Exploring Visual Effects

Learning Objectives

Understand and apply some fundamental concepts of photography and visual effects
Understand the relationship between scale and the distance between the camera and the subject.
Understand light and shadow in relation to photography
Understand image compositing

Concepts

Compositing (using Photopea, Krita, Photoshop)
Scale
Distance to Camera
Light and Shadow quality

These activities are best completed in a small group. Ideally one person in the group would have a phone with a camera, and the others can move the objects, take measurements, and record data. Communication is a key skill !

Introduction

The use of effects in film goes right back to the beginning of the artform. This activity explores the use of miniature photography and forced perspective to give a model the illusion of being a different size.

For example, if a film production doesn't have the budget to build a full scale space ship for a background, they might decide to build a scale model of the spaceship and film it to look as if it is very large. If a small model is brought closer to the camera, it just looks larger. We can use everyday objects to try this ourselves.

Examples on Youtube:

https://www.youtube.com/watch?v=Xj65jTCq1Rs

Exercises

Exercise 1 - Forced Perspective in Camera

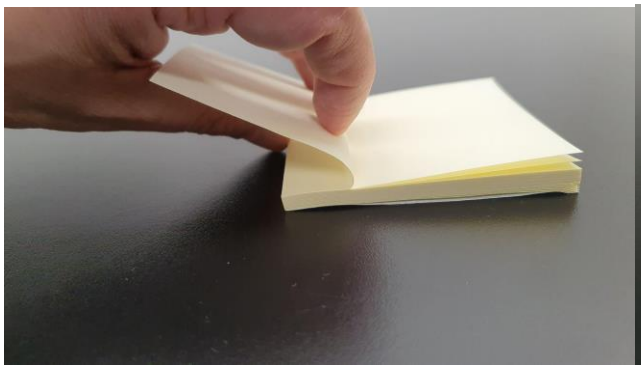
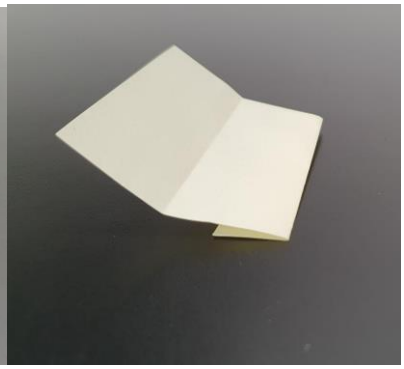
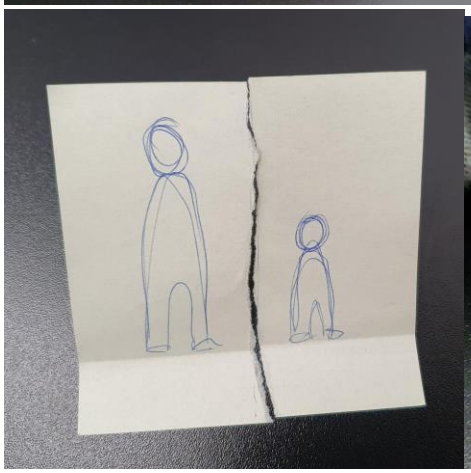
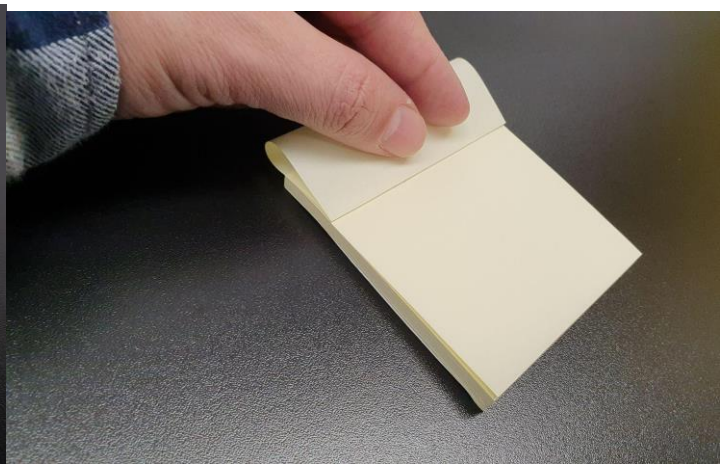
New Concepts: Scale Miniature Photography, Forced Perspective

