STATE LIBRARY QUEENSLAND

3D Holograms Workshop

Michelle Brown, April 2025

Acknowledgement of country

We acknowledge Aboriginal and Torres Strait Islander peoples and their continuing connection to land and as custodians of stories for millennia. We respectfully acknowledge the land on which we all meet today, and pay our respects to elders past, present and emerging.

Welcome

- Check in and get set up on a computer
- Why did you sign up? what are you hoping to get out of this workshop?

Workshop Overview

Goals and Timeline:

- Welcome and intros (10 mins)
- Introduction to the Workshop and demo (15 min)
- Exploring 3D objects online (15 min)
- Capturing our 4 videos in Blender (1 hr)

Break

- Setting up our video files in Premiere Pro (1 hr)
- Exporting and sharing to our iPads (15 min)
- Testing and Sharing (20 min)
- Wrap-up and Next Steps (5 min)

Equipment & Materials

- Computer with Photoshop
- Laser Cutter
- Prefabricated 3D hologram viewer
- iPad or tablet
- Template Workshop files – SLQ Wiki

Health & Safety

- For all workshops at The Edge we like to familiarise participants with:
- Exit points
- Lab Risk Assessments
- Safe operating procedures

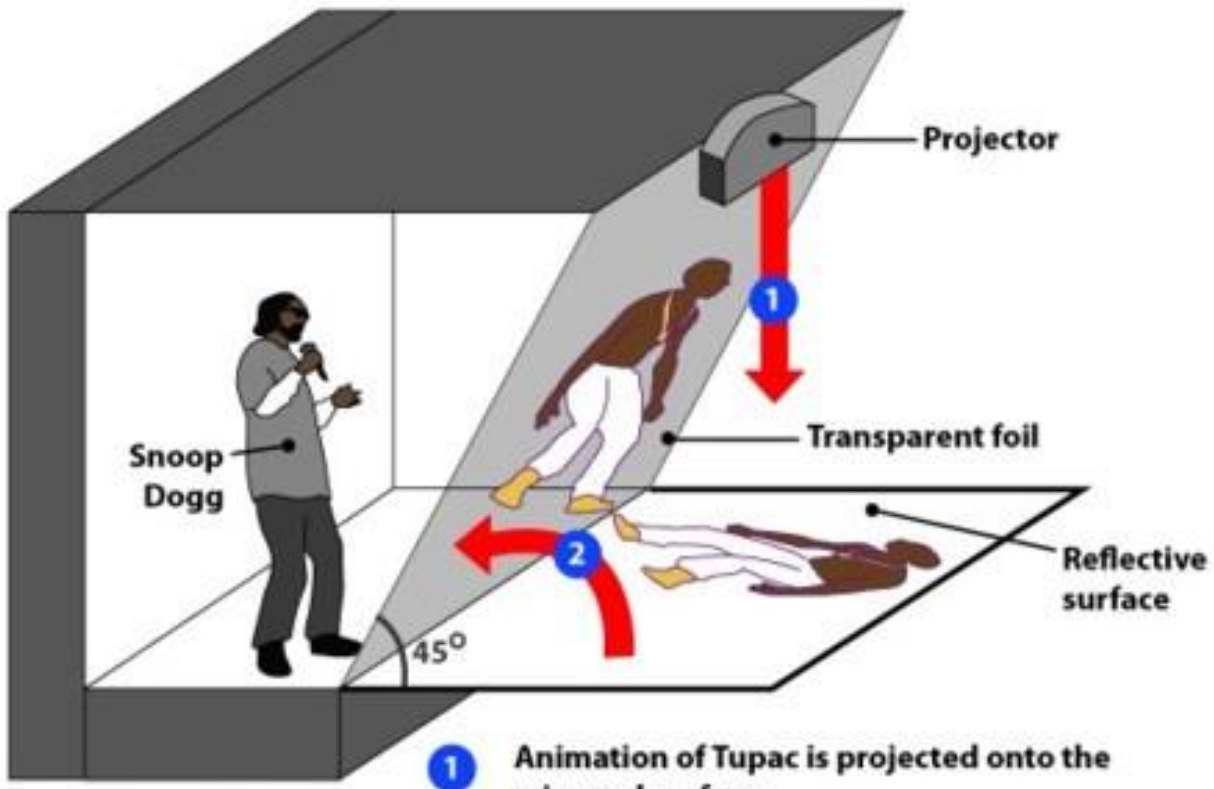
The Edge - SLQ Collection

- Introduction to The Edge and its resources
- Overview of State Library of Queensland's Collection
- How you can use Collection items for research and referencing
- Demo of our Hologram viewer using the Greta Towner Marquette

Historical Overview of Projection and Illusion Techniques

Holographs and Holograms: Evolving Visual Illusions

Pepper's Ghost: Classic Illusion Technique



Source: Musion Eyeliner system patent (U.S. Patent No. 5,865,519, "Device For Displaying Moving Images In The Background Of A Stage"); Musion Systems Ltd.

1. Animation of Tupac is projected onto the mirrored surface
2. Image is reflected onto the transparent screen, which is angled such that the audience sees Tupac but not the foil.

Graphic by Roxanne Palmer for the International Business Times

Not really a Hologram

The holographic illusion is a visual effect that creates the perception of a three-dimensional image in space, seemingly unconnected to a physical screen or surface. While true holograms (invented in the next century) are created through the interference pattern of coherent light sources like lasers. Holographic illusions often rely on simpler techniques.

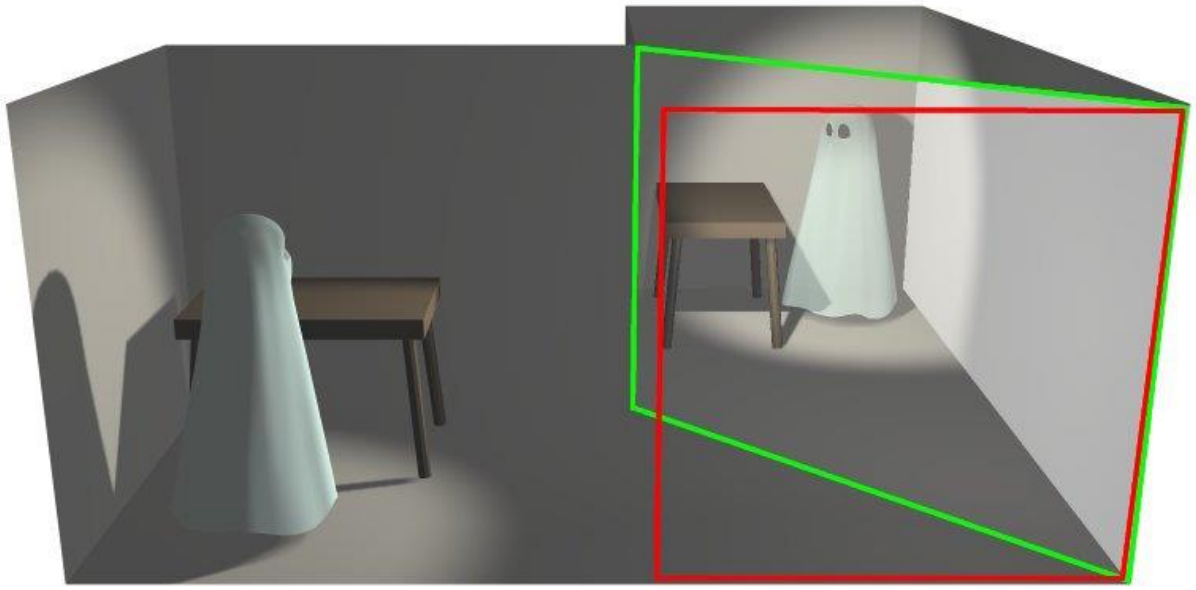
One common method to create illusions using two-dimensional image projected onto a transparent surface or through a medium in a way that the human eye perceives it as floating in three dimensions.

Pepper's Ghost

Pepper's ghost is a 19th-century illusion technique that creates the appearance of a ghostly figure or object by reflecting an image off a transparent surface, like glass or plastic, at a 45-degree angle, making it seem like the image is floating in the air.

The technique was popularized by John Henry Pepper in the 1860s, hence the name "Pepper's ghost".

It was originally used in Victorian stagecraft and entertainment, but has since been used in amusement park attractions, cinemas, museums, television, music videos, and theaters.



Behind-the-scenes of a basic Pepper’s Ghost illusion. Image by Wapcaplet — Own work. Licensed under CC BY-SA 3.0, via Wikimedia Commons.

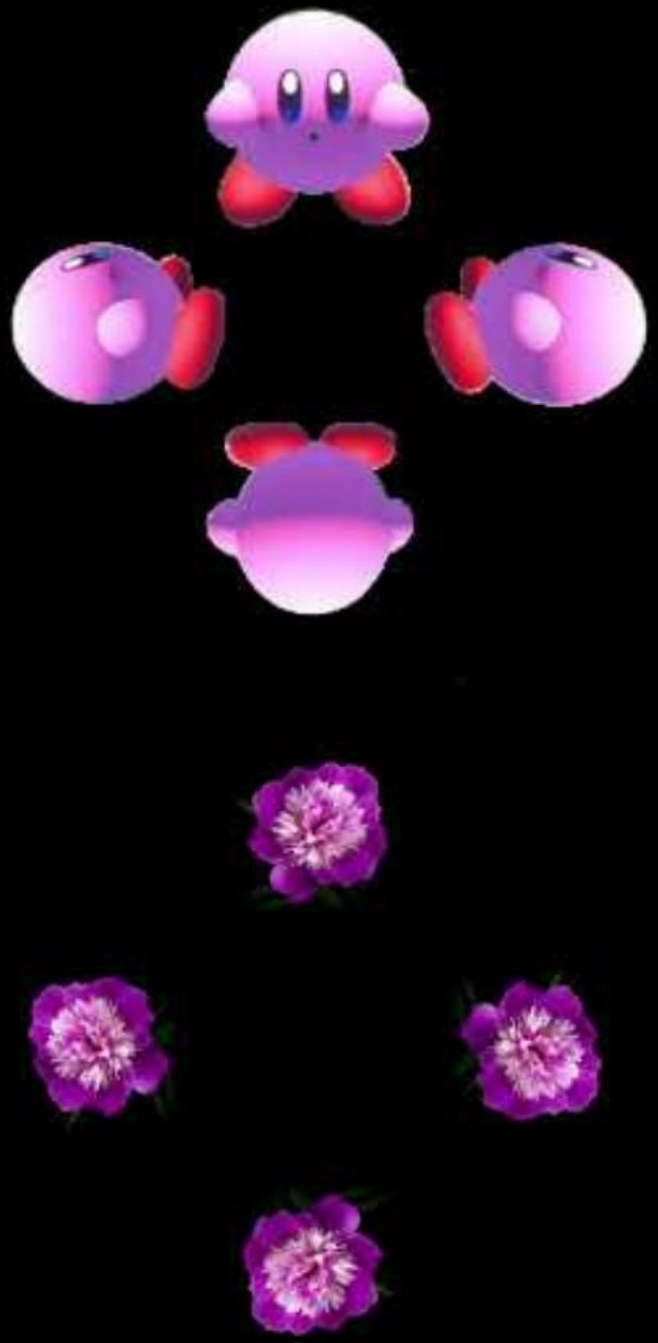
Explaining the Pepper’s Ghost Illusion

- Introduction of the Dircksian Phantasmagoria in the 1860s by Henry Dircks.
- Adaptation of an older Italian optical illusion involving glass and light.
- Lack of popularity due to its complexity and cost, requiring significant theater modifications.
- John H. Pepper's simplification using a sheet of glass, making it feasible for existing theaters.
- Popularization of the effect, known as Pepper's Ghost, in England and Australia.

https://ellingson.notion.site/ELLINGSON-Projects-85703cdefc094b1091bfcf263e4cd544

Creating our Floating Hologram

- Inspiration (Ellingson)
- Using iPads for viewing/projecting
- Our viewing device design



Practice and Experimentation

We'll run through some YouTube examples with our viewing boxes to get an idea of how it all works and tips when setting up our project.

