



kurzgesagt
in a nutshell

Who we are



Lizzy Steib
Head of Text & Research



Vera Hartlieb
Producer & Social Media

The Team



Philipp Dettmer
Head Writer, Founder & CEO



Philip Laibacher
Creative Director



Miri Lee
Head of Illustration (on leave)



Jonas Hoellinger
Interim Head of Illustration



Martin Wackerbauer
Art Director



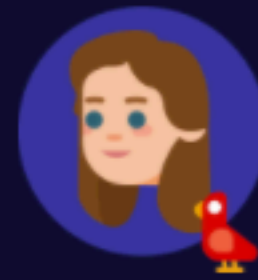
Daniela Görzen
Head of Motion Design



Greta Sennekamp
Motion Designer



Lukas Westner
Motion Designer



Katrin Jucker
Motion Designer



Padraic Rapp
Motion Designer



Michelle Buhrmann
Illustrator



Lukasz Buda
Illustrator



Manuel Kilger
Illustrator



Martina Schaff
Junior Illustrator



Samuel Cadera
Trainee Illustration



Tomi Stevenson
Motion Designer



Solange Carvalho
Trainee Motion Design



Lizzy Steib
Head of Text & Research



Clemens Strottner
Text & Research



Tugce Yildizoglu
Fact-Checker



Mark Rivera
Trainee Illustration



Matthias Mödl
Trainee Illustration



Lisa Donik
Working Student Illustration



Cathi Ziegler
Head of Design



Bella Wolf
Head of Merchandise



Patrizia Mosca
COO/Producer (on leave)



