



## **Anatomy Projects**

### **Objectives**

- ❖ To use movement to explore anatomy in ages 10 and above.
- ❖ To help students learn more about his / her body.
- ❖ To explore the anatomy and movement of the knee.

## *The Knee*

1. As you are handing out the Activity Sheets for this lesson, have the students roll their pants up past their knees and sit on the floor.
2. Ask the students to name the bones that made up the lower leg (shin). These are the **fibula** and **tibia** . Have the students run their hands down their lower legs to feel these bones. The tibia is the bone nearest the center of the lower leg (commonly called the shin bone) and the fibula is more to the lateral (outer) side of the leg. The top of the fibula is the boney bump below and to the outside of the patella, and the bottom edge is the bump on the outside of the ankle commonly referred to the ankle bone, where it is easily seen and felt. The bottom of the tibia bone is the boney bump on the inside of the ankle area.
3. Have the students take the thumb of each hand and run them down the inside and outside edges of the thigh. They will feel a lump on either side of the top edge of the patella. These are called epicondyles and mark the end of the femur (thigh).
4. Have the students find the patella (kneecap) and gently feel around the circumference. They can gently move the patella in all directions when their knee is straight and muscles relaxed. The patella is encased in the tendon of the quadriceps and its movement is influenced by its shape and position at the knee joint. When the knee is in the process of bending and straightening, the patella stays within the groove of the femoral condyles. When the knee goes into hyperextension the patella loses its efficient tracking ability, not a desirable goal.
5. Have the students identify the bony landmarks they just found with their hands on the diagram of the knee.
6. Discuss how the knee joint is created by the balancing of the femur on the tibia with the patella floating in front of the femur between the epicondyles.
7. Ask the students what types of movement the knee should have. Explain how the knee is a hinge joint and should only flex and extend (bend and straighten) When the knee is flexed the lower leg can rotate inward and outward. This can lead to a twisting force at the knee joint and wear and tear on its ligaments if the dancer turns out from the knee or ankle, rather than from the hip joint. It is because of this it is suggested dancers rotate into first position with straight legs, rather than planting the feet, with the knees bent, and then straightening the legs.

8. Lead the students through the following movement exercise.
  - A. Have the students stand in parallel with their legs in neutral alignment with the hip, knee and ankle in line.
  - B. Tell the students to demi pli   a few times. Ask the students to name the motion of the joints of the leg as they lower and rise in their demi pli  .
    - i. Hip joint: flexes on the way down and extends as they straighten.
    - ii. Knee joint: flexes on the way down and extends as they straighten.
    - iii. Ankle joint: dorsiflexes on the way down and returns to neutral as they straighten.

## ***The Knee***

### **Movement Activity**

Stand with your heels under your hips, keeping the legs as parallel as possible and still maintain neutral joints. Bend the knees into a demi plié', paying attention to maintaining correct alignment of the knee and ankle. Stretch the pelvis away from the floor as you return to standing.

### **Anatomy of the Knee**

Label the diagram of the knee below by identifying the following bony landmarks:

**Patella**

**Femur**

**Epicondyles of the femur**

**Fibula**

**Tibia**