Sketchfab

TurboSquid

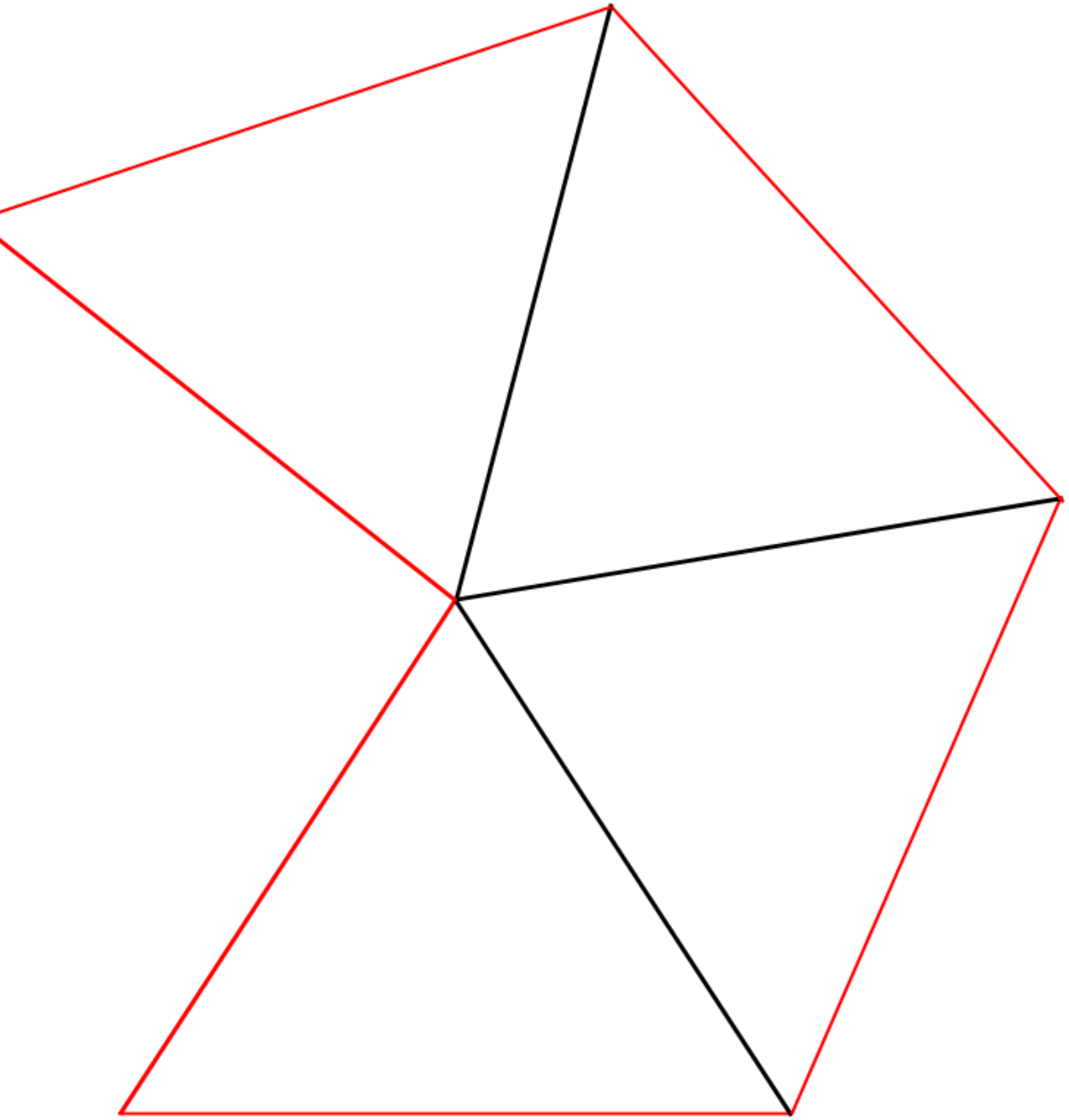
Thingiverse

Free3D

3D Models Online

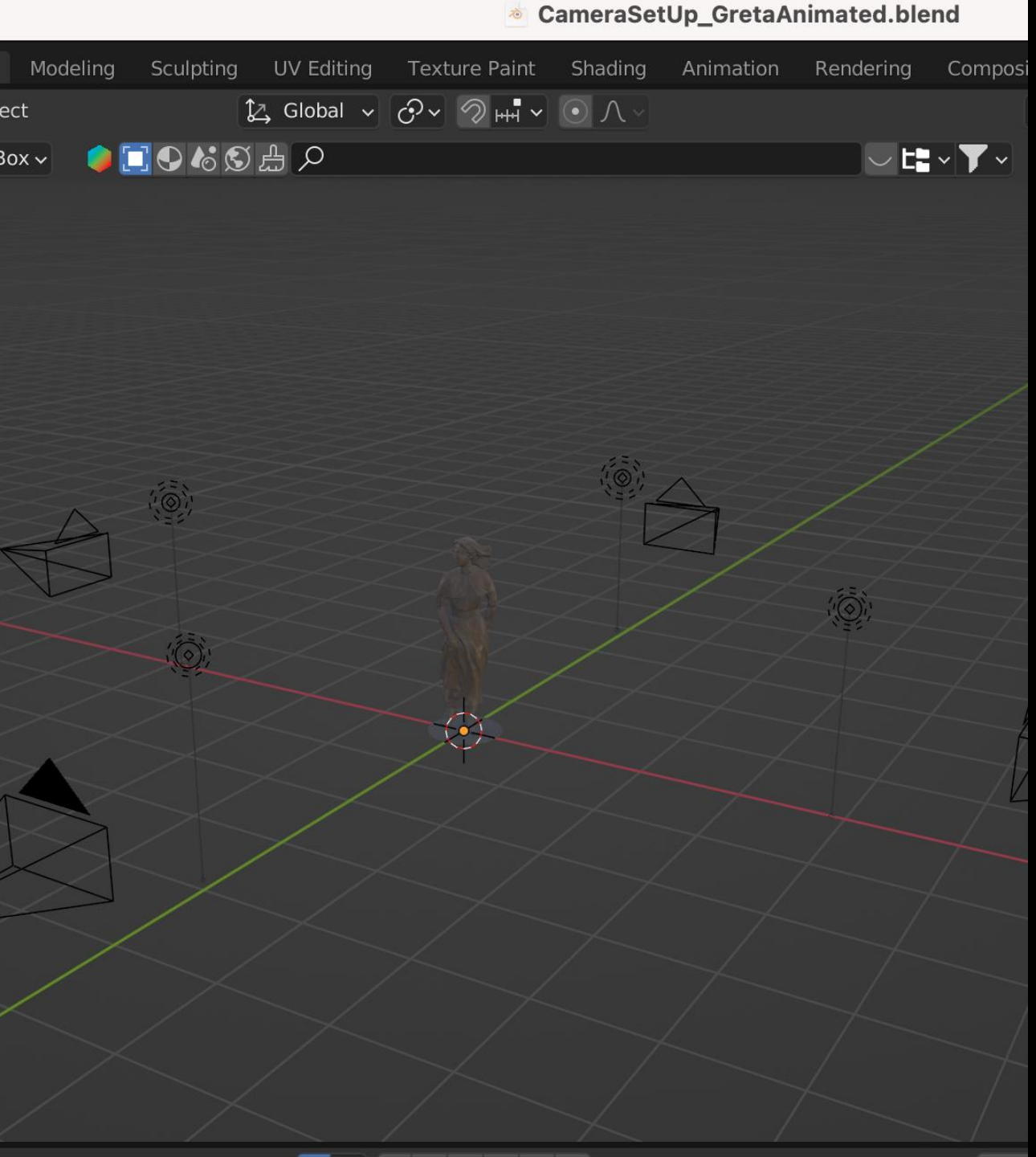
Here are some websites where you can download free 3D models for use. A GLB/GLTF file is probably best to work with, but you can import many different options into Blender.

Some objects may have complex materials/textures or animations, be aware of what you are downloading for any troubleshooting purposes.