Marc Zwiechowski
Head of Production



Vera Hartlieb
Producer



Sandra Semmler
Producer



Julia Grasser
Head of Controlling and Operations



Lara Rudolf
Illustrator Merch & Design



Rico Prodan
Merch Producer



Martin Schuchardt
Designer



Daniel Osusky
E-Commerce Manager



Vira Ronkina
Working Student Merch & Design



Elisabeth Steller, LL.M. (Auckland)
Lawyer



Christina Veith
Accounting & Office Management



Dr. Franziska Grassl
Head of HR and Backoffice

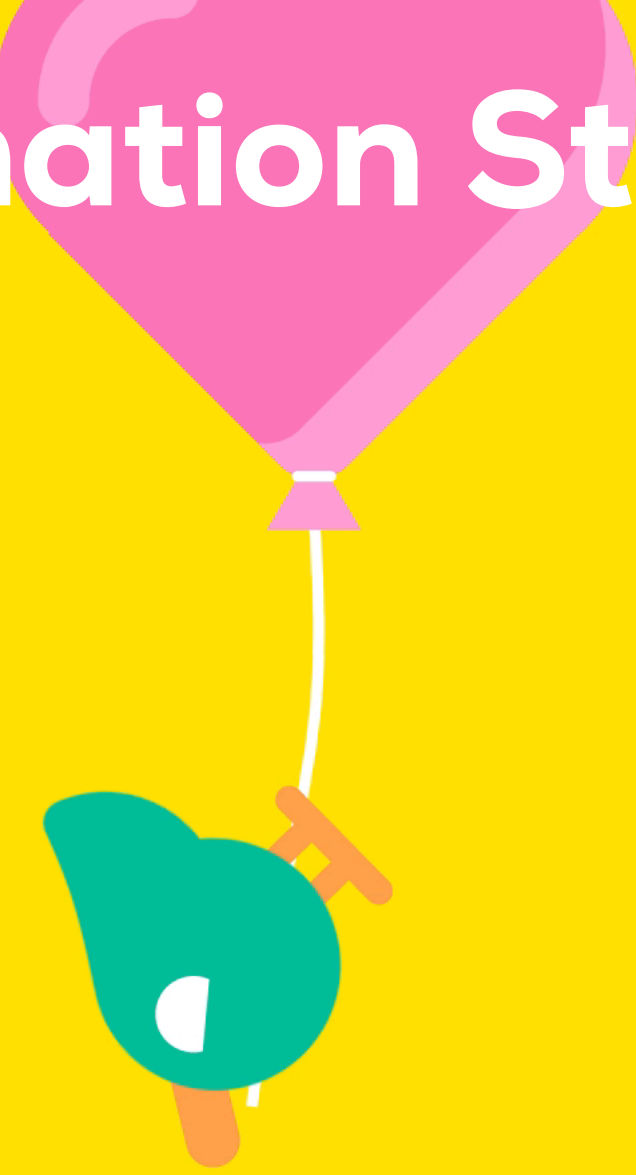


Petra Leutner-Wittmann
HR Assistant & Office Management



Bettina Hochleitner
Working Student Office Management
& HR

Animation Studio



What we do

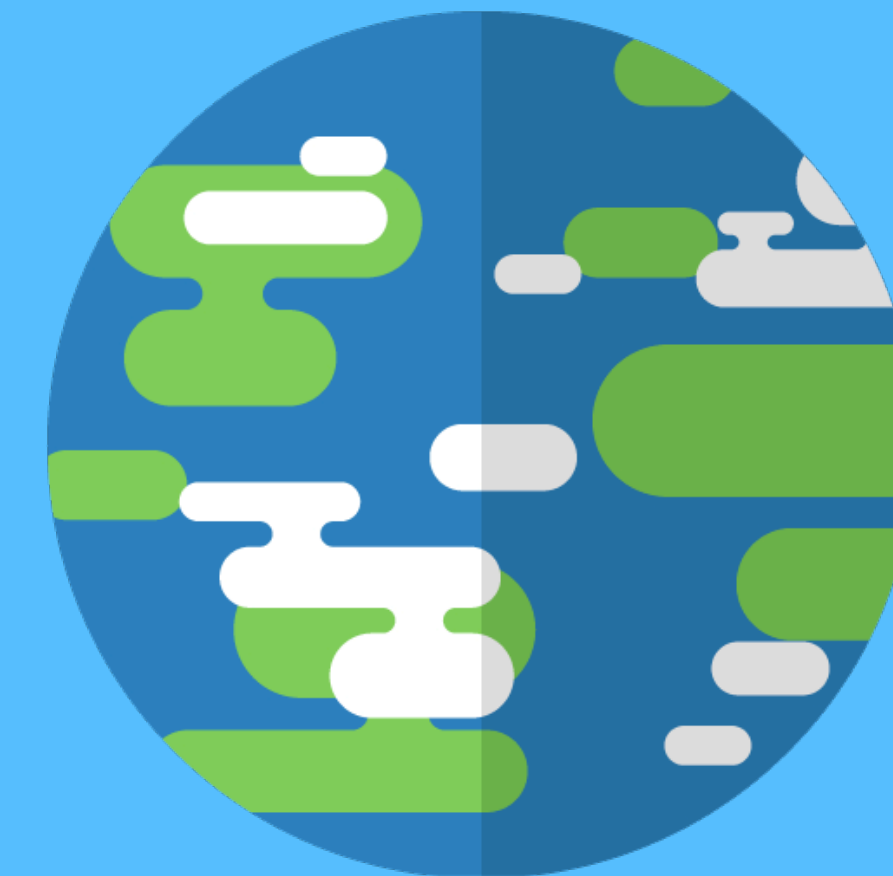
Merchandise



Design Studio



YouTube-Channel



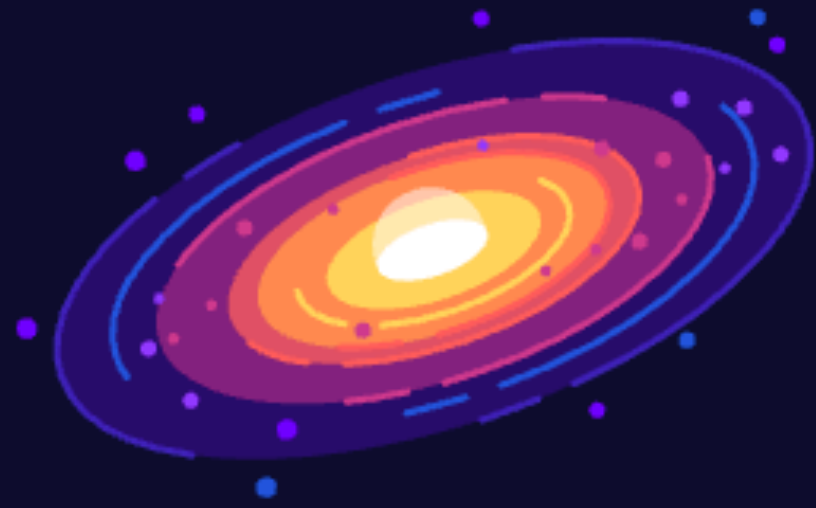
Our Videos

Today

BACTERIA How Large Can a Bacteria get? Life & Size 3 3.5M views · 1 week ago	GEENGINEERING Geoengineering: A Horrible Idea We Might Have to Do 3.9M views · 3 weeks ago	A NEW CHAPTER The 12,021 Human Era Calendar 1.5M views · 1 month ago	THE HUMAN ERA When Time Became History - The Human Era 4.7M views · 1 month ago	CLIMATE DOOM Is It Too Late To Stop Climate Change? Well, It's... 4.3M views · 1 month ago	LARGEST STAR The Largest Star in the Universe - Size Comparison 10M views · 