

# Basic Canine & Feline Anatomy - Student Notes

*Directions:*

Fill in the blanks.

## **Cardiovascular System Segment**

### **1. Cardiovascular**

- Consists of the following:
  - heart
  - \_\_\_\_\_
  - blood \_\_\_\_\_

### **2. The Heart**

- Is composed of an involuntary cardiac muscle
- Pumps blood throughout the body using blood vessels
- Consists of four chambers
  - \_\_\_\_\_: top two chambers
  - \_\_\_\_\_: bottom two chambers

### **3. Blood Vessels**

- Are a \_\_\_\_\_ vascular structure in \_\_\_\_\_
  - transport blood from the heart throughout the body and back to the heart
- Include arteries, veins and capillaries

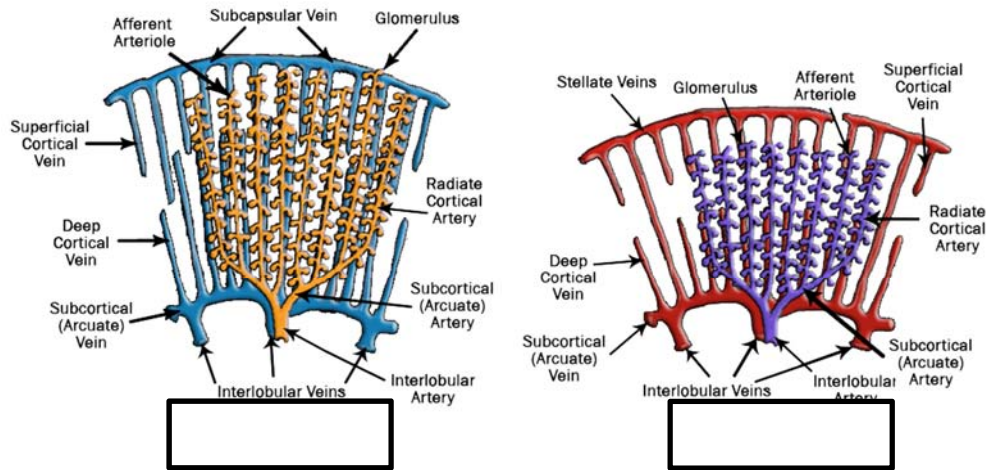
Interesting Fact: Chocolate is poisonous to dogs and affects their hearts when consumed, often resulting in death.

### **4. Arteries**

- Carry blood \_\_\_\_\_ from the heart
- Obtain blood under high pressure from the ventricles of the heart
- Contain \_\_\_\_\_ layers which allow them to stretch each time the heart beats therefore more blood is pumped out

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## 5. Arteries & Veins



Schematic diagrams of the cortical arteries and veins of the feline and canine kidneys

## 6. Veins

- Carry blood to the \_\_\_\_\_
- Receive blood from organs and tissues
- \_\_\_\_\_ waste products away from organs and tissues

## 7. Capillaries

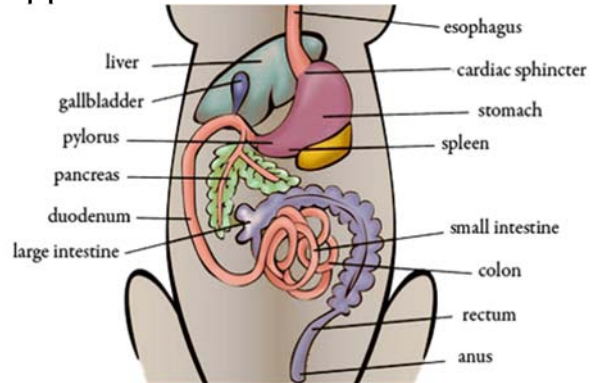
- \_\_\_\_\_ arteries and veins
- Exchange oxygen, water, salts and carbon dioxide between blood and surrounding body tissues
- Remove wastes from the surrounding \_\_\_\_\_

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## **Digestive System Segment**

### **1. The Digestive System**

- Takes in and digests food
- \_\_\_\_\_ solid wastes from the body
- Is also known as the \_\_\_\_\_ tract (GI tract) which can be broken into the upper and lower GI tract



