

Introduction to Bones

The focus of this lab is to identify the general structures associated with bone tissue and to understand the chemical composition of bone. Since they may not have begun the skeletal system yet in lab, it may help to give a brief chalk talk on

- The difference between axial and appendicular skeleton
- The difference in organization between spongy and compact bone
- Anatomy of a long bone
- Microscopic anatomy of compact bone (osteon)
- ECM of compact bone

Case Study: The Mysterious Femur Fracture

The idea behind the case study is to understand what makes bone strong or weak by evaluating the shape, density, age, and chemical composition of bone.

Activity 1- Examining the Gross Anatomy of Bones (students work in pairs)

Students will use the images in their lab instruction book to complete this activity. They will review draw a long bone and label the parts based on the images in the lab. This is also a good activity to do together on the board – just be sure the class helps you with this.

Materials need in the Lab:

Materials for the trays 1 tray/group:

Activity 2- Examining the Cartilage Associated with Bone (students work individually and in pairs)

Using a microscope, students will identify the three types of cartilage and learn to differentiate between them microscopically. They also need to locate the different types of cartilage on a laminated image and explain why that type of cartilage functions best in each location.

Materials needed in the Lab: Microscopes (1 per student)

Materials for the trays 1 tray/group: microscope slide box with hyaline cartilage, elastic cartilage, and fibrocartilage (2 of each slide in the box if possible), lens paper, isopropyl alcohol

Activity 3- Examining the Microscopic Histology of Bone (students work individually and in pairs)

Students should use the osteon model and slides available for compact bone. They should feel comfortable identifying structures on both the model and on the slide of compact bone. And they should use the images in their lab workbook and instruction manual to learn how to compare compact with spongy bone.

Materials needed in the Lab: Model of an osteon, binder and sticky labels

Materials for the trays 1 tray/group: labels with sticky tack, microscope slides of compact bone and spongy bone, lens paper, isopropyl alcohol

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Activity 4- - Examining the Components of Bone (students work in pairs)

Please be sure that students wear gloves for this activity. The bones will be in a tray in the fridge – please place them out on the side bench before the start of lab. Students only need to feel the difference in texture and strength in the bones. Student **MUST** wear gloves if they touch the bones (one of them is a raw chicken bone)

Materials: tray with a baked bone, fresh bone and acid-soaked bone (in the fridge)

Putting It All Together

Remind students that there are questions pertaining to the case study that they must answer prior to leaving lab.

Lab Clean-up Instructions

Students must clean the lab benches with the disinfectant solution. Please be sure students remove ALL labels from any models. Microscopes must be put away correctly – stage down, scanning objective in place.