2 months ago	OUR SUN Wormholes Explained - Breaking Spacetime 13M views · 2 years ago	WORMHOLES What If You Detonated a Nuclear Bomb in Them... 21M views · 2 years ago	DEEP SEA NUKE Plastic Pollution: How Humans are Turning the... 6.2M views · 2 years ago	PLASTIC POLLUTION 3 Arguments Why Marijuana Should Stay Illegal Reviewed 11M views · 2 years ago	MARIJUANA The Deadliest Being on Planet Earth - The... 17M views · 2 years ago	BACTERIOPHAGE The Black Hole Bomb and Black Hole Civilizations 17M views · 2 years ago	BLACK HOLE BOMB How Facebook is Stealing Billions of Views 7.6M views · 5 years ago	WHAT IS LIGHT? What is Light? 6.9M views · 5 years ago	DARK ENERGY What is Dark Matter and Dark Energy? 8.5M views · 5 years ago	MINI BLACK HOLE What if there was a black hole in your pocket? 11M views · 5 years ago	THE DEATH OF BEES The Death Of Bees Explained - Parasites, Poison and... 8.3M views · 5 years ago	FERMI PARADOX II The Fermi Paradox II - Solutions and Ideas - Wher... 12M views · 5 years ago
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2013

Our Topics



Space



Technology



Biology



Philosophy



Society



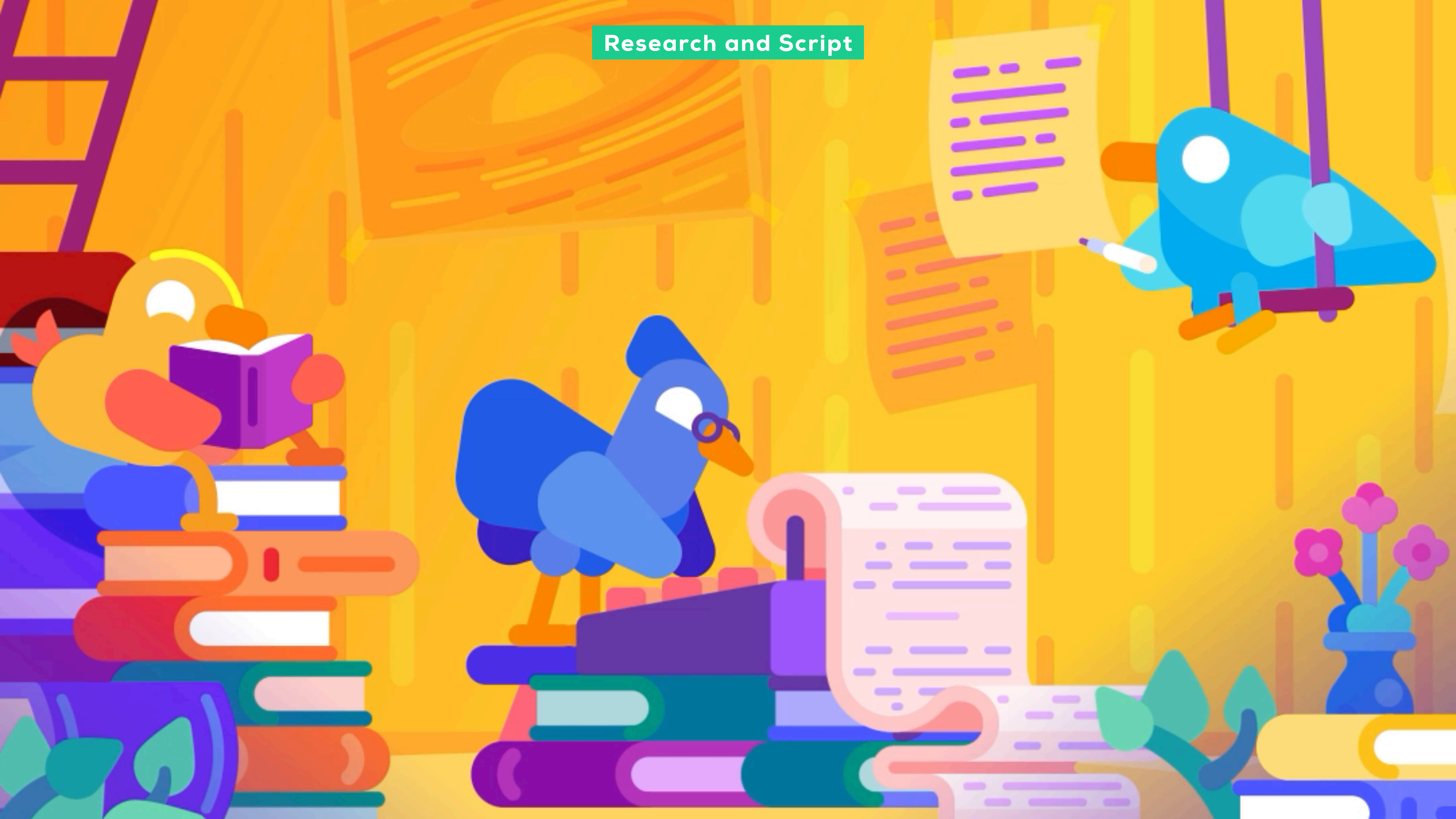
Physics

The Process



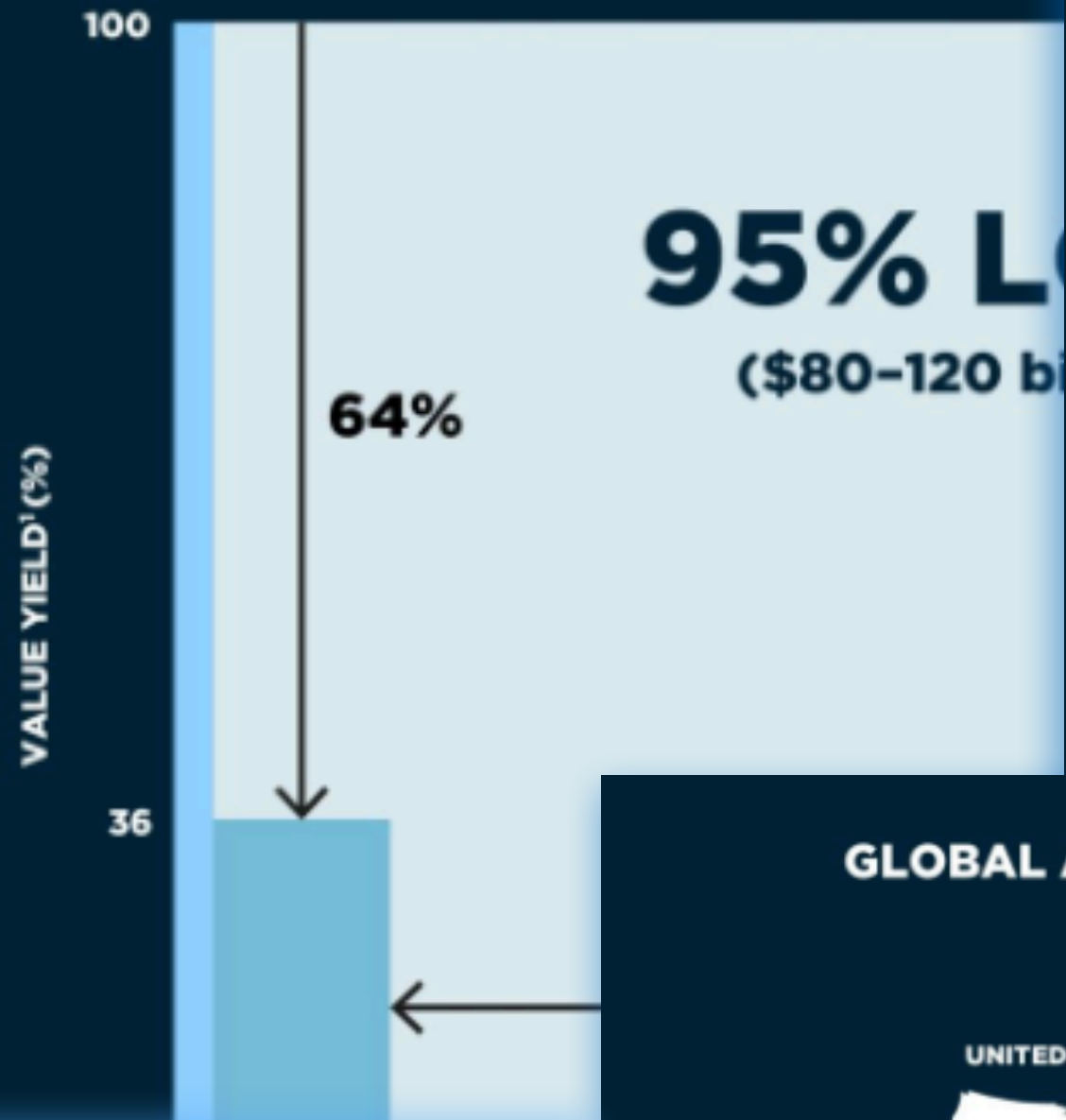
Script

Research and Script



Read, read, read ...

