Unit 2 - Intro to Modeling with Blender

Lesson #6 - Orientations & Object Data

CG Cookie Videos used in this lesson

Videos for this unit are available within the [Mesh Modeling Fundamentals](#) Download, or Included within the [Educator Blender Bundle](#).

- Transform Orientations: Global & Local Space   8 min
- Object VS Mesh Data   4 min
- Shared Mesh Data   5 min

Key Training

- Transforming objects in global and local space.
- Naming of Objects and how the are containers for mesh data.
- Duplication of Objects and the difference between linked and unlinked objects.

Instructor Focus and Tips

- Review X, Y and Z coordinates as part of this lesson. Work with students on understanding global space then focus on local space.
- Show the students the difference between what happens in edit mode and in object mode when you add an object. Show them that the menus are different. In object mode, you will have a full menu, and, in edit mode, you will only be able to add mesh data.
- Some students will add mesh data to an object in edit mode when they mean to create a brand new object. (This is when you walk up to their computer and magically fix it by using the **Hotkey: P** to separate selected vertices into separate objects.)
- If you haven't by now, get students to start naming their objects. Set a standard for naming objects while discussing the importance of this. E.*g. when handing files off to other artists in the production pipeline.*

Student Activities and Assignments

- Have the students watch the video Transform Orientations: Global & Local Space then practice transforming the monkey in global and local space.
- Have the students watch the Object VS Mesh Data and Shared Mesh Data videos. Then have them practice making copies of the monkey.
- **Assignment** - Have the students start a new Blender project and delete the cube. Insert a monkey mesh model (Susan). Make a duplicate of this first model

and move it to the right of the original. Next, make a Linked Duplicate version of the model and move this to the left of the original. Finally, go into Edit Mode on the original Monkey model and transform some of the vertices. Then do this on the far right and far left monkey meshes. Notice the behavioral differences. This give student an example of what the difference between duplication and linked duplication. Have them save and submit a screenshot for approval.

Blender Terminology, Commands and Hotkeys Introduced
- Global Space and Local Space
- Duplicate object (Hotkey: Shift D)
- Linked Duplicate object (Hotkey: Alt D)
- Hide Mesh object (Hotkey: H in edit mode)
- Unhide Mesh objects (Hotkey: Alt H in edit mode)

BellRInger Prompts and Ideas
- Where can you find the current transformations of an object?
- Define the orientation of an Object?

Exit Ticket Prompts and Ideas
- Explain the difference between global and local space?
- What are the two ways to duplicate an object.

Learning Targets
- Students can transform object in Global and Local Space.
- Student can name objects.
- Student can create duplicate objects,
- Student can create linked and unlinked duplicate objects.

Extended Learning Activity
- Explore the View, Normal and Gimbal orientations. What is Gimbal orientation?

Rubric

	Beginning	Developing	Accomplished	Exemplary
Global and Local Space	Student has received a demonstration on global and local space.	Student can transform an object using global and local space with assistance.	Student can transform an object using global and local space without assistance.	Student can transform an object using global and local space without assistance and can explain to others.
Shared Mesh Data Duplicating and Link duplication	Student has received a demonstration on shared mesh data.	Student demonstrates an ability to create duplicate objects with assistance,	Student demonstrates an ability to create duplicate and linked duplicate objects without assistance.	Student demonstrates an ability to create duplicate objects, to create linked duplicate objects, and to unlink linked data.

Standards

Standard 1: 3D Modeling Application Interface

- **Objective 1: Introduce basic 3D terminology and the 3D application interface.**
  - o Indicator 1: Know 3D modeling terminology
  - o Indicator 2: Identify parts of the 3D application interface

Standard 2: Modeling 3D Objects

- **Objective 1: Use and manipulate 3D graphics and primitives**
  - o Indicator 1: Use 3D primitives
  - o Indicator 2: Manipulate 3D models and primitives
- **Objective 2: Create, use and manipulate shapes**
  - o Indicator 1: Create 3D Shapes
  - o Indicator 3: Manipulate 3D shapes
- **Objective 3: Edit Models**
  - o Indicator 1: Modify edges, faces, vertices
  - o Indicator 2: Edit an object after its been created
  - o Indicator 4: Extrude edges, faces, vertices
  - o Indicator 5: Use Reshape/Convert
  - o Indicator 8: Deleting and duplicating edges, faces, vertices