### **2. The Upper GI Tract**

- Includes the following:
  - mouth
  - \_\_\_\_\_
  - esophagus
  - stomach

### **3. The Mouth**

- Houses \_\_\_\_\_ which are used to tear, scrape and chew food
- Includes the salivary glands which produce saliva, breakdown carbohydrates and lubricate the passage of food
- Contains the \_\_\_\_\_ which manipulates food for chewing and swallowing

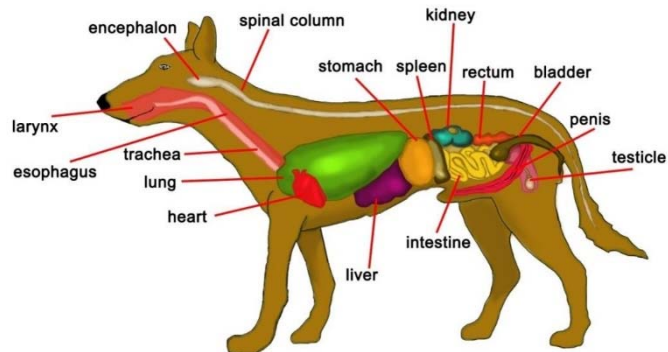
### **4. The Pharynx and Esophagus**

- The \_\_\_\_\_:
  - is located in the throat
  - allows the passage of air and food
  - directs food to the esophagus
- The \_\_\_\_\_:
  - lies between the pharynx and the stomach
  - allows for the passage of food
  - directs food to the stomach

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## 5. The Stomach

- \_\_\_\_\_ the esophagus and the small intestine
- Acts as a \_\_\_\_\_ spot for food during a meal
- Secretes many acids which are used to break down foods



## 6. The Lower GI Tract

- Includes the following:
  - small \_\_\_\_\_
  - large intestine
  - \_\_\_\_\_

## 7. The Small Intestine

- Is composed of the following:
  - \_\_\_\_\_: connects the stomach to the jejunum and is where the most chemical digestion takes place
  - jejunum: connects the duodenum to the ileum and absorbs carbohydrates and proteins
  - \_\_\_\_\_: absorbs vitamin B12, *bile salts*, water and other products not absorbed by the jejunum

Bile Salts – chemicals which aid in digestion by making vitamins easier to absorb from the small intestine

## 8. The Large Intestine

- Is also known as the \_\_\_\_\_
- Is composed of the following:
  - \_\_\_\_\_: aids *enzymes* in breaking down molecules into nutrients the body can use
  - colon: extracts water from feces
  - rectum: temporarily stores feces

Enzymes – proteins produced by living organisms causing or speed up a chemical reaction without being effected

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## 9. The Anus

- Excretes feces
- Consists of specialized \_\_\_\_\_ which allow it to detect whether the contents are liquid, solid or gas
- Is surrounded by \_\_\_\_\_ muscles which allow for the control of stool

Sphincter Muscle – a ring of muscle which contracts to close an opening

## 10. Other Organs of the Digestive System

- Include the following:
  - \_\_\_\_\_: secretes digestive enzymes
  - liver: produces *bile* to aid in digestion of fats
  - \_\_\_\_\_: stores bile until needed

Bile – a bitter liquid which aids in absorption and digestion

## ***Endocrine System Segment***

### 1. The Endocrine System

- Consists of organs which excrete \_\_\_\_\_ to control the body's responses to *stimuli* and functions
- Regulates growth, development and reproduction
- Produces, uses and stores energy
- Works with the nervous system to maintain the body's nutrition, metabolism and \_\_\_\_\_ of salt and water

Stimulus - an agent, action or condition which causes a response

### 2. The Endocrine System

- Consists of the following glands:
  - pituitary
  - thyroid
  - \_\_\_\_\_
  - adrenal
  - pancreas

