood enters the right atrium from the vena cava.
 Blood moves into right ventricle.
 Blood is pumped into the pulmonary artery.
 The pulmonary artery carries deoxygenated blood to the lungs.
 The blood becomes oxygenated in the lungs.
 Oxygenated blood leaves the lungs via the pulmonary vein.
 Blood enters the left atrium.
4. Name the 4 substances in blood and the function each performs? (*continues on next page*)
 - a. red blood cells:-
contain haemoglobin which carries oxygen from the lungs to the rest of the body
 - b. platelets:-
help plug damaged blood vessels

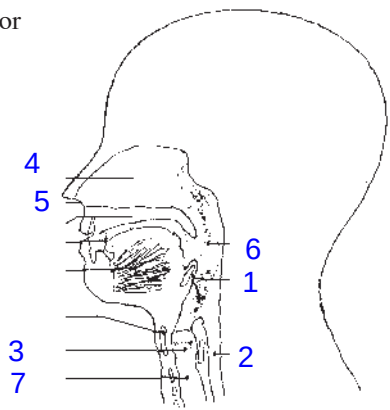
6. Cardiovascular System Review - cont.

4. Name the 4 substances in blood and the function each performs? (*continued*)
- c. **white blood cells:-**
help defend the body against disease and invading organisms
 - d. **plasma:-**
carries proteins, metabolic waste, glucose, amino acids, nutrients, minerals and hormones around the body
5. **Circle** each correct statement about veins:
- ☒ a. Thin walls with smooth muscle
 - b. No valves at all
 - ☒ c. Carry dark blood
 - d. Carry oxygen rich blood
 - ☒ e. No pulse
6. a. Explain the function of arteries.
to carry oxygenated blood from the heart to the rest of the body
- b. What are the important structures in the wall of an artery.
smooth muscle and elastic fibres
7. a. Explain the function of veins.
to carry deoxygenated blood to the heart
- b. Why do veins have valves?
to assist in blood flow against gravity
8. a. Explain the function of capillaries.
to deliver nutrients and oxygen to body tissues
- b. Explain the structure of a capillary wall
The walls of capillaries are one layer of epithelial cells thick to allow the exchange of molecules between the blood and the body's cells

7. Respiratory System Review

Study the list of names. Then write **the correct number** for each body part against the arrows on the figure.

- 1 Epiglottis
2. Esophagus
3. Larynx
4. Nasal cavity
5. Nostril
6. Pharynx
7. Trachea



From **the box below** find **the correct name** for each descriptor and write it in the space.

Alveolus, Bronchus, Carbon Dioxide, Cilia, Diaphragm, Epiglottis, Esophagus, Hiccup, Hyperventilation, Nasal Cavity, Pleura, Pulmonary Arteries, Pulmonary Veins, Thyroid Cartilage, Tongue.

Protects the voice box.	<u>thyroid cartilage</u>
Blocks off the airway when swallowing.	<u>epiglottis</u>
Gas exchange occurs here.	<u>alveolus</u>
Incoming air is warmed and moistened here.	<u>nasal cavity</u>
Helps to form vowel sounds.	<u>tongue</u>
Gas that triggers the breathing reflex.	<u>carbon dioxide</u>
Branch of the air passage.	<u>bronchus</u>
Minute projections on the wall of the trachea.	<u>cilia</u>
Distribute oxygen-poor blood to the lungs.	<u>pulmonary arteries</u>
Covering of the lungs.	<u>pleura</u>
Contracts and moves downwards during inalation.	<u>diaphragm</u>
Sudden inhalation due to a spasm of the diaphragm	<u>hiccough</u>
Carry oxygen-rich blood to the heart.	<u>pulmonary veins</u>
Over-breathing.	<u>hyperventilation</u>
Passage for food.	<u>oesophagus</u>

7. Respiratory System Review - cont.

1. The oxygen rich blood supply that returns from the lungs to the heart is provided via: *(circle which)*

- a. Pulmonary arteries
- b. The aorta
- c. The bronchial arteries
- ☒ d. Pulmonary veins

2. Describe the actions of Inhalation and Exhalation.

a. Inhalation:

Inhalation is triggered involuntarily by the build-up of carbon dioxide in the blood.
The diaphragm contracts and moves downwards.
The intercostal muscles contract and move the ribs upwards and outwards.
This increases the size of the thoracic cavity and decreases the air pressure inside it which sucks air into the lungs

b. Exhalation:

The diaphragm relaxes and moves back to its domed shape.
The intercostal muscles relax so the ribs move inwards and downwards under their own weight.
This decreases the size of the thoracic cavity and increases the air pressure in it so air is forced out of the lungs.

3. Where in the respiratory system are the cilia?

the internal walls of the trachea

4. What is the function of the cilia?

to propel foreign matter and mucus loaded with debris and dust particles away from the lungs to the throat so they can be expelled

continues over

7. Respiratory System Review - cont.

5. Describe the parts of the respiratory system, starting from the nose and mouth, to where gas exchange takes place (within the lungs).

The only visible part of the respiratory system is the nose. Air enters the body either through the nostrils or mouth, held in the nasal cavity/oral cavity (divided by the nasal septum) before passing through the nasal conchae to be warmed, humidified and filtered.

Pharynx:- is a muscular pathway (approx 12-13cm long) for both air and food divided into three different parts, the nasopharynx (back of nasal cavity), oropharynx, and laryngopharynx.

Larynx:- from the pharynx, air proceeds to the larynx (which routes air and food into the correct channels) where it comes into contact with the glottis, a narrow opening that leads into the trachea. The larynx (known as the voice box, from which sound is produced) contains many structures including the epiglottis and vocal cords.

Trachea:- air travels through the trachea (windpipe approx 11-12cm long from the larynx to the 5th thoracic vertebra) which is attached to the cartilage in the throat before it reaches the lungs and then travels downward breaking off into the right and left primary bronchi.

Bronchi: similar to the trachea, with C-shaped rings encircling them to give their structure, as well as cartilage for flexibility. The primary bronchi branch off into the bronchial tree to the secondary bronchi before entering the lobes within the lungs and the smaller tertiary bronchi.

Bronchioles: are the finest conducting pathways within the respiratory system and the the last passageway for air before it reaches the alveoli. Here it is combined with blood that is first pumped back to the heart, and then circulated throughout the rest of the body.

Alveoli: The alveoli are the areas within the lungs where the oxygen is transferred into the blood in exchange for carbon dioxide i.e. gas exchange takes place. The air travels through the alveolar ducts into the alveolar sac where it is met with capillary networks where oxygen is diffused into the blood.

6. Where in the respiratory tract is the air filtered, warmed and moistened?

the nose, nostrils, nasal cavity and nasal conchae

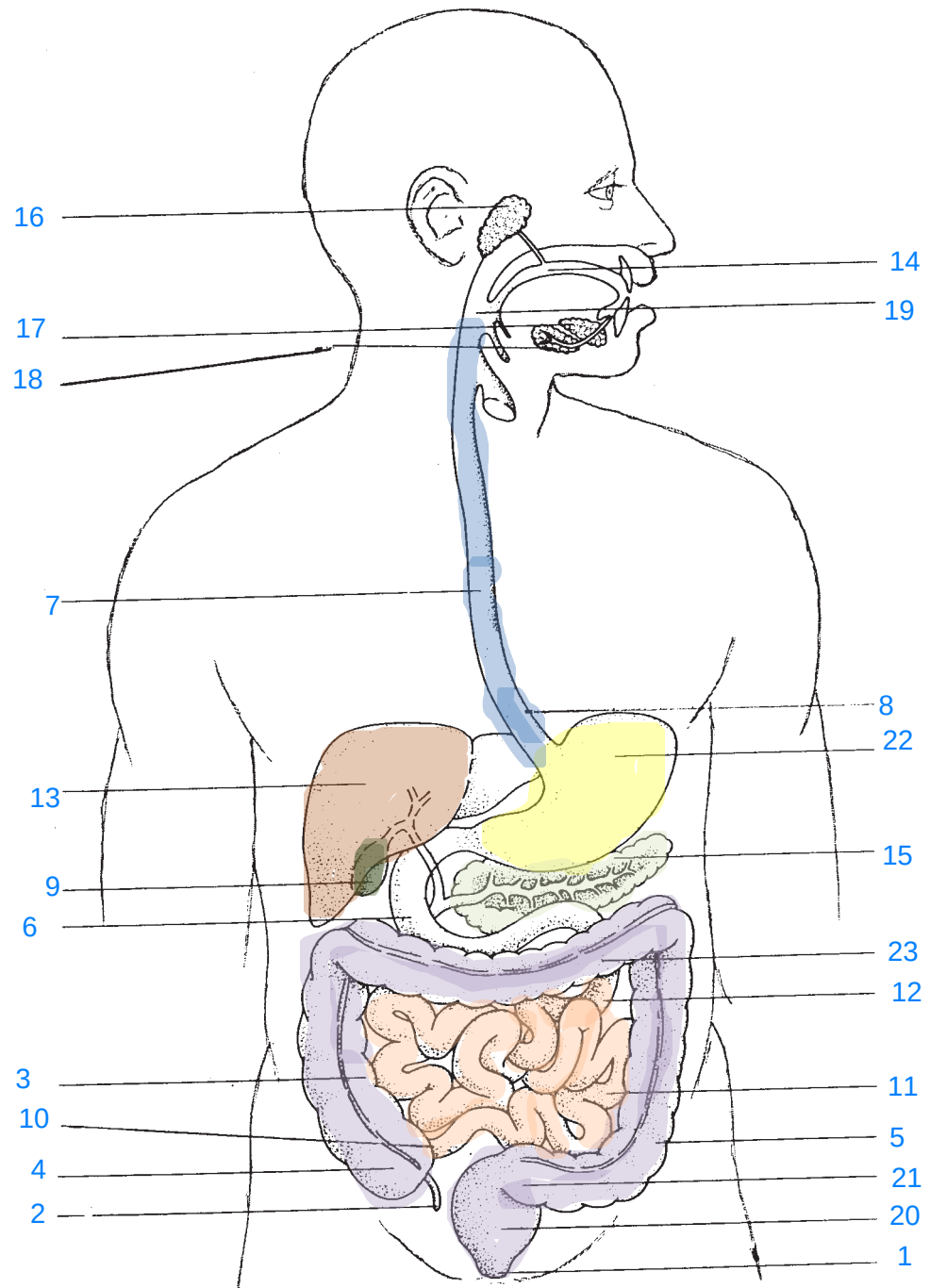
7. What is it about the alveoli that makes them an ideal site for gas exchange?

they are thin enough for gas exchange to take place

8. Digestive System Review

Study the names in the list. Write **the correct number** against each **line on the figure**.

1. Anus
2. Appendix
3. Ascending colon
4. Cecum
5. Descending colon
6. Duodenum
7. Esophagus
8. Esophageal hiatus
9. Gall bladder
10. Ileocecal valve
11. Ileum
12. Jejunum
13. Liver
14. Mouth
15. Pancreas
16. Parotid gland
17. Sublingual gland
18. Submandibular gland
19. Pharynx
20. Rectum
21. Sigmoid colon
22. Stomach
23. Transverse colon



Colour the organs:

Liver: BROWN

Stomach: YELLOW

Esophagus: BLUE

Large intestine: PURPLE

Gall bladder: DARK GREEN

Pancreas: LIGHT GREEN

Small intestine: ORANGE

8. Digestive System Review - cont.

Complete each statement. Look at the text if you need to refresh your memory.

The important parts of the mouth are the tongue, the palate and the teeth cheeks/lips.

The functions of saliva are to:

1. moisten the food and help bind it into a bolus
2. disolves food so the chemical can be tasted
3. contains enzymes that begin the chemical digestion of starchy foods

Another name for the gullet is the esophagus.

Weakening of the fibres of the diaphragm around the esophagus may result in a hatal hernia.

The chemical breakdown of proteins begins in the stomach.

A principal ingredient of gastric juice is hydrochloric acid.

The stomach has a protective coating of mucus.

In the stomach, food is churned to a soupy mixture called chyme.

Emptying of the stomach is slowed by a meal rich in fats.

The 3 divisions of the small intestine are: duodenum, jejunum and ileum.

The pancreas produces a variety of enzymes called pancreatic juice.

The gall bladder stores bile.

Food is moved along the digestive tract by a squeezing action.

The large intestine is connected to the small intestine by the ileocecal valve.

The main functions of the large intestine are:

1. reabsorption of water from indigestible food residues
2. eliminate food residues

Absorption of nutrients takes place mostly in the small intestine.

Excessive pressure on the walls of the large intestine may cause diverticula or haemorrhoids.

Vitamins B and K are synthesized in the large intestine.

8. Digestive System Review - cont.

Write the correct word/phrase from the list to match each descriptor:

Food is introduced here.	<u>mouth</u>	bile cecum chyme diverticula duodenum esophageal hiatus esophagus haustra ileocecal valve ileum mouth mucus pancreatic juice rectum saliva stomach water
Moistens food and dissolves chemicals.	<u>saliva</u>	
Tube connecting the mouth with the stomach.	<u>esophagus</u>	
Chemical breakdown of proteins begins here.	<u>stomach</u>	
Protective material which lines the stomach wall.	<u>mucus</u>	
Creamy paste composed of food.	<u>chyme</u>	
The first part of the small intestine.	<u>duodenum</u>	
The last part of the small intestine.	<u>ileum</u>	
Produced by the liver and stored in the gall bladder.	<u>bile</u>	
Variety of enzymes produced by the pancreas.	<u>pancreatic juice</u>	
Junction of the small and large intestines.	<u>ileocecal valve</u>	
The appendix is attached here.	<u>cecum</u>	
Pouches in the large intestine.	<u>haustra</u>	
Re-absorbed by the large intestine.	<u>water</u>	
Storage place for food waste prior to excretion.	<u>rectum</u>	
Abnormal pockets in the large intestine.	<u>diverticula</u>	
Gap in the diaphragm for the passage of the esophagus.	<u>esophageal</u> <u>hiatus</u>	

Complete these sentences:

- The function of the digestive system is to (5 things) 1. take in food
2. move it along the digestive system
3. break the food down into small fragments
4. absorb nutrients
5. eliminate undigested residues
- The total length of the GI tract is about 7-8 metres.
- Average daily output of saliva is about 1000/1500 ml.

9. Urinary System Review

Write the correct word/phrase from the list to match each descriptor:

Conveys urine from the kidneys to the bladder.	<u>ureter</u>
Minute filter within the kidney.	<u>nephron</u>
Squeezing action of the ureter.	<u>peristalsis</u>
Provides voluntary control of urine flow.	<u>external urethral sphincter</u>
Another name for bedwetting.	<u>nocturnal enuresis</u>
Chemical that enhances urine output.	<u>diuretic</u>
Protective cushioning for the kidneys.	<u>adipose tissue</u>
Need to urinate at night.	<u>nocturia</u>
Stores urine.	<u>bladder</u>
Deliver blood to the kidneys.	<u>renal arteries</u>
Muscular layer of bladder wall.	<u>detrusor muscle</u>

adipose tissue
bladder
detrusor muscle
diuretic
external urethral sphincter
nephron
nocturia
nocturnal enuresis
peristalsis
renal arteries
ureter

Complete these sentences:

In a young adult the bladder holds about 600 ml of urine.

