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IT'S MOVIE MAGIC

In this month's Snail Mail, our instructors investigate the professional tools used in movie making. Hollywood is known for using impressive special effects, but indie films and DIY filmmakers use very similar techniques! Join us to start your filmmaking journey and investigate:

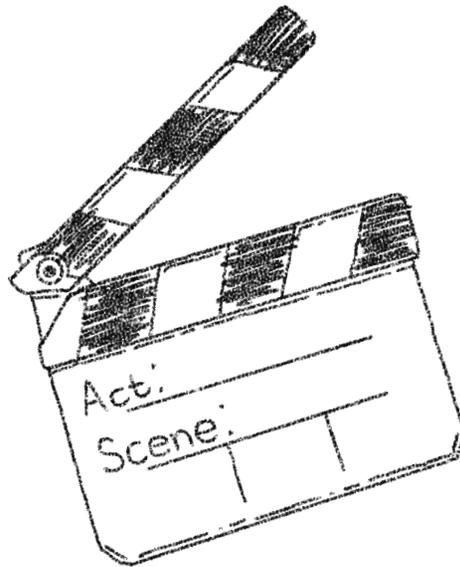
How does a story script turn into a series of images?

Who decides what the environment looks like?

Is it possible to make a film about giant monsters without a giant budget?

What kinds of skills are involved in the movie-making process?

Ask your own questions and follow along with the activities. If you have any thoughts, share them with the Eureka crew at codeva.info/SubmitYourSnailMail



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EUREKA CLASS HIGHLIGHT: PIXELS TO PLAY



When: Tuesdays and Thursdays 4:30-5:30, starting November 16. Virtual classroom.

What: Students will learn the basics of pixel art through the lens of low-res character design and, using the platform Scratch, create controllable video game characters of their own design! Students will be able to share their work with the class and seek feedback from the instructor.

Who: Pepper Blush is teaching this class! She says - "I'm a pixel artist with years of experience in the medium. I've made a few small games, and I love pixel art. It's an accessible, quick, and rewarding process that lets me bring my ideas to life and I can't wait to share this process with young creatives!"

You can sign up at www.codevirginia.org/classes or email camps@codevirginia.org with any questions!

STORYBOARDS

What is a storyboard? A storyboard is a visual tool used to plan out a scene in animation or film. The filmmakers draw out what each shot will look like in a series of **panels**, like a comic book. They often include notes about the shot under each panel, or include arrows in the drawing to indicate the movement of the actor or the camera during the shot.

If you plan to make a video, starting out with a storyboard is a great idea! It's like a script that will help you know what shots you need to create when you start filming.

Become a storyboard artist

A **flipbook animation** (see page 10) contains every single frame of action. But a storyboard artist only draws the most important frames needed to tell the story.

When you design a storyboard, make a list of all of the important moments in your story. Then draw each one. It will look a lot like a picture book!

Then, the director of your film will know how the story is supposed to look and an animator or a different artist will draw the rest of the frames. This is a very important job because it takes a story that was written as words and turns it into images!

VIRTUAL BACKGROUNDS THEN AND NOW

At this point we've ALL seen virtual backgrounds! We might have used them ourselves on video calls, or we might have seen them used in TV shows and movies. The very first example of replacing the background in a video dates all the way back to 1898! George Albert Smith, a British film pioneer, developed the technique of **double exposing film** to change the background of scenes already captured.

As the film industry progressed, a new technique called **Chroma-Key** was developed in 1930. Chroma-Key works by filming scenes in front of a solid color background that is very different from other colors in the scene. By having a solid background color such as blue or green it's fairly easy to replace just that color with what we want in the background! This process is called **keying**.



But wait! We've seen programs like Zoom and Google Meet use virtual backgrounds without needing a solid color background, how does that work? Modern video software uses a process called **image segmentation**. Image segmentation utilizes artificial intelligence to analyze each pixel to determine what the main object of the video is and what is a part of the background! This process is happening to every pixel multiple times a second! This allows software like Zoom to *automagically* remove any background!