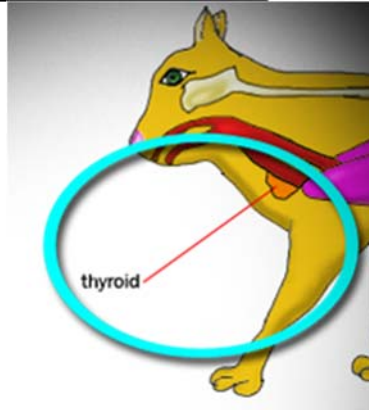
### 3. The Pituitary Gland

- Is located on the underside of the \_\_\_\_\_
- Produces specific hormones to respond to the needs of the body, including the following:
  - \_\_\_\_\_ hormones to stimulate the growth of cells and tissues
  - prolactin which stimulates milk production after birth

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## 4. The Thyroid Gland

- Is located in the neck next to the \_\_\_\_\_
- Controls how fast the body burns energy, makes proteins and the sensitivity of the body to other hormones
- Regulates the rate of \_\_\_\_\_



## 5. Parathyroid Glands

- Are located \_\_\_\_\_ the thyroid gland in the neck
- Are responsible for maintaining \_\_\_\_\_ levels
- Release a hormone to boost calcium levels when they sense the calcium level in blood is too low

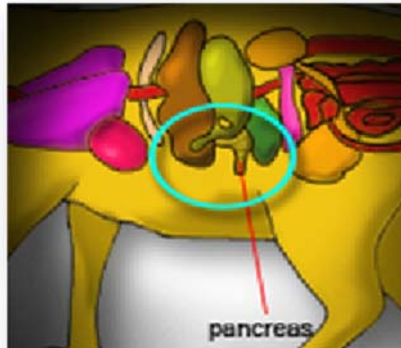
## 6. Adrenal Glands

- Are located on top of each \_\_\_\_\_
- Release hormones in response to stress or excitement
- Produce the following hormones:
  - \_\_\_\_\_: regulates salt and water balance in the body
  - cortisol: controls carbohydrate, protein and fat metabolism

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## 7. The Pancreas

- Is located in the upper \_\_\_\_\_
- Secretes insulin which metabolizes sugar
- Releases glucagon and \_\_\_\_\_ which regulate energy and metabolism in the body



## *Excretory System Segment*

### 1. The Excretory System

- Is responsible for the \_\_\_\_\_ of wastes from the body
- Regulates the amount of water and \_\_\_\_\_ present in bodily fluids

Ions – an atom or group of atoms which have a positive or negative electrical charge

### 2. The Excretory System

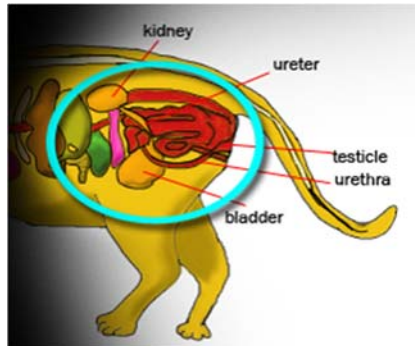
- Includes the following:
  - urinary system
  - liver
  - \_\_\_\_\_
  - lymph \_\_\_\_\_

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## 3. The Urinary System

- Is comprised of the following:
  - kidneys: filter blood to form and excrete urine as well as regulate fluid and \_\_\_\_\_ balance
  - bladder: hollow muscular organ which stores urine
  - \_\_\_\_\_: excretes urine from the body

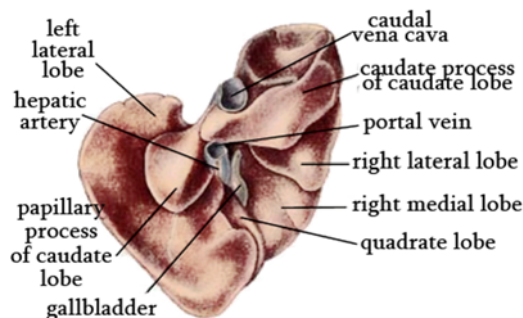
Electrolyte – a chemical substance which separates into ions and gives cells the energy needed to function



## 4. The Liver

- \_\_\_\_\_ blood of drugs and toxic substances
- \_\_\_\_\_ and alters the chemical structure of foreign material in blood
- Excretes these waste products in the form of bile

Metabolize – the processing of a specific substance within the living body



## *Immune System Segment*

### 1. The Immune System

- Identifies and kills \_\_\_\_\_
- Divides into two categories depending on how specific their functions are, the \_\_\_\_\_ and adaptive immune systems

