

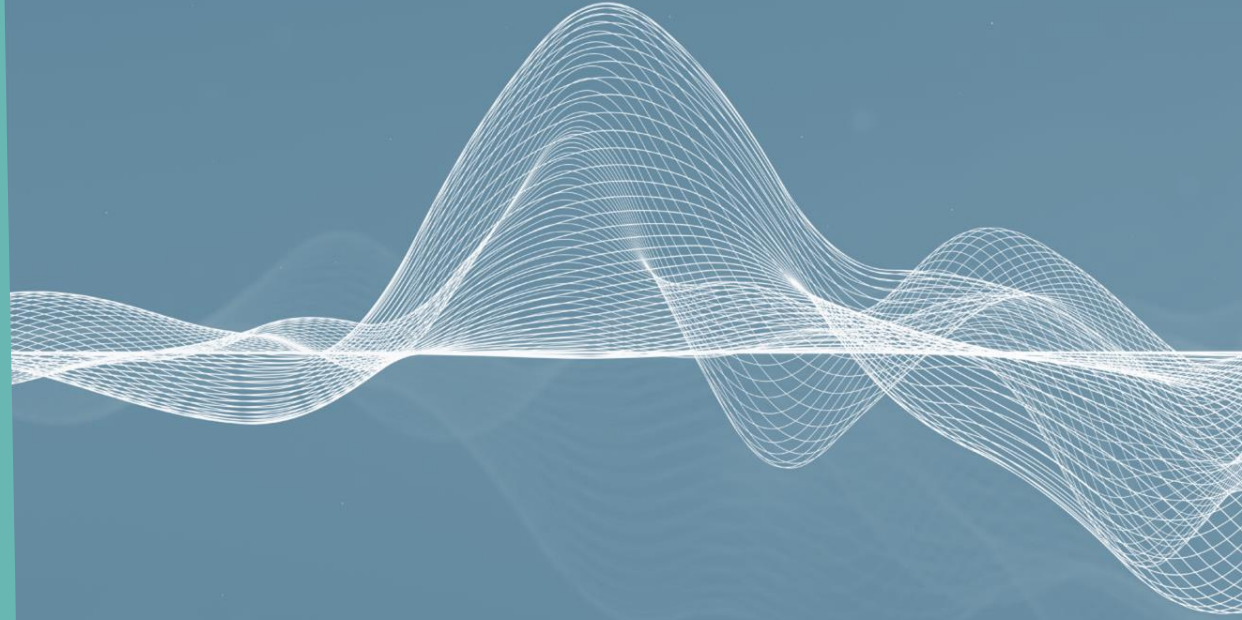
Data-Driven Animation

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	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

AGENDA

Today's agenda

- 2:00 - 2:20: Agenda & questions** - Course Outline & Welcome! (20 min)
- 2:20 - 2:50: Opening Activity** - Abstract switch, introductions, and reflection (30 min)
- 2:50 - 3:00: Break / Reflection** (10 min)
- 3:00 - 3:30: Lecture:** Intro to Data Visualization & Design (30 min)
- 3:30 - 4:00: Work time** - Data Description, Style Guides, Audience Brainstorming (30 min)
- 4:00 - 4:10: Break** (10 min)
- 4:10 - 4:40: Closing Activity (Instructions)** - Scripts / Contracts / Budgets (30 min)
- 4:40 - 5:20: Work time** - Scripts / Contracts / Budgets / Approvals (40 min)
- 5:20 - 5:30: Break** (10 min)
- 5:30 - 6:30: Guest speaker** - Science through Story with Sara ElShafie

