

The Knee3D

Teaching Human Anatomy through 3D simulation

Lesson

Teaching Human Anatomy through 3D simulation

Objectives

1) Students will gain a basic understanding of the Knee through 3D simulation and visualization,

2) Students will gain a deeper understanding of the components of the Knee, and how they function together.

Activity

Students travel through the Knee in real-time 3D, helping them to visualize and understand its structure and function.



Materials

Knee3D Homepage

(click or cut and paste URL into browser)

<http://www.sunrisevr.com/theknee3d>

3D Simulation and Investigation

3D simulations are designed to make subject matter more engaging to today's technology-savvy kids, and help them bridge the gap between the "concrete" world and the abstract world of concepts. When students experience complex subject matter in real-time 3D it becomes clearer. Students learn best when they are actively immersed in subject matter from a variety of different viewpoints; 3D simulation is designed to help students visualize difficult ideas and objects through investigation at any scale (atomic, cellular, planetary, conceptual, etc), and doing things that would normally be impossible.

Required Technology

- PC/Tablet

Optional Technology

- Projector
- Multiple Computers
- Internet Connection

Grouping

- Large Group Instruction
- Small Group Instruction

Staging

Check computer/Tablet for Internet access if needed

Procedure

1. Access program
2. Pick a lead student navigator to control movement through the 3D environment
3. Pick a lead student reader to read information about the Knee as it appears on-screen
4. Begin the lesson by asking students what they already know about the Knee; write responses on the board
5. Review basic facts about the Knee including:
 - The Knee is the largest joint in the body
 - The Knee is the intersection of four leg bones
6. Start traveling through the program, facilitate discussion by asking students where the class should go.
7. Use the 3D simulation as a visual aid; explain information as needed
8. Have students pay special attention to:
 - The number of ligaments
 - The function of the Knee
9. Have a final wrap-up with students with a question and answer period about the Knee. Ask them how it works, and what are the primary components and function of each component.

Optional Activity: 3D Scavenger Hunt + Discussion

Have students find a particular part of the Knee, such as the Medial Collateral Ligament (MCL). If students are on multiple computers, have them “race” to the part of the Knee the teacher wishes to highlight. Once students find/arrive at the location, the teacher may commence discussion. Repeat in other areas of the simulation as desired to build understanding.

Homework/Review

Students may also access the program outside the classroom to supplement textbook questions

Functional Notes

- An internet connection is needed
- Ensure the Unity3D Player or Adobe Flash is installed on the computer; download the latest at <https://unity3d.com/webplayer> and <http://www.adobe.com/downloads.html>.
- If you see something in **red** you can probably click on it
- For ease of use you can go through most 3D objects, and even the ground
- The school library can request and access programs (free) at www.sunrisevr.com for off-line use via PC and Mac if there is no internet connection