Urine is about 95 % water.

Each day the kidneys extract from the blood and process about 180 litres of fluid.

Enlargement of the prostate in males may cause difficulty in urination.

9. Urinary System Review - cont.

1. **Name** the four parts of the urinary system and **describe** the general function of each part.
 - a. **kidneys:**
function to filter waste products from the blood
return some water and necessary substances back to the blood
excrete excess fluid as urine thereby balancing body fluids
release hormones to regulate blood pressure
control production of red blood cells
 - b. **ureters:**
carry urine from the kidney to the bladder by downwards peristalsis
 - c. **urinary bladder:**
functions to store urine by relaxing and expanding for storage and contracting and flattening on urination
 - d. **urethra:**
a tube that allows urine to drain from the bladder out of the body. It accommodates the prostate gland in males
2. How are kidney stones formed?
some chemical elements in urine combine to form soluble salts which usually remain dissolved in the urine. Lower volumes of concentrated urine or slower drainage are factors that can lead to the soluble salts precipitating out and forming crystals which can get larger over time and form kidney stones
3. What is the main role of the kidneys?
to filter the blood of waste products, save necessary substances and return the blood to the body
to collect urine, pass it to the bladder for elimination

9. Urinary System Review - cont.

4. How does the kidney filter blood?

a kidney is made up of a million filtering units called nephrons. Each nephron includes a filter, the glomerulus, and a tubule. The nephrons work through a two-step process: the glomerulus filters the blood, and the tubule returns needed substances to the blood and removes wastes.

As blood from tiny branches of the renal artery flow into each nephron, it enters a cluster of tiny blood vessels—the glomerulus. The thin walls of the glomerulus allow smaller molecules, wastes, and fluid—mostly water—to pass into the tubule. Larger molecules, such as proteins and blood cells, stay in the blood vessel.

As the filtered fluid moves along the tubule, the blood vessel by the tubule reabsorbs almost all of the water, along with minerals and nutrients the body needs. The tubule helps remove excess acid from the blood. The remaining fluid and wastes in the tubule become urine. The filtered blood flows out of the kidney via the renal vein

5. What happens to the unwanted products collected?

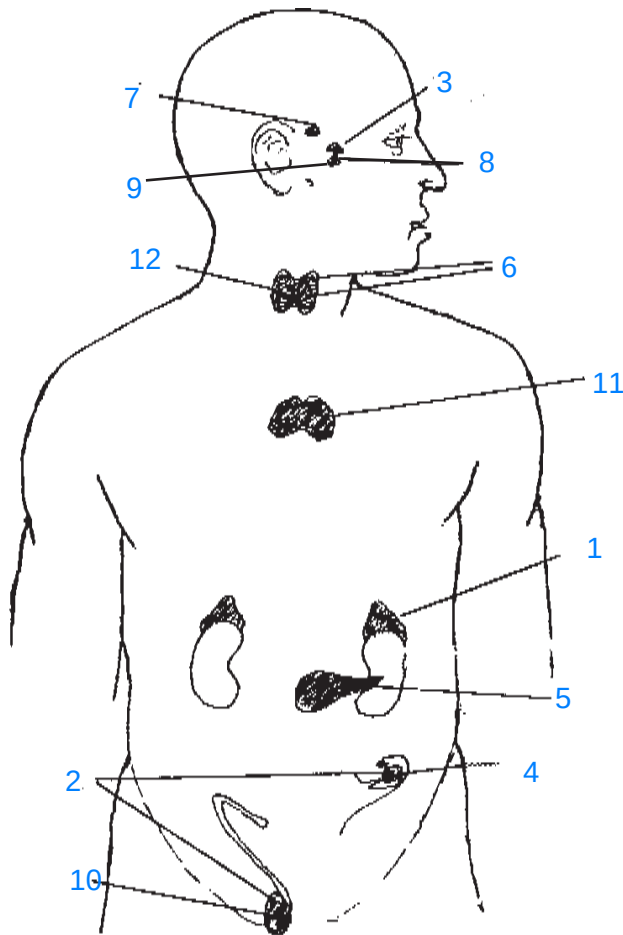
they are passed as urine to the urinary bladder until they can be eliminated from the body

9. Urinary System Review - cont.

6. a. How many urinary sphincter muscles in a male? 2
b. How many urinary sphincter muscles in a female? 2
7. Describe the various sphincter muscles in the urethra and which have voluntary/involuntary control?
- a. In a male:
the internal urethral sphincter is made of smooth muscle and is located at the junction of the urethra and bladder. It is under autonomic or involuntary control. The more inferiorly located external urethral sphincter close to the prostate gland, surrounds the membranous or intermediate part of the urethra. It is formed from skeletal muscle and therefore under voluntary control. In their resting state, both sphincters compress or close the urethra, providing urinary continence. When voiding, the sphincters relax to allow the passing of urine.
- b. In a female:
the internal urethral sphincter, under involuntary control, is also made of smooth muscle and located at the junction of the urethra and bladder but the external urethral sphincter is closely related to the levator ani muscle, surrounds the urethra which passes through the pelvic floor, while inferiorly it blends with the smooth muscle of the urethra and vagina.
8. Describe the various types of incontinence and how they might occur.
- a. nocturnal enuresis or bed wetting - commonly associated with children until they have established bladder control, it can also affect adults. Adult bedwetting can be caused by a urinary tract infection, other medical condition, a side effect of medication, stress or an overactive, or smaller than usual bladder.
- b. stress incontinence - occurs when the urethral sphincter, the pelvic floor muscles, or both these structures have been weakened or damaged and cannot dependably hold in urine. Urine leaks out when jumping or coughing, common in women after childbirth, and sometimes in men after prostate surgery. Pregnancy may also be a cause due to the pressure on the bladder
- c. urge incontinence or overactive bladder - may be caused by physical problems such as damage to the brain, the spine, or the nerves extending from the spine to the bladder, e.g. from an accident, diabetes, or neurological disease. Irritating substances within the bladder, such as those produced during an infection, might also cause the bladder muscle to contract.
- d. overflow incontinence - occurs when something blocks urine from flowing normally out of the bladder, as in the case of prostate enlargement that partially closes off the urethra. It can also occur in both men and women if the bladder muscle becomes underactive.
9. What does urine contain?
- 95% water plus wastes, mineral salts, glucose and proteins

10. Endocrine System Review

Select the organ **number (#)** from the **box** for each organ and write it against the line(s).



1. Adrenal
2. Gonads
3. Hypothalamus
4. Ovary
5. Pancreas
6. Parathyroids
7. Pineal
8. Anterior Pituitary
9. Posterior Pituitary
10. Testis
11. Thymus
12. Thyroid

Complete this table:

Organ #	Hormone	Effect
8	Growth hormone (GH)	stimulates growth
8	Prolactin (PRL)	promotes lactation
9	Oxytocin	stimulates uterine contractions and milk flow
9	Antidiuretic hormone (ADH)	reabsorption of water, inhibits urine production
12	Calcitonin	lowers blood calcium levels
6	Parathyroid hormone (PTH)	stimulates release of calcium into blood
5	Glucagon	stimulates release of glucose to raise blood sugar levels
5	Insulin	lowers blood sugar levels
1	Epinephrine (adrenaline)	stimulates flight/flight response

10. Endocrine System Review - cont.

1. Name a hyperglycaemic hormone. **glucagon**
2. Name the hormone that affects calcium in the bone matrix. **parathyroid hormone**
3. Women have FSH and LH.
 - a. Do males have FSH and LH? **Yes**/ No (circle one)
 - b. **If No**, why not? **If Yes**, what is the function of FSH and LH in males.

FSH in males stimulates the production of sperm

LH in males stimulates the production of testosterone

4. Name the TWO hormones involved with the stress response.
 - a. **epinephrine**
 - b. **norepinephrine**
5. Name a hormone (other than those produced by the Pancreas) that helps to maintain blood sugar levels.
 - a. **growth hormone** (**Clue:** it comes from the Pituitary).

b. what else does it do?

directs the growth of skeletal muscles and the long bones of the body
facilitates amino acids building into proteins
helps the breakdown of fats into energy

6. Name the SIX ways the Hypothalamus maintains body homeostasis.
 - a. **regulates the autonomic nervous system influencing heart contractions, blood pressure, respiration rate and death**
 - b. **controls perception of pain, pleasure, fear, rage, sex drive and physical expression of emotion**
 - c. **controls hunger/satiety in response to changes in blood glucose or amino acid levels**
 - d. **thermo-regulation - cooling or heating the body via sweating or shivering**
 - e. **regulates sleep cycles**
 - f. **produces ADH (anti diuretic hormone) to control water content of the blood**
7. What mineral deficiency causes a goiter? **iodine**

11. Lymphatic System Review

Write **the correct word(s) from the list** below to match each descriptor:

Armpit, edema, exercise, interstitial fluid, lactic acid, lymph node, macrophage, thoracic duct

Liquid in the spaces between tissue cells.

interstitial fluid

Most of the body's lymph drains through this.

thoracic duct

Essential to the maintenance of lymph flow.

exercise

Swelling resulting from excess fluid in the interstitial space.

oedema

Filters lymph as it is transported.

lymph node

Accumulation of this may result in cramping.

lactic acid

Protective cell that engulfs foreign substances.

macrophage

'Axillary region' is another name for this.

arm pit

Write the names of two lymphoid organs related to the immune system.

spleen

thymus

12. Immune System Review

1. How do antibodies help defend the body?

Antibodies are proteins produced by lymphocytes that can specifically bind to antigens and elicit a defence response. Additionally antibodies mediate humoral immunity, and their presence on mucosal surfaces provides resistance to many infectious agents. Once an antibody binds to an antigen, it inactivates the antigen in several ways:

Complement fixation – antibody binds to the antigen and breaks the cell wall (lysis)

Neutralization – the antibody binds to a site on the bacteria or virus that releases toxins (exotoxins) to block the harmful effects of the toxin

Agglutination & precipitation – antibody binds to the cell and causes clumping so they are easily captured by phagocytes

2. a. Do vaccines produce active or passive humoral immunity? **active** or **passive** (circle one)
b. Explain your answer.

Active immunity is when the body's own immune system mounts an adaptive immune response following direct exposure to a disease organism or antigen. Vaccination can artificially stimulate active immunity by exposing the body to a dead or weakened form of a pathogen, which, though unable to mount an infection, still activates the adaptive immune response and memory cell formation.

- c. Why is passive immunity less satisfactory?

Passive immunity relies on antibodies rather than memory cells. It involves the introduction of ready-made antibodies to a non-immune individual. Passive immunity is short-lived (because there are no memory cells) but beneficial where there is a high risk of infection and the body is unable to develop its own immune response

3. What events can result in autoimmune disease?

It is not clear what events cause autoimmune diseases to occur but genetics and factors in the environment such as viruses, chemicals, foods, stress may contribute.

Autoimmune disease occurs when an immune system (T-cells and B-cells) attacks its own tissues driving a chronic inflammatory process, which gives rise to diseases such as MS, systemic lupus erythematosus, rheumatoid arthritis.

12. Immune System Review - cont.

4. Explain the underlying mechanisms responsible for each of the cardinal signs of acute inflammation:

a. heat

blood vessels dilate, increasing blood flow to the inflamed area: e.g. a large influx of core-temperature blood arrives to normally cooler skin.

b. pain

chemicals released from damaged or infected tissues attract immune cells to the injured site for the inflammatory response which in turn activate the pain receptors

c. redness

blood vessels dilate, increasing blood flow to the inflamed area

d. swelling.

capillaries become more permeable, serum and water can leak out into the tissues causing the accumulation of fluid in the area

5. The main cellular target of the HIV virus that causes AIDS is:

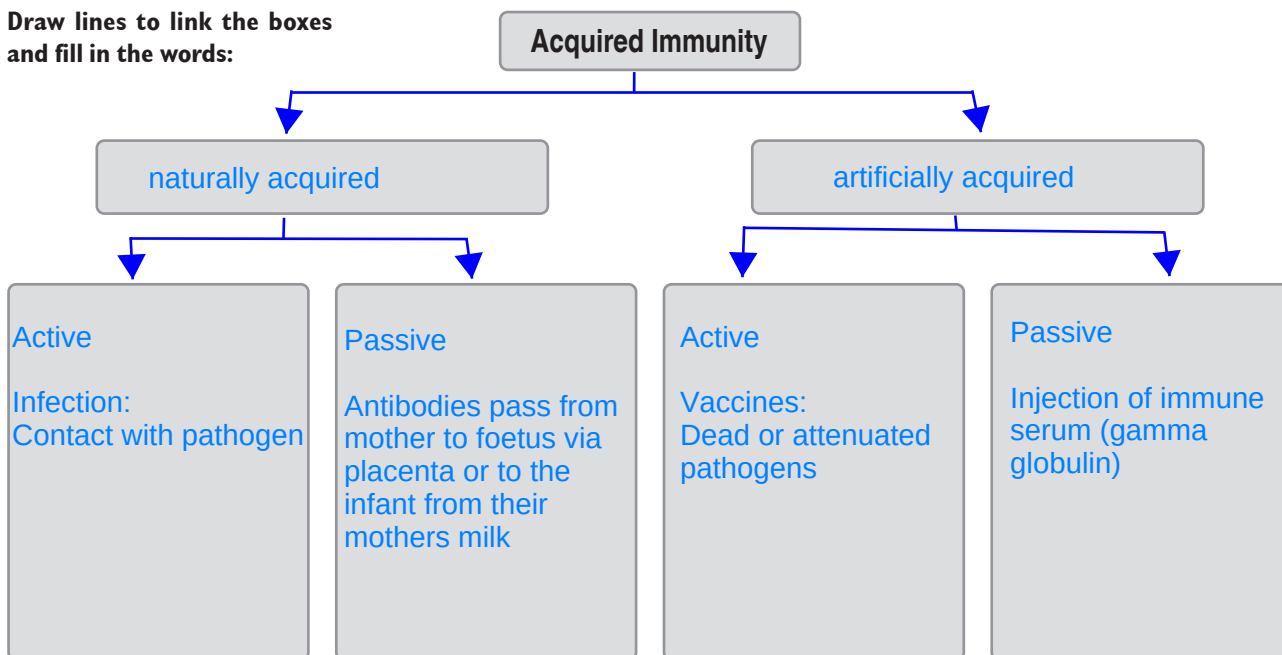
- ☒ a. Helper T cells
- b. B cells
- c. Macrophages
- d. Cytotoxic T cells