TODAY, 95% OF PLASTIC PACKAGING MATERIAL VALUE IS LOST SHORTLY AFTER FIRST USE CYCLE



THE NEW PLASTICS ECONOMY

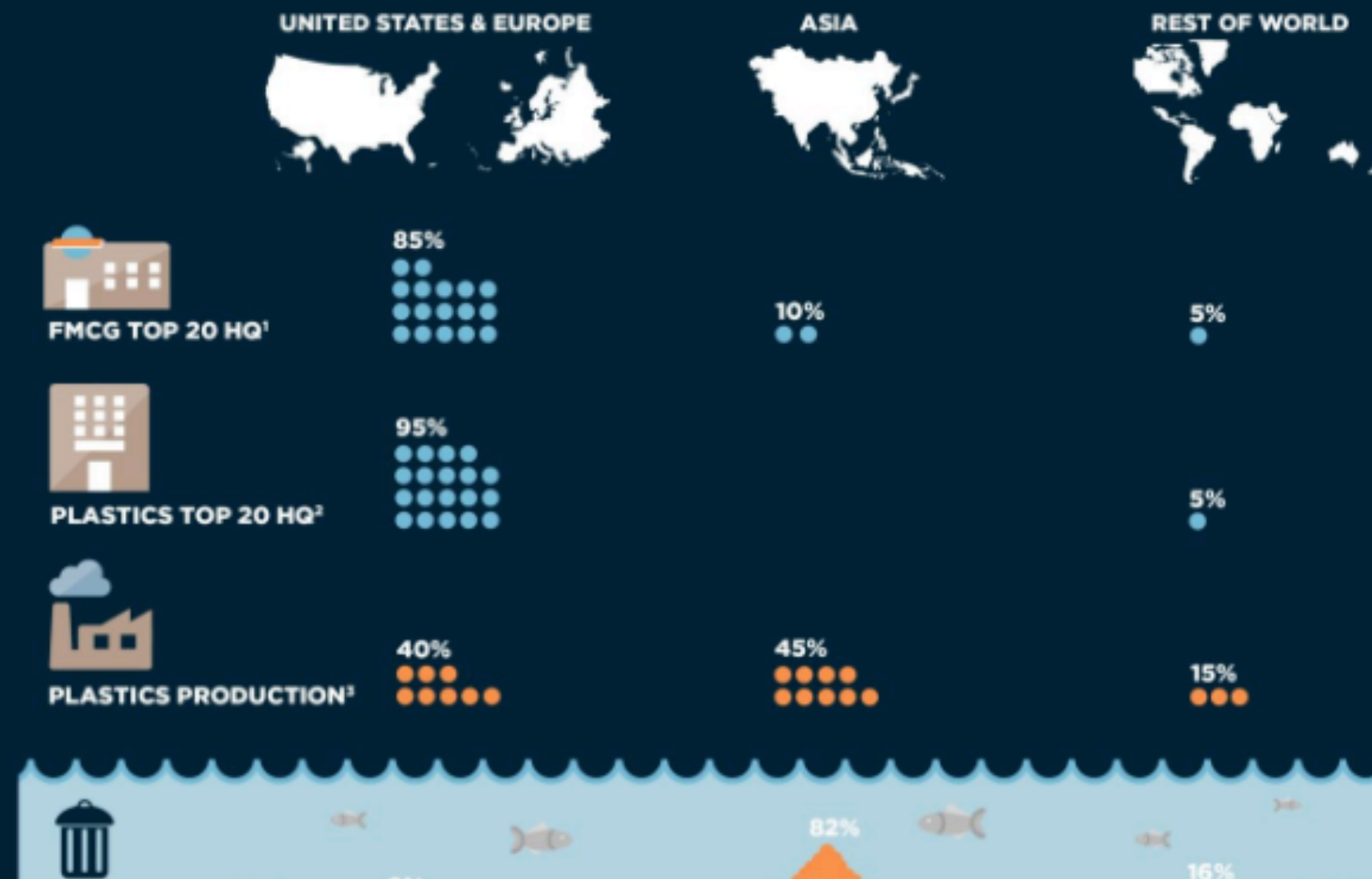
1 CREATE AN EFFECTIVE AFTER-USE PLASTICS ECONOMY



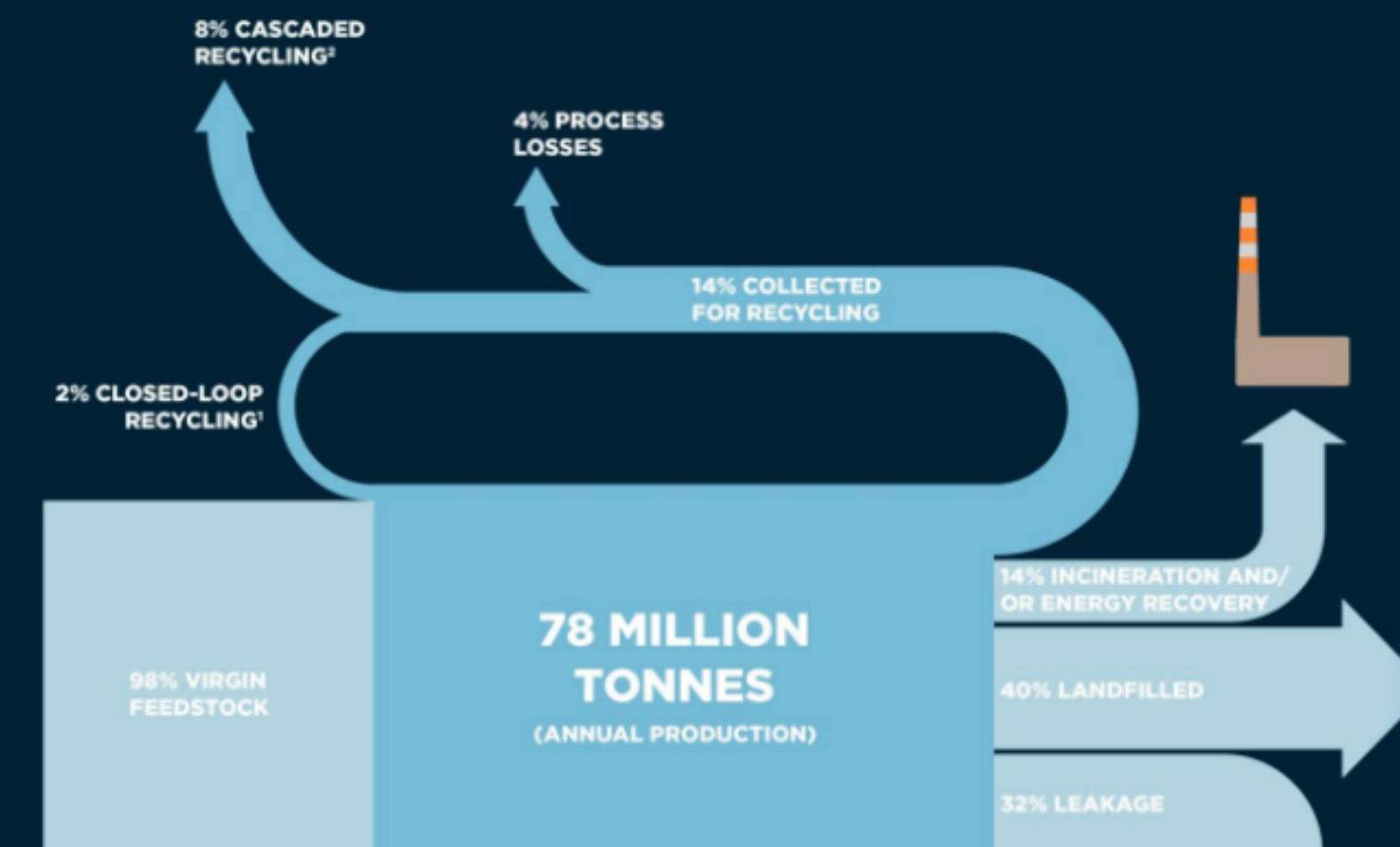
PLASTIC PACKAGING IS PRESENT THROUGHOUT OUR EVERYDAY LIFE



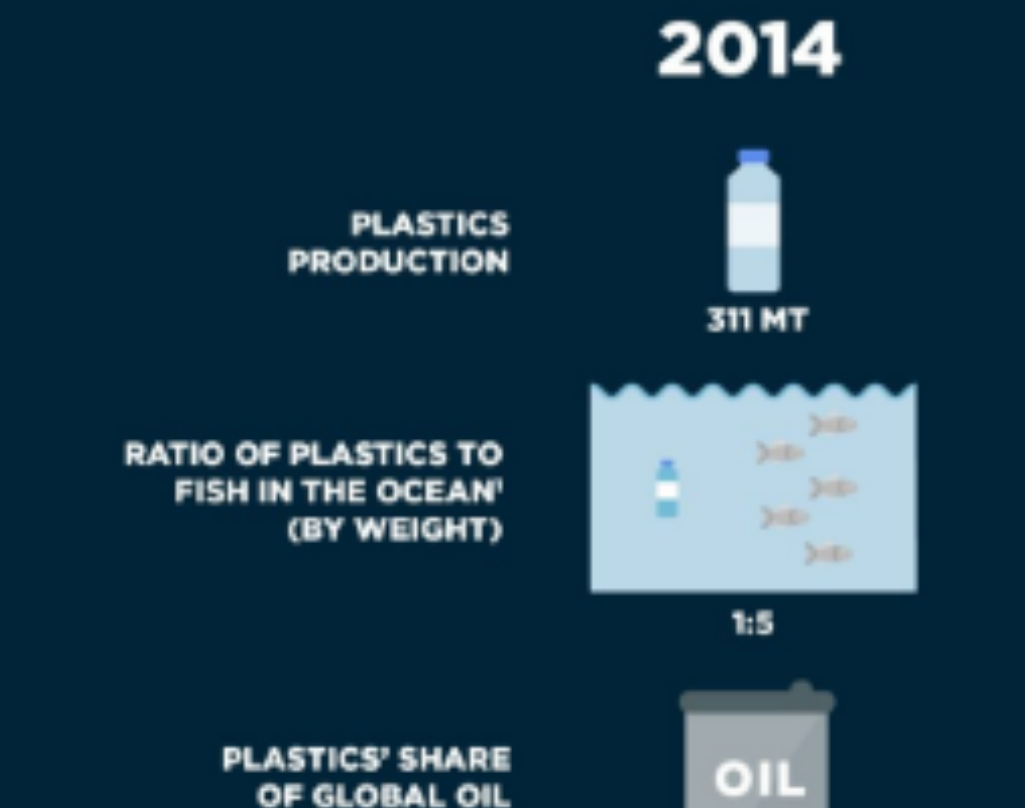
GLOBAL ACTION IS REQUIRED TO TRANSITION TO A NEW PLASTICS ECONOMY



TODAY, PLASTIC PACKAGING MATERIAL FLOWS ARE LARGELY LINEAR



WITH AN EXPECTED SURGE IN CONSUMER AWARENESS AND EXTERNALITIES RELATED TO PLASTIC POLLUTION

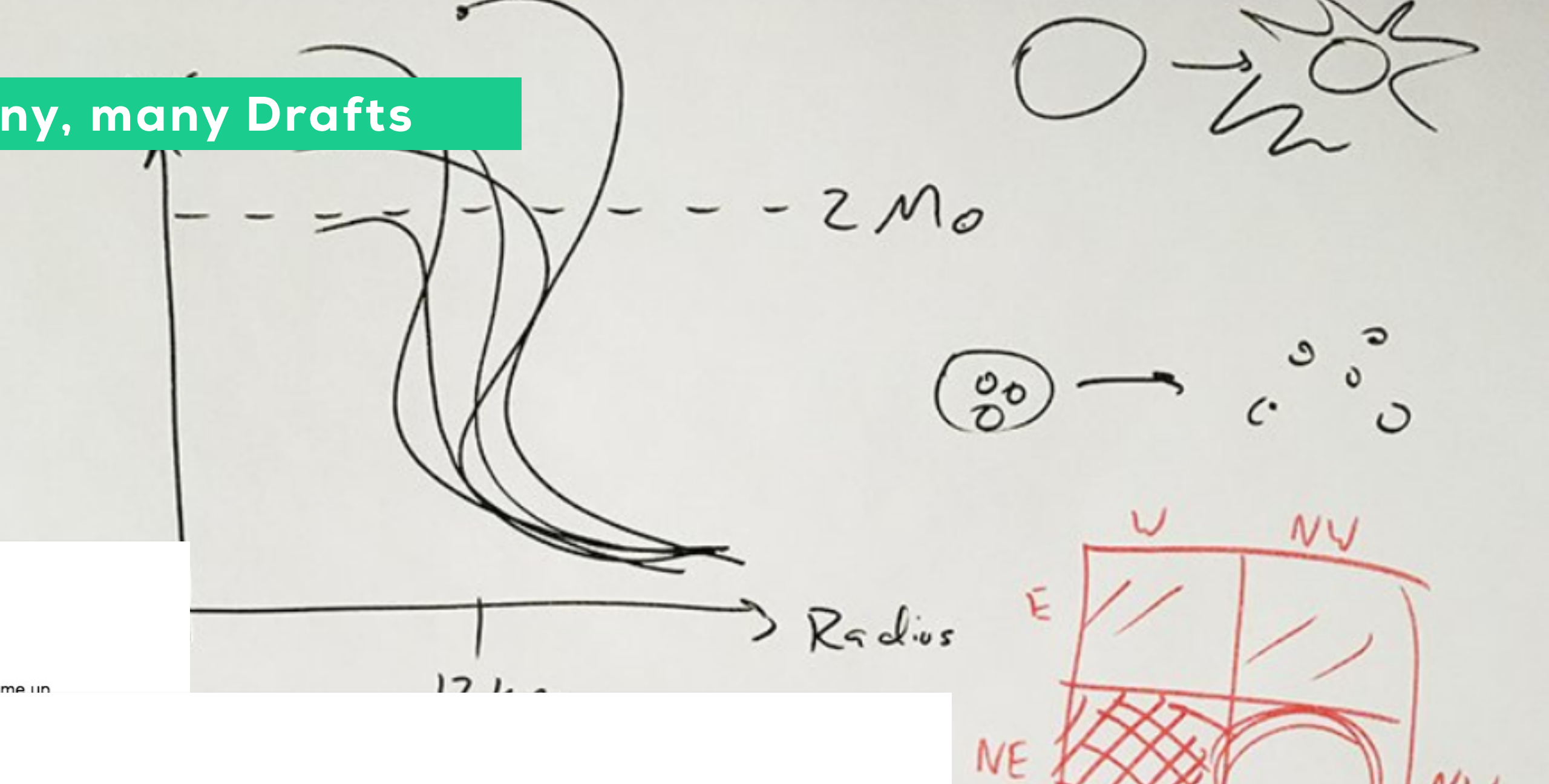


'MOON SHOT' INNOVATION: A NEW PLASTICS ECONOMY





Write many, many, many Drafts



Draft #1

Why are things the way they are? As our understanding with more complex and specific and super weird ideas to solve ever more complicated questions. One of the most famous and maybe one of the most misunderstood ones of these is string theory. A concept often criticized for being non provable but also fiercely defended by some physicists. So, what is string theory, why do we have it and what is its purpose?

INTRO

To really learn the nature of reality we need to understand structures. Magic machines we called cells, wonderous landscapes in the dust, gardens made from crystals. As we zoomed in more we discovered another layer: Complicated structures of molecules made up of thousands of even smaller things. We zoomed in even more and saw the atom, which seemed like the last layer. Until we smashed them together really hard and discovered elementary particles: things that we can't divide anymore.

For a while it looked really great for us. We found particles that seemed to be a sort of solid sphere that did stuff. We tested our ideas about them in experiments and we could test our ideas about them in experiments. The better our tools got the more we found out: We could see things that again did stuff.

Others were undividable. Like electrons, things that had

Draft #2

Why are things the way they are? As our understanding of the universe grew we came up with more complex and specific and super weird ideas to solve ever more complicated questions. One of the most famous and maybe one of the most misunderstood ones of these is string theory. A concept often criticized for being non provable but also fiercely defended by some physicists. So, what is string theory, why do we have it and what is its purpose?

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But now we had a problem. Things got so tiny that we could not zoom in any further. The world suddenly got cloudy and out of focus. But we could see and measure what particles did and the rules they followed.

For example the electron. They do not want to get close to some things and want to stay close to others. We could make a lot of them and test our ideas about them in experiments.

But at least for now we could see things that we could see and measure what they did. How does an electron? How does it interact with other particles?