Pathogen – any disease causing agent, such as a virus or bacteria



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## 2. The Innate Immune System

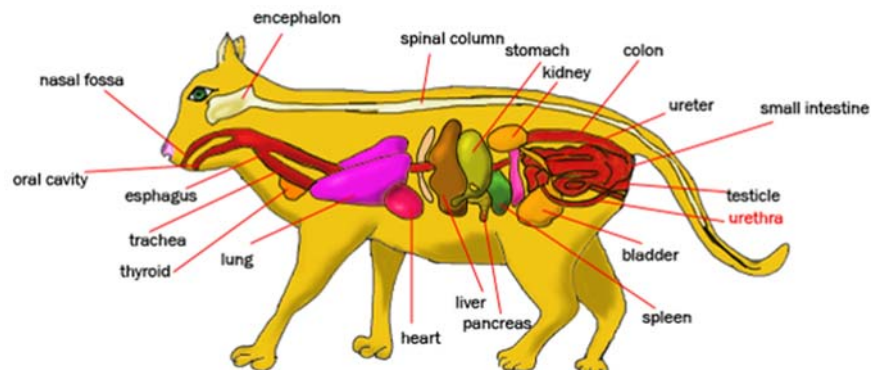
- Acts as the first line of \_\_\_\_\_
- Is nonspecific, meaning it tries to prevent everything from coming in
- Is \_\_\_\_\_
  - does not have a memory
  - will not learn to keep substances out even after repeated exposure
- Includes skin, fur, saliva, stomach acid and mucous

## 3. The Adaptive Immune System

- \_\_\_\_\_ specific threats to the body
- Designs different methods of attack for different invaders
- Is adaptive
  - has a \_\_\_\_\_
  - remembers how to defeat an infection and will be able to overcome it faster if exposed again
- Works with the innate immune system to prevent disease and remember how to treat previous attacks
- Includes the spleen and lymph nodes

## 4. The Spleen

- Is located in the \_\_\_\_\_
- \_\_\_\_\_ worn out red and white blood cells
  - breaks them down and returns needed iron to the blood while excreting the excess material as waste



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## 5. Lymph Nodes

- Are scattered throughout the body
- Filter the \_\_\_\_\_ of particular matter and microorganisms
- \_\_\_\_\_ waste to veins to be evacuated

Lymph – a clear fluid containing white blood cells derived from the tissues of the body

## *Integumentary System Segment*

### 1. The Integumentary System

- Includes the skin, fur, nails and sweat glands of an animal
- Distinguishes, protects and separates an animal from its surroundings
- \_\_\_\_\_ to the animal by acting as a receptor for touch, pain, pressure and temperature
- Acts as an innate \_\_\_\_\_ system

### 2. Skin

- Is composed of the following three layers:
  - \_\_\_\_\_: outermost layer of skin
  - dermis: connective tissue which provides the body with cushioning from stress and strain as well as housing sweat glands, hair follicles and nerve endings
  - \_\_\_\_\_ tissue: provides insulation and nutrient storage

## *Muscular System Segment*

### 1. The Muscular System

- Allows an organism to \_\_\_\_\_
- Represent \_\_\_\_\_ in dogs and allows them to jump, run and play
- Is highly evolved in cats and allows swift, agile movements used for catching prey and escaping predators

Fun Fact: Cats have 32 muscles in each ear

### 2. Muscles

- Can be divided into the following:
  - voluntary
  - involuntary
  - \_\_\_\_\_
  - skeletal
  - cardiac

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## 3. Voluntary Muscles

- Can be controlled by \_\_\_\_\_
- Consist mainly of \_\_\_\_\_ muscle
- Include muscle found in the arms and legs

## 4. Involuntary Muscles

- Contract without conscious control
- Consist primarily of muscle \_\_\_\_\_ organs
- Include muscle found in the stomach, \_\_\_\_\_ and bladder

## 5. Smooth Muscle

- Is \_\_\_\_\_ muscle tissue
- Forms thin layers or sheets of flat muscle
- Cells have \_\_\_\_\_ nucleus