6. Which of the following is/are examples of autoimmune disease?

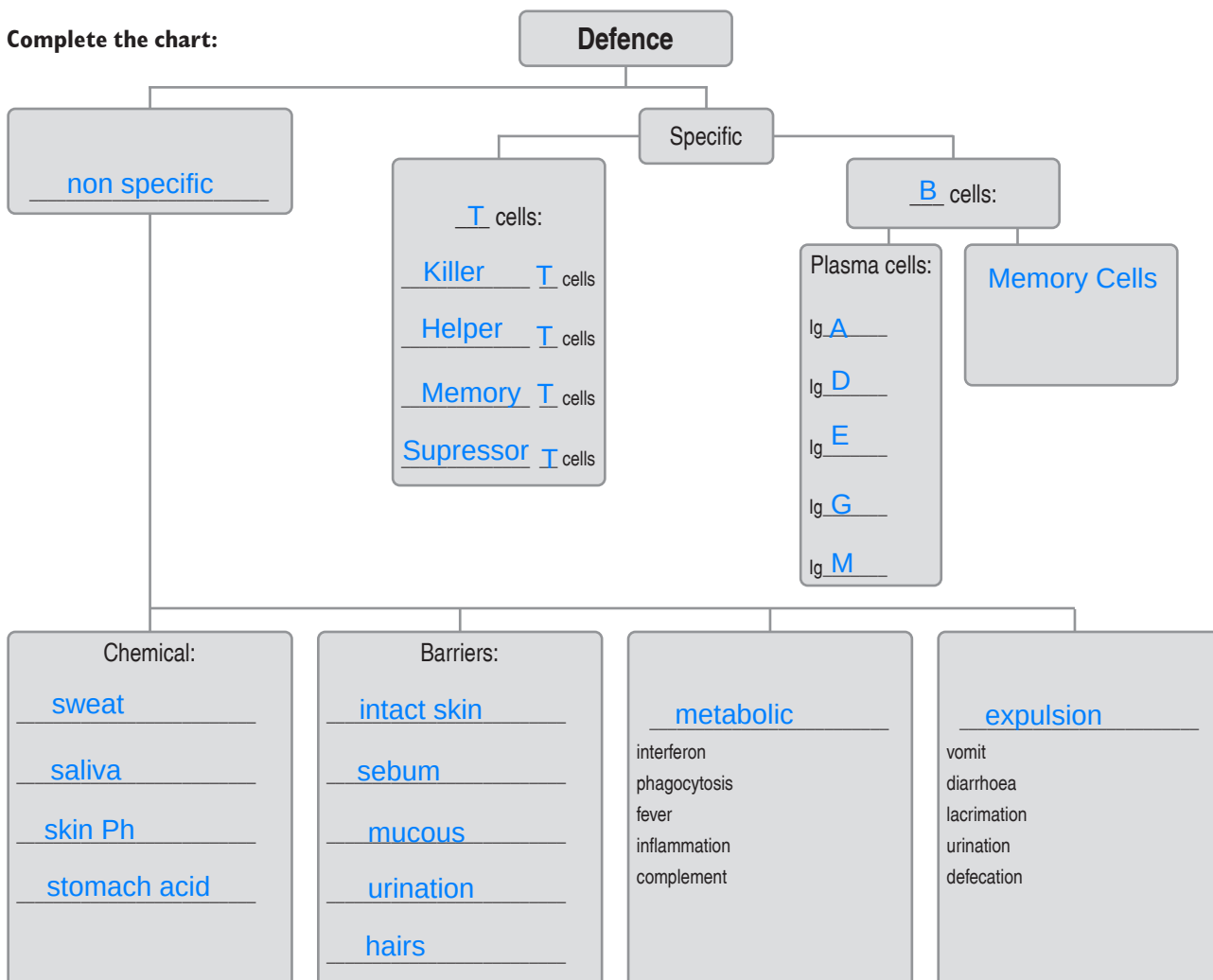
- ☒ a. Multiple sclerosis
- ☒ b. Juvenile diabetes
- ☒ c. Rheumatoid arthritis
- ☒ d. Grave's disease

12. Immune System Review - cont.

Draw lines to link the boxes
and fill in the words:

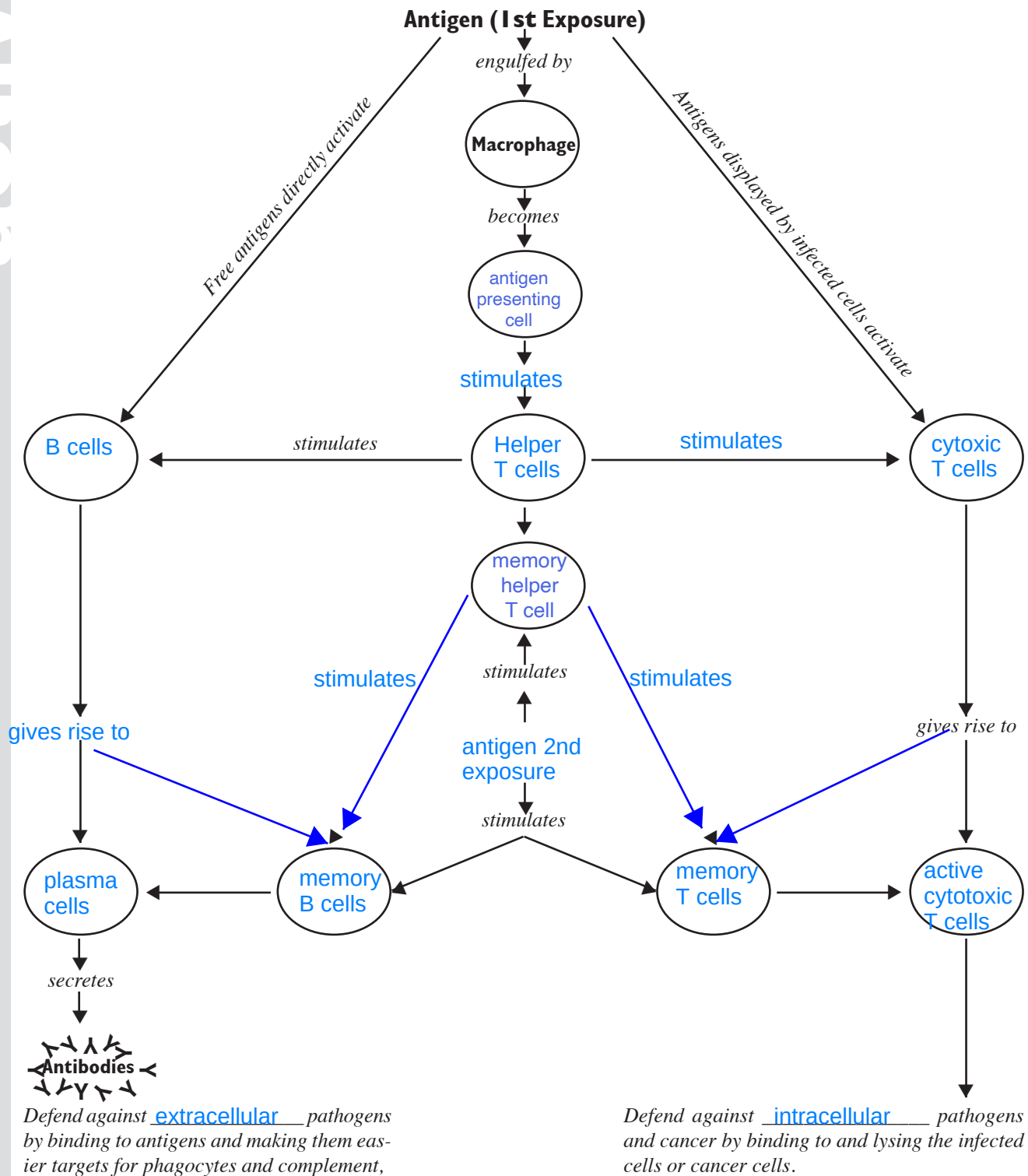


Complete the chart:



12. Immune System Review - cont.

Fill in the lines and any gaps around the chart:



Adapted from Marieb. Human Anatomy and Physiology

13. Reproductive System Review

Study the list of terms in the box.

Select **the number** for the correct term and write it on the line against the descriptor.

Each term is used only once.

11 Male gonad.

4 Sperm cells develop here.

9 Male gland encircling the urethra just below the bladder.

2 Conveys sperm to the urethra.

10 Contains the testicles.

8 Cuff of skin at the tip of the penis.

14 Female external genitalia.

13 Canal connecting the labia to the uterus.

1 Lower portion of the uterus.

7 Female gonad.

3 Inner lining of the uterus.

12 Duct system between ovary and uterus.

5 Waft mature ova into uterine tube.

6 Cessation of menstruation.

15 Common name for the uterus.

Use each word once only

1. cervix
2. ductus deferens
3. endometrium
4. epididymis
5. fimbriae
6. menopause
7. ovary
8. prepuce
9. prostate
10. scrotum
11. testis
12. uterine tube
13. vagina
14. vulva
15. womb

Complete these:

Enlargement of the prostate makes urination difficult in the male.

In pregnancy, pressure by the uterus on the bladder results in the need for frequent urination.

13. Reproductive System Review - cont.

1. Each month of the menstrual cycle: *(circle the correct answers)*

- ☒ a. oogenesis occurs
- b. ovulation occurs due to the rupture of the fallopian tube
- ☒ c. FSH, LH, oestrogen and progesterone are released in varying amounts
- ☒ d. at preovulatory phase the oestrogen levels rise
- e. post-ovulatory phase is when menstruation occurs (day 15-20)

2. Describe (a) the uterus, (b) the endometrium, (c) the uterine (fallopian) tubes and (d) the ovaries.

- a. The uterus:

is a thick-walled muscular organ capable of expansion to accommodate a growing fetus. It is connected distally to the vagina, and laterally to the uterine tubes.

It has three parts; fundus – top of the uterus, body - central part, cervix – lower part of uterus. It is about the size and shape of a pear.

- b. The endometrium:

is the inner layer or mucosa of the uterus. Every month the lining thickens, preparing for pregnancy. If pregnancy doesn't occur then the endometrium is shed resulting in menstruation

- c. The uterine (fallopian) tubes:

after ovulation, the fallopian tubes receive the oocyte and provide the place for fertilisation to occur. Each tube is about 10 cm long extending medially from an ovary, emptying into the superior region of the uterus.

- d. The ovaries:

are the primary reproductive organs of a female. They are the size and shape of a walnut and the site of the production of ova.

3. a. Oogenesis is the production of female sex cells.

- b. The anterior pituitary gland releases follicle stimulating hormone which stimulates

primary follicles to grow and mature each month.

13. Reproductive System Review - cont.

4. List and describe the four main phases of the menstrual cycle.

- a. **Menstrual phase (days 1 - 5)** - If fertilisation hasn't occurred, the corpus luteum eventually degenerates
When the corpus luteum degenerates, oestrogen and progesterone levels drop and the endometrium can no longer be maintained
The endometrial layer is sloughed away (50 - 150 ml of blood, mucus, tissue fluid and epithelial cells are discharged from the endometrium and eliminated from the body through the vagina as menstrual blood.
Oestrogen and progesterone levels are too low to inhibit the anterior pituitary.
- b. **Follicular phase (pre-ovulation, days 6 - 13)** - rising levels of oestrogen are produced by the growing follicles of the ovaries.
Follicle stimulating hormone (FSH) is secreted from the anterior pituitary and stimulates growth of ovarian follicles.
The dominant follicle produces oestrogen, which inhibits FSH secretion (negative feedback) to prevent other follicles growing.
Oestrogen acts on the uterus to stimulate the thickening of the endometrial layer
- c. **Ovulation (~ day 14)** - midway through the cycle, oestrogen stimulates the anterior pituitary to secrete hormones (positive feedback)
This positive feedback results in a large surge of luteinizing hormone (LH) and a lesser surge of FSH.
LH causes the dominant follicle to rupture and release an egg (secondary oocyte)
- d. **Luteal Phase (days 15 - 28, post ovulation)** - the ruptured follicle develops into a slowly degenerating corpus luteum
The corpus luteum secretes high levels of progesterone, as well as lower levels of oestrogen
Oestrogen and progesterone act on the uterus to thicken the endometrial lining (in preparation for pregnancy)
Oestrogen and progesterone also inhibit secretion of FSH and LH, preventing any other follicles from developing
If fertilisation occurs, the developing embryo will implant in the endometrium and release hormones to sustain the corpus luteum

13. Reproductive System Review - cont.

5. Describe the testes, vas deferens, prostate and Cowper's glands.

a. The testes:

are the primary reproductive organs of the male, olive shaped approximately 4 cm long, produce sperm and aid in the delivery of sperm to the body exterior or to the reproductive tract of the female

b. The vas deferens:

is part of the duct system carrying sperm, running upwards from the epididymis through the inguinal canal into the pelvic cavity and arches over the superior aspect of the bladder.

c. prostate:

is a single gland about the size of chestnut encircling the upper part of the urethra just below the bladder. It secretes a milky fluid which enters the urethra through several small ducts and which plays a role in activating sperm during ejaculation

d. Cowper's glands:

are tiny pea sized glands lying beneath the prostate which releases a thick clear mucus into the urethra just before ejaculation

6. a. What condition causes elderly males to have difficult urination?

benign prostatic hypertrophy

b. How does it occur?

the prostate becomes enlarged, strangling the urethra and making urination difficult

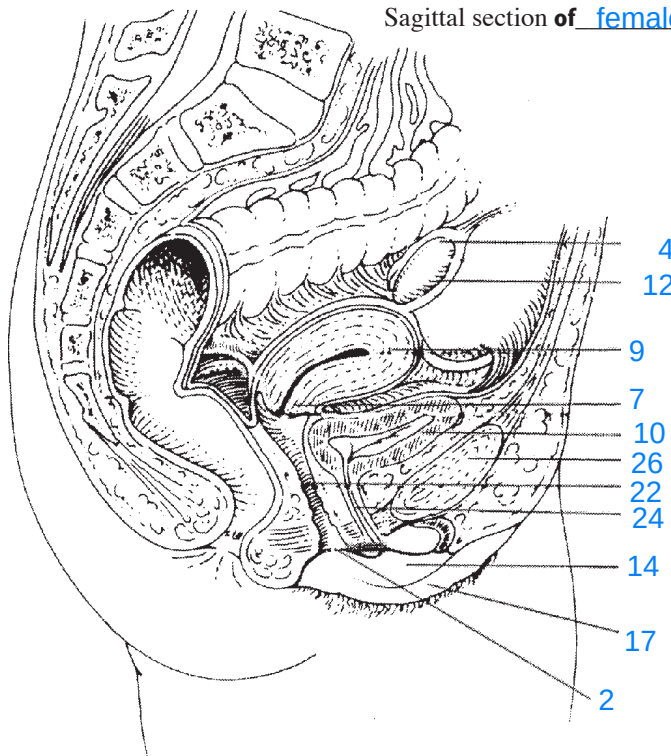
13. Reproductive System Review - cont.