Hands-On: Practice and Experimentation

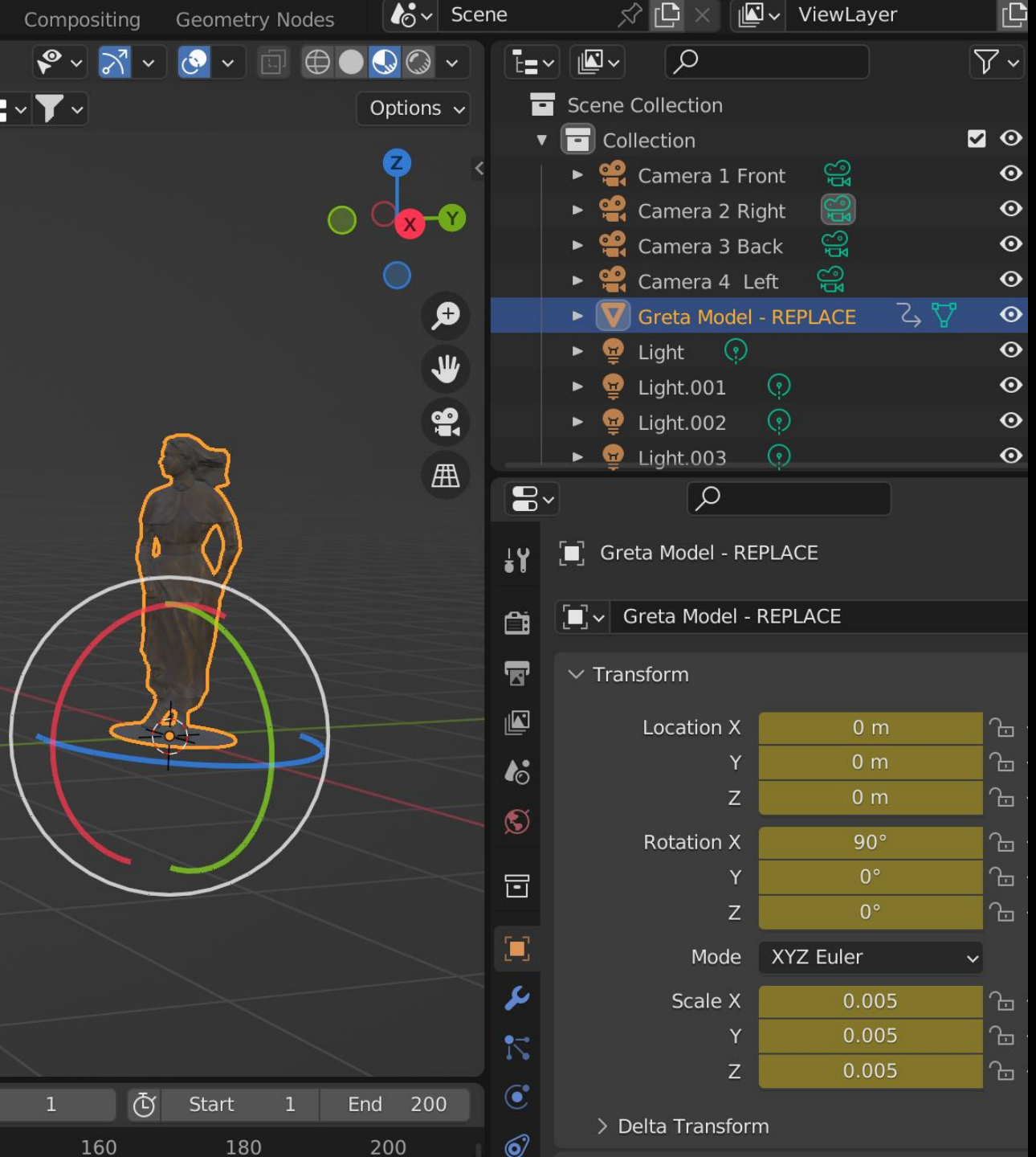
Creating Your Holograms



Blender

Blender is a complex program with lots of different use cases. We are just using it today to animate and capture video footage of all 4 sides of our 3D model.

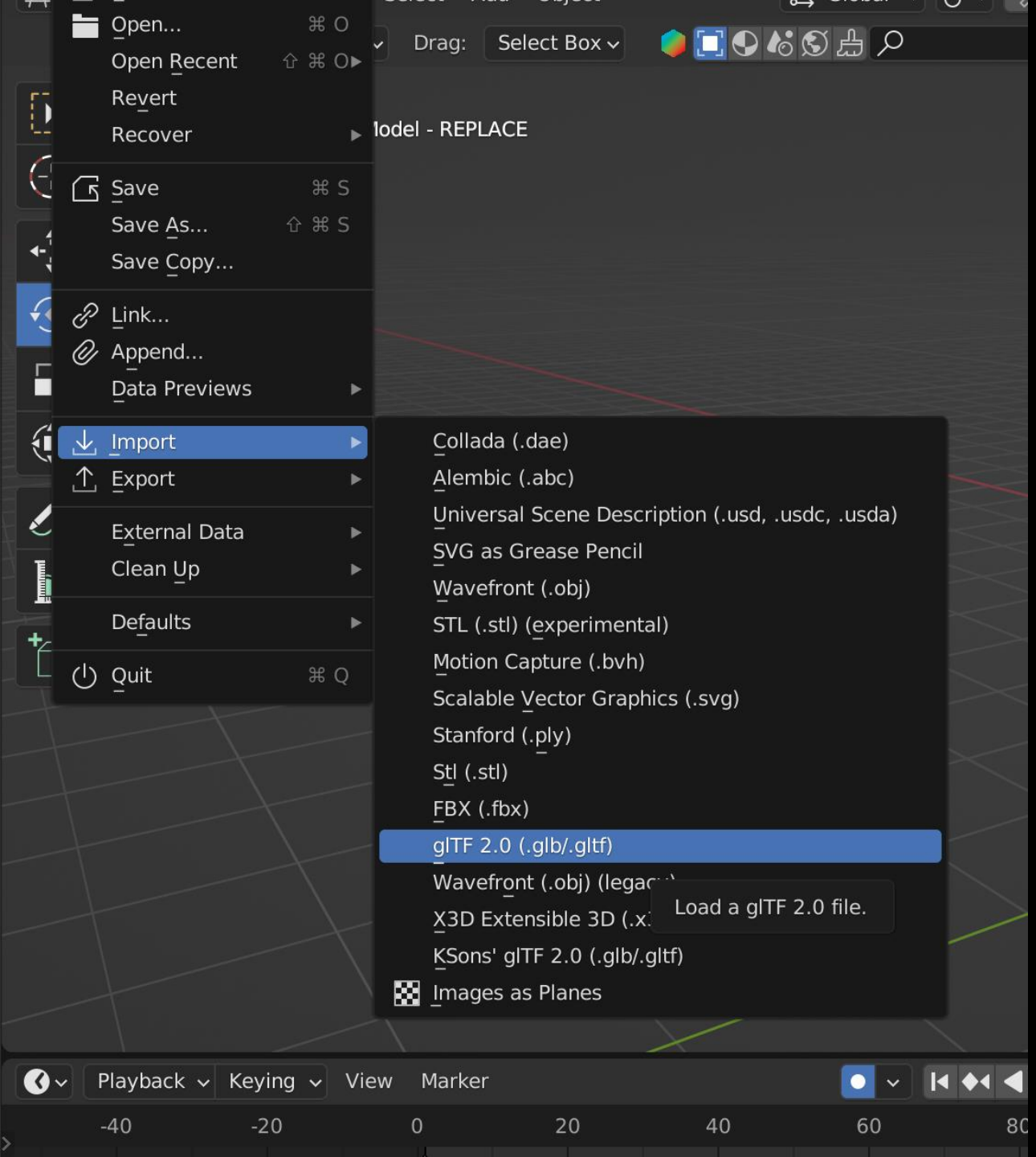
Download the Blender file as directed by the facilitator.



Replace 3D model

Once Blender and the downloaded file is open, we will go through the workspace, lighting and camera setup along with the animation timeline.

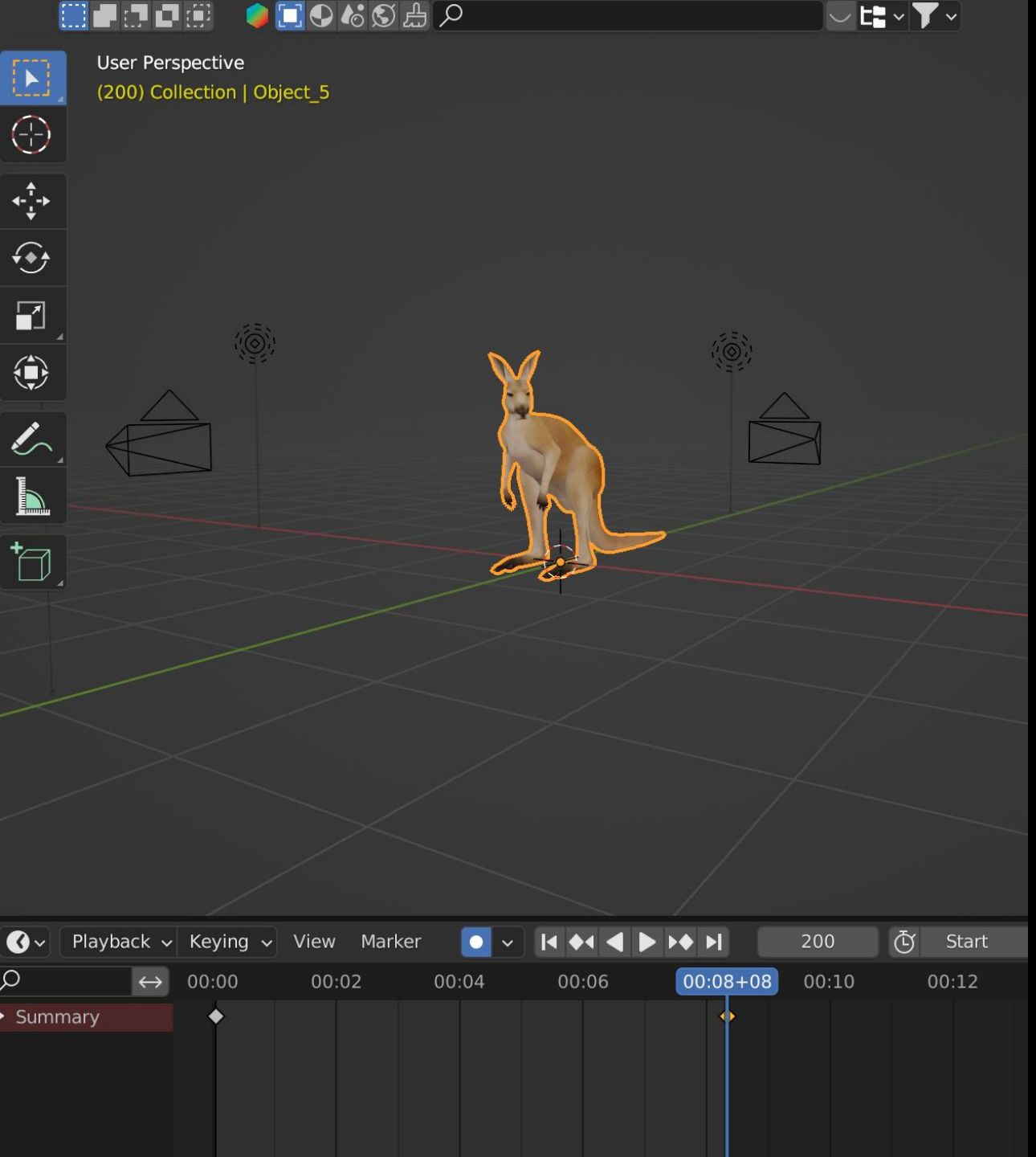
We will then import a model to replace the Greta example model and place it at the 0 location point.