Draft #5

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Draft #3

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Draft #4

What is the true nature of the universe? This question haunts us since we can think. To answer them we came up with stories and ideas to describe the world. We tested our stories if they were true and regardless of the outcome, we learned something about our universe. As our knowledge grew we decided some people should spend their whole life to think about them and come up with new stories. But some of them are weird and confusing. Like string theory. A famous, controversial and often misunderstood story about the nature of everything. Why did we come up with it and is it true or just an idea we should end?

INTRO

To really learn the true nature of reality we started by looking at things up close and discovered structures. Protein robots we call cells, wonderous landscapes in the dust, crystal gardens, zoos of bizarre creatures. The closer we looked, the more worlds, the more layers we discovered.

Structures of molecules made up of countless smaller things, atoms. We thought they were the final layer of reality until we smashed them together really hard and discovered things that we can't divide anymore: elementary particles.

But now we had a problem. Things on this final layer of reality are so small that we could no longer look at them.

Think about it. What is seeing? When you see something, an electromagnetic wave coming from a light source, hits the surface of a thing and gets reflected back from it. This wave then hits your eye, carrying with it information from the object. And your brain then creates the image for you from this information.

So you can't see something without somehow interacting with it. Without touching it. Seeing is an active process, not a passive one. This is not a problem for most things.

But particles are very, very, very small. So small that the electromagnetic waves we use to see are too big for them. Visible light just passes over them.

Draft #6

Why are things the way they are? As our understanding of the universe grew we came up with more complex and specific and super weird ideas to solve ever more complicated questions. One of the most famous and maybe one of the most misunderstood ones of these is string theory. A concept often criticized for being non provable but also fiercely defended by some physicists. So, what is string theory, why do we have it and what is its purpose?

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Ask, ask, ask ...