These diagrams are both sagittal sectional views . **Write the correct number against each line on the figures.**

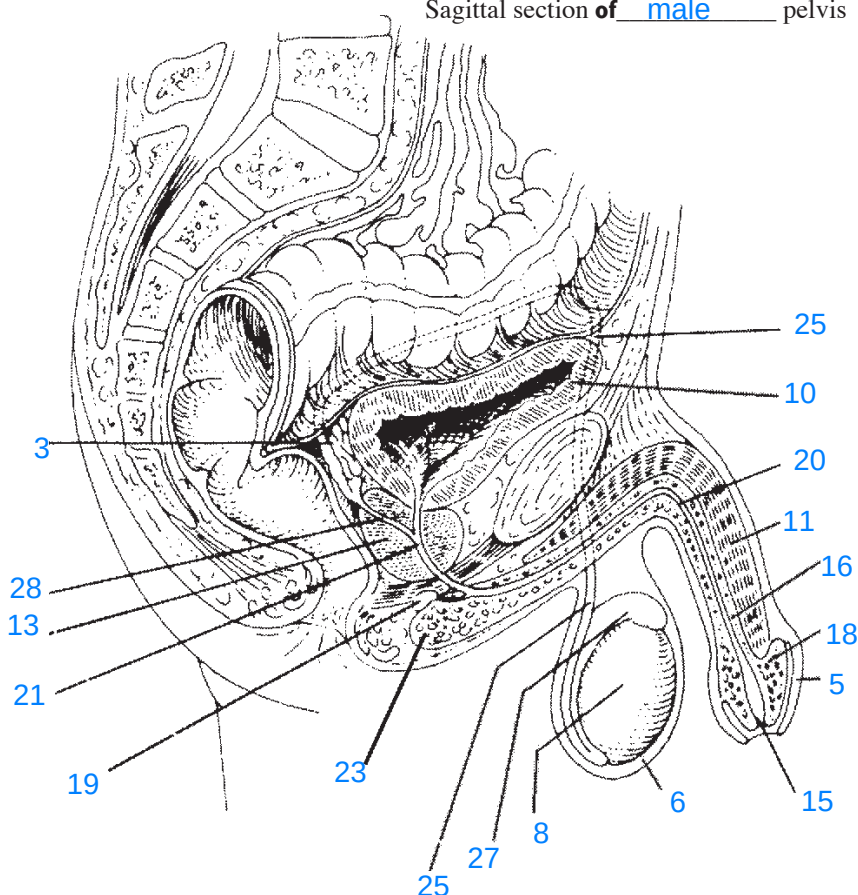
Words may be used more than once

1. Anus
2. Hymen
3. Seminal vesicle
4. Ovary
5. Prepuce
6. Scrotum
7. Cervix
8. Testis
9. Uterus
10. Urinary Bladder
11. Corpus Cavernosum
12. Uterine (fallopian) tube
13. Prostate
14. Labium Minora
15. External urethral orifice
16. Corpus Spongiosum
17. Labium majora
18. Glans penis
19. Bulbo-urethral gland
20. Spongy urethra
21. Prostatic urethra
22. Vagina
23. Bulb of penis
24. Urethra
25. Ductus Deferens
26. Pubis
27. Epididymus
28. Ejaculatory duct
29. Male pelvis
30. Female pelvis

Sagittal section of female pelvis



Sagittal section of male pelvis

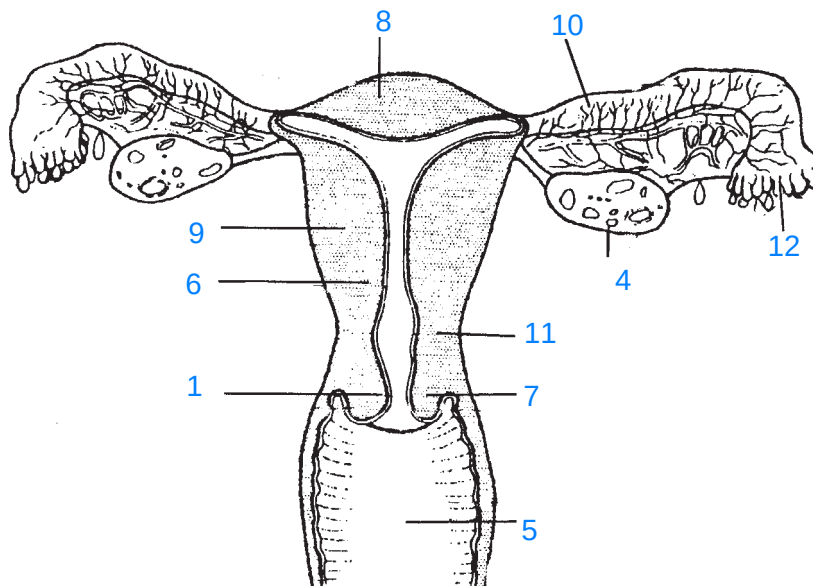


13. Reproductive System Review - cont.

Diagram of the internal female genital organs. Write the correct number against each line on the figures.

Words may be used more than once

1. External Os
2. Hymen
3. Seminal vesicle
4. Ovary
5. Vagina
6. Internal Os
7. Cervix
8. Fundus
9. Body of uterus
10. Uterine (fallopian) tube.
11. Cervical canal
12. Fimbriae

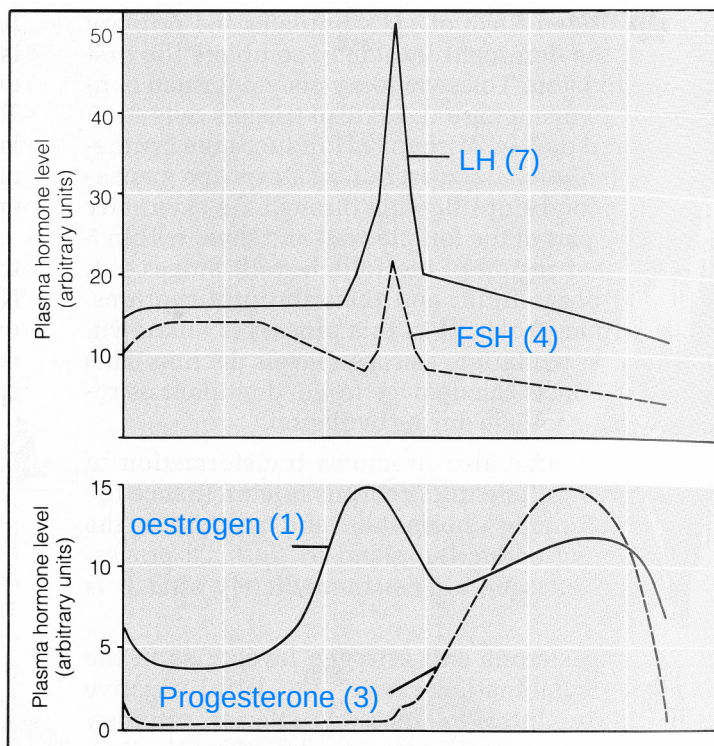


These graphs show the changing plasma hormone levels throughout the menstrual cycle

Write the correct number against each of the four labels on the graphs. (You do not need to use all the words and words may be used more than once.)

Words may be used more than once

1. Oestrogen
2. Oxytocin
3. Progesterone
4. FSH
5. PRL
6. ADH
7. LH



14. Integumentary System Review

Select **the correct words from the list** and write them against their descriptor.

alopecia, arrector pili, ceruminous gland, epidermis, keratin, melanin, pore, sebaceous gland, sudoriferous gland

Opening in the skin	<u>pore</u>
Excretes sweat	<u>sudoriferous gland</u>
Secretes oil (sebum)	<u>sebaceous gland</u>
Secretes wax	<u>ceruminous gland</u>
Loss of hair	<u>alopecia</u>
Outer layer of skin	<u>epidermis</u>
Nails are made of this	<u>keratin</u>
Substance that darkens skin	<u>melanin</u>
Makes a hair stand up	<u>erector pili</u>

Can you **list three ways** the skin is important for the body?

1. communication with the environment through touch and heat sensors .
2. serves as a reservoir for blood .
3. protection from dehydration, microorganisms/bacteria, injury/trauma, ultraviolet radiation .

Try this skin sensitivity (pin-prick) test:

Have a friend take two pins or a pair of geometry dividers and have them lightly touch your skin with the pins in the following places:

finger, forearm, cheek, back of shoulder, thigh, sole of the foot.

Do this with the pins, first 70mm apart, next 50mm apart, then 30mm apart and finally 10mm apart.

For each place make a note of the narrowest width between the pins that you are able to recognise two separate points.

finger <u>10</u> mm	cheek <u>30</u> mm	thigh <u>10</u> mm
forearm <u>30</u> mm	back of shoulder <u>10</u> mm	sole of foot <u>10</u> mm

14. Integumentary System Review - cont.

1. The skin has two different layers, the dermis and epidermis. Explain where each is situated in relation to the other and their functions.

- a. Dermis:

is immediately deep to the epidermis and is tightly connected to it.
It has 2 layers, the superficial papillary layer, and the deeper reticular layer which is thicker, with thicker bundles of collagen fibres that provide more durability.
It contains fibroblasts, mast cells, blood vessels and cutaneous sensory nerves, hair follicles, nails, sebaceous and sweat glands.

- b. Epidermis:

The epidermis is the most superficial layer of the skin formed by layers of keratinocytes which become increasingly flat towards the surface of the skin until they die or are worn away i.e. they are produced from the bottom up.
This layer is bloodless and helps reduce water loss from the body and prevents water entering from outside
There are also several other cells in the epidermis including melanocytes which produce melanin and merkel cells (sensory mechanoreceptors)

2. What is the substance in the skin that darkens your skin when in the sun?

melanin

3. From which glands does sweat come?

sudoriferous glands
exocrine and apocrine

4. Why does one type of sweat smell?

contains fatty substances and proteins that produce an unpleasant odour as they decompose

14. Integumentary System Review - cont.

5. What are the arrector pili?

small muscles attached to hair follicles

6. What do the arrector pili do?

they contract when the body is cold which raises the hair on the skin. The contractions press on nearby oil glands which dimple the skin surface giving a 'goose bumps' appearance.

5. Describe the various imbalances that sebaceous glands can have.

they can become blocked producing 'white heads' then 'blackheads'
if they become inflamed they produce acne
if they are overactive they can produce 'cradle cap'

6. Which structure is **not** associated with a nail? (Circle it)

- a. Nail bed
- b. Cuticle
- c. Nail fold
- (d.) Nail follicle

15. Special Senses Smell / Taste Review

Write a word or some words to match the definition:

Unpleasant odours may trigger these responses.

sneezing or gagging

These odours cause the mouth to water.

appetising

Our sense of smell is enhanced by doing this.

sniffing

Olfactory receptors are located here.

roof of nasal cavity

Olfactory receptors are covered with a layer of this.

mucus

Smell sensations are carried to the brain by this nerve.

olfactory

Taste buds are located in these.

papillae of tongue

These are the largest papillae.

circumvallate

These papillae are found mostly on the tip and sides of the tongue.

fungiform

Both taste buds and olfactory hairs are this kind of sensory organ.

chemoreceptors

These are the 4 kinds of taste sensation.

sweet, sour, salt, bitter

For a taste sensation, food must be dissolved in this.

saliva

Taste sensations from the front of the tongue are conveyed to the brain primarily by this nerve.

facial nerve

Damage to the Glossopharyngeal Nerve may reduce the ability to detect these substances.

bitter

Taste impulses trigger the secretion of these fluids.

saliva and gastric juice

A bitter substance may trigger these responses.

gagging or vomiting

Number these in the order travelled by a smell sensation on its way to the brain

2 olfactory nerve

3 olfactory bulb

4 olfactory tract

5 olfactory cortex

1 olfactory receptors

To think about:

Can you get used to a smell so that you don't notice it? yes

Do you make judgements about people and houses or other places based on smell? sometimes

Do you have a favourite perfume or flower scent? yes

Why does it make you feel good? reminds me of holidays

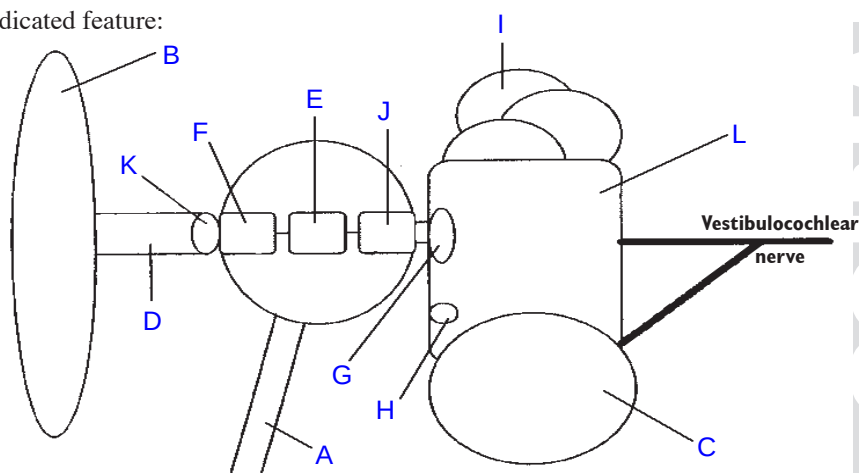
Is it possible to give a smell a rating? yes

Would everyone else give it the same rating, do you think? no

15. Special Senses Hearing / Balance Review

On the diagram **add the letter** for each indicated feature:

- A. auditory tube
- B. auricle
- C. cochlea
- D. external auditory canal
- E. incus
- F. malleus
- G. oval window
- H. round window
- I. semicircular canals
- J. stapes
- K. tympanic membrane
- L. vestibule



Write these in the correct order for conveying a sound sensation to the brain:

auditory cortex, auricle, cochlea, external auditory canal, incus, malleus, oval window, stapes, tympanic membrane, vestibulocochlear nerve, vestibule

1. auricle 2. external auditory canal 3. tympanic membrane
4. malleus 5. incus 6. stapes 7. oval window 8. vestibule
9. cochlea 10. vestibulocochlear nerve 11. auditory cortex

The semicircular canals respond to tilting of the head and change of motion

Hearing and Balance - Match each word to its definition:

auditory tube, eardrum, helix, malleus, otitis media, oval window, Ménière's syndrome, motion sickness, round window, tinnitus

- | | |
|--|---------------------------|
| Rim of the auricle. | <u>helix</u> |
| Inflammation of the middle ear. | <u>otitis media</u> |
| Membrane serving as an expansion valve for the cochlea. | <u>round window</u> |
| Nausea resulting from confused messages to the brain about movement. | <u>motion sickness</u> |
| Disorder of the labyrinth resulting in vertigo. | <u>Ménière's syndrome</u> |

15. Special Senses Review - cont.

Match each **word from the list** with its descriptor:

aqueous humour, auditory (eustachian) tube, canthus, caruncle, cataract, conjunctiva, cornea, eardrum, macula lutea, malleus, olfactory, orbit, oval window, papillae, pupil, retina, saccades, saliva, suspensory ligament, tinnitus.