Prep needed: Constructing the paper figures

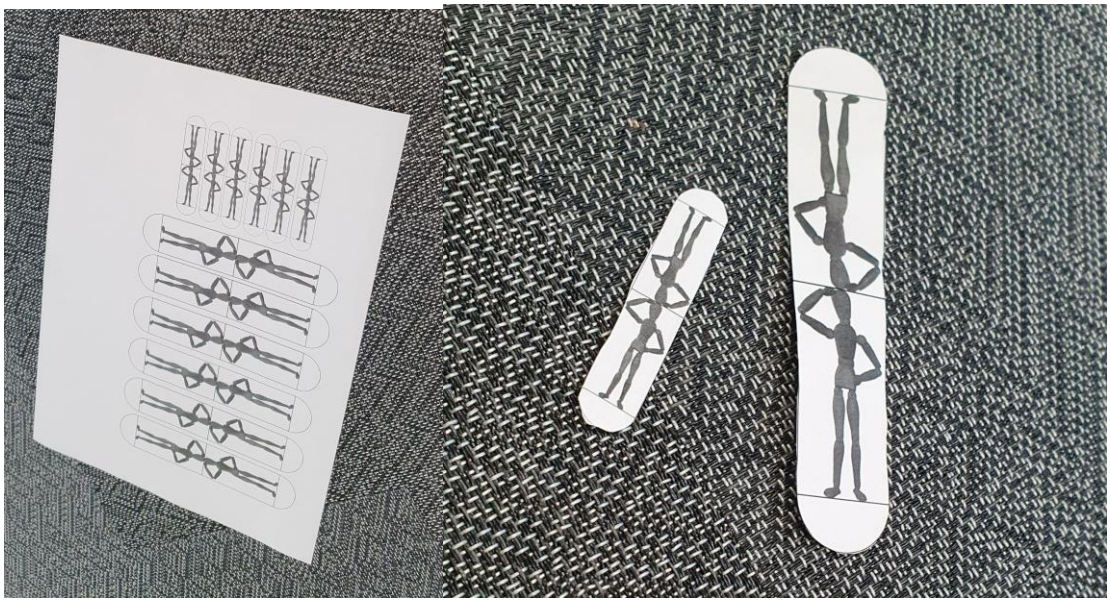
Time to complete: 1 Hour

Using figures of two different scales on a table, how can we position the figures to look like they are the same size in screen space?
How can we position the camera to make the effect work? (at the table edge, at feet level)

Figures can be created on a simple sticky note or sheet of A4.

Optionally, you can print out the paper figures and adhere to heavy card, like cereal or tissue box.



Supplies Needed:

-Pack of sticky notes, medium or large size, **Or**, Print out the included paper figures. Make a set for each team
-Pencils or pens
-Tape measure
-Phone with camera, or any digital camera
-Ability to move photos from camera to computer (USB or memory card)

Once the figures are ready, place them on a table. Have a team member place the camera at the end of the table, with the lens near the level of the feet of the figures. Then another member of the team moves the figures closer or further away from the camera to try to make them appear to be the same height.

Measure the distance from each figure to the camera and compare them.

(Maths) What is the relationship between the scale of each figure and their distance from camera?

Exercise 2 - Miniature photography

Prep needed: Assembling and constructing the toys

TIme to complete exercise: 1 hour

Let's apply what we learned from exercise 1 to change the size of a toy in a photo. We use a dinosaur in this example, but any toy that is about 10cm or taller would work. We will create the illusion of the model being larger than it really is.

New concept: The Clean Plate: This is a photo of the environment without the toy in it, and with no effects.

It might be useful to attach the toy to some kind of wooden dowel or rigid coffee stirrer so that a person's hand doesn't occlude parts of the model. You can hold it in your hand but try to hold it in such a way that your fingers don't cover up much of the toy.

Getting it done:

1. Planning: Design the shot, find the right framing for a cool shot
2. Make sure to take a 'clean plate!' This is the background without the toy.