DAY 2

GUEST SPEAKER

Place-based learning and storytelling

Ilgavak (Peter Williams)

artist & culture bearer

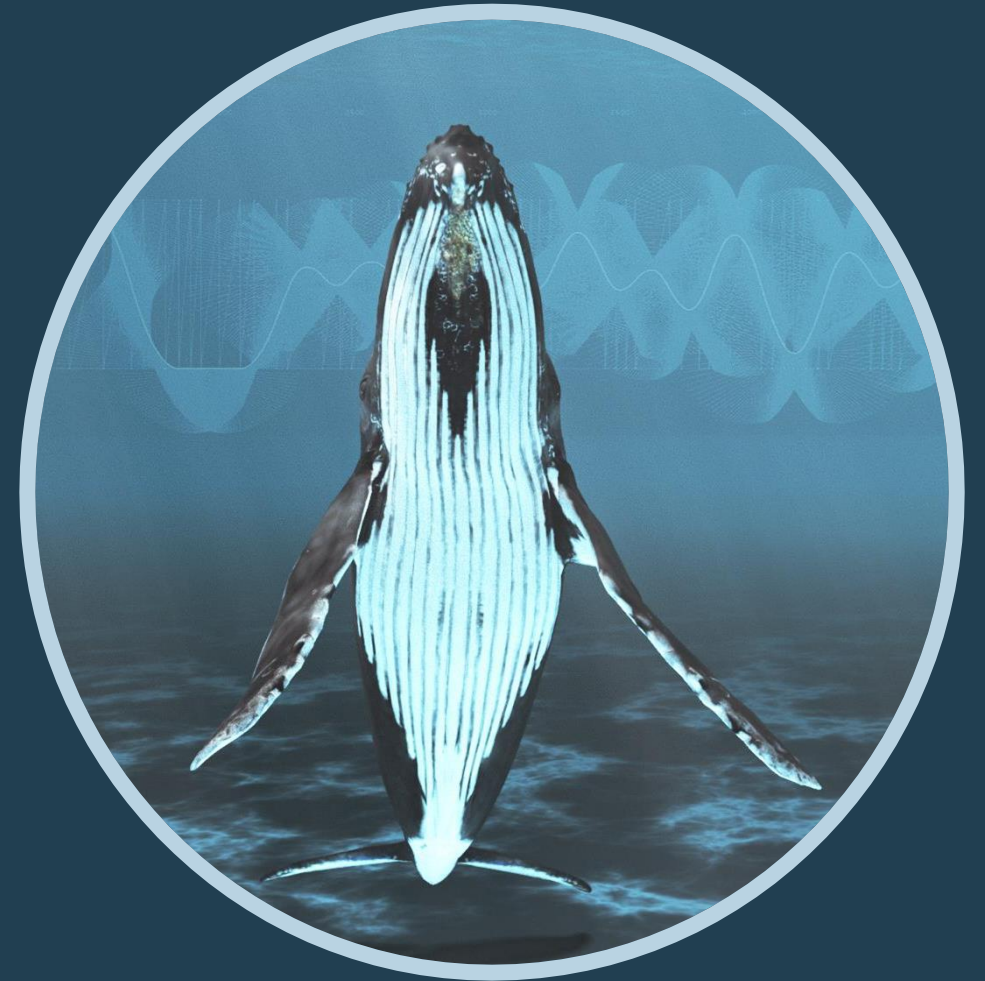
Contact: seaotterfur@gmail.com



DAY 2

Conceptualization

Data-Driven Animation
for Science Communication



PART 1

WELCOME

Script Critique

Listen to scripts by your classmates
- 20 min



WELCOME

While you listen & look at Style Guide...

Consult the rubric for scripts & style guides:

	0.5	Data Description	Correctness	Data is described/interpreted correctly.
			Completeness	Data is categorized correctly.
	1.5	Style Guide	Verbal description	Verbal description is provided and evokes the intended emotion/feeling.
			Color palette	Color palette has 3 main hues (3 values for each hue); 3 main hues are distinguishable and colorblind friendly; text and background colors have enough contrast
			Fonts	Fonts are provided, legible, and consistent with verbal description
			Credit slide and Watermark: Logo/Permit #/etc.	Example credit slide has all required funders acknowledged according to their style stipulations (e.g. USGS has very specific requirements for videos hosted on their site). A sample frame from the animation shows required watermarks and logos (e.g. NMFS Permit # displayed for marine mammal research/data visualizations)
			Spelling/Abbreviations/Capitalization	List critical assets that may be labeled in your animation to ensure that you are using proper and consistent spelling/abbreviations/capitalization.