Smell & Taste

Smell sensations are carried to the brain by this nerve.

olfactory

Taste buds are located in these.

papillae

Taste impulses trigger the secretion of this fluid.

saliva

Vision

Transparent area of the sclera.

cornea

Inner, sensory tunic of the eye.

retina

Connects the ciliary body to the lens.

suspensory ligament

Protective lining of the sclera and eyelid.

conjunctiva

Area of retina most sensitive to visual detail.

macula lutea

Corner of the eye.

canthus

Clouding of the lens.

cataract

Quick, jerky movements of the eye.

saccades

Small hollow at the medial corner of the eye.

caruncle

Hollow in the skull bones which enclose the eye.

orbit

Fluid in the anterior cavity of the eye.

aqueous humour

Aperture at the centre of the iris.

pupil

Hearing & Balance

Another name for the tympanic membrane.

eardrum

Ossicle connected to the tympanic membrane.

malleus

Membrane of the vestibule connected to stapes.

oval window

Connects the middle ear with the pharynx.

eustachian tube

Sensation of ringing or buzzing in the ear.

tinnitus

15. Special Senses Vision Review

Write the word(s) from the list that match(es) each definition:

Canal of Schlemm, canthus, caruncle, conjunctiva, conjunctival sac, cornea, iris, macula lutea, orbit, palpebrae, pupil, retina, saccades, sclera, suspensory ligament

Hollow in the skull bones which enclose the eye

orbit

Outer tunic of the eye

sclera

Muscular curtain that controls the amount of light entering the eye

iris

Drains aqueous humour

canal of schlemn

Space between sclera and eyelid

conjunctival

Another name for eyelids

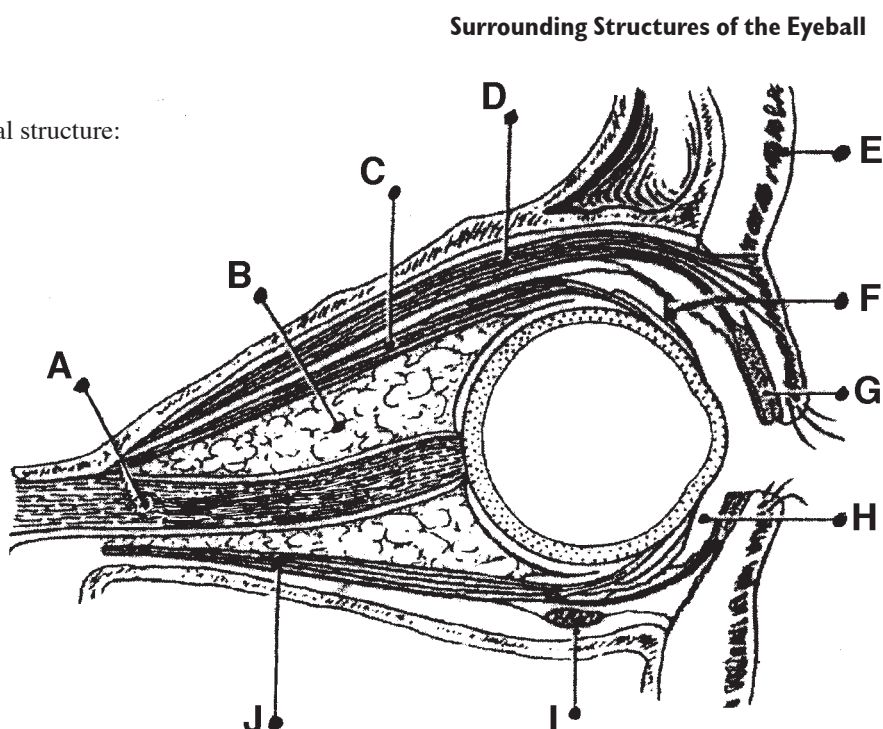
palpebrae

Match each letter to the individual structure:

- F conjunctiva
- H conjunctival sac
- B fatty pad
- A optic nerve
- G tarsal gland

Muscles

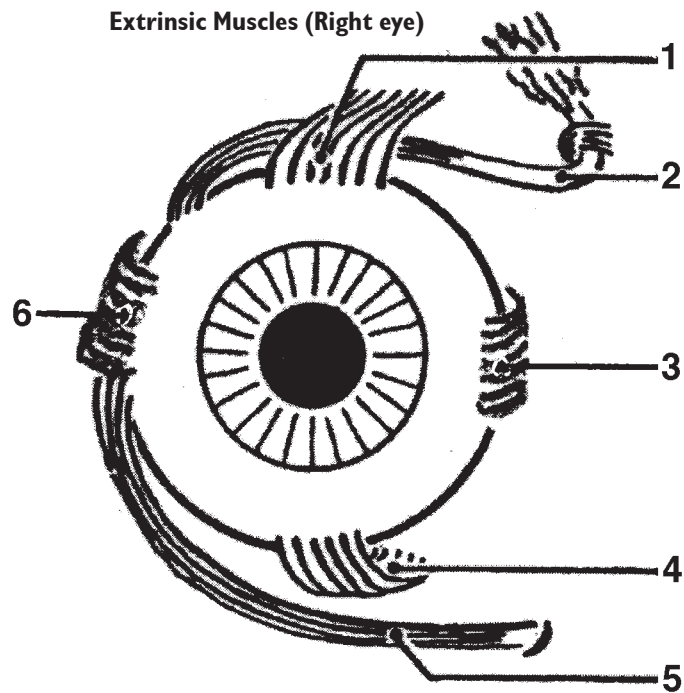
- I inferior oblique
- J inferior rectus
- D levator palpebrae superioris
- E orbicularis oculi
- C superior rectus



15. Special Senses Vision Review - cont.

Match each number to the individual muscle

- 1 superior rectus
- 4 inferior rectus
- 3 medial rectus
- 6 lateral rectus
- 2 superior oblique
- 5 inferior oblique



Muscular Structures of the Eye (Eyeball)

Write 'I' for intrinsic; write 'E' for extrinsic. Remember: 'in' = inside; 'ex' = outside.

- | | | |
|---------------------------------------|-----------------------|----------------------------|
| <u>E</u> lateral rectus | <u>I</u> ciliary body | <u>E</u> orbicularis oculi |
| <u>E</u> levator palpebrae superioris | <u>I</u> iris | <u>E</u> inferior oblique |

Eye Problems

Select the correct word to match the definition:

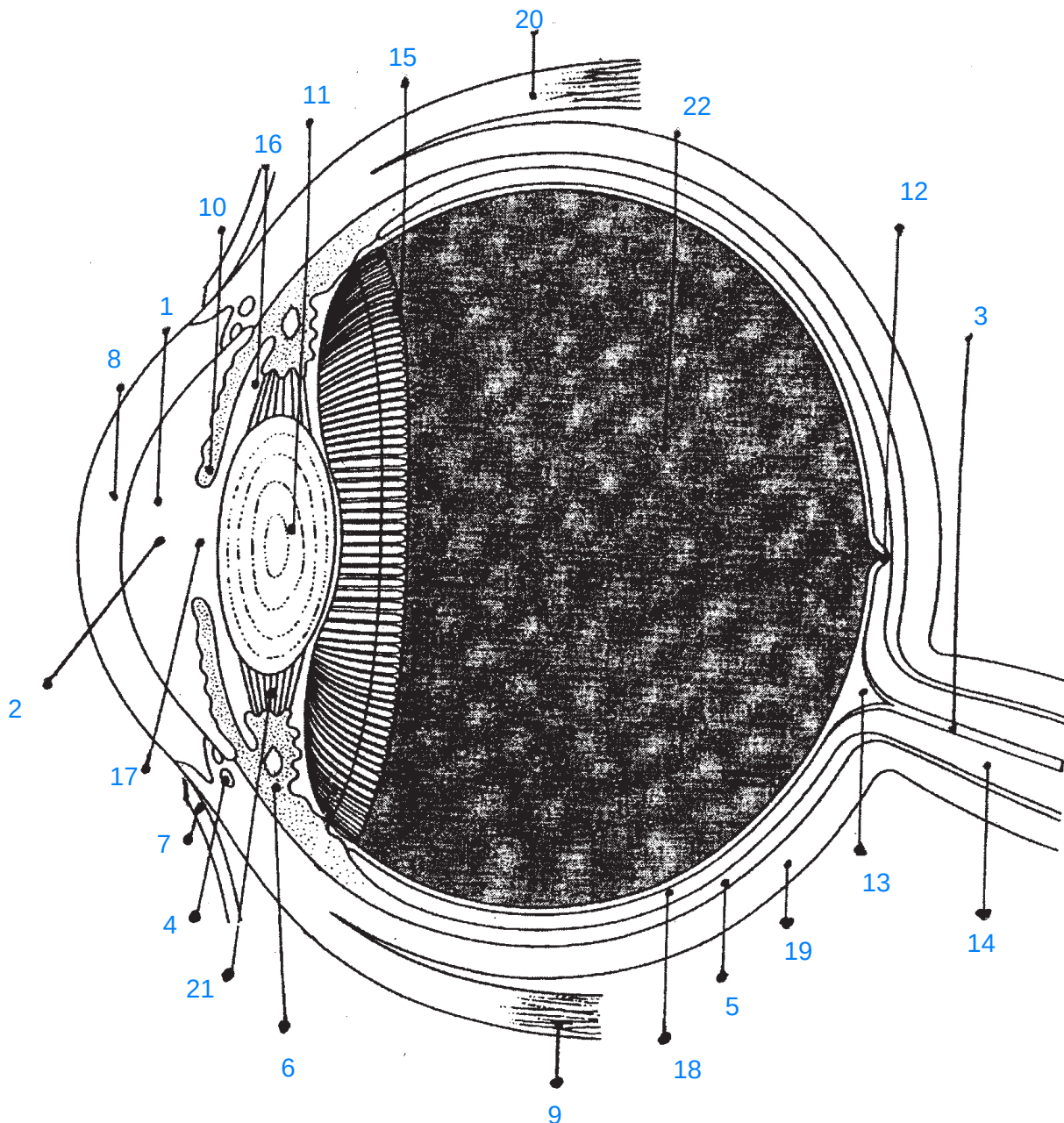
Cataract, conjunctivitis, glaucoma,
hyperopia, myopia, strabismus, sty

- | | |
|--|-------------------|
| Inflammation of a tarsal gland | <u>sty</u> |
| Excessive pressure of aqueous humour | <u>glaucoma</u> |
| Inability to see distant objects clearly (nearsightedness) | <u>myopia</u> |
| Inability to see close objects clearly (farsightedness) | <u>hyperopia</u> |
| Clouding of the lens | <u>cataract</u> |
| Imbalance of extrinsic muscles | <u>strabismus</u> |

15. Special Senses Vision Review - cont.

Choose **from the list, the number** for each structure and write the number on the diagram

- | | | | |
|---------------------|---------------------------|-----------------------|----------------------------|
| 1. anterior chamber | 7. conjunctiva | 13. optic disc | 18. retina |
| 2. aqueous humour | 8. cornea | 14. optic nerve | 19. sclera |
| 3. blood vessels | 9. inferior rectus muscle | 15. ora serrata | 20. superior rectus muscle |
| 4. canal of Schlemm | 10. iris | 16. posterior chamber | 21. suspensory ligament |
| 5. choroid | 11. lens | 17. pupil | 22. vitreous humour |
| 6. ciliary body | 12. macula lutea | | |



15. Special Senses Vision Review - cont.

Accommodation

Circle the correct words:

1. In **distant** vision:

a. **Ciliary body** (contracts / relaxes) b. **lens** (flattens / thickens); c. **iris** (contracts / dilates).

2. In **close** vision:

a. **Ciliary body** (contracts / relaxes); b. **lens** (flattens / thickens) c. **iris** (contracts / dilates).

Photoreceptors

Fill the spaces:

The 2 types of photoreceptors are rods and cones.

cones are concentrated towards the centre of the retina.

rods are most abundant at the outside of the retina.

Lacrimal Apparatus

List these in the correct order to show the normal movement of lacrimal fluid (tears):

Lacrimal canals, medial canthus, lacrimal sac, nasal cavity, lacrimal gland, puncta

1. lacrimal gland
2. medial canthus
3. puncta
4. lacrimal canals
5. lacrimal sac
6. nasal cavity

Vision Pathways

Circle the correct word in each statement:

Sensations of light coming from the right are conveyed to the (left) / right) visual cortex.

Fibres of the optic nerve arising in the (medial / lateral) part of the retina travel to the visual cortex on the same side.

Complete these statements:

Fibres of the optic nerve arising from the medial part of the retina of each eye cross over at the optic chiasma.

Receiving a different image by each eye is called bionocular vision.

Blind Spot (Optic Disc) - Try this:

Close your left eye. Hold the page in your right hand at arm's length. Focus on the dot inside the circle.

Bring the page slowly towards you. At some point the cross will disappear.

Repeat this with the other eye, with the page in your left hand, focusing on the cross with the right eye closed. This time the circle disappears.



Can you explain this?

the black dot 'disappears' when it is focussed onto the area of the retina where there are no photoreceptors i.e. the optic nerve/optic disc

16. Muscles Introduction Review

Complete the statements:

- The 3 types of muscle are skeletal, smooth and cardiac.
- Only skeletal muscle is voluntary.
- Skeletal muscles are responsible for maintaining posture and joint stability.
- Indirect attachment of muscles to bones may be by tendons or aponeuroses.
- The slightly contracted state of a muscle at rest is termed muscle tone.
- How do muscles lengthen? by relaxing and allowing the origin and insertion to be pulled apart by another force such as the opposing muscle.
- Match each action** with its correct descriptor:

pronation, supination, extension, flexion

 - Arm held behind the body = extension
 - Arm rotated with the thumb pointing laterally = supination
 - Arm rotated with the thumb pointing medially = pronation
 - Arm held in front of the body = flexion
- Name a muscle that has predominantly red slow-twitch fibres. gluteus maximus.
- Name a muscle that has predominantly white fast-twitch fibres. rectus muscles of the eye.
- Match each feature** to the appropriate muscle fibre.

On each line clearly write either 'S' for slow or 'F' for fast:

F white

S high myoglobin

F anaerobic respiration

F lactic acid accumulates

S rich capillary supply

S fatigue resistant

S red

S many mitochondria

F powerful contractions

S depends on high oxygen supply

S aerobic respiration

F best suited for short period

16. Muscles Introduction Review - cont.

Complete the statements:

11. Muscles are stimulated by impulses carried by efferent or motor neurons.

12. Information is carried from muscles to the brain by afferent or sensory neurons.

13. **Select the correct words from the list** to fill in the spaces:

Sarcomeres, nuclei, myofibrils, myofilaments, muscle cells

Within each muscle fibre there are contractile elements called myofibrils. Each of these contains thick and thin myofilaments, which are grouped into units called sarcomeres.

14. Muscles spindles are located within the belly of the muscle.

They send information to the Central Nervous System about the length and rate of change of length.

15. Golgi tendon organs are located at the ends of the muscle in the tendons

They send information to the Central Nervous System about:

the load on a muscle and the rate of change of the load.

16. An example of a muscle with parallel fibres is biceps brachii.

17. An example of a muscle with convergent fibres is pectoralis major.

18. An example of a muscle with pennate fibres is extensor digitorum longus

19. The total length change in which a skeletal muscle can function efficiently is about 60 % of resting length.

20. As well as being located in muscles, proprioceptors are found in skin and joints
connective tissue.

17. Hip Muscles Review

From the **list of muscles in the box**, select **one** for each movement:

Adductors, Gluteus Medius, Hamstrings, Piriformis, Quadriceps, Sartorius, Tensor Fascia Latae

Flexes, medially rotates and abducts the thigh	<u>tensor fascia lata</u>
Extends the thigh and flexes the leg	<u>hamstrings</u>
Rotates the thigh laterally	<u>piriformis</u>
Flexes, laterally rotates and abducts the thigh	<u>sartorius</u>
Flexes the thigh and extends the leg	<u>quadriceps</u>
Abducts the thigh	<u>gluteus medius</u>
Adducts the thigh	<u>adductors</u>

Complete these sentences:

A weak quadriceps may cause difficulty in climbing stairs.