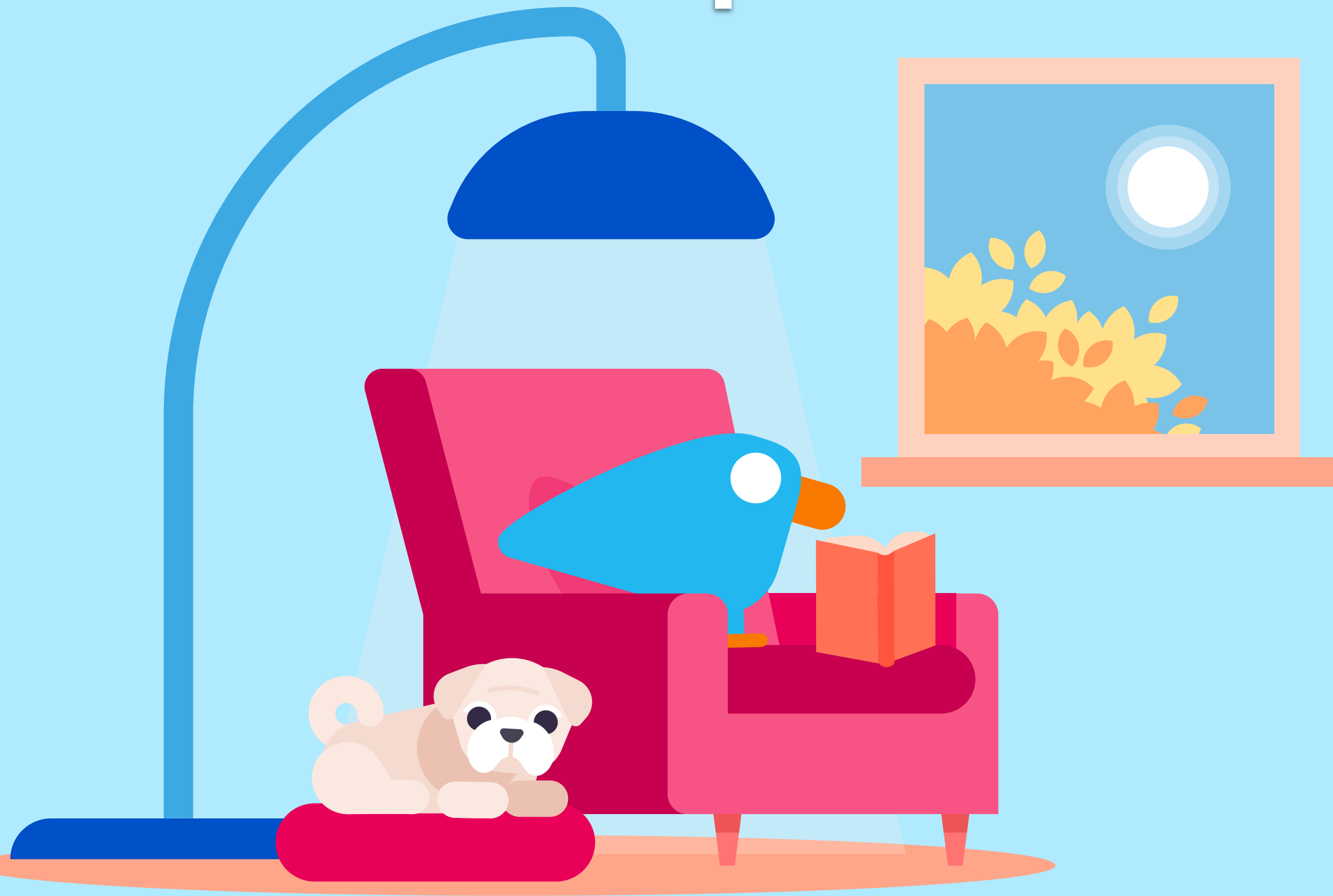


Usual Process

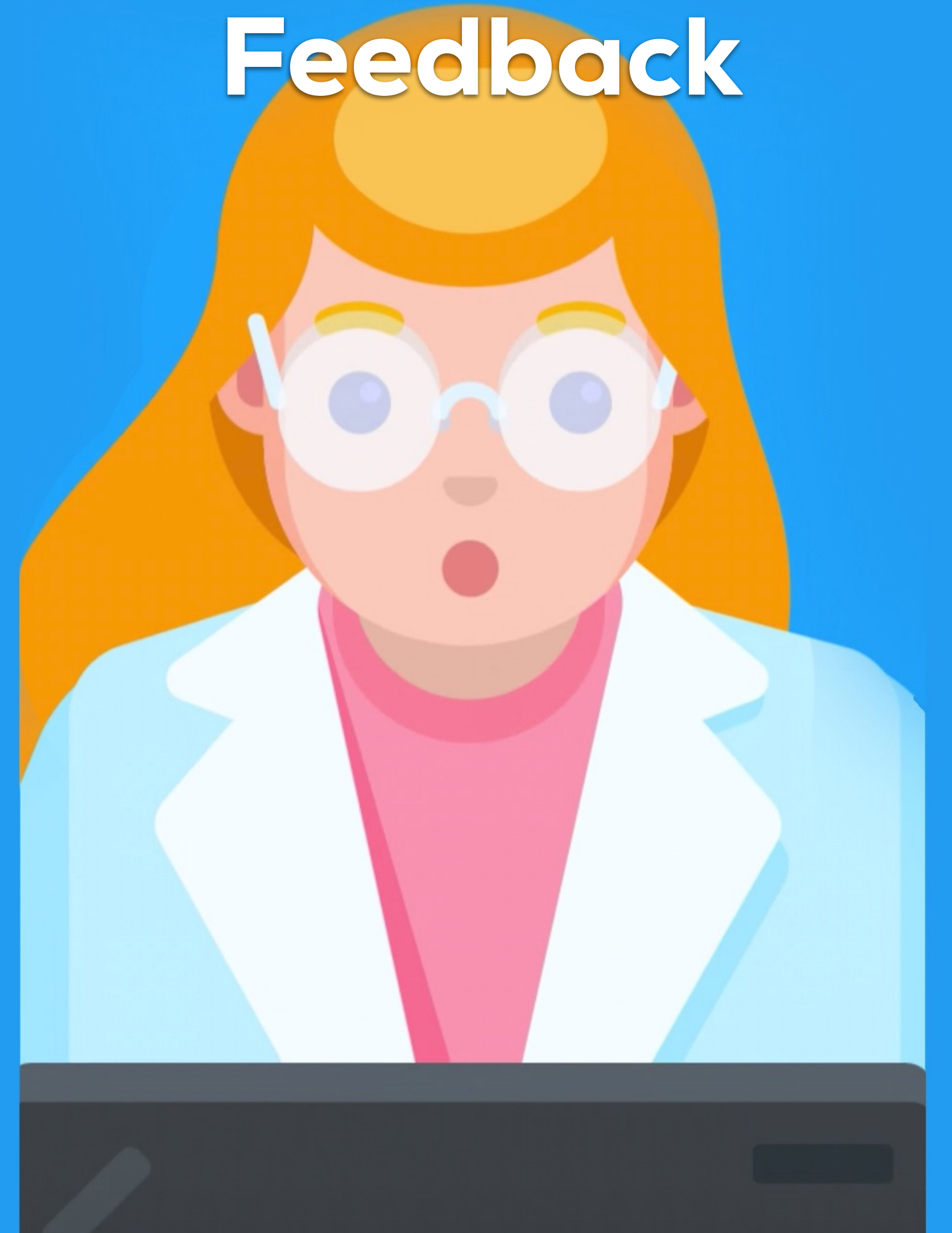
Research & Script



Research & Script



Scientists' Feedback



Usual Process

Research & Script



Scientists' Feedback



Final Script



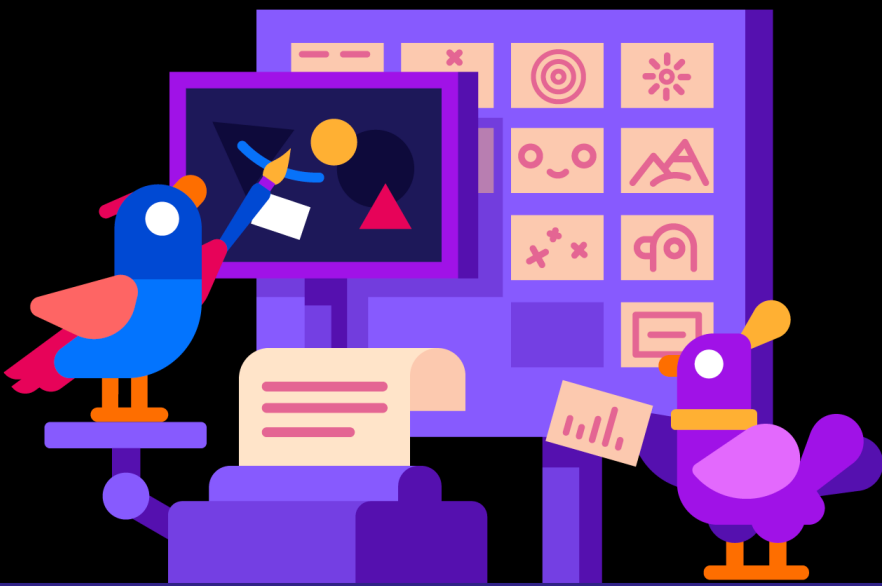
Damn it.