	3	Script	Hook	Script uses one of the discussed strategies to grab the audience's attention and interest.
			What the scientists did	Script explains how and why the science was done.
			What they found	Distills the main point of the paper into at most 3 separate ideas (~ at most 3 key points)
			Why does it matter	Focuses on the impact of the study with respect to the audience, appeals to the audience using their predicted cares and interests.
			Clarity & intelligibility	Script avoids using acronyms and domain-specific jargon unless absolutely essential to the story. If terms are deemed essential, a definition must be provided. Script should be intelligible to a lay audience (no assumed prior knowledge related to the study).
			Recording quality	Audio quality is good (no background noise, no interruptions, no static, no popping)
			Time Limit	The recorded script is less than 2 minutes long.

PART 2

OPENING ACTIVITY

Scripts – Reflection

Group discussion –
what worked what didn't –
30 min + 10 min for revisions (if needed)



INTRODUCTIONS

Scripts – Reflection

- In large group, share successes:
 - What were some things that you enjoyed in the scripts?
 - What grabbed your attention?
 - What was effective in making the research accessible?
- What could be improved?
 - What were some things that you think could be improved?
 - How could you grab attention more effectively?
 - How can you make the research more accessible?
- We will be working with our scripts for the rest of the class – take the rest of the hour to make sure you have something you (and your collaborator) are happy with.

BREAK

10 min - Return at 3:00 PM



PART 3

LECTURE

Storyboards – Illustration for animation

Why & how to conceptualize an
animation - 20 min



STORYBOARDS

Storyboards

- What is a storyboard?
 - Visual representation of your script that shows the narrative flow of your video, scene by scene. Outlines each shot, clearly explaining the action that will be depicted, the verbal descriptions, and the sounds that will be played.
- What is a storyboard NOT?
 - A photorealistic rendering of your final animation
 - Perfect 😊

STORYBOARDS

Why storyboard?

- It is the easiest way to explain & share your vision
- It will allow you to see whether what you plan will work
- It will save you time
 - Helps identify problems/misunderstandings early on
 - By clearly communicating the content of your video, your client will know what to expect
 - Can receive clear, visual feedback from your client
- It will allow you to revisit and re-plan when you make changes

STORYBOARDS

How much effort to spend?

- **Audience?**
 - Who are you making this storyboard for? Is it simply a planning tool for you and a close collaborator or is it something you will show to a client in hopes that they will hire you again?
- **Style?**
 - Beyond a style guide, a storyboard is a good way to make sure you and your client are on the same page in terms of what the animation will look & feel like, to avoid issues further down the line.
- **Length/complexity?**
 - A storyboard should have enough information to plan out each of your main shots so that you can decide which are worthwhile and which might be too much work.
- **Things to keep in mind:**
 - Ultimately, this storyboard is a tool for you to save time. Keep it as simple as possible and make it clear to your client what kind of feedback you are looking for (e.g. is this the exact style that you will use? Are you seeking detailed feedback on illustrations and/or color or are you seeking general feedback on the story's flow?)