A weak tensor fascia lata may result in a tendency to bowleg.

A tight gluteus maximus may cause difficulty in raising the knee.

A tight hamstring may cause difficulty in touching the toes.

Write the name of a hip muscle or muscles involved in the following activities.

(You may use a muscle name more than once.)

Skiing	<u>gluteus maximus, hamstrings, quadriceps</u>
Dancing	<u>quadriceps, hamstrings, gluteus maximus, adductors, abductors</u>
Cycling	<u>gluteus maximus, hamstrings, psoas, gluteus medius, abductors</u>
Rising from a chair	<u>gluteus maximus, hamstrings, quadriceps</u>
Kicking a football	<u>psoas, iliacus, quadriceps, hamstrings, gluteus maximus, adductors, abductors</u>

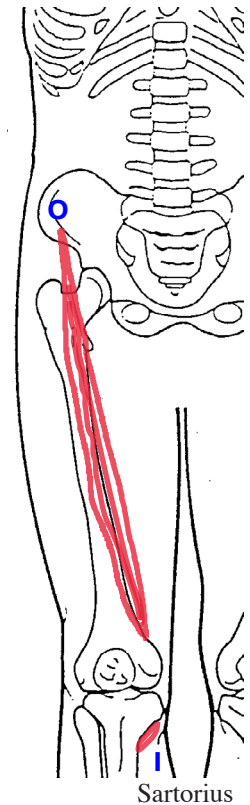
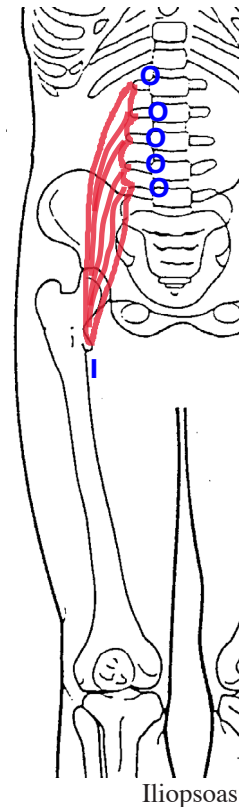
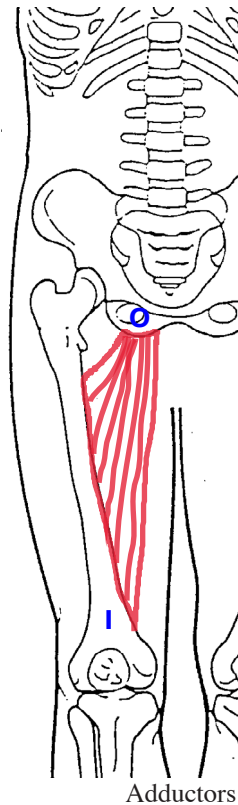
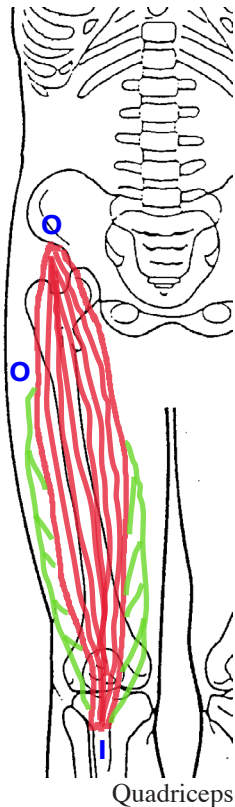
Quick quiz

How does the Sartorius muscles get its' name? from the Latin word sartor, meaning tailor, in reference to the cross-legged position in which tailors once sat.

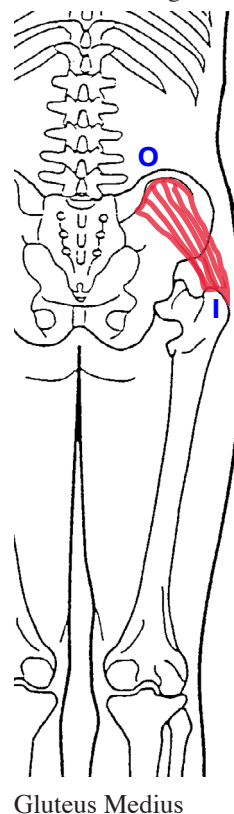
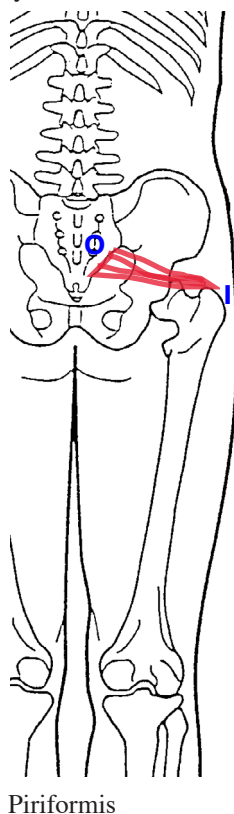
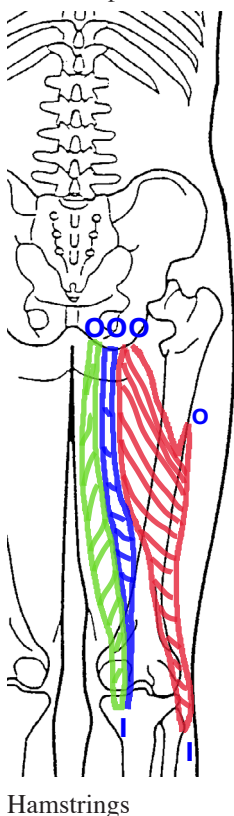
17. Hip Muscles Review - cont.

Markers note: student's drawings to be marked based on clarity and accuracy rather than artistic ability. Use of color and/or shading to differentiate various muscles in a group is not mandatory but helps bring clarity.

On these anterior views carefully draw the indicated right side muscle on the figure. Label the **origin** and **insertion**:



On these posterior views carefully draw the indicated right side muscle on the figure. Label the **origin** and **insertion**:



18. Arm / hand Muscles Review

1. From the list of muscles select those that are chiefly responsible for each movement:

Adductor Pollicis, Biceps, Brachialis, Brachioradialis, Extensor Communis Digitorum, Flexor Carpi radialis, Flexor Carpi Ulnaris, Flexor Digitorum Profundus, Flexor Digitorum Superficialis, Flexor Pollicis Longus, Interossei, Opponens Pollicis, Pronator Quadratus, Triceps

Extends the fingers	<u>extensor communis digitorum</u>
Pronates the forearm	<u>pronator quadratus</u>
Flex the forearm (2 muscles)	<u>brachioradialis</u> and <u>brachialis</u>
Flexes the arm, flexes and supinates the forearm	<u>biceps</u>
Flexes the thumb	<u>flexor pollicis longus</u>
Flex the fingers (2 muscles)	<u>flexor digitorum superficiales</u> and <u>flexor digitorum profundus</u>
Spread the fingers (2 muscles)	<u>extensor communis digitorum</u> and <u>palmar interossei</u>
Flex the wrists (2 muscles)	<u>flexor carpi ulnaris</u> and <u>flexor carpi radialis</u>
Extends the forearm	<u>triceps</u>
Draw the thumb across the palm (2 muscles)	<u>adductor pollicis</u> and <u>opponens pollicis</u>

2. Write the name of a muscle or muscles of the arm or hand involved in the following activities. (You may use a muscle name more than once.) *Note: Some possible answers have been abbreviated to fit space.*

Unscrewing a lid	<u>OP, FPB, FDB, Adductor Pollicis, Dorsal/Palmar Interossei, FPL, Biceps, FCR/U</u>
Hammering	<u>triceps, biceps, ECR, ECU, brachioradialis, FPL, FPB, Adductor Pollicis, FDM, ADM,</u>
Lifting a small child	<u>triceps, biceps, brachioradialis, brachialis, abductor pollicis longus</u>
Doing push-ups	<u>triceps, biceps, brachialis, pronator teres, FCR,</u>
Opening the hand	<u>dorsal interossei, APL, EPL, EPB, extensor digitorum, EDM, ADM, APB</u>
Grasping a saucepan	<u>palmar interossei, adductor pollicis, flexor digitorum, EDM, OP, FPB, FDM, FPL</u>
Playing a musical instrument	<u>dorsal interossei, extensor digitorum, flexor digitorum, lumbricals, FCR, FCU,</u>
Pushing a pram	<u>pronator teres, flexor digitorum, adductor pollicis, FPL,</u>
Stitching with a needle	<u>FPL, FPB, flexor digitorum, lumbricals, supinator, pronator teres,</u>
Playing chess	<u>FPL, FPB, flexor digitorum, lumbricals, biceps, triceps, brachialis</u>
Writing a letter	<u>FPL, FPB, flexor digitorum, adductor pollicis, opponens pollicis</u>

3. Something practical:

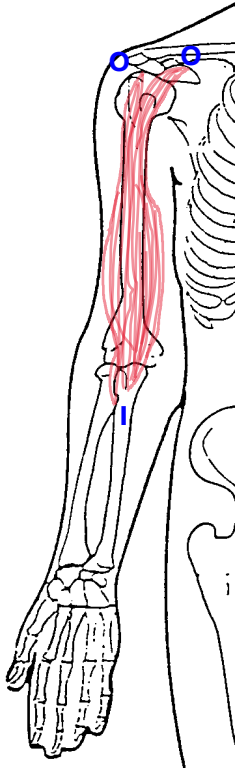
Fully flex the middle finger of one hand at the knuckle and first joint, so that the tip of the finger is pointing towards the wrist. Tap the nail of this finger several times.

- What do you notice? the tip of the finger feels loose
- Why is this? flexor digitorum profundus and extensor digitorum communis are prevented from working

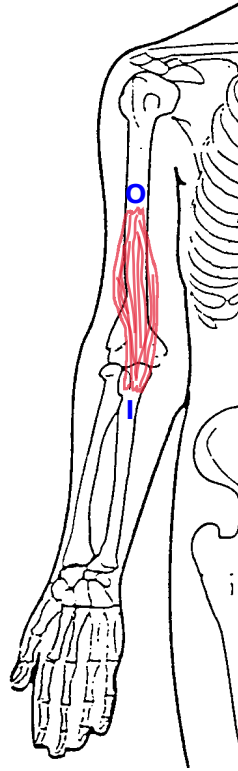
18. Arm / hand Muscles Review - cont.

Markers note: student's drawings to be marked based on clarity and accuracy rather than artistic ability. Use of color and/or shading to differentiate various muscles in a group is not mandatory but helps bring clarity.

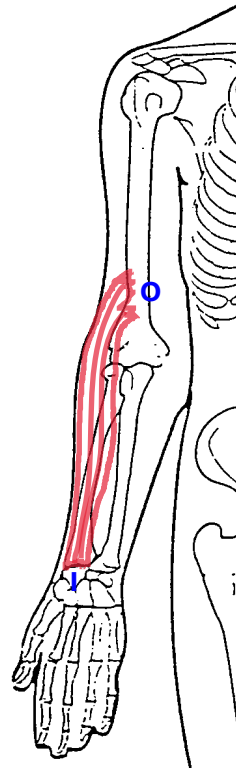
Carefully draw the indicated muscle on each figure (Right arm, anterior view). Label the **origin** & **insertion** on each one.



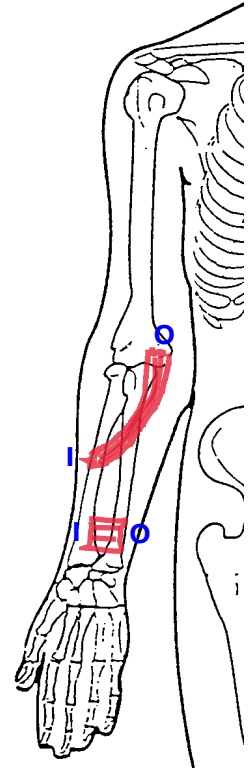
Biceps Brachii



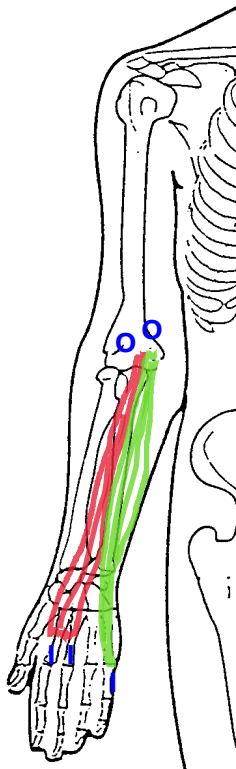
Brachialis



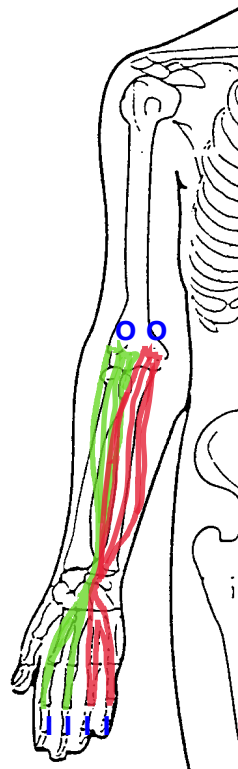
Brachioradialis



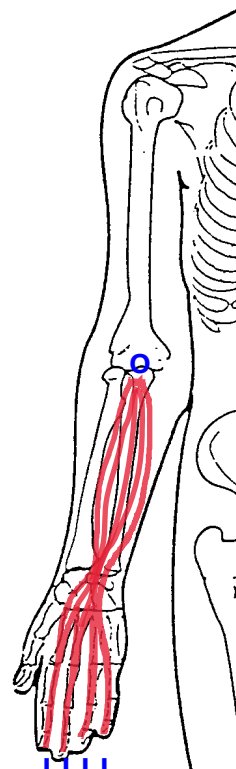
Pronator teres &
Pronator Quadratus



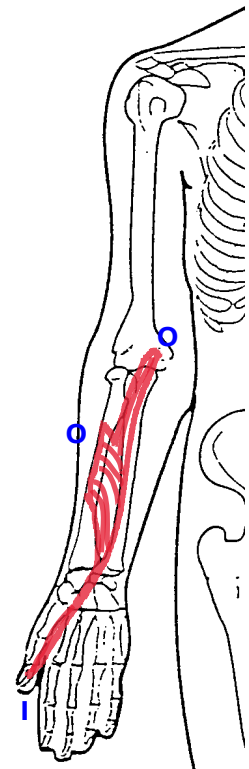
Flexor Carpi Radialis
& Ulnaris



Flexor Digitorum
Superficialis



Flexor Digitorum
Profundus

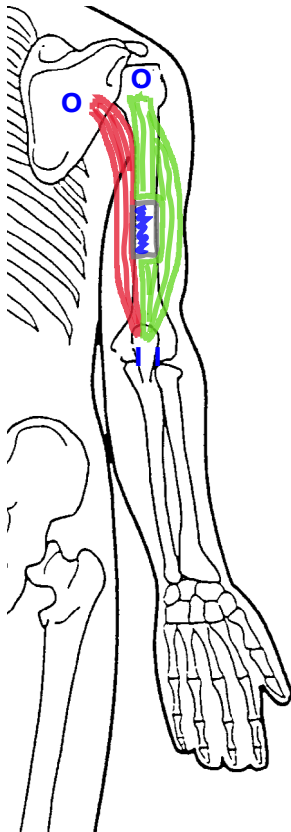


Flexor Pollicis
Longus

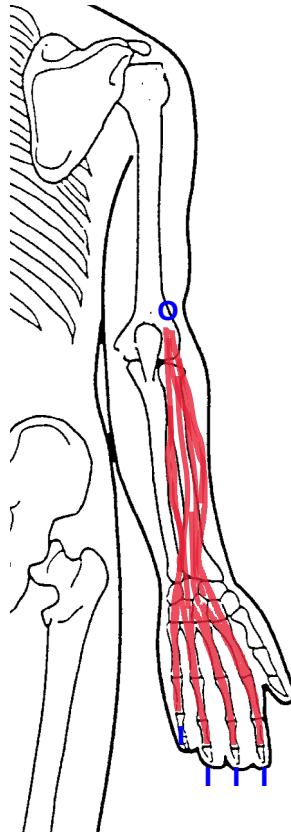
18. Arm / hand Muscles Review - cont.