Import

Choose the appropriate file type for your 3D Model to be imported. Common 3D file types include;

- GLB/GLTF
- OBJ (separate material files)
- FBX

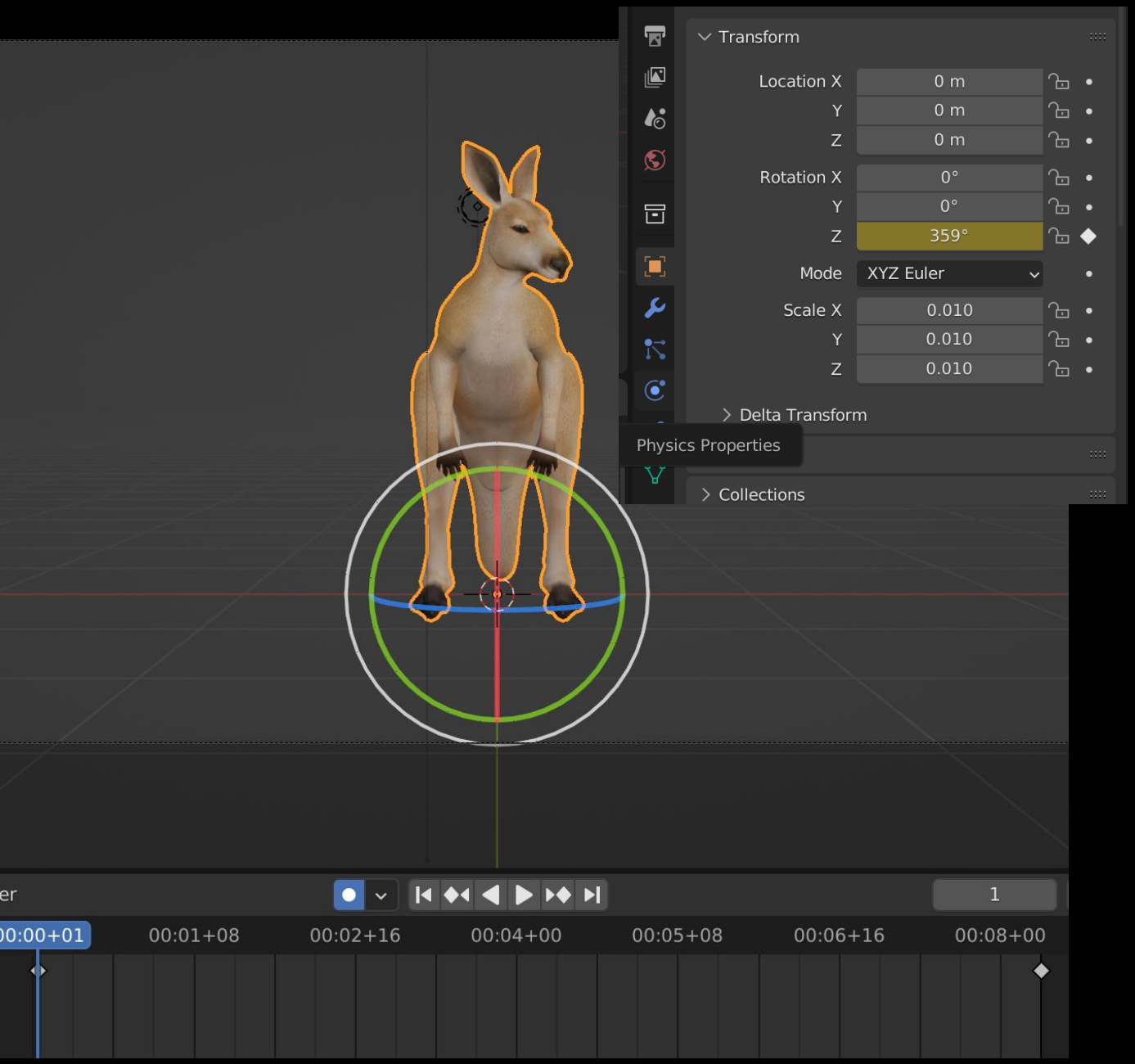


Timeline

Make sure the Timeline is open in your workspace. The default frame length is usually 200, which is about 8 seconds.

To change the length of the video file we want to produce we can change the end frame amount.

We could just render images of each of our cameras for our Premiere Pro video needs, but a moving model is more fun!

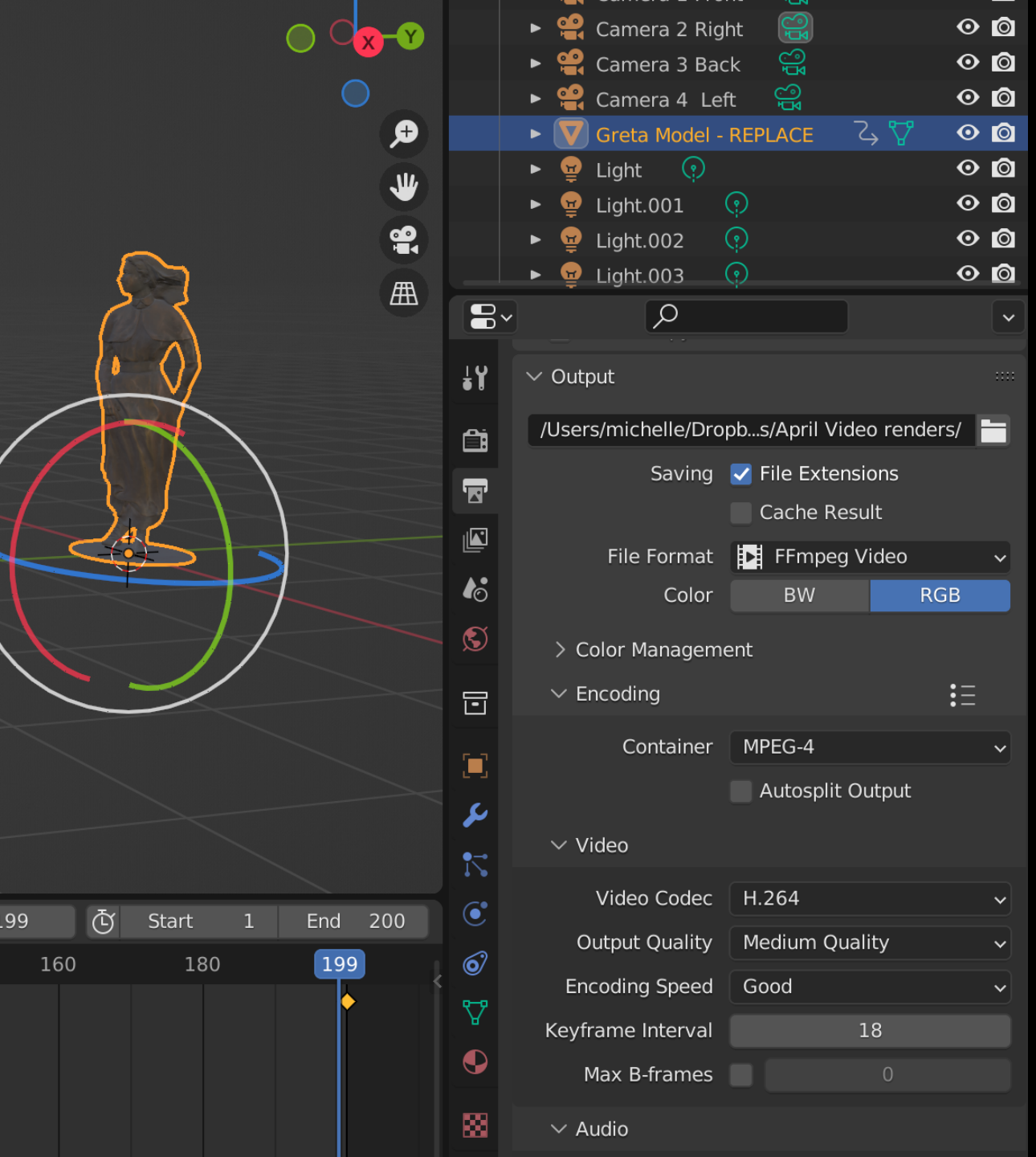


Animate

Let's add a simple 360 rotation animation to our new model like the Greta one, so it's not just a static 3D model.

Make sure the model is selected and in the object properties section we will add a rotation along the Z axis to create a 360 loop.

Add keyframes at the start by clicking the dot next to the Z leaving the value at 0, then add another and enter 359 at the end frame.

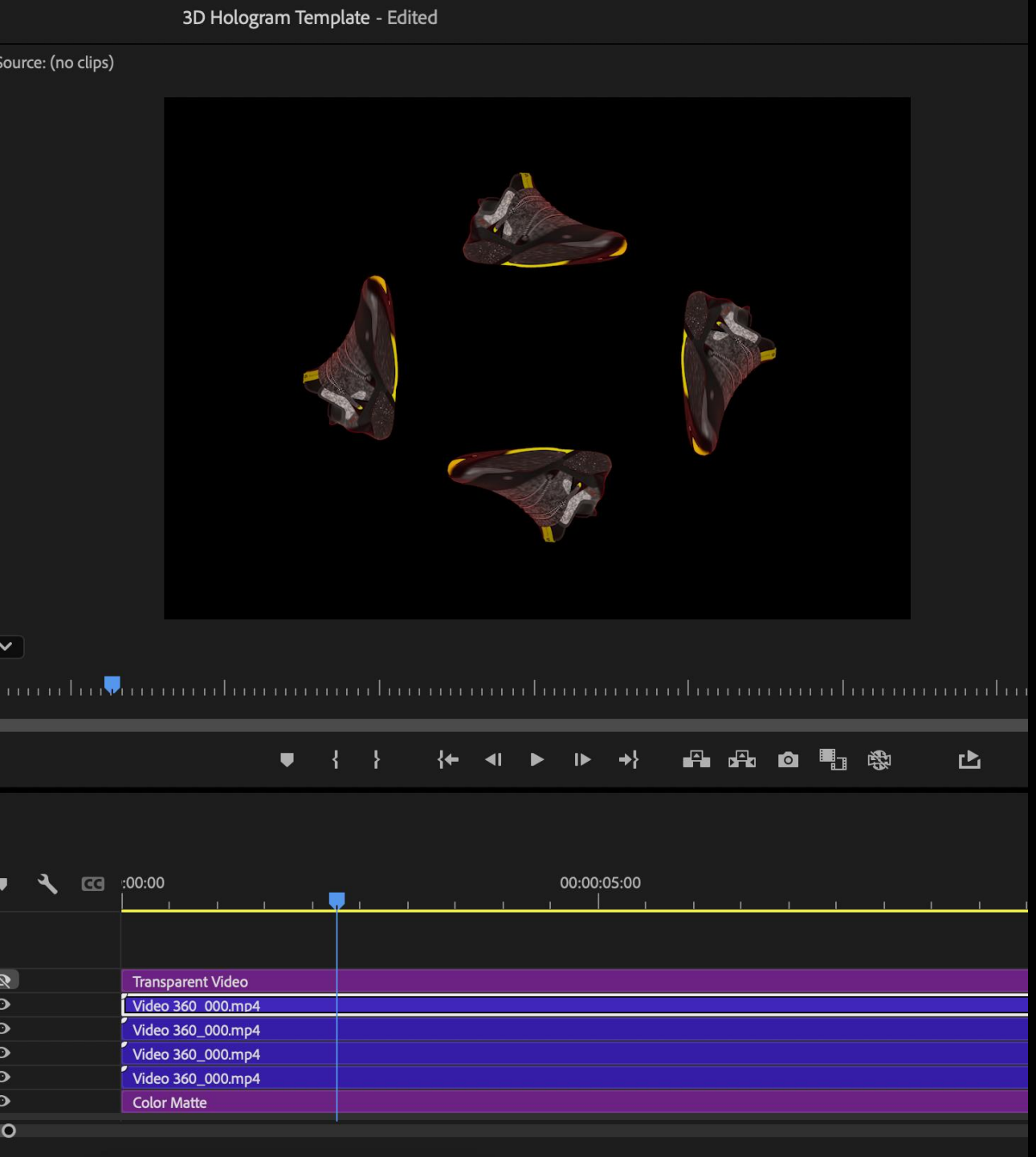


Capture

We need to choose a file path and naming conventions.