STORYBOARDS

Examples

- Audience?
- First animation client

• Shot 2



need to attach tag
may re-render TO DO next

don't need

don't need

don't need

Shot 13

3 whales drive down in echelon

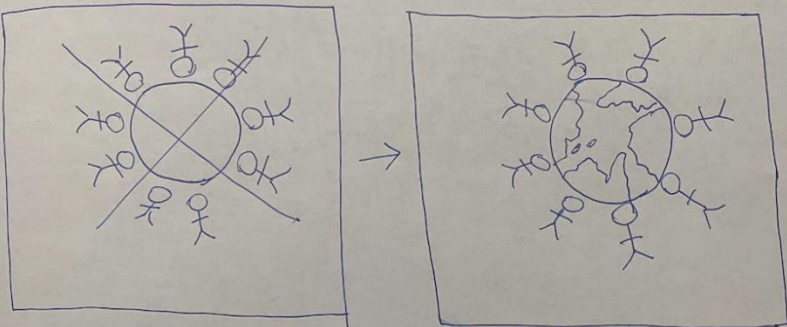
SHOT 13 = ~13 seconds → ~7 seconds

→ 10 seconds
notes for Nick on SHOT 12:
→ must be at 50% this speed (slower)
→ keep 2 whales mouths open longer (until 0:05)
→ for single whale, close mouth at 0:04 and reopen 0:05