## 6. Skeletal Muscle

- Is usually voluntary muscle tissue
- Is connected to a \_\_\_\_\_
- Is elongated and striped
- Cells have many \_\_\_\_\_

## 7. Cardiac Muscle

- Is an involuntary muscle tissue
- Is found specifically in the \_\_\_\_\_
- Has \_\_\_\_\_ to the continuous rhythmic contractions of the heart

## *Nervous System Segment*

### 1. The Nervous System

- Is constructed of specialized tissue which controls the actions and reactions of organisms to their environment
- Coordinates the activity of \_\_\_\_\_
- Involves sensory stimulation to evoke \_\_\_\_\_
- Is divided into the central and peripheral nervous systems

Motor Response – activities which result in muscular reaction

### 2. The Central Nervous System

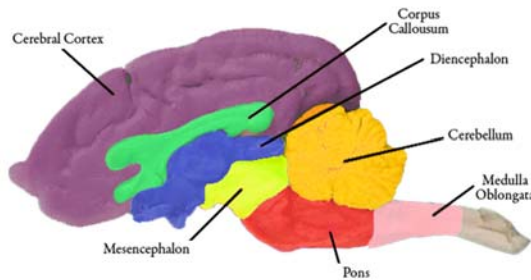
- Includes the following:
  - \_\_\_\_\_
  - spinal cord

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## 3. The Brain

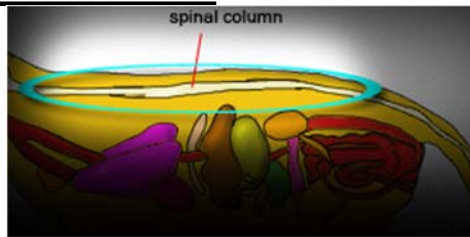
- Receives messages from all over the body and tells it how to react
- Houses billions of \_\_\_\_\_
- Is protected by the \_\_\_\_\_

Neurons – impulse conducting cells which carry and transmit electrical signals throughout the nervous system



## 4. The Spinal Cord

- Consists of a long bundle of nerve tissue
- Starts at the \_\_\_\_\_ of the brain and continues down the spine
- Allows nerves to branch out, forming the peripheral nervous system
- Is protected by \_\_\_\_\_



## 5. The Peripheral Nervous System

- Consists of the following
  - \_\_\_\_\_ nerves: are located on the brain and carry impulses to the head and neck
  - spinal nerves: extend from the spine and provide information to areas of the body below the neck
  - \_\_\_\_\_ nerves: responsible for involuntary body functions such as breathing and digestion

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## Reproductive System Segment

### 1. The Female Reproductive System

- Includes the following:
  - ovaries
  - uterus
  - \_\_\_\_\_
  - vulva
  - mammary \_\_\_\_\_

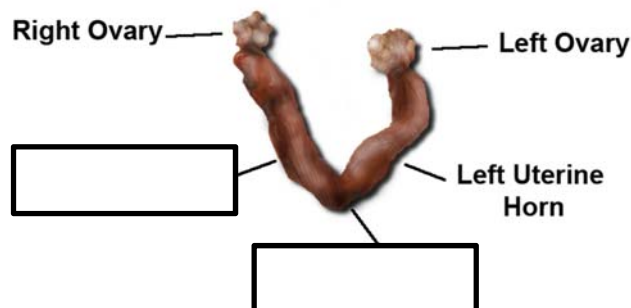
### 2. The Ovaries

- Are located right behind the \_\_\_\_\_
- Contain eggs which are waiting to be fertilized
- Produce \_\_\_\_\_ such as estrogen and progesterone

### 3. The Uterus

- \_\_\_\_\_ muscular organ
  - Two long, nearly straight horns
  - Serves as the site of \_\_\_\_\_ of fertilized eggs and fetus development
  - The top two sections are called uterine horns and extend from each ovary to join with the uterus
    - when pregnant, the fetuses are arranged in a row in both horns
- Implantation – the attachment of the early embryo to the lining of the uterus

### 4. The Uterus



### 5. The Vagina

- Is the site where males deposit semen during reproduction
- Provides a \_\_\_\_\_ from the outside to the inside of the uterus
- Provides a protected passage for fetuses to move from the uterus to the outside during \_\_\_\_\_