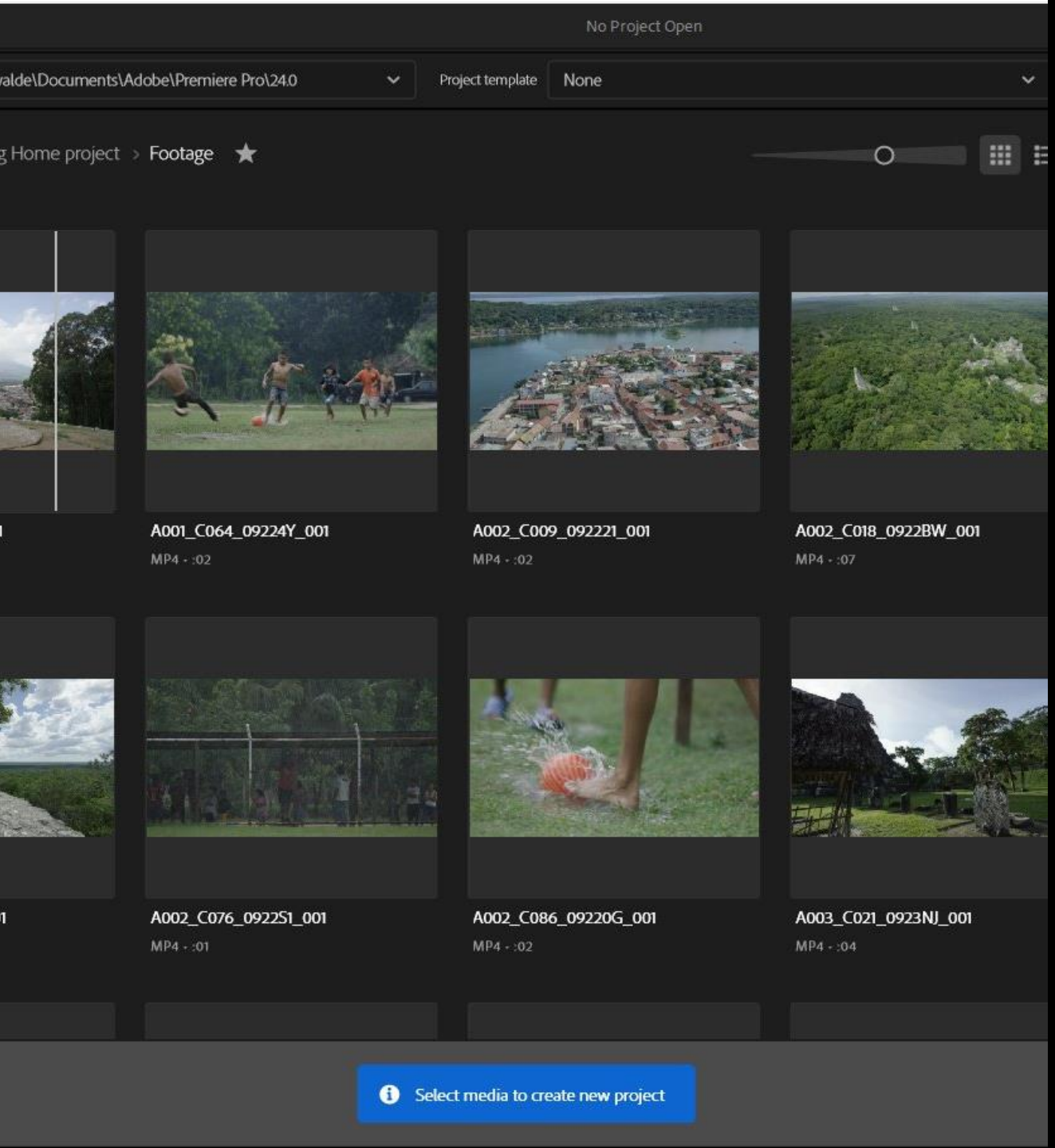
Navigate to Output Properties (printer looking icon) and choose the correct settings. On the DML Macs, we want to export as an MPEG-4 (MP4), match settings to the image including making sure the File Format is set to FFmpeg Video.

Select Render Animation for each of the cameras. You can change between them by clicking the camera icon. This may take a while for each file to render.



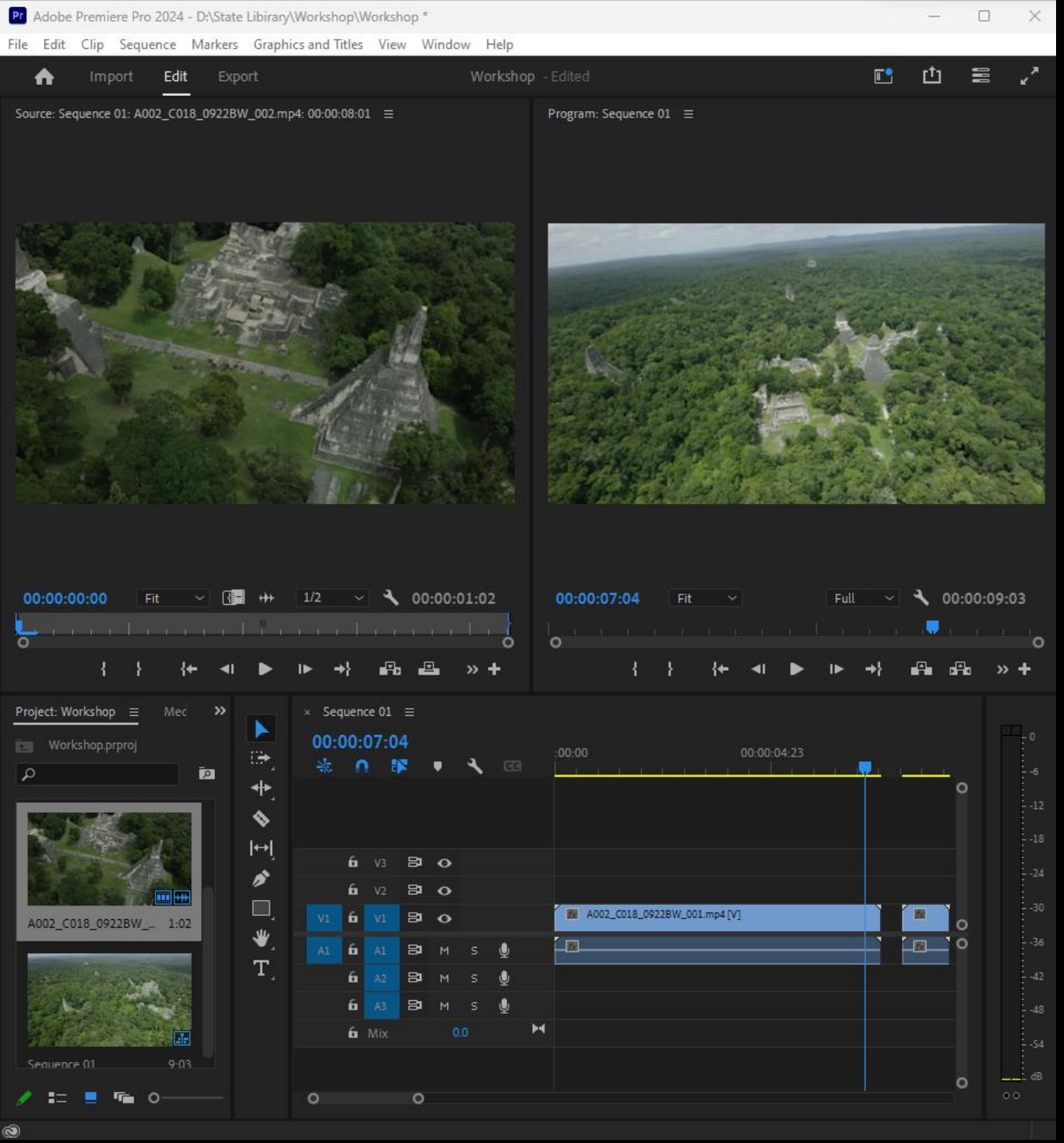
Premiere Pro

Let's open Premiere Pro and look at a basic template.



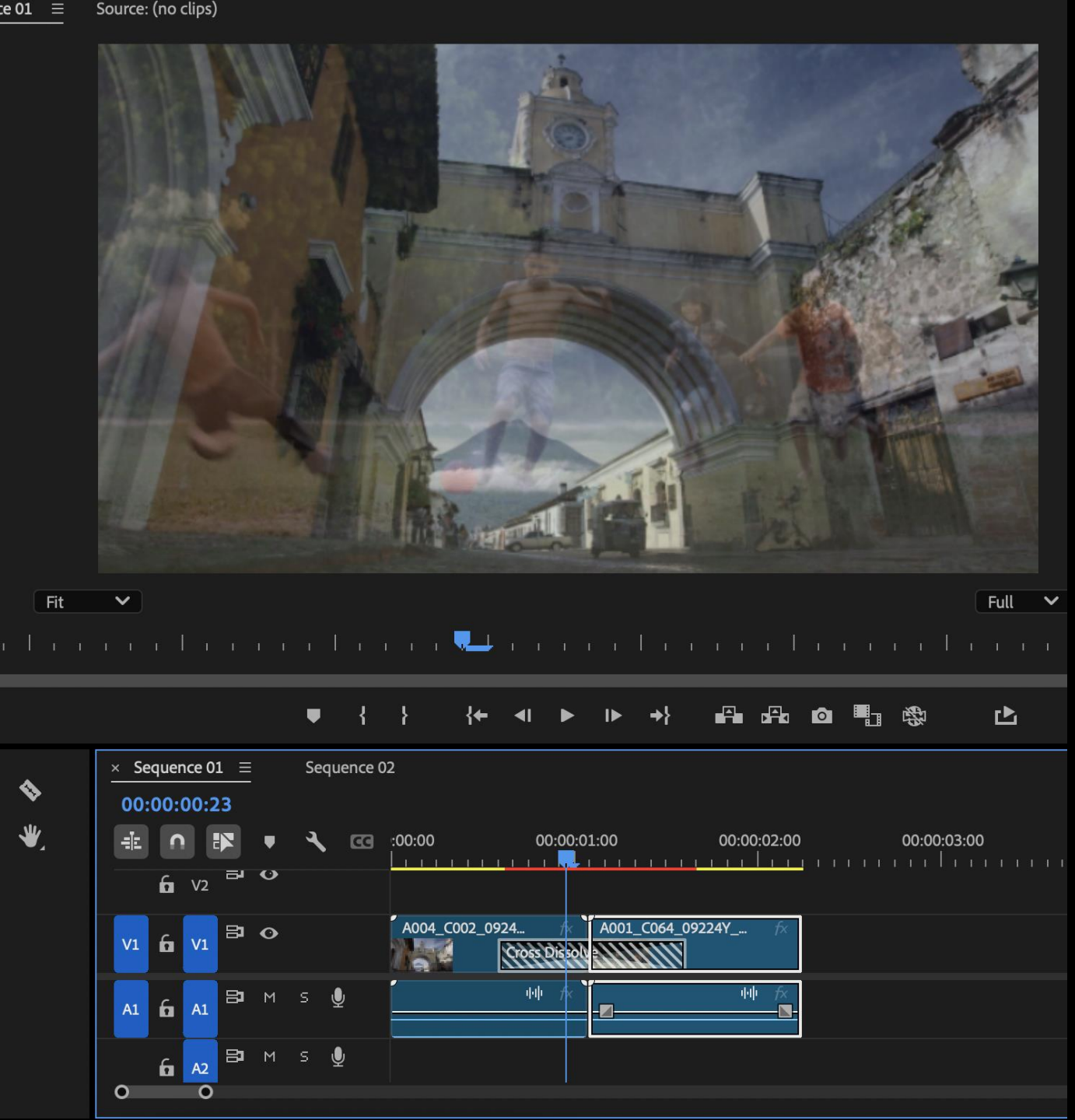
Introduction to Video Editing

- Basics of Video Editing: Tools and Techniques
- Editing a Video/Image for Hologram Use
- Demo: Simple Video Editing Using Premiere Pro



