

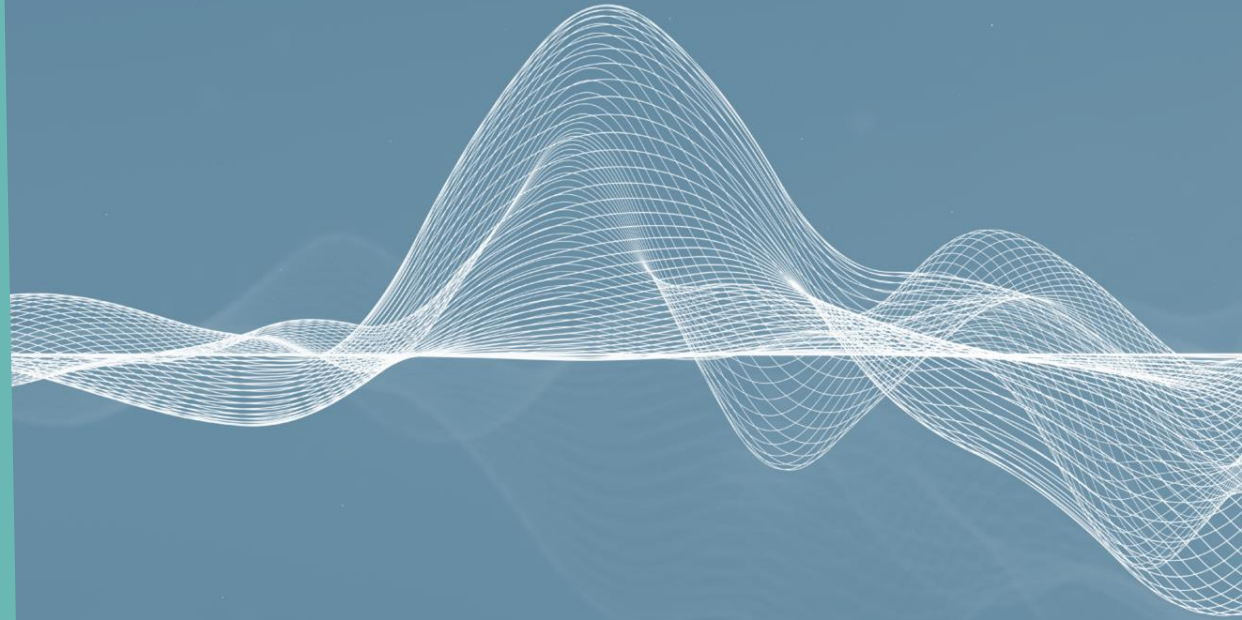
Data-Driven Animation

for Science
Communication

Jessica Kendall-Bar

July 18-29

CSUMB Summer of Science Illustration



OUTLINE

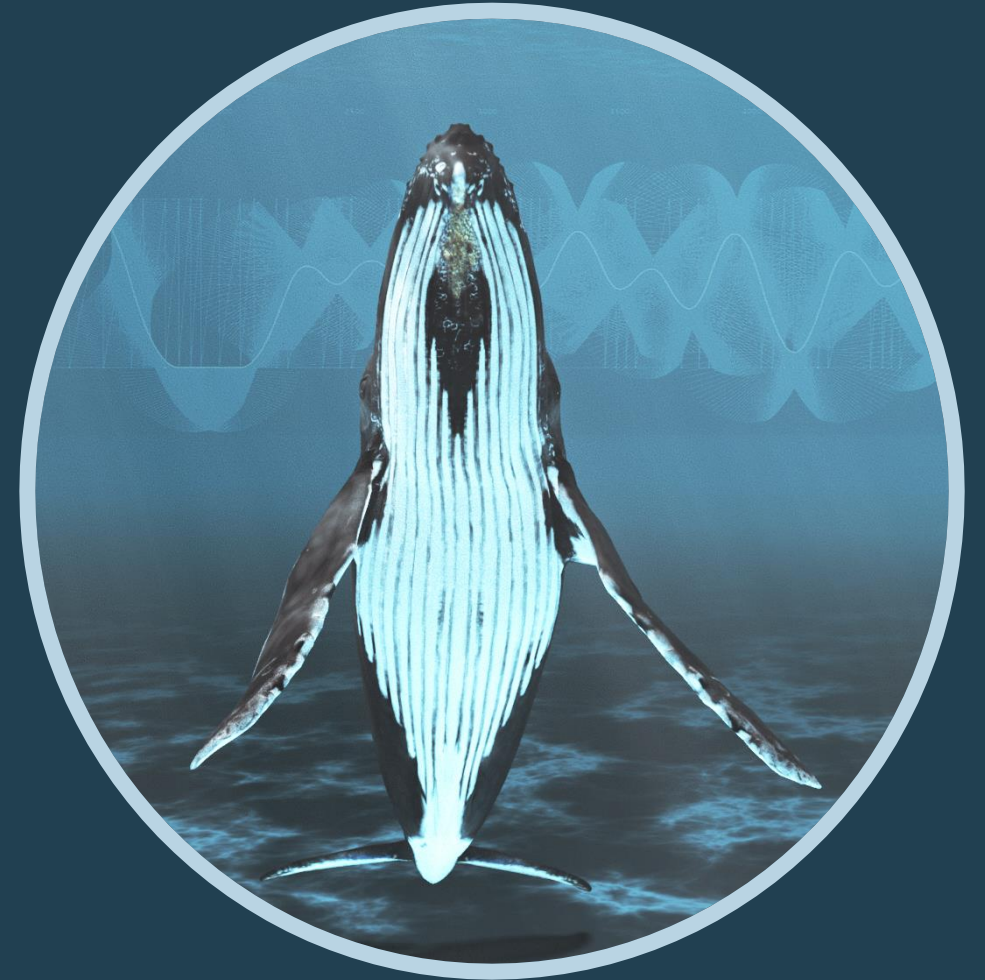
Course structure

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
	Jul 18	Jul 19	Jul 20	Jul 21	Jul 22	Jul 25	Jul 26	Jul 27	Jul 28	Jul 29
Topic	<i>Introductions & Collaboration</i>	<i>Conceptualization</i>	<i>Digital Art and Design</i>	<i>Data Visualization</i>	<i>Animation & Motion Graphics</i>	<i>Animating 2D Data</i>	<i>Intro to 3D Animation</i>	<i>Animating 3D Data</i>	<i>Editing & Compositing</i>	<i>Final Critique & Communication Strategy</i>
Program	Adobe Premiere Pro	Adobe Premiere Pro	Adobe Photoshop & Illustrator	Adobe Illustrator & R	After Effects	After Effects	Autodesk Maya	Autodesk Maya	Adobe After Effects/Premiere Pro	Social Media
Starting products	Draft scientific paper with key figures and points, any existing assets (videos, illustrations, or 3D models).	Style Guide & Script	Reference images and list of key assets and animatic	One key figure	Animatic	Made-over key figure	3D asset	Animated 3D scene	Rendered image sequences	Final composition