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## 6. Mammary Glands

- Run from the \_\_\_\_\_ to the chest
- Are composed of connective tissue to provide support and structure
- Provide \_\_\_\_\_ for any offspring

## 7. The Male Reproductive System

- Includes the following:
  - scrotum
  - testicles
  - \_\_\_\_\_
  - deferent ducts
  - \_\_\_\_\_ gland
  - penis

## 8. The Scrotum

- Houses the \_\_\_\_\_
- Functions as a \_\_\_\_\_ regulator for the testicles and epididymides
- Lies toward the back of the abdomen between the hind legs in dogs
- Lies just below the anus in cats

## 9. Testicles

- Reside in the \_\_\_\_\_
- Contain seminiferous tubules which manufacture sperm
- Produce \_\_\_\_\_

Testosterone – sex hormone responsible for developing male secondary sex characteristics

## 10. The Epididymides

- Are enlarged tubes which lie along the edge of a testicle
- Start at the \_\_\_\_\_ of a testicle and end on the bottom
- Store sperm before ejaculation
- Transport \_\_\_\_\_ to the deferent ducts

## 11. The Deferent Ducts

- Are muscular tubes which begin at the tail of the \_\_\_\_\_ and empty into the urethra
- Transport sperm from the epididymides to the \_\_\_\_\_ using strong contractions along the muscle wall

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## 12. The Penis

- Is housed within a \_\_\_\_\_ when not erect
- Acts as the male sexual organ
- Contains specialized connective tissues and \_\_\_\_\_ vessels which allow it to become erect

Prepuce – protective tubular sheath of skin

## ***Respiratory System Segment***

### 1. The Respiratory System

- Takes in \_\_\_\_\_
- Eliminates waste gases such as carbon dioxide
- \_\_\_\_\_ temperature

### 2. The Respiratory System

- Includes the following:
  - \_\_\_\_\_: oral cavity where air is admitted and released
  - nose: admits and releases air in conjunction with the mouth
  - trachea: tube which transports air gained from the mouth or nose into the body and out
  - \_\_\_\_\_: transport oxygen into the body and carbon dioxide out of the body

### 3. Temperature Regulation

- Must be completed because dogs and cats do not \_\_\_\_\_ like humans to help cool their body
- Occurs when animals pant, which replaces the warm air in the body for the cooler outside air

## ***Skeletal System Segment***

### 1. The Skeletal System

- Serves many different functions throughout the body
- Is composed of five different types of \_\_\_\_\_
- Divides into \_\_\_\_\_ parts including the axial, appendicular and visceral skeletons

Fun Fact: Almost 10 percent of a cat's bones are in its tail

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## 2. The Skeletal System

- Supports the body
- Provides a system of levers which are used in movement
- Protects the \_\_\_\_\_ organs inside the body
- Produces \_\_\_\_\_ blood cells

## 3. The Skeletal System

- Is composed of the following five types of bone:
  - \_\_\_\_\_ bones: found in the limbs
  - short bones: only in the wrist and ankle regions
  - flat bones: found in the pelvis and head
  - irregular bones: found in the vertebral column and parts of the skull
  - \_\_\_\_\_ bones: found in locations where tendons pass over joints, such as the knee

Tendon – tissue which serves to connect muscle with a bone

## 4. The Skeletal Systems

- Include the following:
  - \_\_\_\_\_ skeleton: the bones of the head and trunk, such as the skull and vertebral column
  - appendicular skeleton: bones which comprise limbs, such as the femur and tibia
  - \_\_\_\_\_ skeleton: bones which form part of an organ, such as the ossicles in the middle of the ear

## 5. The Canine Skeleton

- Differs from the human body in that it is designed to allow the dog to run fast, hunt and chase
- Is not tightly attached to the \_\_\_\_\_ blades, allowing for a higher potential of greater motion and flexibility
- Consists of an average of \_\_\_\_\_ bones, while the human skeleton consists of 206

## 6. The Feline Skeleton

- Differs from the human body in two major ways:
  - their backbone contains \_\_\_\_\_ bones than ours, mainly due to the tail, and their vertebrae are not as tightly connected, allowing for higher flexibility
  - they do not have a \_\_\_\_\_