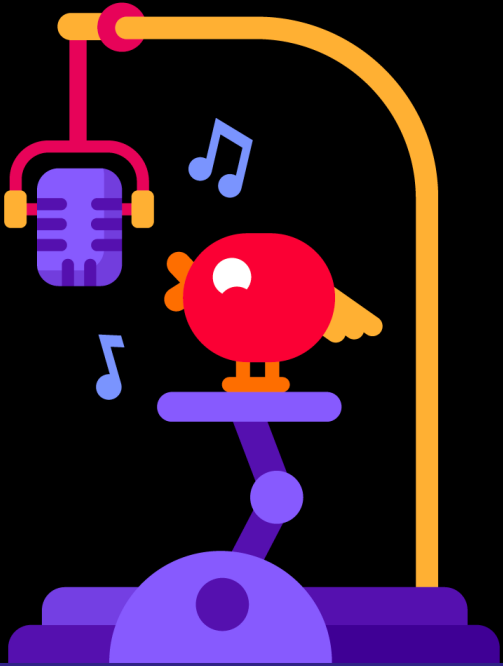
Let's go back to the beginning



Script



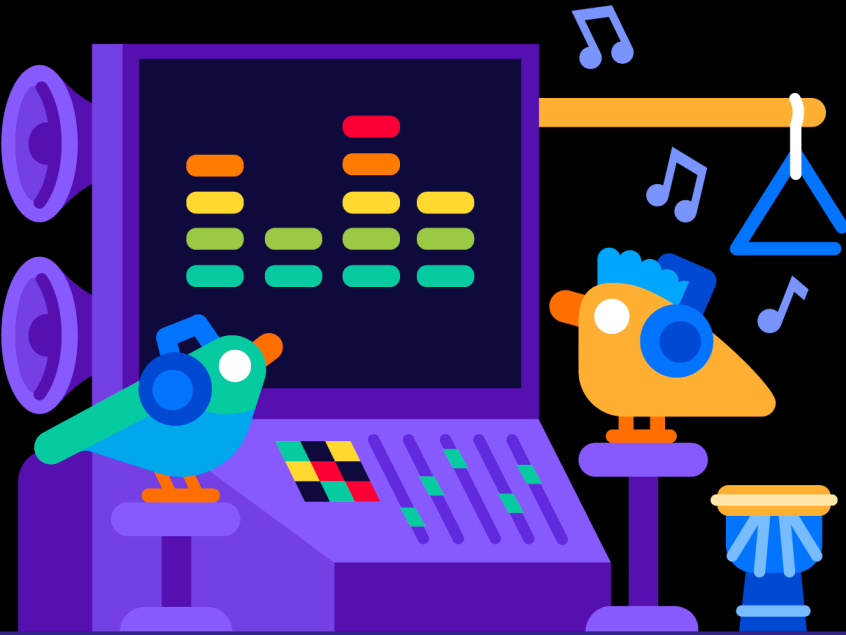
Design & Storyboard



Narration



Animation



Music & Sound Design



Finished Video



Kurzgesagt – In a Nutshell

Sources

Plastic Pollution: How Humans are Turning the World into Plastic

What is plastic

- Invention of plastic

<https://bit.ly/2i9bgdq>

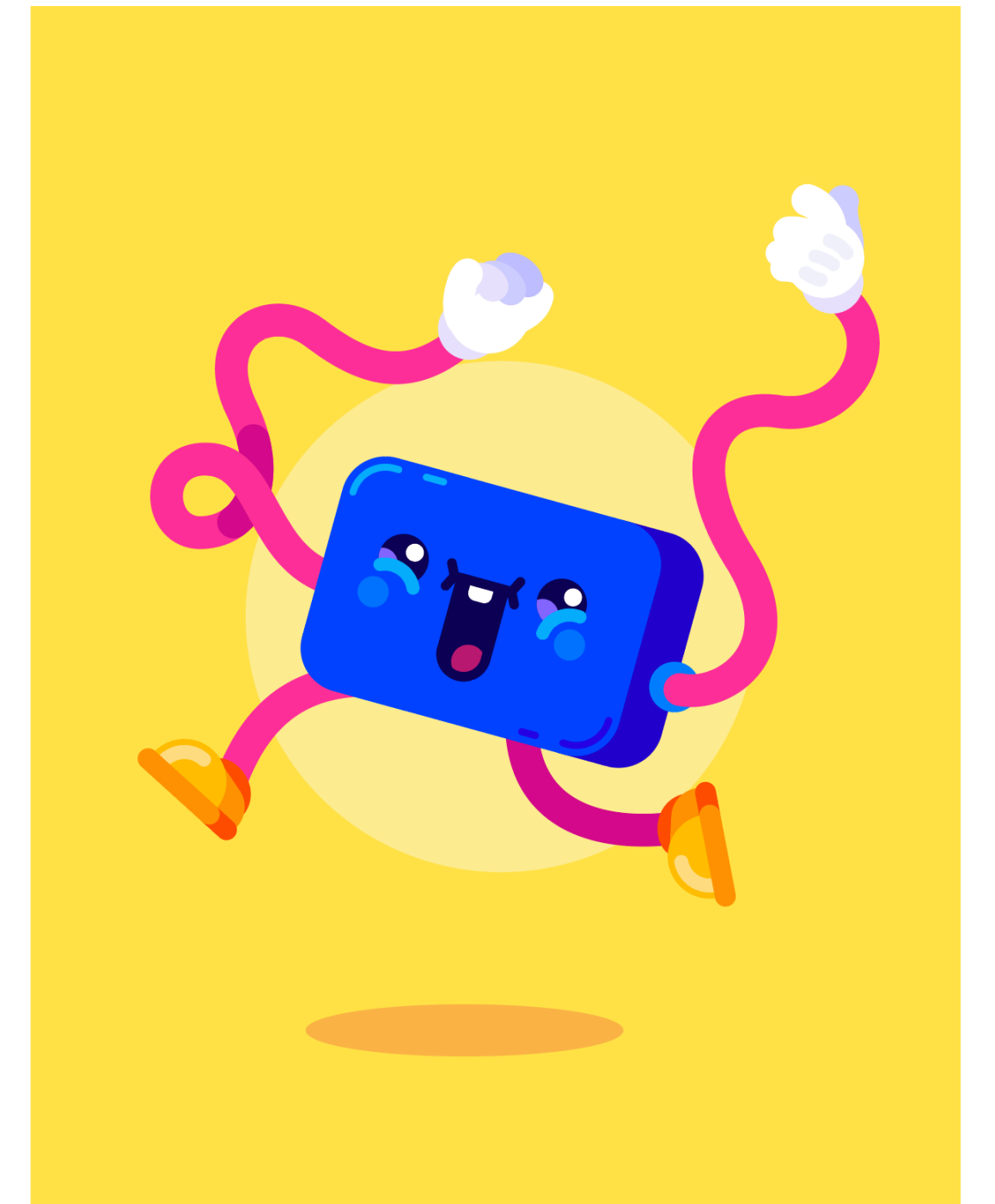
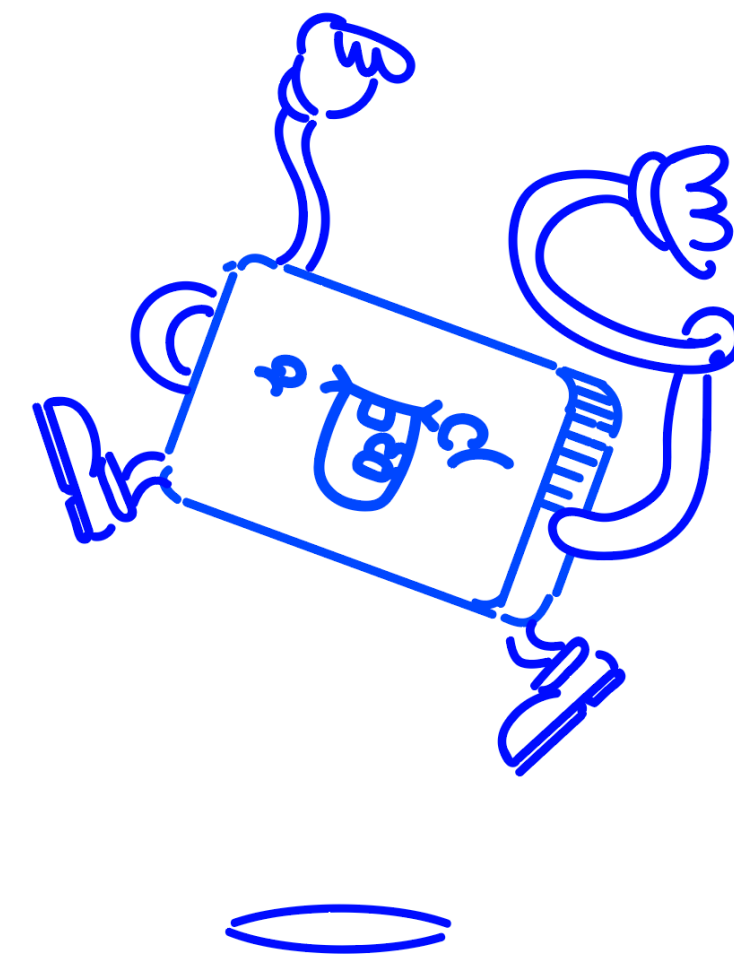
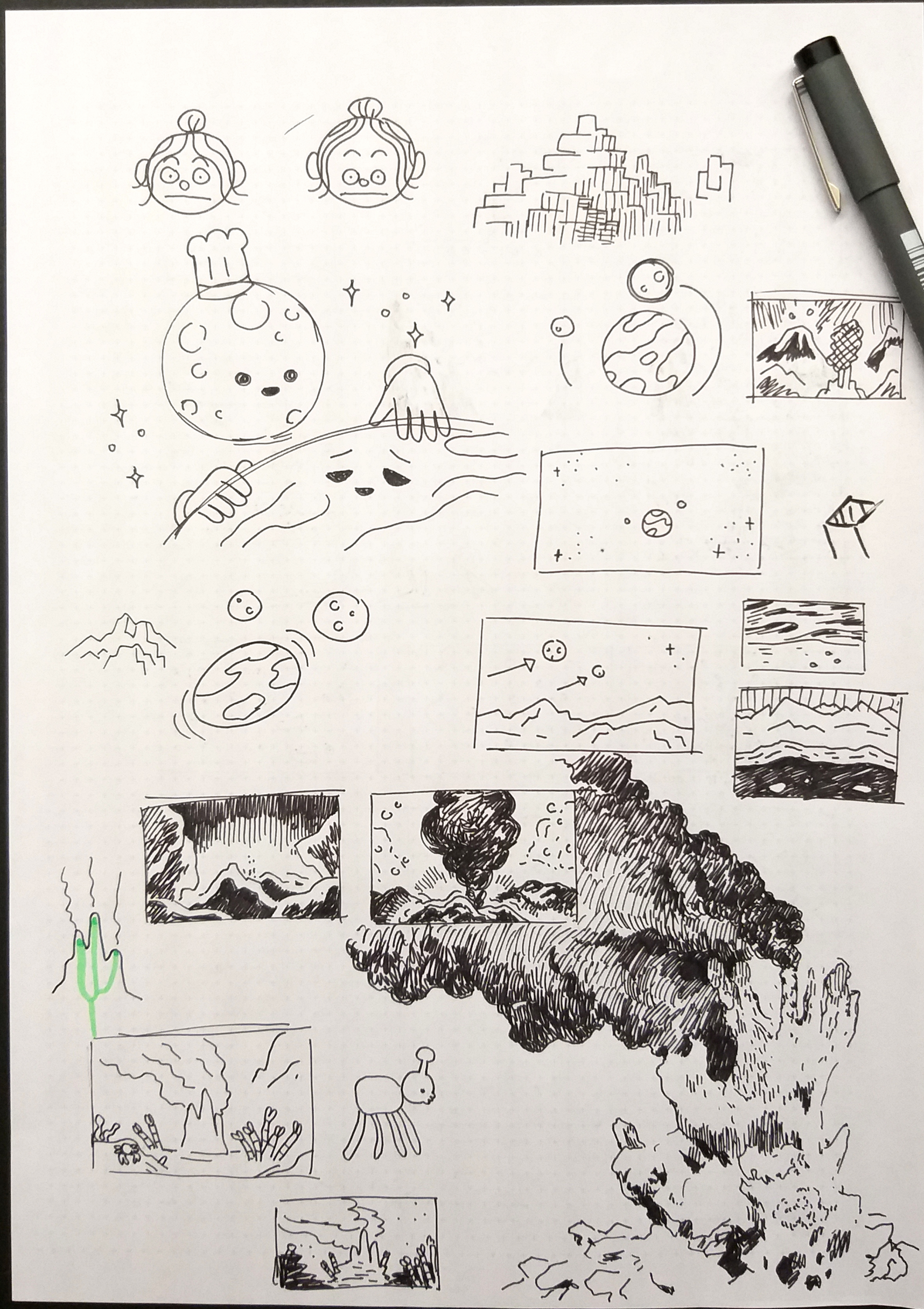
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- Natural Polymers



Illustration



Sketches

wave flensing in the ocean is constantly exposed to UV radiation,



which makes it brittle and crumble into smaller and smaller pieces,



This wear and tear is happening all around us:



acrylic paint peels off rubber particles dislodge from tires



and everywhere we wash synthetic fabric clothing about 1,500 microfibers come loose.



50 million such particles float in the ocean



where they are even more easily swallowed by all kinds of marine life.



And it turns out that's not great.



Fish that have eaten microplastic develop health problems.



Their endocrine systems stopped working properly, their fertility was negatively affected and some developed liver cancer.



This is mainly caused by the chemicals added to plastic.



DEHP for example makes the plastic in bottles and food containers transparent



but there is also evidence that it interferes with our hormone system.



DEHP is used to make plastics more flexible but also may cause cancer.



On top of that, microplastics absorb toxic chemical pollutants from seawater.



So like they magnets they collect poison and they enter the bodies of living things.



You wouldn't want to eat anything like that, but you do.



- microplastic travels up the food chain.



About 17% of the animal protein we consume comes from the sea.



and globally each one of us eats about 10 kilograms of fish per year.



Deep down, the smallest creature in the ocean, eat microplastic.



Small fish and crustaceans eat amphipods and lots of microplastic with it.



The same goes for octopus, crabs, sea cucumbers and predatory fish.



- and they all end up on our plate eventually.



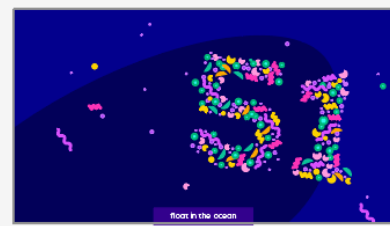
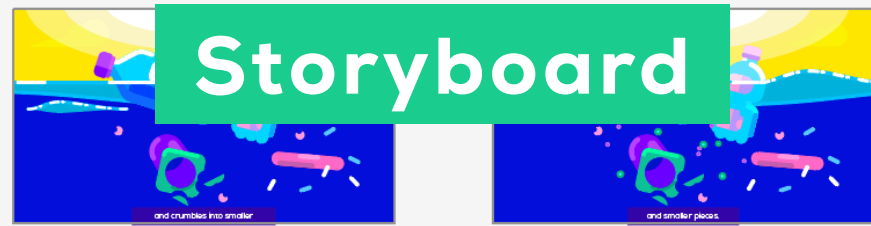
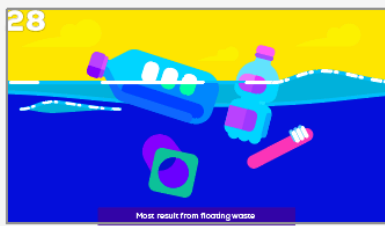
Europeans that eat shellfish regularly are estimated to eat about 11,000 pieces of microplastic per year.