Main output	Style Guide, Budget, Contract, & Script	Storyboard & Animatic	Custom 2D raster & vector graphics	Made-over key figure	Scene with motion graphics	Animated key figure	Animated 3D scene	Data-driven 3D scene	Final composition (mp4 with narration, annotations, custom musical score)	Science Communication Strategy document
Interview with industry Expert - Guest lecture	Sara El Shafie - Distilling Complexity; Science through Story	Ilgavak (Peter Williams) - Storytelling and place-based learning	Alex Boersma - Scientific illustrations and animations for high-impact science	Allison Horst - Art to build agency for budding data scientists	Bailee Desrocher - Animations for science storytelling; NASA & beyond	Katherine Vlamis - CrossTown LA COVID data visualizations for large cities amidst a global pandemic	Johnson Martin - Digital Life 3D: Realistic animal models for science and education	Geraldine Fauville ; VR for environmental education	Connor Vance - Musical Compositions for Data Storytelling	Sal Alper - Science communication and outreach through the SF Exploratorium

DAY 5

Animation & Motion Graphics

Data-Driven Animation
for Science Communication



PART 1

WELCOME

Agenda & Goals

Review today's agenda & goals - 20 min



AGENDA

Today's agenda

2:00 - 2:20: Animation Brainstorming - Sketch explainer shot frames (20 min)

2:20 - 2:50: Group Discussion - Collect animation techniques required (30 min)

2:50 - 3:00: Break / Reflection (10 min)