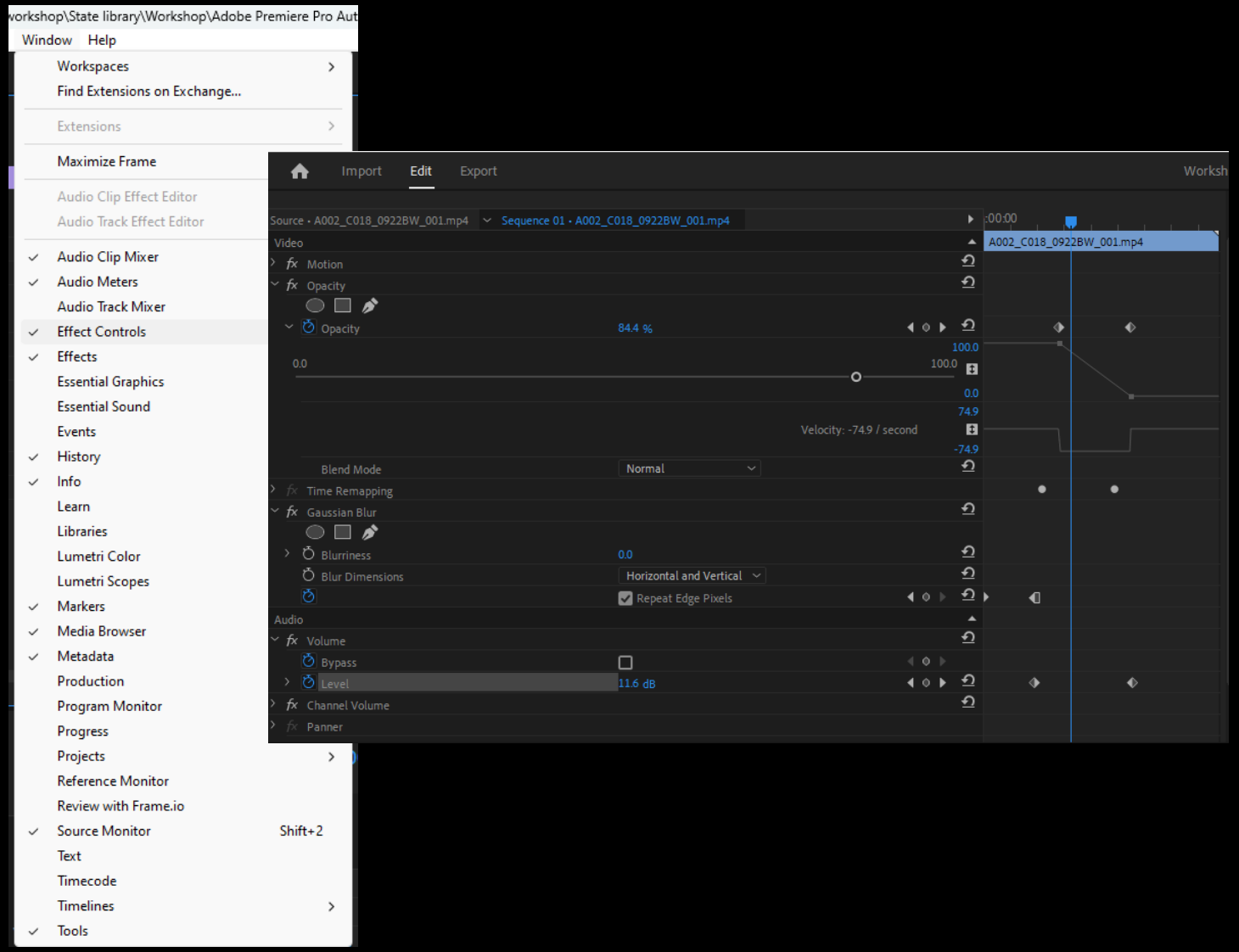
Premiere Pro

- Project (bottom left): Where you import and organize your media
- Source Monitor (top left): Where you view and trim your raw media (sometimes a tab in the Monitor view)
- Program Monitor (top right): Where you view your timeline sequence
- Timeline (bottom right): Where you create your edit



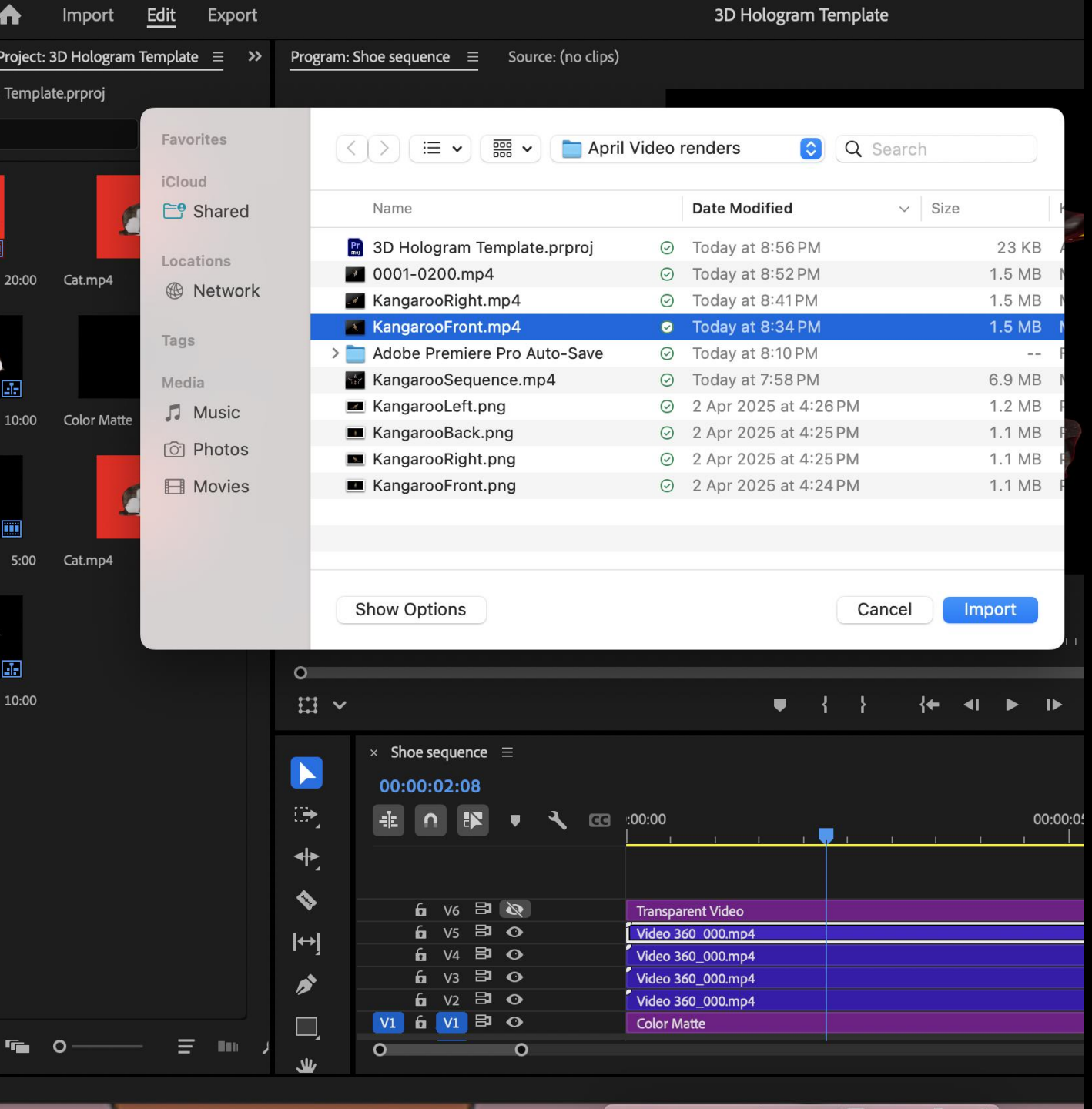
Transitions

- Transitions occur between each piece of footage or audio segment.
- Enhances the flow and maintains audience engagement.
- Straight Cut
- Dissolve/Fade
- Dip to Black
- Drag and drop transitions from the Effects panel to the timeline.
- Locating Effects Panel: Select Window > Effects from the main menu or press Shift+7.