ANIMATING WITH STOP MOTION

Stop motion animation is a well established style of filmmaking that creates entire movies frame by frame. A **frame** is a single still-image, and an animation is a sequence of those frames. To achieve fluid and “lifelike” motion, a stop motion film must have at least 24 frames every second to trick our brain into thinking that the frames are moving.

Tim Burton is one of most famous stop animation filmmakers. He directed movies such as *Coraline* and *Nightmare Before Christmas* that are known for their eerie and unique style. Often in his films, the characters used are highly intricate and specialized puppets that a team of animators and artists position and manipulate between each frame. Because every single frame of animation is being created, movement looks more realistic than a recording of a puppet. It takes a long time to combine enough frames into an animation, but animators do it anyway because of the amazing detail that can be brought to life when it's complete.

This style can also be done at home with drawings, clay (claymation), LEGOs other toys, and even people! All that is needed is a camera, a tripod or mount to help keep things steady, and some software to arrange the frames or photographs.

Flip to page 10 for instructions to make your own stop motion flipbook!

1	2	3
4	5	6
7	8	9
10	11	12

1	2	3
4	5	6
7	8	9
10	11	12



YOUR OWN FLIPBOOK

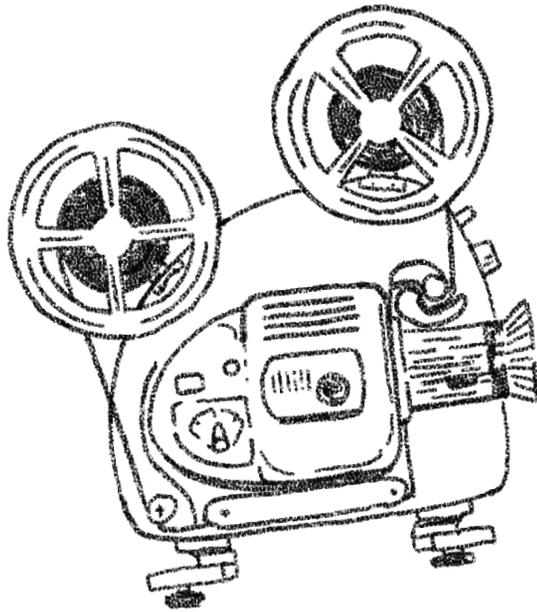
Did you know you can create an animation at home with just pencil, paper, and scissors?

You can start with stick figures doing simple movements, like throwing a ball or catching a fish, and then try more detailed drawings!

Use the grid on the previous page. Draw your figure in the first box, and in the next box draw them in the same place, but move an arm or leg.

Continue this process with all the boxes. When you're done, cut out each square and stack them in order.

Staple the left side or hold it, and as you flip through the pages your figure will start to move!



Hello Snailers, it's Pepper! One of the people I really look up to in the world of computer science is a woman named **Danielle Feinberg**. She has been a critical artistic player in almost every Pixar movie going back to *Bugs Life* as the lead lighting director.

Before I talk more about Danielle, I want to talk about why lighting is so cool. When we think about what goes into digital animation, we think often about:

- Character & Background designers
- 3D Sculptors
- Animators
- Musicians

But the thing that brings all of these aspects together is the lighting. Lighting is the KEY to the mood and emotion of a scene! When people hold flashlights underneath their faces, that lighting makes them look spooky. Bright sunny lighting has a different feeling from moonlight. Fluorescent lighting is different from flickering torchlight. The best acting in the world isn't worth much if the lighting telegraphs the wrong mood.

So read on to learn about Danielle Feinberg, Pixar lighting designer and advocate for girls and women in cinema!

PERSON OF THE MONTH: DANIELLE FEINBERG

Danielle Feinberg's career working at Pixar has been so important because Pixar showed the cinema world that high budget (and high quality) digital animation was possible! Pixar, and Danielle by extension, know how good CG-animated movies can look when made with love and care. Her lighting direction helps craft the mood of a scene, and that's what sticks in our memory after watching a movie!

On top of being the lighting director for some of the most beloved movies of all time, including my favourite *Wall-E*, she has a degree in computer science and has been working with organizations like Girls Who Code to help bring people into her profession!