Markers note: student's drawings to be marked based on clarity and accuracy rather than artistic ability. Use of color and/or shading to differentiate various muscles in a group is not mandatory but helps bring clarity.

Carefully draw the indicated muscle on each figure. (Right arm, posterior view.) Label the **origin** and **insertion**.

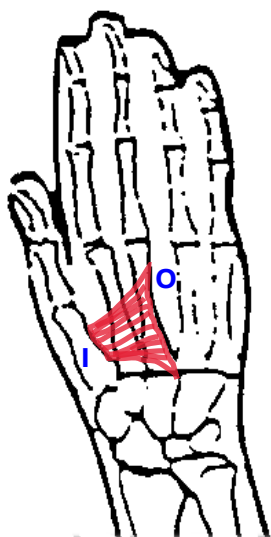


Triceps

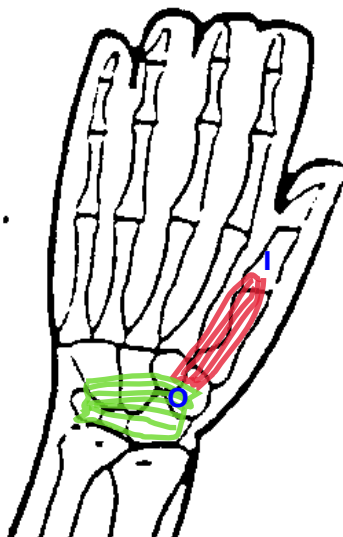


Extensor communis
Digitorum

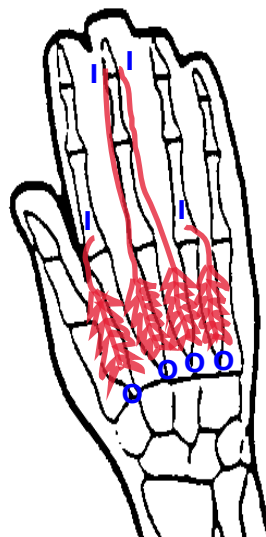
Draw the indicated muscle(s) on the right hand. Label the **origin** and **insertion**.



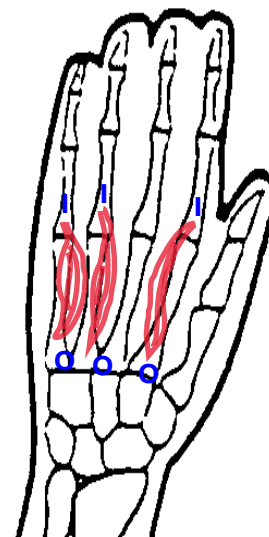
Adductor Pollicis
anterior view



Opponens Pollicis
anterior view



Dorsal Interossei
posterior view



Palmar Interossei
anterior view

19. Leg - Foot Muscles Review

1. **From the list** of muscles **select those that are chiefly responsible** for each movement:

Extensor Digitorum Longus, Extensor Hallucis Longus, Flexor Digitorum Longus, Flexor Hallucis Longus, Gastrocnemius, Peroneus, Popliteus, Soleus, Tibialis anterior, Tibialis Posterior

Extends (dorsiflexes) and inverts the foot	<u>tibialis anterior</u>
Flexes the small toes	<u>flexor digitorum longus</u>
Points (plantar flexes) the foot (2 muscles)	<u>gastrocnemius</u> and <u>soleus</u>
Medially rotates the leg, stabilizes the knee	<u>popliteus</u>
Plantar flexes and inverts the foot	<u>tibialis posterior</u>
Everts the foot	<u>peroneus</u>
Extends the small toes	<u>extensor digitorum longus</u>
Extends the big toe	<u>extensor hallucis longus</u>
Flexes the big toe	<u>flexor hallucis longus</u>

2. **Write the name of a muscle or muscles** of the leg or foot involved in the following activities. (You may use a muscle name more than once.)

Standing on tip toe	<u>gastrocnemius, soleus, plantaris, flexor hallucis longus, flexor digitorum longus, tibialis, peroneus</u>
Kicking a football	<u>quadriceps, hamstrings, tibialis anterior, gastrocnemius, soleus, gastrocnemius, soleus, flexor digitorum longus, flexor hallucis longus, peroneus</u>
Putting on your shoes	<u>quadriceps, hamstrings, gluteus maximus, soleus, gastrocnemius, abductors, tibialis anterior, flexor hallucis longus, flexor digitorum longus.</u>
Jumping up and down	

3. Practical department

If you twist or sprain your ankle it may result in a weakened peroneus muscle. Stiffness in the calf after running may mean overworked gastrocnemius and soleus.

‘Hammer toe’ may result from tightness in flexor hallucis longus or flexor digitorum longus.

Did you know...?

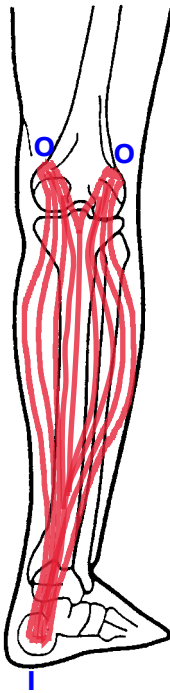
The ankles serve as pulley blocks for the calf muscles that insert underneath the foot.

19. Leg - Foot Muscles Review - cont.

Markers note: student's drawings to be marked based on clarity and accuracy rather than artistic ability. Use of color and/or shading to differentiate various muscles in a group is not mandatory but helps bring clarity.

Carefully draw the indicated muscles on the legs. Label the **origin** & **insertion** on each one.

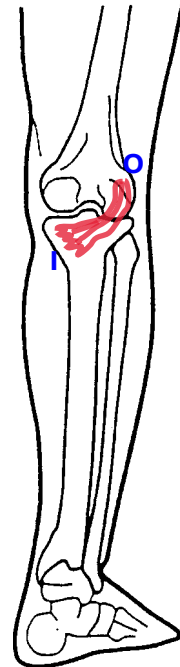
Gastrocnemius



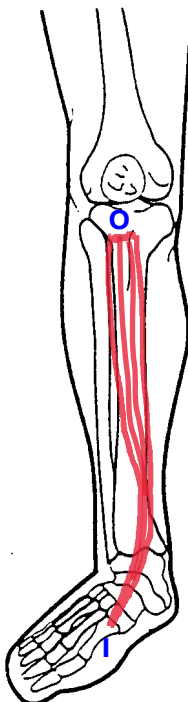
Soleus



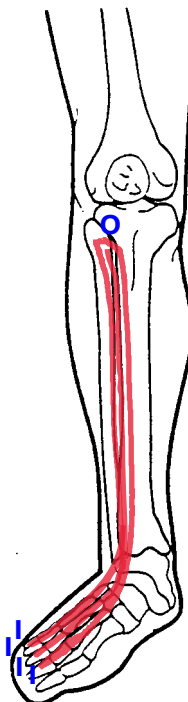
Popliteus



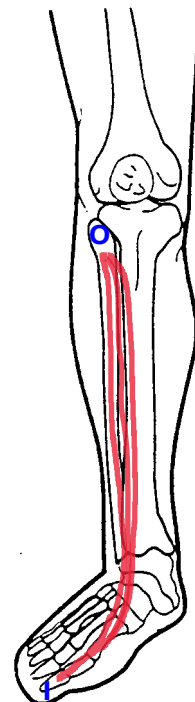
Tibialis Anterior



Extensor Digitorum Longus



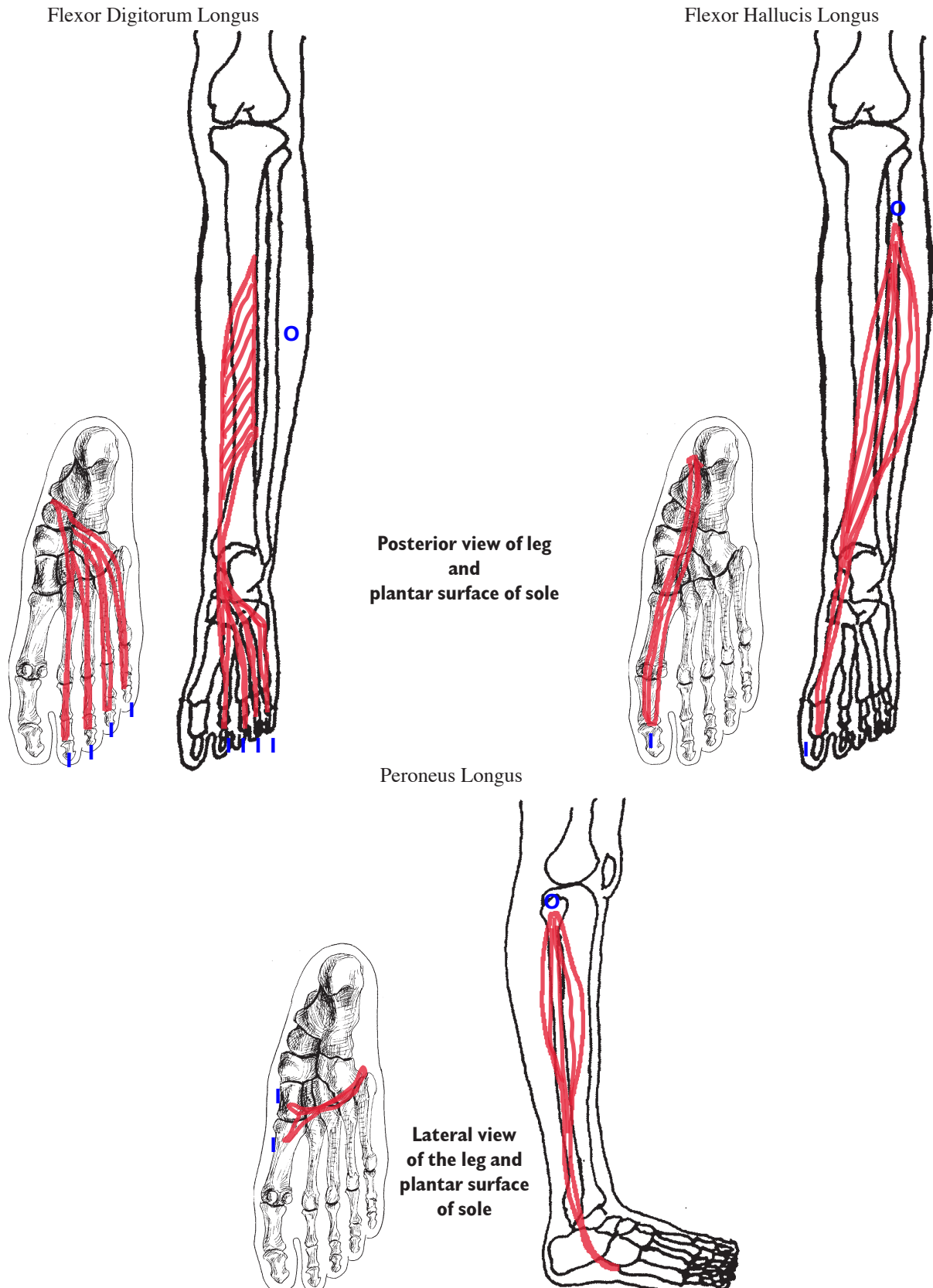
Extensor Hallucis Longus



19. Leg - Foot Muscles Review - cont.

Markers note: student's drawings to be marked based on clarity and accuracy rather than artistic ability. Use of color and/or shading to differentiate various muscles in a group is not mandatory but helps bring clarity.

Carefully draw the indicated muscle on **both** legs and feet. Label the **origin** and **insertion**:



20. Shoulder Muscles Review

1. From the list of muscles in the box, select one for each movement:

Coracobrachialis, Deltoid, Infraspinatus, Pectoralis Major, Pectoralis Minor, Rhomboids, Serratus Anterior, Subclavius, Subscapularis

Rotates the glenoid cavity upward to raise the arm high	<u>serratus anterior</u>
Abducts the arm	<u>deltoid</u>
Tilts the arm laterally	<u>pectoralis minor</u>
Rotates the arm laterally	<u>infraspinatus</u>
Flexes and adducts the arm	<u>coracobrachialis</u>
Draws the clavicle forwards and downwards	<u>subclavius</u>

2. Complete these sentences:

- A weak deltoid may lead to subluxation (displacement) of the humerus. Also acceptable: supraspinatus
- A weak subclavius may cause difficult in raising the arm high. Also acceptable: deltoids, trapezius, anterior serratus
- A tight pectoralis minor may result in hunched shoulders. Also acceptable: pectoralis major/sternal
- A tight infraspinatus may cause difficulty in reaching the hand behind the back. Also acceptable: Teres Minor and Pectoralis Major Clavicular

3. Write the name(s) of a shoulder muscle(s) involved in the following activities. (You may use a muscle name more than once.)

- Washing windows trapezius, deltoid, rotator cuff, latissimus dorsi, serratus anterior
- Playing golf pectoralis major clavicular/sternum, deltoids, latissimus dorsi, rotator cuff
- Combing your hair rotator cuff, coracobrachialis, biceps, triceps, deltoids
- Swimming freestyle deltoids, rotator cuff, rhomboids, serratus anterior, upper trapezius, latissimus dorsi, pectoralis major,
- Sweeping the floor deltoids, biceps, triceps, supra spinatus, rotator cuff, trapezius

Write the names of the 4 Rotator Cuff muscles:

supraspinatus

infraspinatus

teres minor

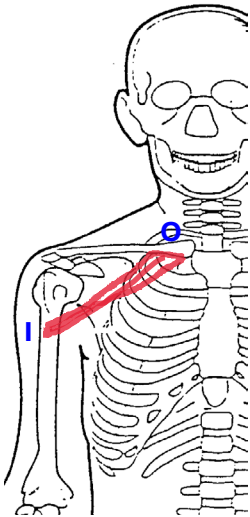
subscapularis

20. Shoulder Muscles Review - cont.

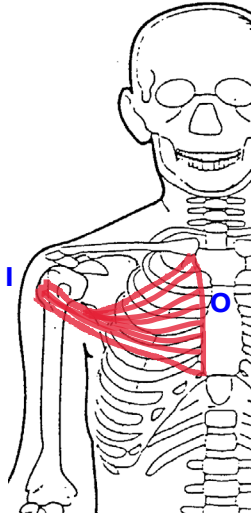
Markers note: student's drawings to be marked based on clarity and accuracy rather than artistic ability. Use of color and/or shading to differentiate various muscles in a group is not mandatory but helps bring clarity.

