Life Sciences/HHMI OutReach PROGRAM

Teacher Guide
The Morphology and Function of Tissue Types
Using prepared slides and internet resources to understand histology

Overview and Rationale:

Students will be able to identify, draw, describe and label various tissue types. In order to best understand the morphology AND the function of the tissue types students will

1. Make lab drawings based on prepared slides
2. Describe how the morphology of the cell is related to the function (ex: skeletal muscle is made up of sliding fibers because it's function is to contract or shorten allowing for movement)

Lesson Components:

15 minutes: Outline notes on 4 different cell types

Provide students with the basic types and locations of the following major tissue types:

A. Muscle (smooth, skeletal, cardiac)
B. Connective (bone, blood, adipose, cartilage)
    a. Big clue to give students here is the idea of cells in matrix
C. Nervous
D. Epithelial (squamous, cuboidal, columnar AND stratified, simple)

15 minutes: Student collaboration and critical thinking

Give students one "flash card" each and have them find the 2 other people in class that they match up with. Cards will either have:

1. Type of tissue and morphology
2. Appearance of real cells (image)
3. Location/Function of tissue

15 minutes: Student share

Once student are in groups of three they must look at the image and determine what is one cell. Then the group will present their 3 flash cards to the rest of the group and explain them.

Homework:
Students take notes on tissue types using their textbook. Notes should be focused on describing the morphology of the tissue types, the specific location in the human body, and the function.

30 minutes: Microscope lab work
Students will use their knowledge from previous class and homework to find examples of the various tissue types on prepared slides of various healthy human tissue. (Ex: Carolina biological supply company: Medical histology slides or comparable slides)

30 minutes: Internet lab work
Students will use the Internet sites listed here to complete sketches of the various tissue types in the human body.

Use these internet resources:
http://www.udel.edu/biology/Wags/histopage/colorpage/colorpage.htm
has great images but no labels of the following histological sections

Adipose Tissue	Cartilage	Endocrine Glands
Eye	Integumentary System	Lymphatic System
Nervous System	Peripheral Blood	Spleen and Thymus
Blood Vessels	Connective Tissue	Epithelium
Female Reproductive System	Large Intestine	Male Reproductive System
Oral Cavity	Respiratory System	Urinary System
Bone	Ear	Esophagus and Stomach
Hematopoeisis	Liver and Gall Bladder	Muscle
Pancreas	Small Intestine	

http://www.kumc.edu/instruction/medicine/anatomy/histoweb/
Images on the flash cards come from this website: brief explanations of following images, some categories have an overview of location and function as well

Cell Structure	Lymphoid
Epithelia	Skin
Glands	Respiratory
Nervous	GI System
Muscle	Eye & Ear
Connective	Endocrine
Cartilage	Urinary
Bone	Female
Vascular	Male
Blood	Histopathology

http://www.udel.edu/biology/Wags/histopage/histopage.htm
links to the first University of Delaware (UDel) site and has additional information including lecture notes and one link needs an additional plug-in to function
http://www.histology-world.com/ Site has a HUGE table of contents including:

> http://www.histology-world.com/audioslides/audio.htm which has views of slides and audio explanations

http://www.tvcc.edu/depts/biology/Study%20Resources/A&P/review_of_tissues.htm Images with no explanations- but tissue type is noted in URL and a good practice quiz
http://media.pearsoncmg.com/aw/bc_marieb_humananphy_5/hap_place_media/medialib/histology/index.html Excellent resource mimics levels of magnification and gives hints about image being viewed, labels can be added.