Effect Panel

- Keyframes
- Opacity
- Audio
- Colour Correction
- Position
- Rotation

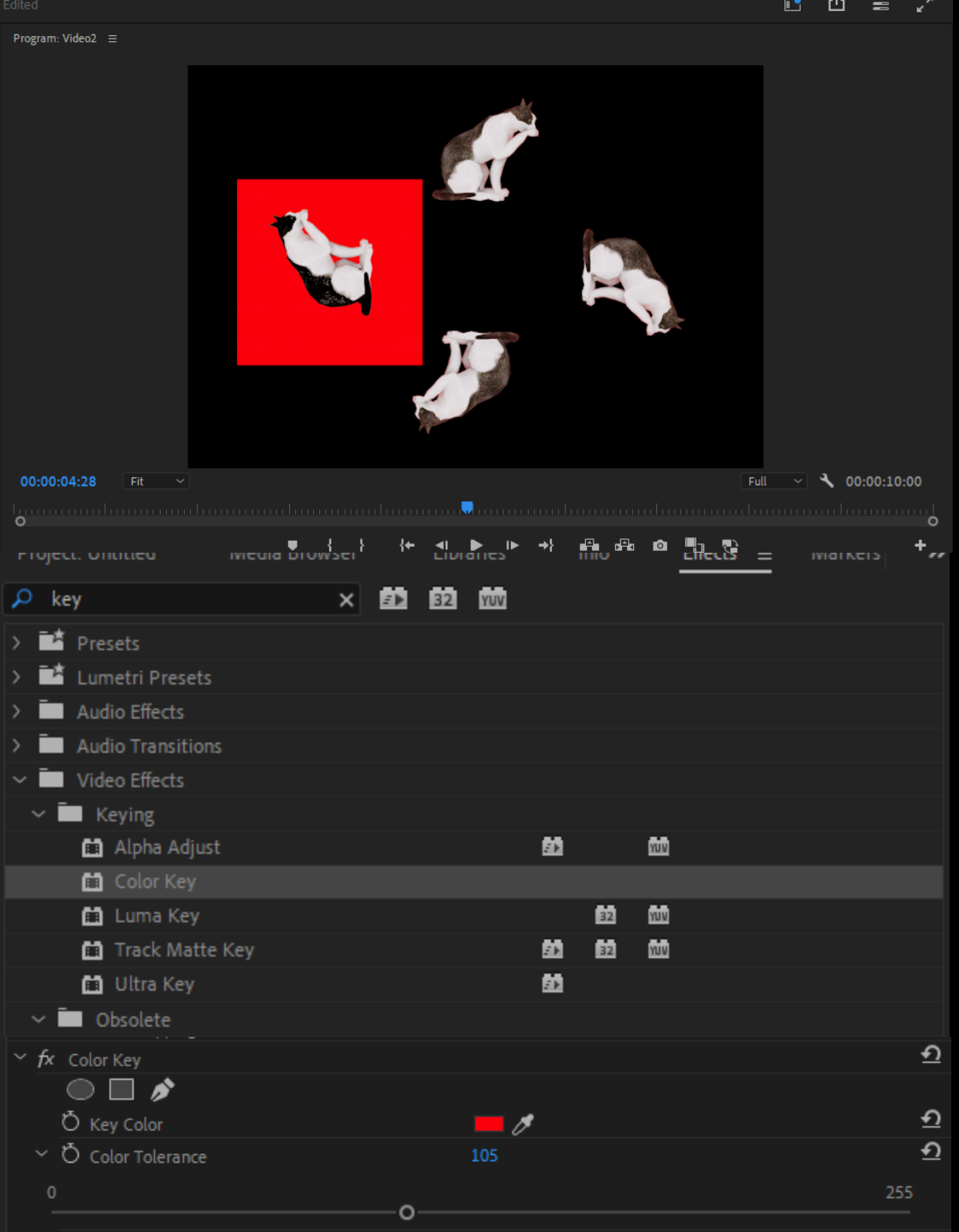


Download Template

We're going to download and use the template provided and replace the examples with our own captures.

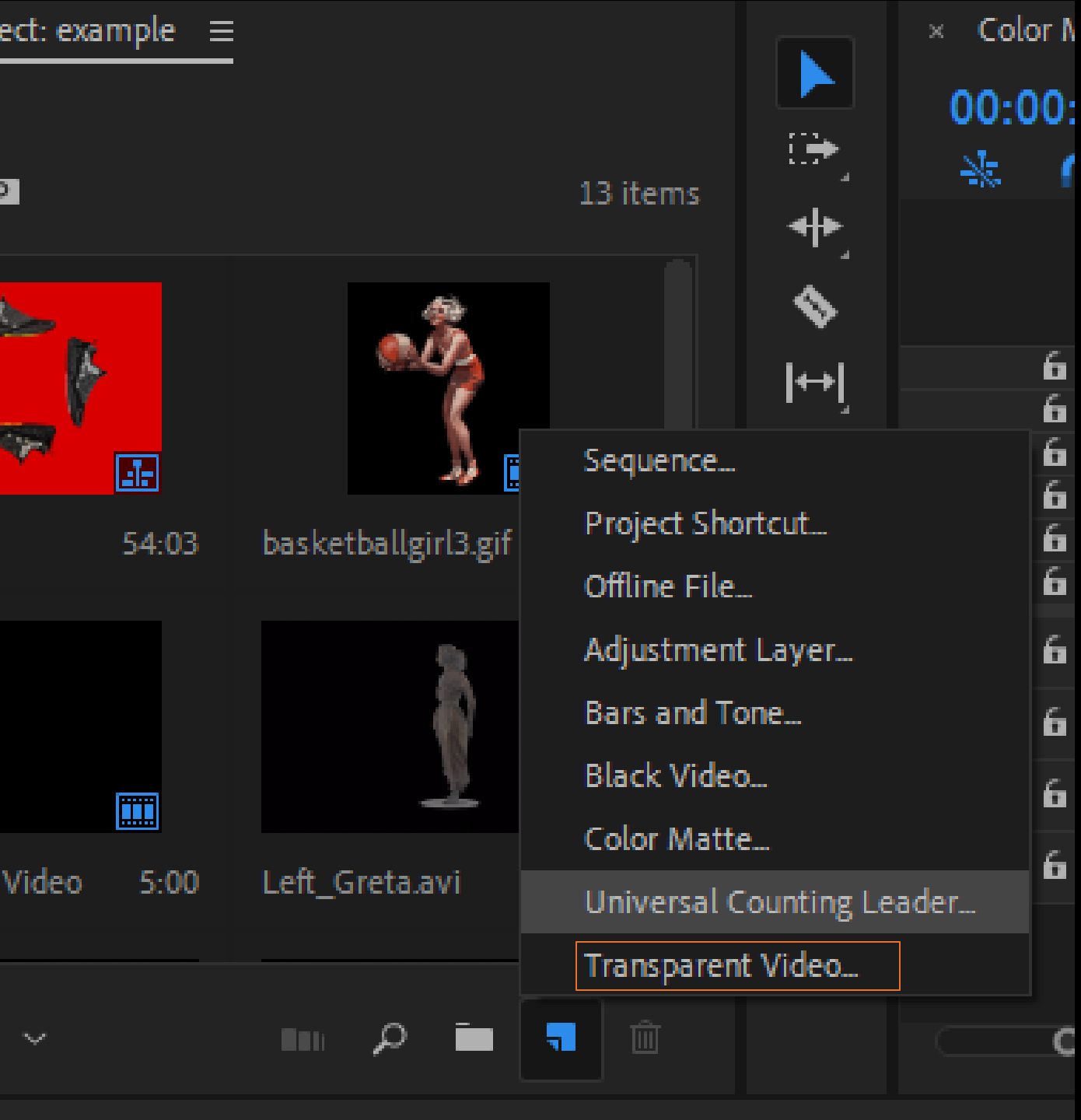
Load your video or image files into the project 'Bin' by double-clicking it in the project panel or right clicking.

Size: 2388 x 1668 for our iPad screen.



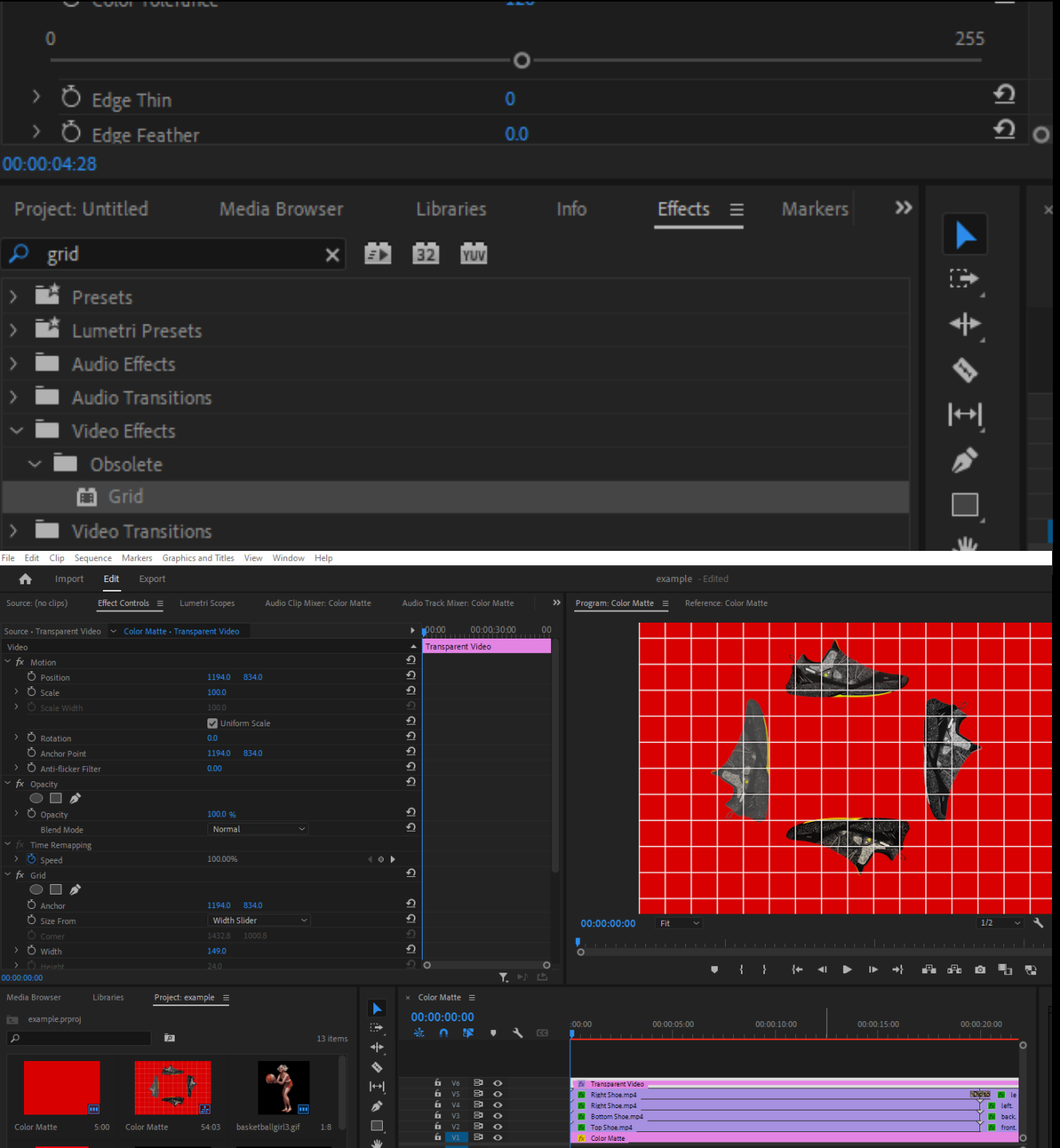
Color Key

Let’s go through our template sequence first. If you have a video with a background colour, you can key it out with this effect, let's try it on the last cat video in our template.