3:00 - 3:30: Lecture: Introduction to Animation (30 min)

3:30 - 4:00: Discussion - List & brainstorm animation techniques (30 min)

4:00 - 4:10: Break (10 min)

4:10 - 4:40: Demo: Learning to animate in After Effects (30 min)

4:40 - 5:20: Work time - Make your animated motion graphic (40 min)

5:20 - 5:30: Break (10 min)

5:30 - 6:30: Guest speaker - Bailee Desrocher: Scientific animations for science storytelling at NASA & beyond

DAY 5

GUEST SPEAKER

*Animations for science:
storytelling at NASA & beyond*

Bailee DesRocher

Senior Animator, Ingenuity Studios

Contact: contact@beautifulcritters.com



GOALS

Today's goals

- Learn principles & techniques of animation
- Create motion graphics scene

PART 2

OPENING ACTIVITY

Animation Brainstorming

Sketch, brainstorm, discuss, reflect - 50
min



Opening Activity

Animation Brainstorming

- Sketch explainer shot frames

Opening Activity

Group Discussion

- Collect animation techniques required

B R E A K

10 min - Return at 3:00 PM



PART 3

LECTURE

Introduction to Animation

INSERT SUB-HEADER HERE - 30 min



DEFINING SOME THINGS

ANIMATION

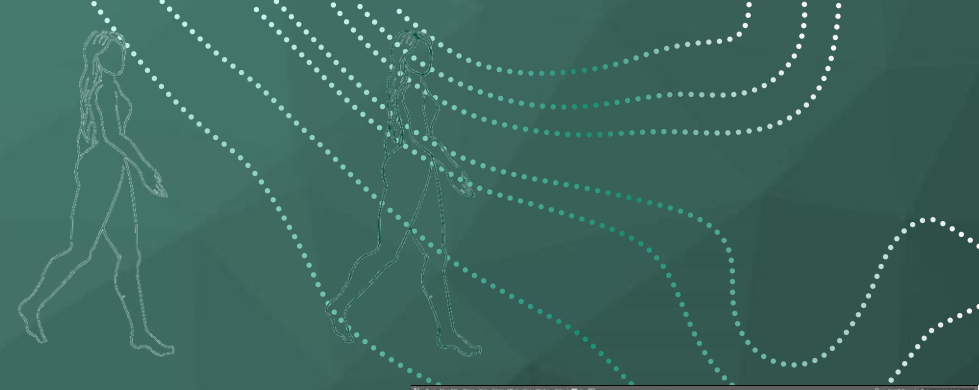
A method in which static figures appear as moving images, by changing the graphic in sequential frames

MOTION GRAPHICS

Animations which mostly involve text and graphics

AFTER EFFECTS

A "motion graphics and visual effects software"



WHAT ADOBE SOFTWARE SHOULD I USE TO CREATE A VIDEO?

Start in:

AFTER
EFFECTS

or

PREMIERE
PRO

Creating a video with many motion graphics or visual effects

Video editing with
multiple clips

And **then** link to an After Effects file for adding title motion graphics or visual effects.

Within After Effects, you can link to updating Adobe files such as Photoshop and Illustrator Files.