To learn more about Danielle and lighting you can visit her website and watch her TED Talk: <http://daniellefeinberg.com>.

DEEP DIVE: MINIATURES

IN FILM

Miniature effects in television and films use small models called **miniatures** in order to create settings or events that would otherwise be too difficult to film in reality. Popular films like Star Wars, Thomas the Tank Engine, Godzilla, Lord of the Rings, and so many more, have used miniatures to capture scenes with explosions, spaceships, giant monsters, and other fantastical stuff!

When model makers are tasked with creating miniatures they ask themselves a lot of questions about size including how big they should make the model, and what size everything inside or around the miniature should be. When they ask themselves these questions, they are really asking about **scales** and **ratios**.

The scale is the size of the model, while ratio is the sizes of two objects compared to each other (e.g., the miniature compared to the size of what would be the real model). If you research films that use miniatures, though, you'll find that miniatures can be any size! In fact, there have even been some films that use "bigatures" (a.k.a., big miniatures).

MAKE A MINIATURE FILM SET WITH IRENE!

But how do model-makers make miniatures? Well, you can use items from around your house to make your own! I took some time to gather some materials from around my house to make my own miniature, and later I used a free app on my phone called Picsart and a free transparent tool by Lunapic to edit myself into a picture of my model. You can do the same!

Some materials that might help you make your miniature are:
Cardboard from cereal boxes, tissue boxes, paper towel rolls,
Scissors,
Foam core board,
Acrylic/craft paint,
Glue or tape,
Old plastic/packaging material,

If you need wood or greenery, consider grabbing some dead bark from trees (make sure it's clean of any insects or animals), tiny plants, or some popsicle sticks, coffee stirrs, disposable chopsticks, toothpicks, fake plants, etc.

Get creative! Think of materials you might be able to recycle/reuse.

Flip the page to see my own miniature room! Then brainstorm your own ideas.



PLANNING YOUR MINIATURE

Before you make your miniature, think about what exactly you want. Do you want to make a **place**, like a scary Victorian castle, or a **thing**, like a funky robot?

Write some ideas here:

Think about what story you want to tell with your miniature. Will you want to edit yourself onto your set, or go even further and DIY your own film with a greenscreen featuring your miniature?

Write a short story, or use a story that you already like:

Make a list of items that you'll need to find or create:

Now that you're starting to think more like a model-maker, you'll also have to ask yourself questions about what scale and ratio your model should be in order to take care of what size you want your miniature (or bigature) to be.

One of the things that makes miniatures so believable in film is how detailed they are! Think about what details you can add to make your place or thing look super realistic on camera.



Here is the miniature set that I made. Can you tell what materials I used to make the furniture?

Try using a storyboard to capture your ideas!

RESOURCES

To keep up with what CodeVA and Eureka are doing and to see current class offerings, visit us at **CodeVirginia.org**

Computer Science Classes and Learning

eureka workshop - codevirginia.org/classes

adafruit - adafruit.com

hour of code - hourofcode.org

micro:bit - microbit.org

Art & Design

earsketch - earsketch.gatech.edu

gb studio - gbstudio.dev

makecode - makecode.com

piskelapp - piskelapp.com

scratch - scratch.mit.edu

DID YOU KNOW?

You can use your search engine to see what other filmmakers are making right now. Do an image search for "DIY miniatures", "flipbook animation", and "virtual background for film".



CodeVA

SEE YOU NEXT MONTH!



Would you like to help us improve Snail Mail? Answer the physical survey, or access the survey online via computer or mobile device: bit.ly/CodeVASnailMail

Sincerely Yours The Snail Mail Team

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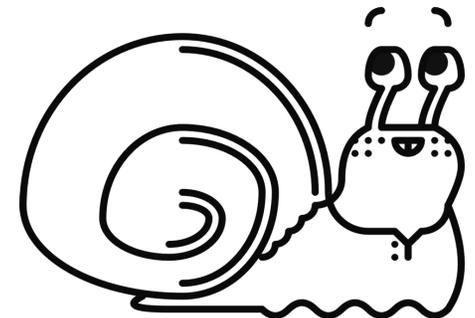
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