Educator Guide

Activity at a glance

Time to complete	Approximately 1-1.5 hours
Age level	Advanced high school, College, or Professional school
Bloom's level(s)	• BL1 - Remember • BL2 - Understand
Learning objective	After completing this activity, students will be able to **identify** (BL1 - Remember) the connective tissues of the knee, **describe** (BL2 - Understand) their position relative to other structures using anatomical language, and **match** (BL2 - Understand) these structures from a 2D diagram to a 3D physical model.
Assessment	• **Students:** Students can assess their own work by comparing their answers to an anatomical reference text or atlas. • **Educators:** Educators can assess students' work by comparing the completed activity worksheet to the answer key (only visible to educators).
Materials needed	See Materials needed

Systems / Tissue types	• Connective tissues
	  ◦ Bones
	  ◦ Cartilage
	  ◦ Ligaments
	  ◦ Tendons

Core concepts	Not applicable for Bloom's levels 1-2
Competencies	• Integration of 2D and 3D representations • Observation
Activity ID	HSKN1

About the kit, viewing answer key, purchasing kits, and more

Why was this kit developed?

The Human Knee Active Learning Kit is a life-size and fully functional reproduction of a real knee designed by 3D Anatomy Studios to engage learners in a deeper understanding of knee structure and function through hands-on activities.

Who made this kit?

The Human Knee Active Learning Kit was designed by 3D Anatomy Studios founder Aaron Olsen, PhD. Aaron is a professional anatomist and designer who has published several peer-reviewed articles on the form, function, and evolution of vertebrates and has taught comparative vertebrate anatomy at the University of Chicago and human gross anatomy at the University of Chicago's Pritzker School of Medicine and Brown University's Warren Alpert Medical School. The kit was designed in the open-source 3D modeling program Blender using public domain data from the NIH Visible Human Project. Every kit is made by hand at the 3D Anatomy Studios workshop in Portland, Oregon.

When was this kit made?

Initial development of the Human Knee Active Learning Kit began in late 2024. Prototypes were exhibited at the Society for Integrative and Comparative Biology annual meetings in January 2025 and January 2026 and the first commercially available version of the kit was completed in May 2026.

Where did the anatomical data come from?

The anatomical data used to build the kit were sourced exclusively from the Visible Human Female of the NIH Visible Human Project. These data were first released into the public domain in 1995. Because these data are in the public domain, they can be used for any purpose, including commercial use. Hard tissue data (i.e., bones) were segmented from CT scans and soft tissue data (i.e., muscles, tendons, ligaments, cartilage, etc.) were segmented from cryosection image stacks. All segmentation was performed using the open-source software 3D slicer. Meshes exported from 3D Slicer and their face count was reduced using the open-source software MeshLab, before importing meshes into Blender.

How is the kit licensed? Can I copy the kit?

3D Anatomy Studios asserts copyright over the Human Knee Active Learning Kit, covering all aspects of the kit design, including packaging, that represent creative expression, beginning with its initial design in 2025. This grants 3D Anatomy Studios exclusive rights to reproduce, distribute, display, or adapt the kit. If you'd like to request permission to reproduce, distribute, display, or adapt the Human Knee Active Learning Kit, please email us at contact@3danatomystudios.com. Requests that are non-commercial may be granted at no cost; commercial requests may require a licensing fee. Please note that while 3D Anatomy Studios asserts copyright over the kit itself, the activity guides for the kit are released with a CC NC-BY-SA license.

How do I use the kit?

You can use the kit to learn about knee structure and function by completing any of the available activity guides. All the activity guides are maintained by 3D Anatomy Studios at guides.3das.us using the open-source wiki software Bookstack. Every activity guide for the kit follows the same structure:

- Activity Worksheet: a printable PDF that you can fill in
- Activity Guide: a step-by-step guide through the activity with hints and self-assessments
- Educator Guide: an overview of the activity for educators and answer key

How do I view the answer keys?

The activity answer keys will only be visible to logged in users who have been given educator permissions and have purchased one or more Human Knee Active Learning Kits. Once you've been granted access, you can find the answer keys in the "Educator Guide" section of each activity. If you've purchased one or more kits, you should have received an email to access your Educator account. If you need us to resend this email or have any other issues accessing your account, please email us at contact@3danatomystudios.com.

Can I share and/or edit the activity guides?

All of the activity guides for the kit are released under a CC NC-BY-SA license. This allows you to share and edit this module as long as you (1) do not sell the module or module derivatives ("NC"), (2) attribute the author(s) of all the content, including preserving text and graphic attributions ("BY"), and (3) share the module under the same license ("SA").

How can I purchase kits?

To purchase Human Knee Active Learning Kits, please send us an email to contact@3danatomystudios.com.