PHOTOSHOP

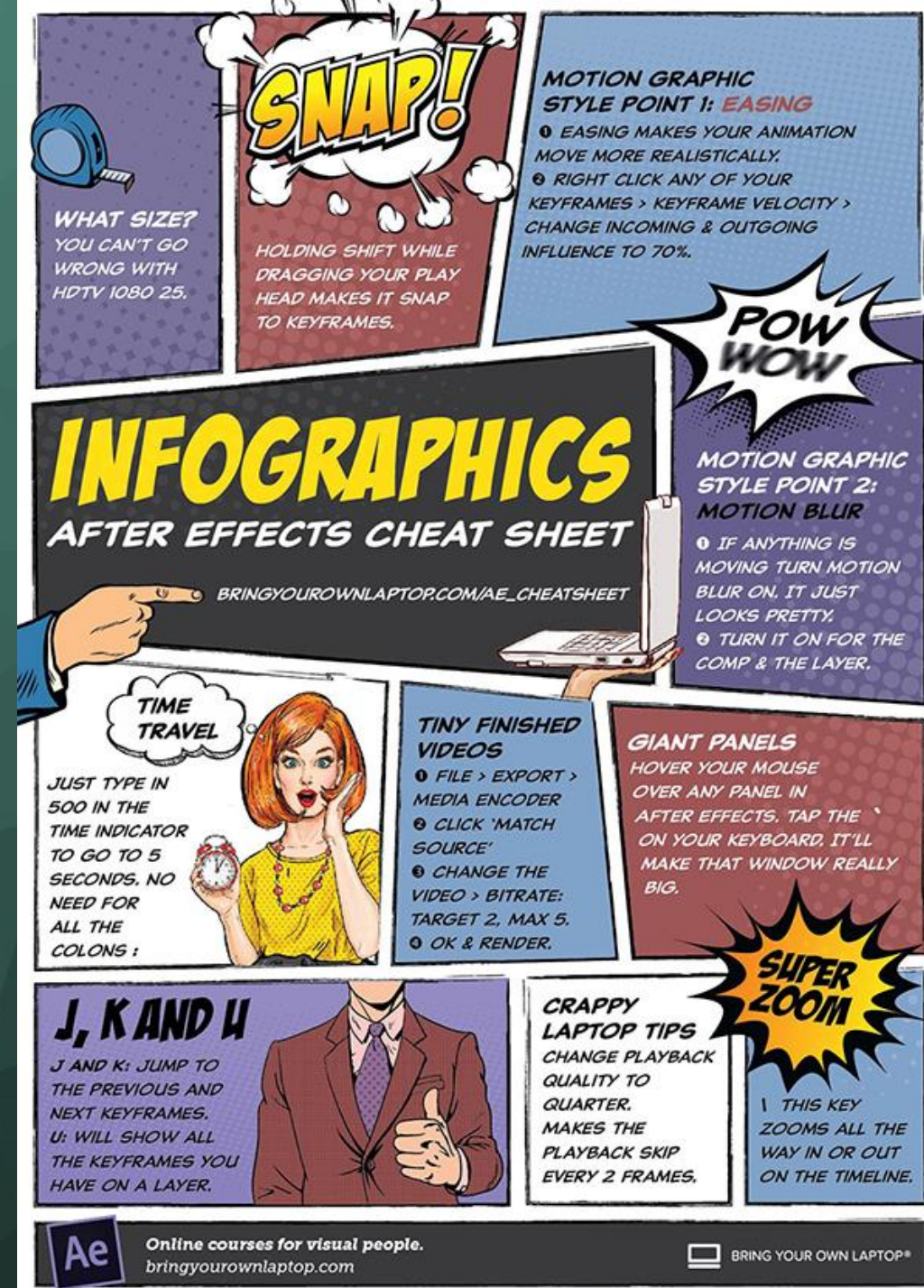
Creating digital paintings with raster graphics, compositing illustrations, and editing a single photo.

ILLUSTRATOR

Creating vector graphics, figure editing, and composition.

KEY TECHNIQUES AND TOOLS

- Layers and Blending Modes
- Masks
- Stroke effects:
 - Trim paths
 - Wiggle paths
 - Roughen edges
- Visual effects
 - Fractal Noise/Displacement maps
- Expressions: JavaScript