Carefully draw the indicated right side muscle on the figure. Label the **origin** & **insertion** on each one.

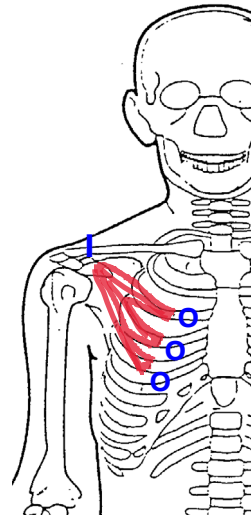
Pectoralis Major
Clavicular



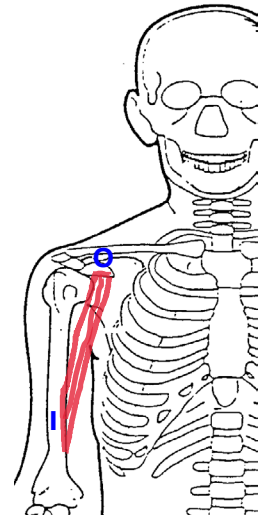
Pectoralis Major
Sternal



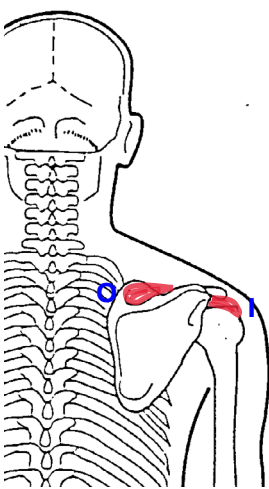
Pectoralis Minor



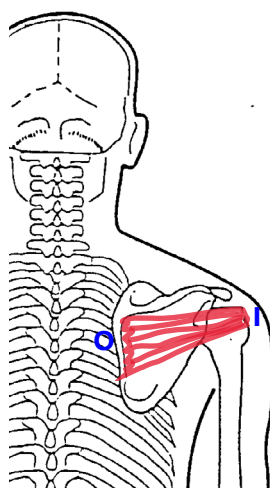
Coracobrachialis



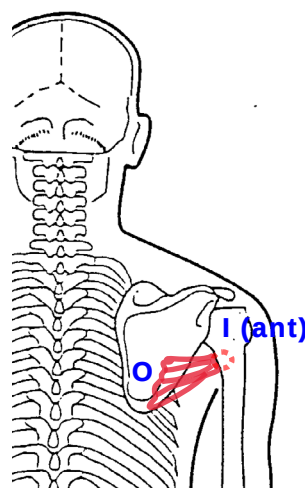
Supraspinatus



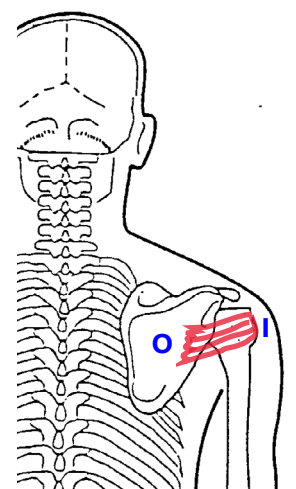
Infraspinatus



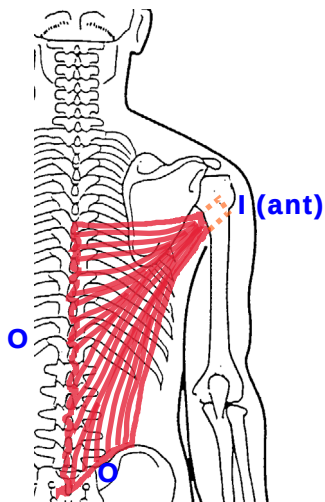
Teres Major



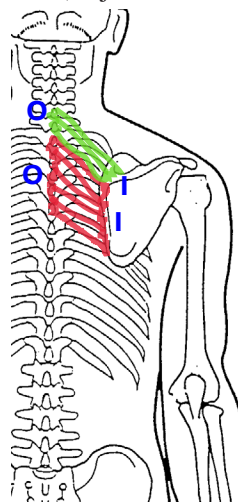
Teres Minor



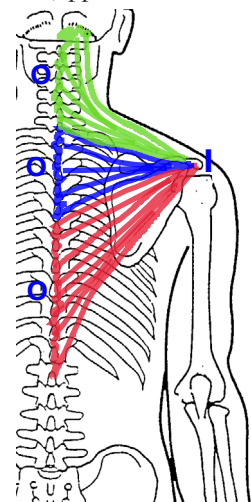
Latissimus Dorsi



Rhomboids (major and minor)



Trapezius (upper, middle, lower)

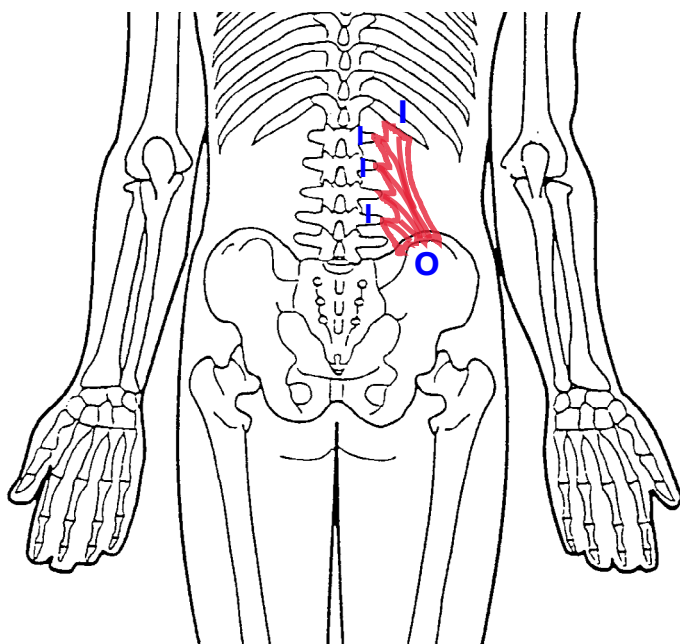


21. Torso / Neck Muscles Review

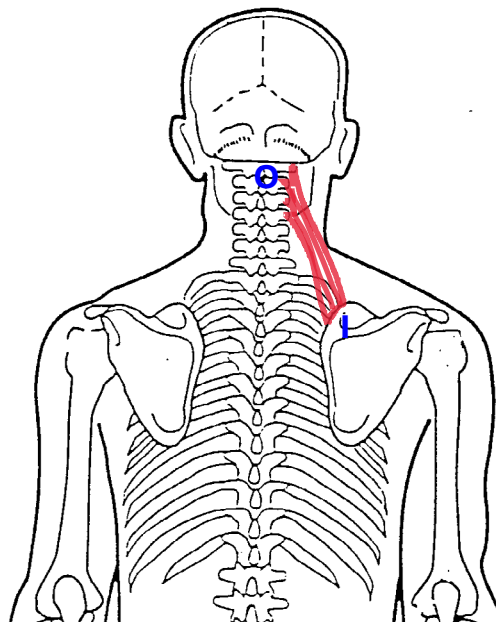
Markers note: student's drawings to be marked based on clarity and accuracy rather than artistic ability. Use of color and/or shading to differentiate various muscles in a group is not mandatory but helps bring clarity.

Carefully draw the indicated muscles on the figure. Label the **origin** & **insertion** on each one.

Quadratus Lumborum



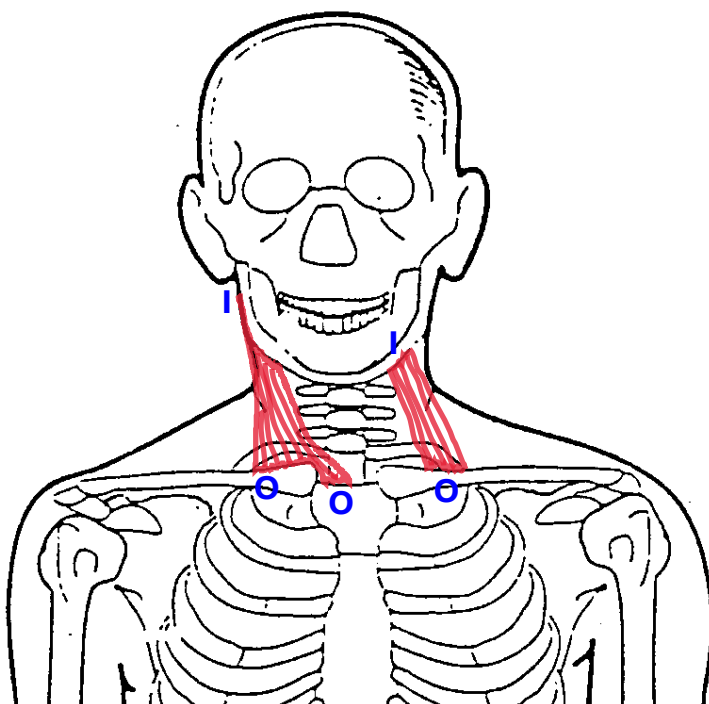
Levator Scapulae



Neck Flexors

Draw in the **right** Sternocleidomastoid

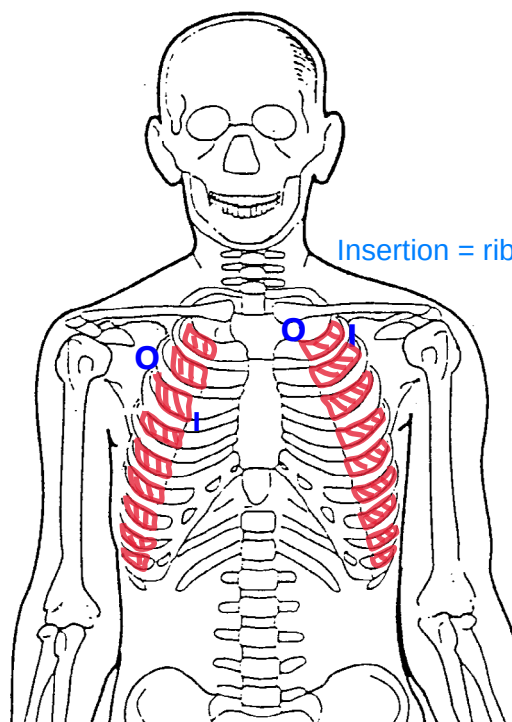
Draw in the **left** Scalenes



Intercostals

Draw in the **right** External Intercostals

Draw in the **left** Internal Intercostals



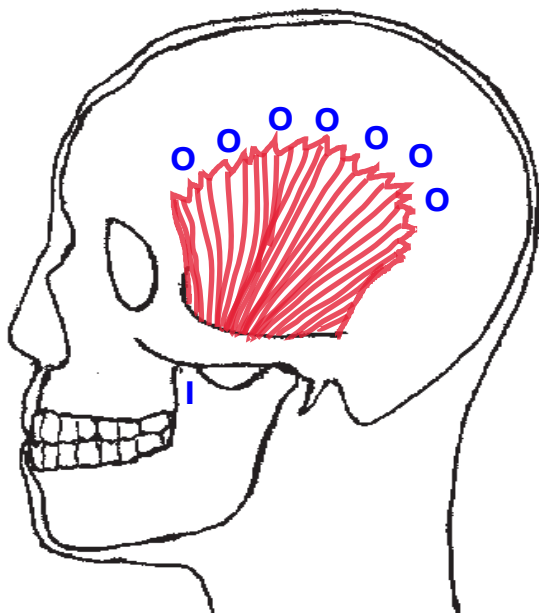
Insertion = rib below

22. Face Muscles Review

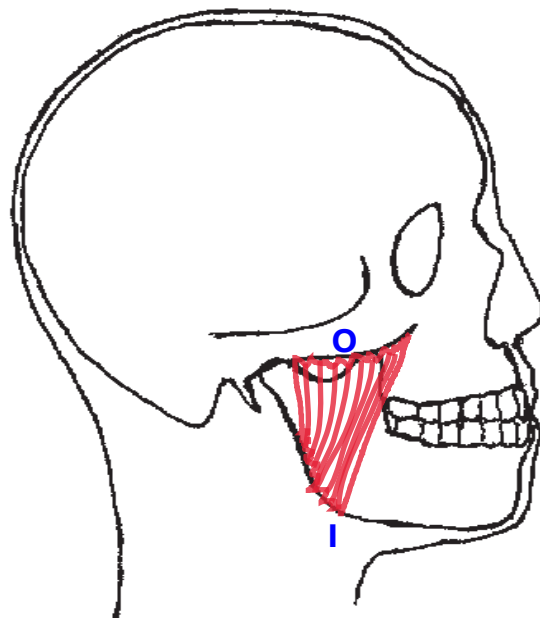
Markers note: student's drawings to be marked based on clarity and accuracy rather than artistic ability. Use of color and/or shading to differentiate various muscles in a group is not mandatory but helps bring clarity.

Carefully draw the indicated muscles on the figure. Label the **origin** & **insertion** on each one.

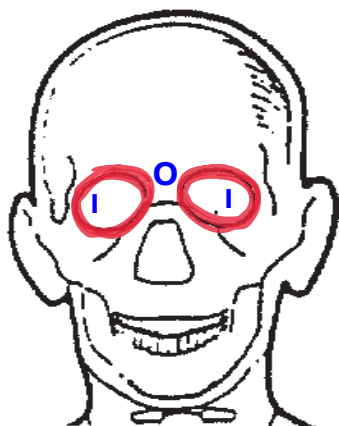
Draw in the **left** Temporalis



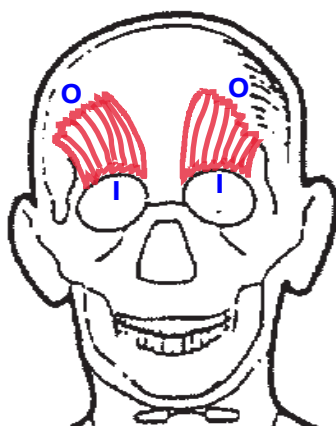
Draw in the **right** Masseter



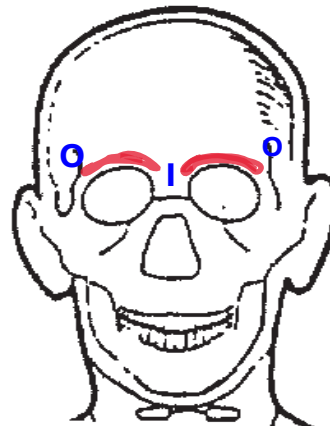
Draw in Orbicularis Oculi



Draw in Frontalis



Draw in Corrugator supercilii



Notes