LAB 1: Introduction to A&P and the Microscope

Unit 1: Introduction to Anatomy & Physiology

Anatomical terms (based on **anatomical position**):

Directional Terms:

- Superior – Inferior
- Anterior - Posterior
- Medial – Lateral
- Proximal – Distal
- Superficial – Deep
- Parietal – Visceral

Body Regions:

- Abdominal
- Antebrachial
- Axillary
- Brachial
- Calcaneal
- Cephalic
- Cervical
- Cranial
- Femoral
- Frontal
- Lumbar
- Nasal
- Occipital
- Pelvic
- Scapular
- Sternal
- Tarsal
- Thoracic
- Umbilical
- Vertebral

Body Cavities and Membranes

Major Body Cavities:

1) Dorsal Cavity
   - Cranial cavity
   - Vertebral (spinal) cavity

2) Ventral Cavity
    - Thoracic cavity
        - Pleural cavity
        - Mediastinum
        - Pericardial cavity
    - Abdominopelvic cavity
        - Abdominal cavity
        - Pelvic cavity

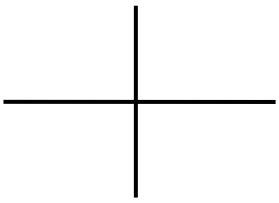
Serous Membranes:

Pleural: Visceral & Parietal

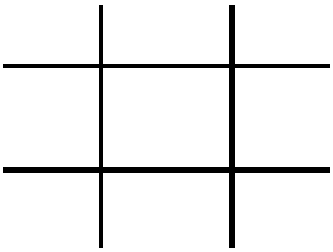
Pericardial: Visceral & Parietal

Peritoneal: Visceral & Parietal

4 quadrants:



9 abdominopelvic regions:



Sectional Anatomy:

Sagittal

Mid-sagittal

Parasagittal

Coronal (frontal)

Transverse

Oblique

Organs and Organ Systems

- Integumentary
- Skeletal
- Muscular
- Nervous
- Endocrine
- Cardiovascular
- Lymphatic
- Respiratory
- Digestive
- Urinary
- Reproductive

Unit 3: Introduction to Cells and Microscope

Parts:

- Arm
- Base
- Lamp (light source)
- Stage
- Mechanical stage
- Ocular lens
- Objective lenses
- Iris diaphragm
- Nosepiece
- Coarse adjustment knob
- Fine adjustment knob

Terms:

Resolution

Working distance

Field of view

Parfocal

Depth of Field

Magnification vs. Total Magnification

Objective lens	Magnification	(Objective x Ocular) =	Total Magnification
Scan	4x	4 x 10	40x
Low			
High			
Oil			

Slides:

“e”

crossed threads

wet mount of hair

wet mount of cheek cells

live specimen (Paramecium/ Euglena)

Lab 2 : Diffusion, Osmosis, Tonicity

Diffusion

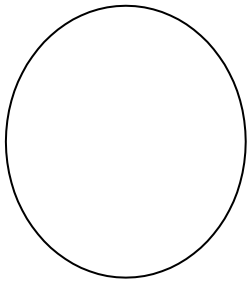
Def.:

Experiment 1: Diffusion in liquid (Groups of 4)
Observation of MeBlue in water:

Experiment 2: Diffusion in a semi solid medium (Groups of 4)

- petri dish with agar
- remove two small plugs of agar with a straw
- place $KMnO_4$ (MW 158g) and MeBlue (MW 320g) within each well

Observation of the diffusion rate vs. molecular weight:



Experiment 3: Diffusion and Membrane Permeability (Groups of 4)
Color of solution in beaker:

Color of solution in dialysis bag:

IKI (iodine) → test for _____

positive test = _____

Osmosis and Tonicity

Def.:

Experiment 4: Thistle tube osmometer (DEMO)

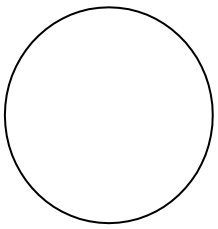
Molasses in thistle tube

Water in beaker

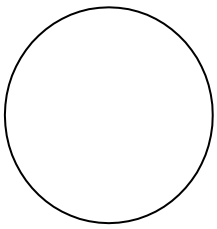
Experiment 5: Osmosis and living cells - red blood cells (Groups of 4)

Observe (under the microscope) RBCs in each of the following solutions:

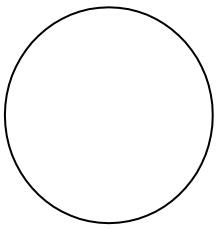
0.9% NaCl



100% dH_2O



10% NaCl



Which solution was hypotonic? Explain.

Which solution was isotonic? Explain.

Which solution was hypertonic? Explain.

Did you observe hemolysis or crenation? Where?

Filtration (Groups of 4)

Def.:

Experiment 6:

Pour solution of copper sulfate, charcoal, and starch through filter paper in a funnel over an empty beaker.

Which passes through the filter paper into the beaker?
Explain why or why not.

Copper sulfate:

Charcoal:

Starch:

Lab 3: Cell Division and Epithelial & Connective Tissue

Cell Cycle = Interphase + Mitosis

Interphase:

$G_{0:}$

$G_{1:}$

S:

$G_{2:}$

Mitosis (M phase):

Prophase:

Metaphase:

Anaphase:

Telophase:

Slide: Whitefish blastula

Spermatogenesis

Oogenesis

Slides:

Testis

Sperm

Ovary

Unit 4: Tissues

Four main tissue types: _____ _____

_____ _____

Epithelial tissue:

Know characteristics, functions, and locations for each tissue type.
Make a sketch of each cell type as you go through each of the slides.

Simple squamous:
Slide: Lung

Mesothelium

Simple cuboidal:
Slide: Kidney (tubules)

Simple columnar:
Slide: Villi of small intestines

Goblet cells

Stratified Squamous:
Slide: Esophagus

Skin – Palmer (epidermis)

Pseudostratified ciliated columnar: PSCCE
Slide: Monkey trachea

Transitional:
Slide: Transitional (urinary bladder)

Connective Tissues:

Adipose (Fat):
Slide: Adipose

Dense irregular CT:
Slide: Skin (dermis)

Lab 4 : Integumentary System

Regions of Cutaneous Membrane: Functions:

Epidermis

Dermis

Epidermis

Tissue type:

5 specific cell layers: Stratum corneum

(or strata) Stratum lucidum {thick skin only}

Stratum granulosum

Stratum spinosum

Stratum basale

Dermis

Tissue type:

2 specific layers: Papillary layer
Reticular layer

Hypodermis

Tissue type:

No specific layers.

Not considered a region of the integument!

Histology of Integument

Slide 1	Slide 2	Skin Model
Skin palmer (thick skin) Identify:	Scalp (thin skin) Identify:	Identify:
Regions	Regions	(All structures, regions, and layers from the slides)
Specific Layers	Tissue Types	Arrector Pili Muscle
Tissue Types	Hair Follicle	
Sweat glands	Hair Shaft	
	Sebaceous Glands	
	Sweat Glands	

Tissue / Cell Type	Regions	Specific Layer
	Epidermis	1. 2. 3. 4. 5.
	Dermis	1. 2.
	Hypodermis	