EXAMPLES

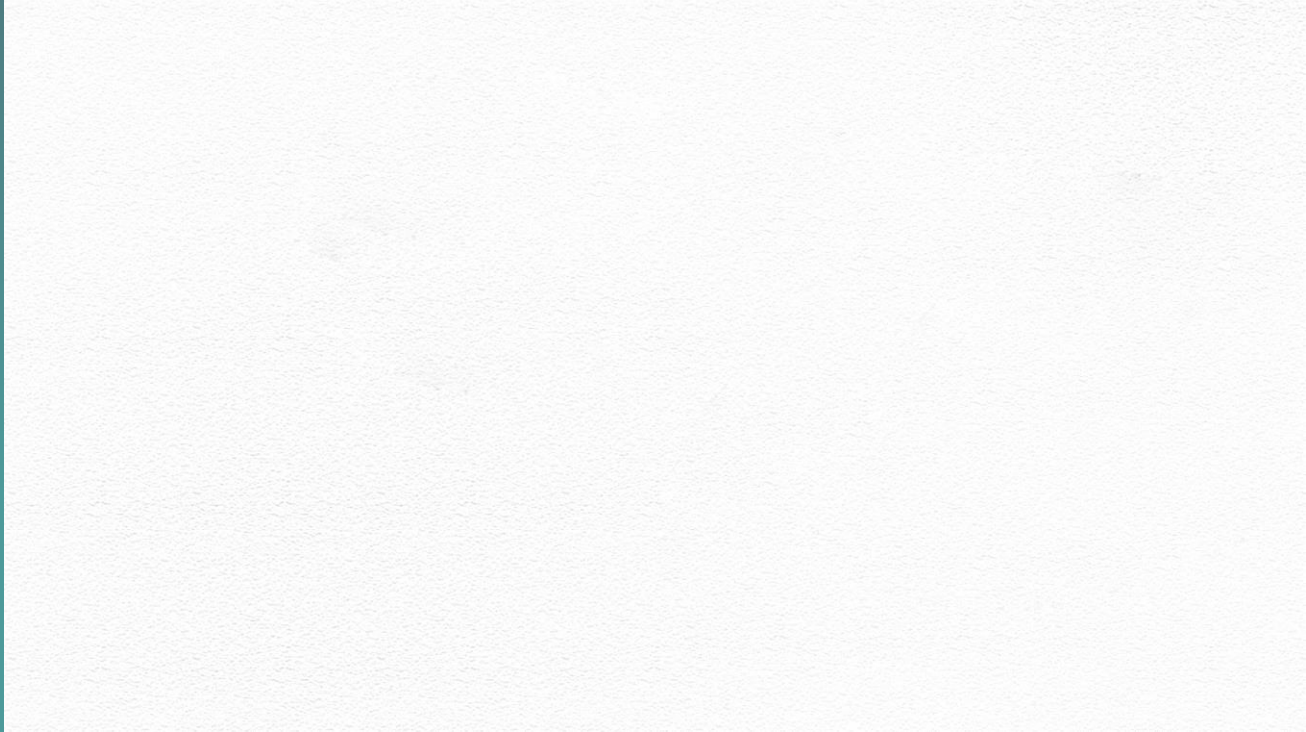
Can add labels, captions, and graphics to existing footage or 3D rendered animations.



these humpback whales fed.

3D tag model created in AutoDesk MAYA - program we will explore next time!

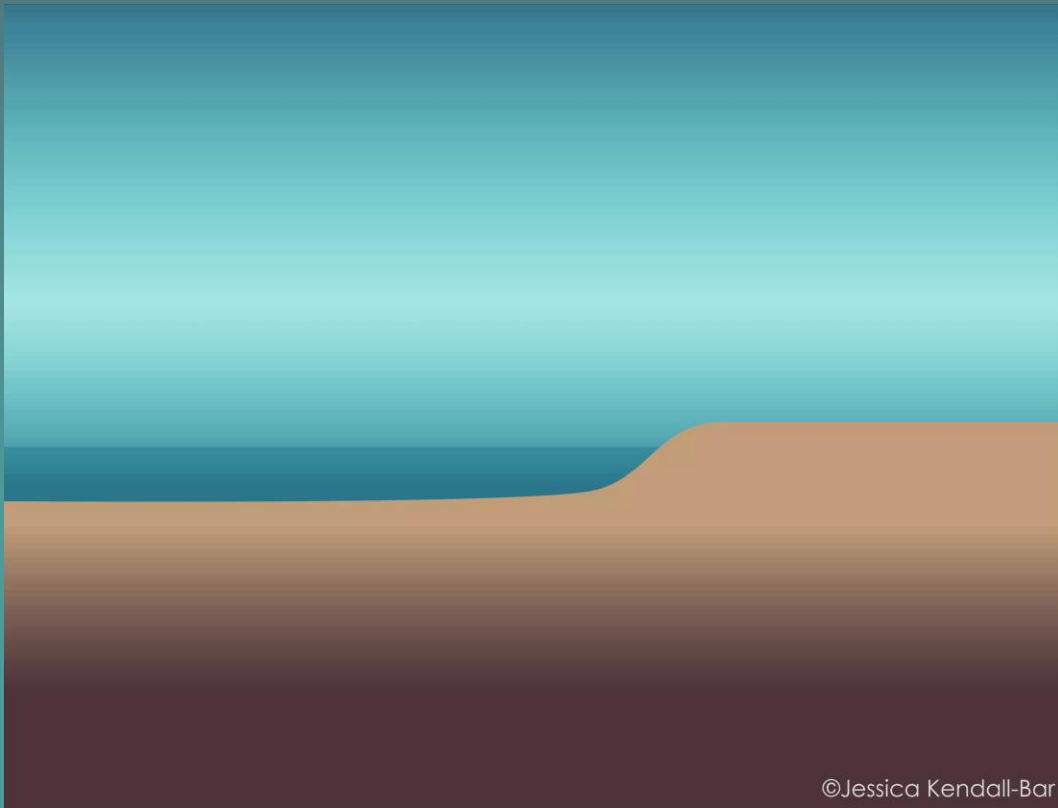
Can create your own line animations from scratch.