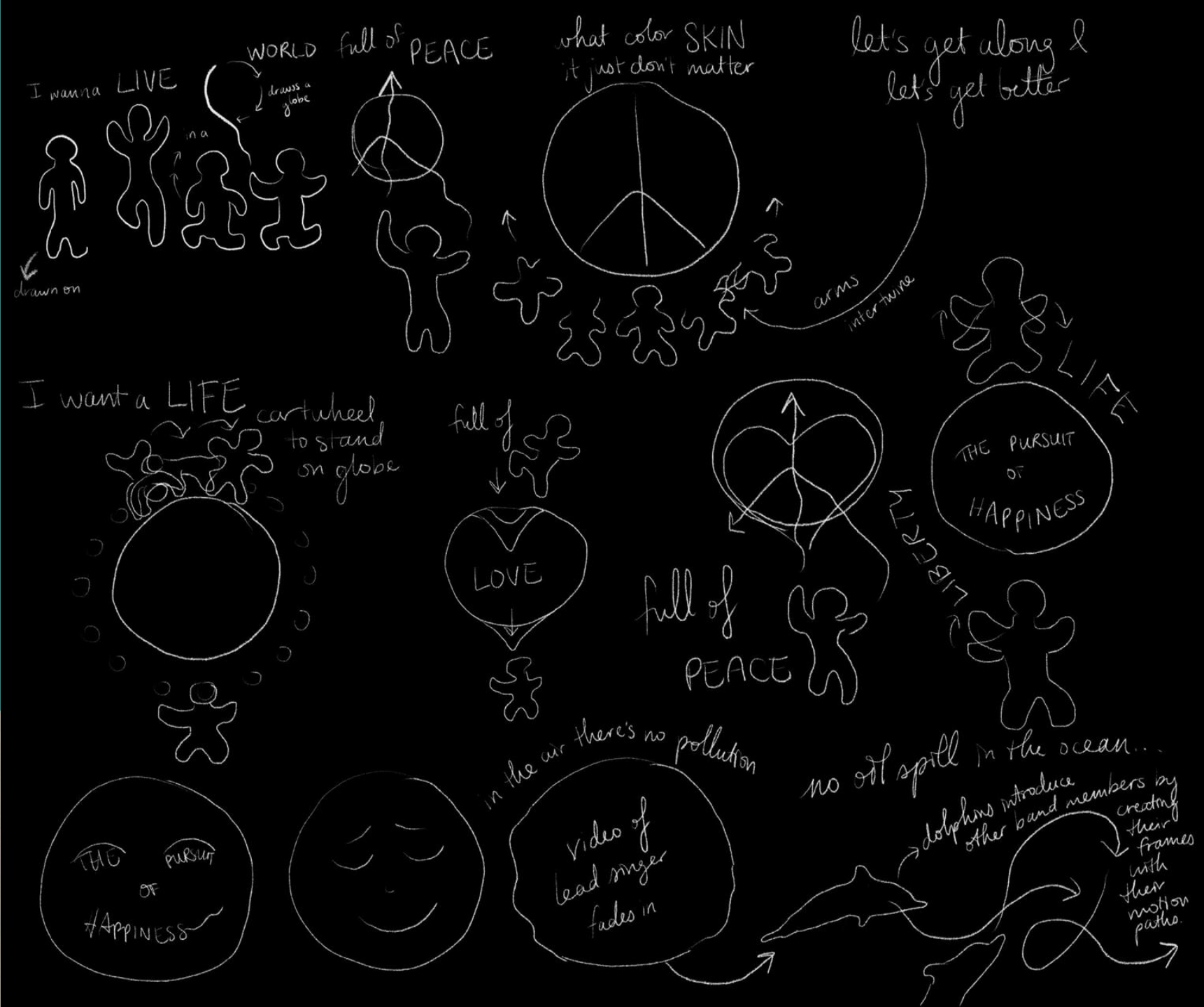
STORYBOARDS

Examples

- Audience?
 - Music Producer
- Style?
 - Hand-drawn sketch
- Length/complexity?
 - First 30 sec of ~6 min music video



1. KEEP EARTH THROUGH SPANNING
BUBBLE MEN SEQUENCE