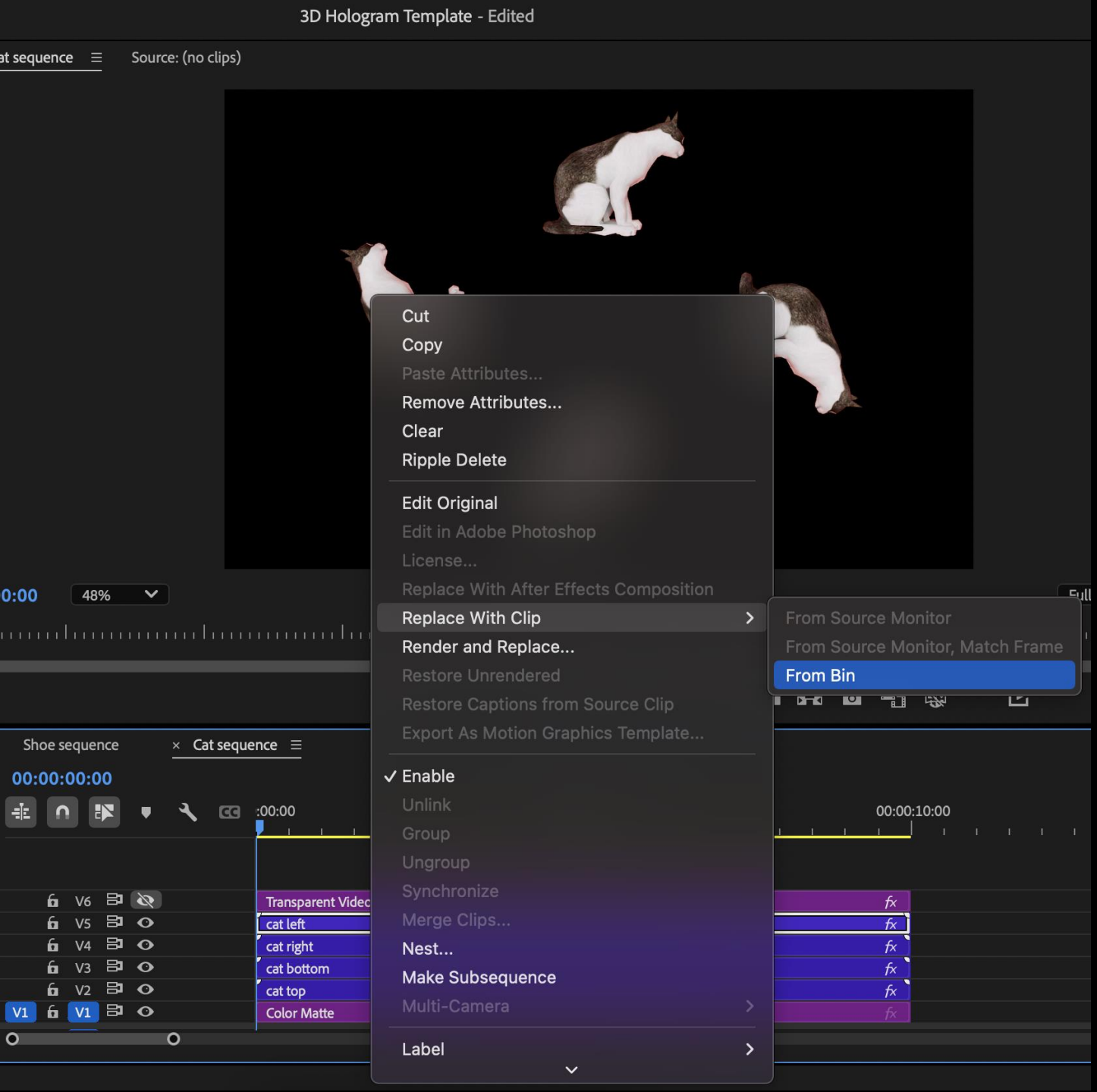
Transparent Video

There's a transparent video in our timeline to help map our 4 videos. In our project monitor right click or use the add button to add one to your project.



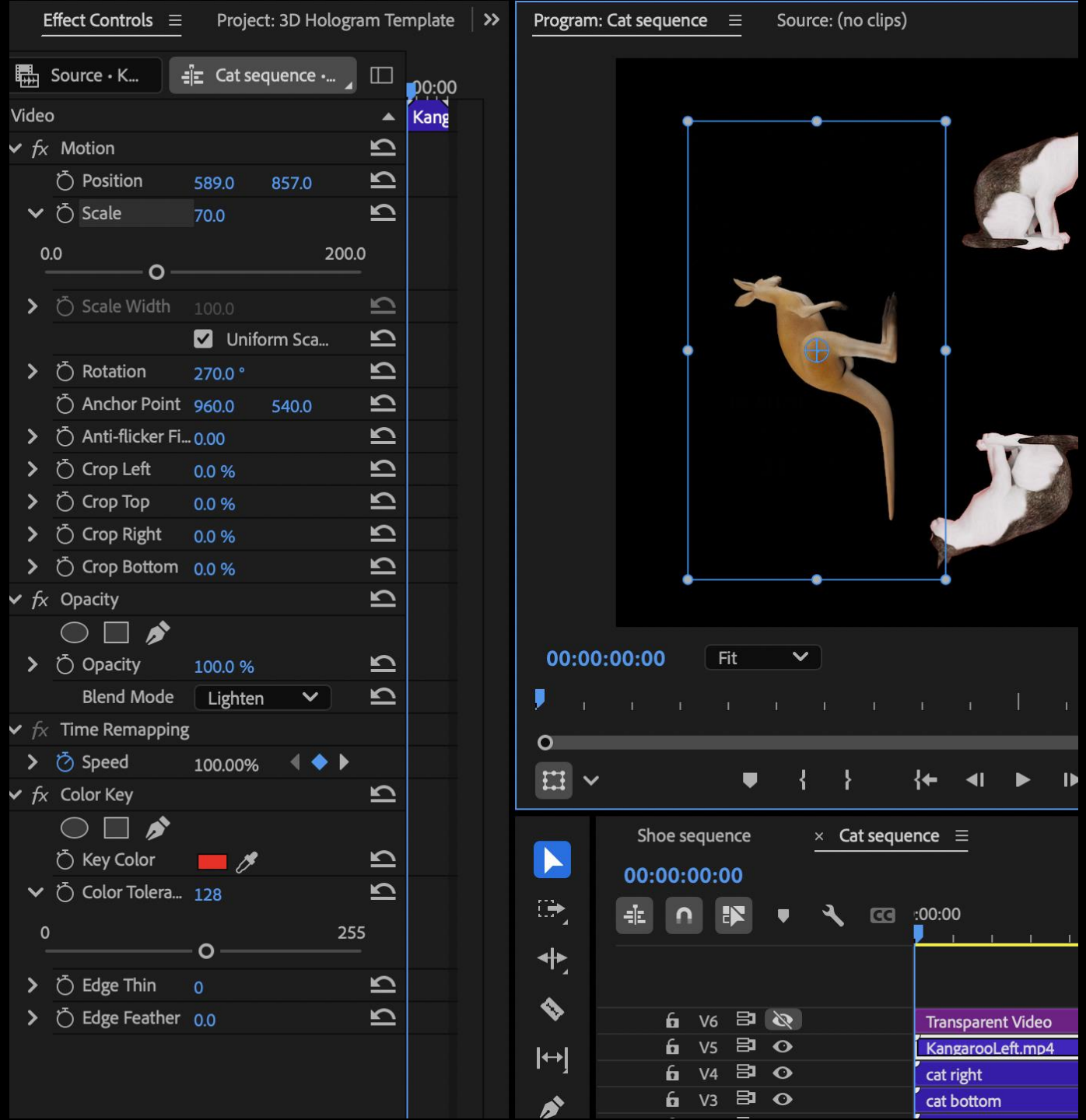
Grid Effect

There's a Grid effect on the transparent video to help align the 4 video files 4 video files, turn it off and on with the eye icon.



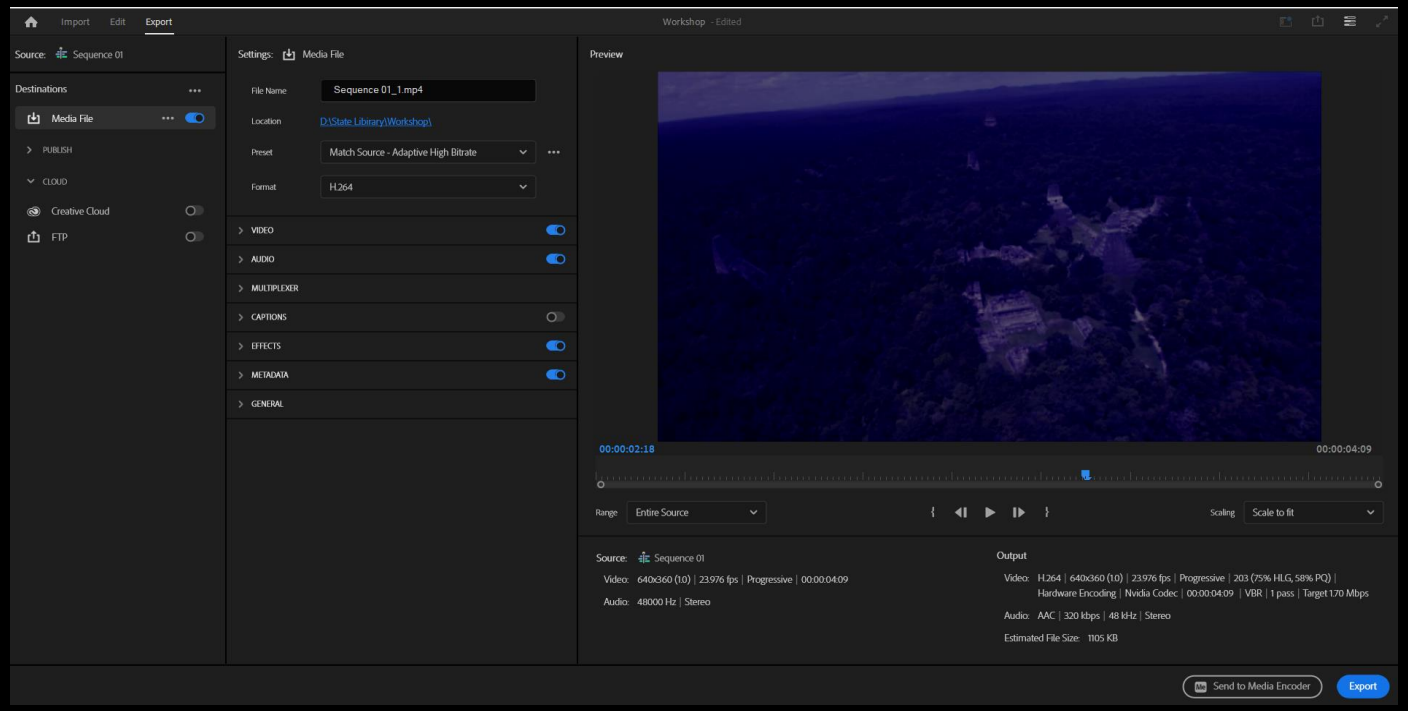
Change Videos

Since our template has done all the work, let's just right click and replace each clip with the ones we imported. Make sure you have the correct clip selected in the project monitor.



Resize

If your object looks small or too big, you can scale it using the effects controls, make sure you chose the same amount for each file as you replace each one.



Exporting Video

- Ensure the Timeline panel is active.
- Navigate to File > Export > Media
- Setting Export Preferences
- In the Export Settings dialog box, select Format: H.264.
- Choose Preset: Match Source – High Bitrate.
- Choosing File Location and Name
- Click the blue export button
- Click Export to start creating the new video file.
- Wait for the file to be processed and ready for sharing.

Practice and Experimentation

Let's test our videos on the iPads. We should be able to AirDrop our video files and put them on loop.

THANKS FOR ATTENDING

Please complete our survey that will be sent out via Eventbrite.

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Contact us on appliedcreativity@slq.qld.gov.au

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