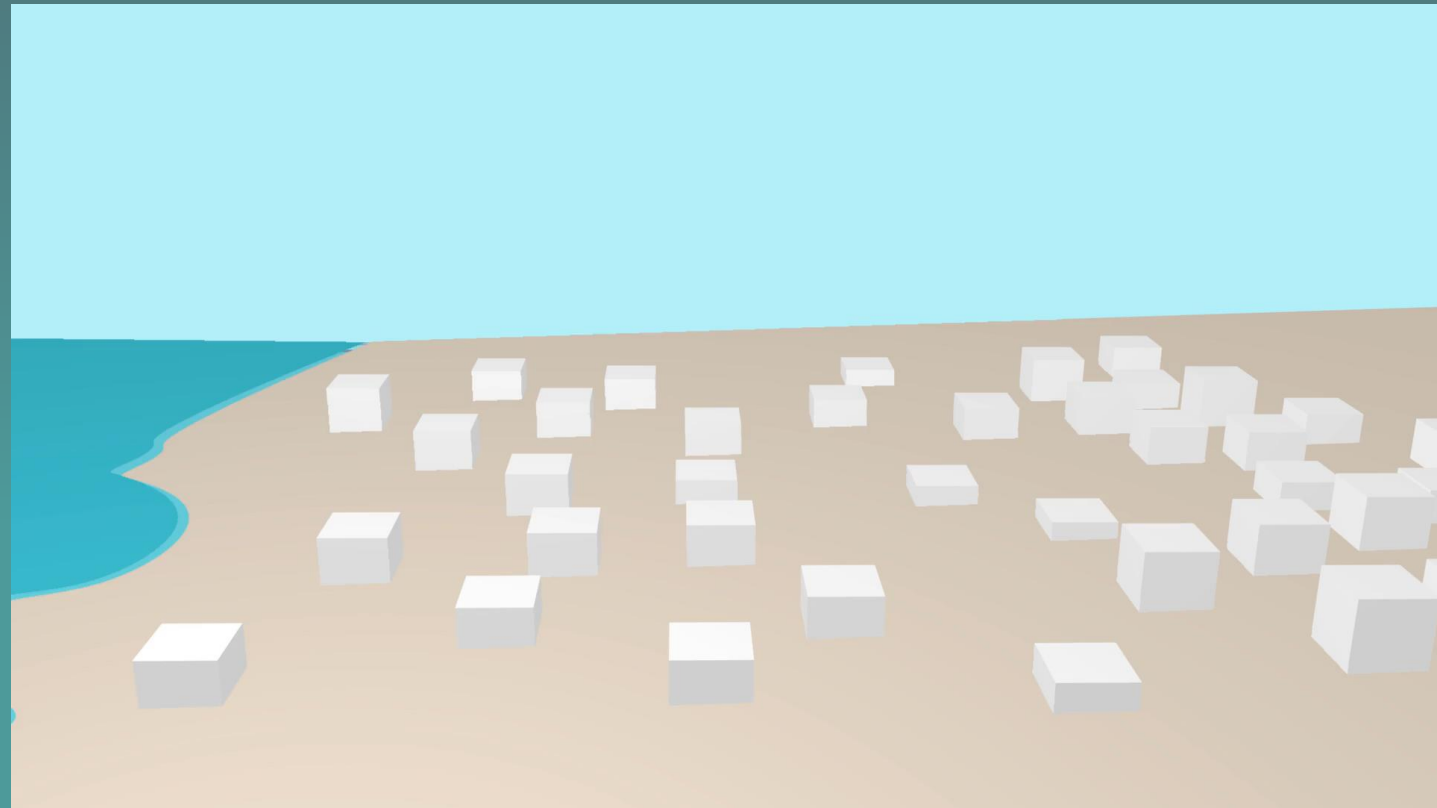
Background inside of theater created in Adobe Photoshop.