PART 4

WORK TIME

30 min - Stop & break at 4:00 PM



BREAK

10 min – Return at 3:00 PM



PART 5

CLOSING ACTIVITY

Scripts, Contracts, & Budgets

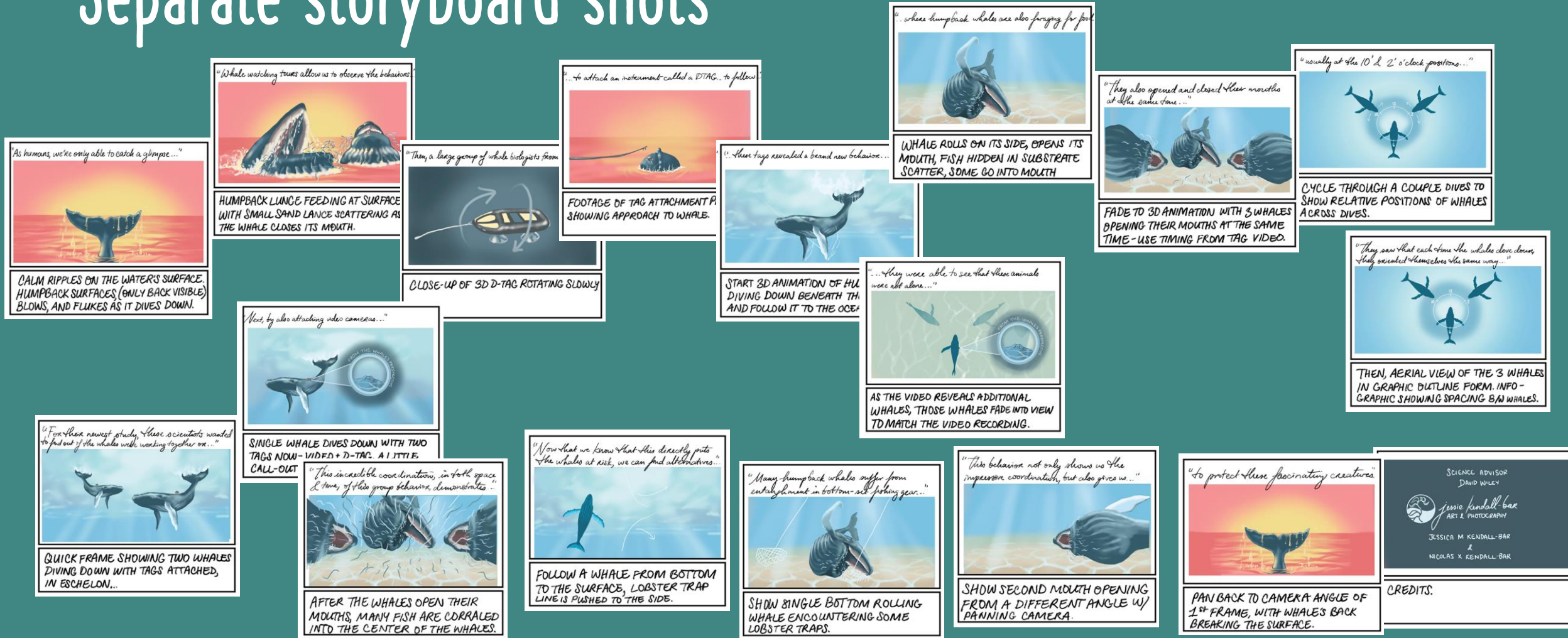
Distill the science & establish
expectations - 20 min