3. Then, without moving the camera, take another photo with the toy in the shot.

4. Try to take some reference photos of the shadows and reflections in the scene. This can be done by placing the toy on the ground with a sheet of paper under it.

Ideas
-make a toy dinosaur look like it's a giant in a park or town.
-make a toy car look like it is full size in a parking lot.

Exercise - 3 Compositing
Modern Visual Effects artists make use of software to combine layers of imagery. This exercise explores the challenges involved with combining the digital photos you took in exercise 2 to create a convincing final image.

New Concept: Layers

Prep needed: Moving the photos from camera to computer. Access to image editing software

Time to complete: About 2 Hours

Use photo editing software to cut the dinosaur out of it's image, and place it as a layer on top of the clean plate. This would be the same idea as cutting a figure out of a magazine and placing it onto a different photo.

This is the most complex exercise and may take more than the allotted time to complete, but as long as you get the main concepts you can always complete it later.

Getting it done

Most image editing software will work with the ideas of layers, which are tools to help stack images on top of each other.

1. Open Both Images

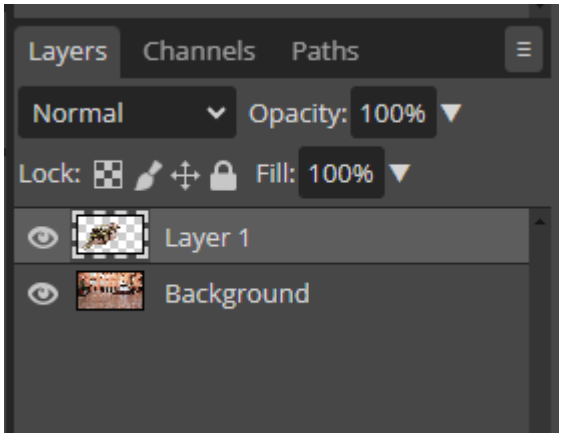
Go to Photopea.com, or open an image editing software like Krita or Photoshop on your computer.

Find the File menu, and choose 'Open'
Open the Clean Plate image
Then, Open the image with the toy in place.
You should have two images open.

2. Extract the toy from it's image

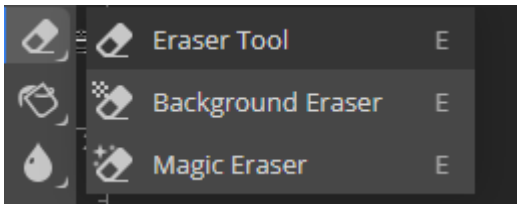
Using the selection tool, like the lasso tool displayed below, create a rough selection of the dinosaur, and go edit-copy.

Then click over to the Clean plate image and Paste, by going to edit-paste.
This should create a new layer on the clean plate image, with the toy information in it.



Now it's just a matter of refining the cutout of the toy from it's original background. You can click on each layer to select it before working on it.

There are a number of ways to erase away the excess background from the toy layer. The easiest way is to use the eraser tool. You will need to be very careful when using this tool because if you erase too much of the figure you won't be able to get it back.



A more advanced way to do this is with a Layer Mask (sometimes called a raster mask) This takes a while to get comfortable with, but it's a great way to stretch your skills.

Reflection:
Does it look right? Do you need to move, rotate or scale the dinosaur to make it look right? How can we add shadows to the ground to make it look like it's sitting in the scene? (integration)

Bonus advanced task:
Does the toy's shadow look right on the ground? You may want to create a new empty layer between the plate and the toy layers to paint in a shadow using a paintbrush tool.

Again, don't worry if you find this challenging to complete during a single class time, it's just a way to start thinking about the challenges that VFX artists meet when working on complex film shots.

Resources

Links to Information
Miniature Effect
https://en.wikipedia.org/wiki/Miniature_effect

Forced Perspective
https://en.wikipedia.org/wiki/Forced_perspective

Scale Model
https://en.wikipedia.org/wiki/Scale_model

'One Piece' Framestore VFX Breakdown Example
https://www.youtube.com/watch?v=ExyxrgzQVfg

'VFX Games - The Art of Compositing
https://www.youtube.com/watch?v=gYu4esqvnQ0

Links to Free software
Photopea.com
Krita https://krita.org/en/
Blender https://www.blender.org/