EXAMPLES

Can import Adobe Illustrator files and animate them.



Can bring 2D objects into 3D to make simple 3D animations.



Window > Workspace > Animation

Adobe After Effects 2020 - C:\Users\Jessie\Downloads\logo_animation.aep

File Edit Composition Layer Effect Animation View Window Help

Project

Water Comp 6
1280 x 720 (1.00)
△ 0:00:30:00, 40.00 fps

Water Comp 5
Water Comp 3

Active Camera

Renderer: Classic 3D

Info

Preview

Effects & Presets

- > * Animation Presets
- > 3D Channel
- > Audio
- > Blur & Sharpen
- > Boris FX Mocha
- > Channel
- > CINEMA 4D
- > Color Correction
- > Distort
- > Expression Controls
- > Generate
- > Immersive Video
- > Keying
- > Matte
- > Noise & Grain
- > Obsolete
- > Perspective
- > Simulation
- > Stylize
- > Text
- > Time
- > Transition
- > Utility

0:00:05:23
00223 (40.00 fps)

Layer Name Mode T .TrkMat Parent & Link

8	[Adjust... Layer 3]	Normal	None	None	None
9	[Adjust... Layer 2]	Normal	None	None	None
10	Camera 1	Normal	None	None	None
11	★ Shape Layer 2	Normal	None	None	None
12	T jessie kendall-bar 2	Normal	None	None	None
13	[waterm...ircle.png]	Normal	None	None	None
14	[Adjust... Layer 4]	Normal	None	None	None
15	[bkgrd_...ds.jpg]	Normal	None	None	None
16	[bkgrd_...ds.jpg]	Normal	LInv	None	None

Transform

Reset

Anchor Point 1949.5, 575.0

Position 640.0, 713.0

Scale 35.0, -72.0 %

Toggle Switches / Modes

EXAMPLES

Kool & the Gang music video animated in After Effects



EXAMPLES

Kool & the Gang music video animated in After Effects



BLOBBY DANCING

shape path
animated
with
keyframes

FACES MORPHING

path
animated
with
keyframe,
trim paths

LINEAR WIPE

same as
wipe
transition in
PowerPoint

BAND MEMBERS IN FRAMES:

animated
masks

STYLISTIC EFFECTS:

background
watercolor
texture and
blending
modes,

Frame-by-frame drawings in Illustrator with the blob brush- doh! ☹

You can apply textures to your paper, lines, and fills in After Effects.

To achieve a hand-drawn/watercolor look:



Imported into Adobe Animate then After Effects.
Would suggest different workflow..... ☺

PART 4

DISCUSSION

List & brainstorm animation techniques

30 min - Stop & break at 4:00 PM



B R E A K

10 min - Return at 3:00 PM



PART 5

DEMO

Learning to Animate in After Effects

INSERT SUB HEADER HERE - 30 min



DEMO

Animating in After Effects

- Demo/lecture: Animating motion graphics in After Effects - trim paths/simple shapes/vector graphic animations with “Position” attribute

PART 6

WORK TIME

40 min - Stop & break at 5:20 PM



B R E A K

10 min - Return at 5:30 PM



H O M E W O R K

Deliverables for Tomorrow

- Upload your motion graphic shot to the shared Google Drive & Canvas and name it:

05_MotionGraphics_FirstName_LastName_SceneName.mp4

- MOTION GRAPHICS RUBRIC

Animation storyboard sketch	Completeness (0.5)	Animation is planned out with a clear sequence of what the action is in each sequential shot.
Animation Reflection	Completeness (0.5)	Reviews animation storyboard sketch, keeping in mind 12 principles of animation and the list of potential techniques to accomplish desired effect; decide which techniques to implement and which might be too time-intensive.
Motion Graphics Scene	Completeness (4)	Provided .mp4 incorporates 2 concepts from the lecture to help clarify animation content.

DAY 5

GUEST SPEAKER

*Animations for science:
storytelling at NASA & beyond*

Bailee DesRocher

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