ANIMATIC

- Crop storyboard into individual shots-
name shots according to their order

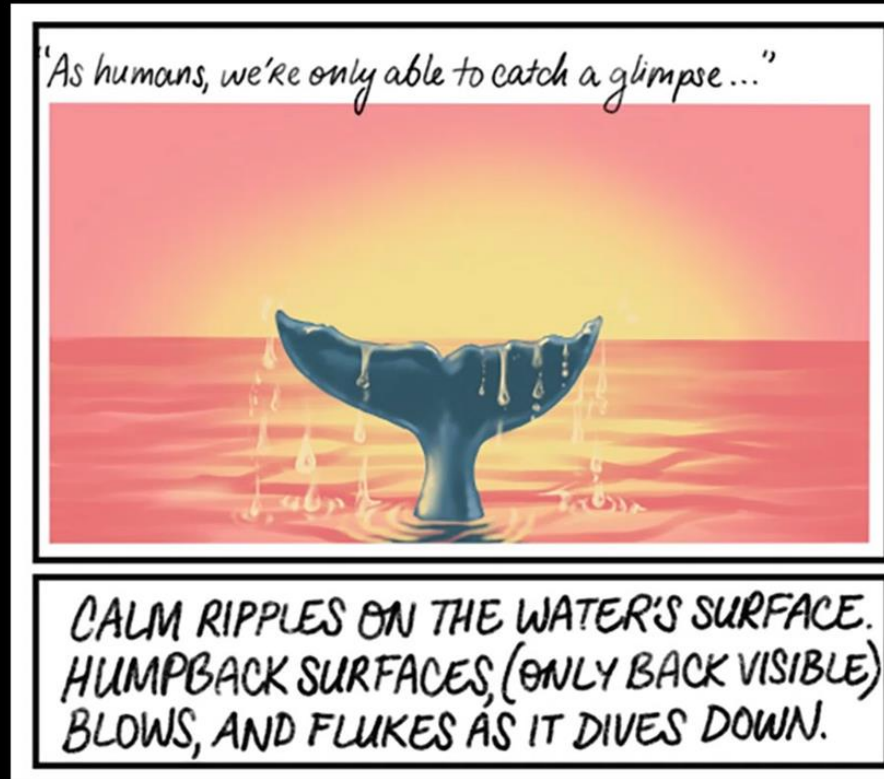
Separate storyboard shots



ANIMATIC

Examples

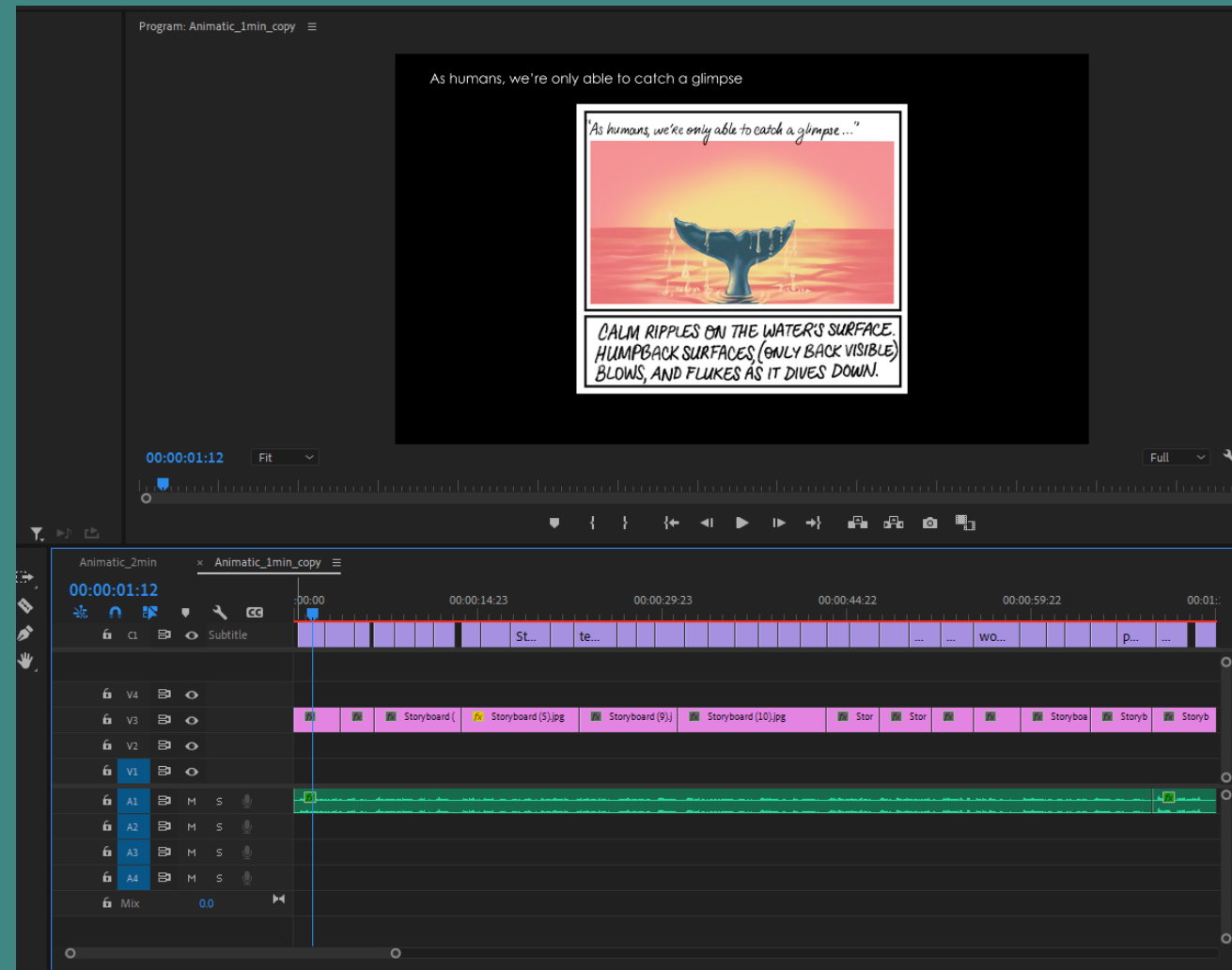
- Audience?
 - First animation client
- Style?



ANIMATIC

Working in Adobe Premiere Pro

- Import cropped images & script audio
- Add Script to audio track
- Create Open Captions track; write captions
- Adjust duration of each photo to match the script



PART 6

WORK TIME

40 min - Stop & break at 5:20 PM



BREAK

10 min - Return at 5:30 PM



HOMework

Deliverables for Next Time

- Upload to Google Drive & Canvas:
 - Storyboard (pdf)
 - Animatic (mp4)
- Instructions & links in [Data-Driven Animation Journal](#)

DAY 2

GUEST SPEAKER

Place-based learning and storytelling

Ilgavak (Peter Williams)

artist & culture bearer

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