You might think staying away from fish will keep you safe, but it doesn't.

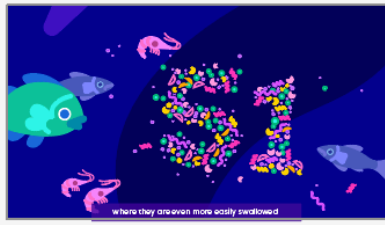


Most result from floating waste that is constantly exposed to UV radiation and crumbles into smaller and smaller pieces. 51 trillion such particles float in the ocean



where they are even more easily swallowed by all kinds of marine life.

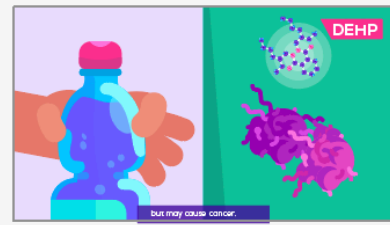
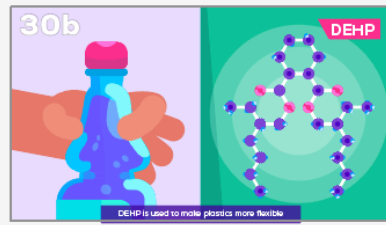
This has raised concerns among scientists, especially about health risks from the chemicals that are added to plastic.



BPA for example makes plastic bottles transparent

but there is also evidence that it interferes with our hormonal system.

DEHP is used to make plastics more flexible but also may cause cancer.



It would be pretty bad if micro plastics are toxic, because they travel up the food chain

Zooplankton eat micro plastic.

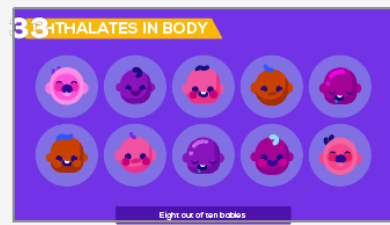
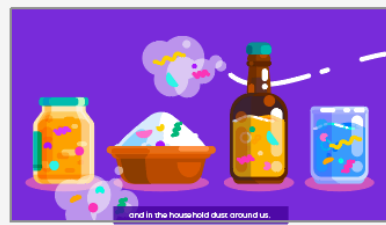
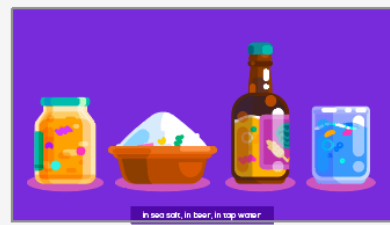
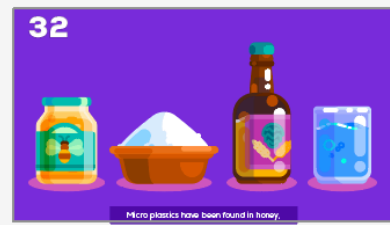
Small fish eat zooplankton.



So do oysters, crabs and predatory fish – and they all land on our plate.

Micro plastics have been found in honey, in sea salt, in beer, in tap water and in the household dust around us.

Eight out of ten babies

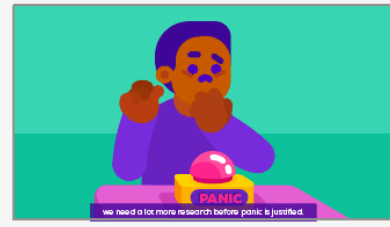
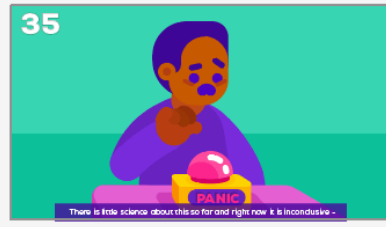
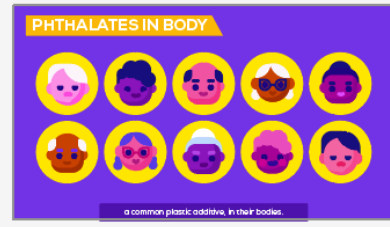
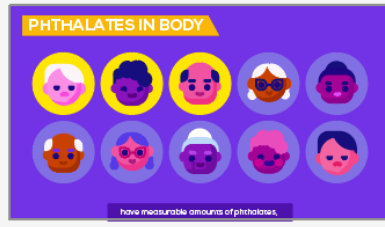
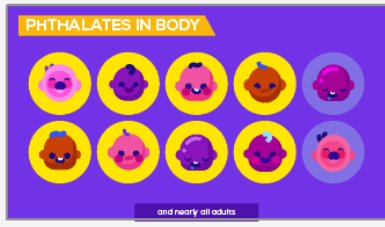


and nearly all adults have measurable amounts of phthalates,

a common plastic additive, in their bodies.

And 93% of people have BPA in their urine.

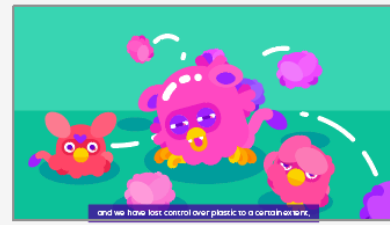
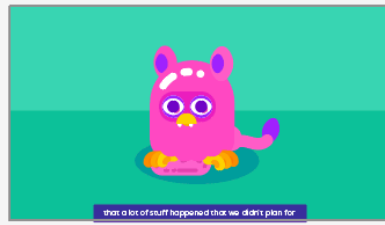
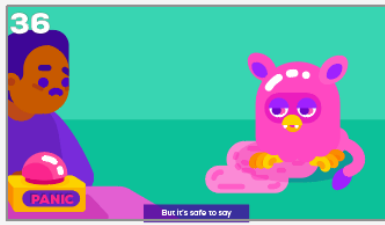
There is little science about this so far and right now it is inconclusive – we need a lot more research before panic is justified.



But it's safe to say that a lot of stuff happened that we didn't plan for

and we have lost control over plastic to a certain extent, which is kind of scary.

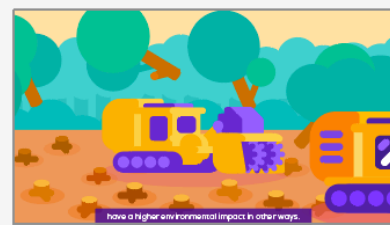
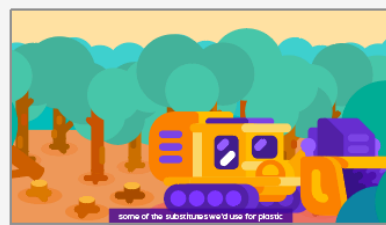
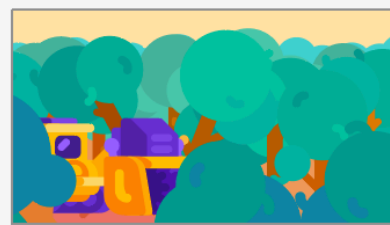
But just to make sure we should simply ban plastics, right?



Unfortunately it is a bit more complicated than that.

Plastic pollution is not the only environmental challenge we face;

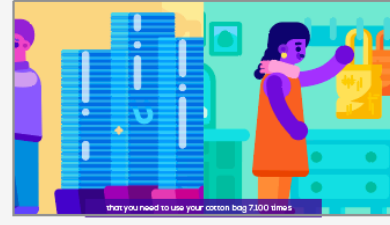
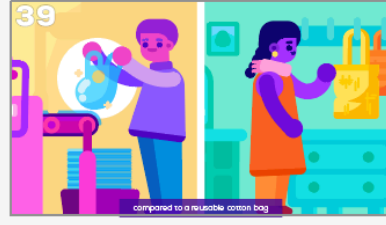
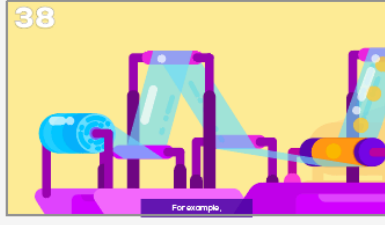
some of the substitutes we'd use for plastic have a higher environmental impact in other ways.



For example, according to a recent study by the danish government,

making a single-use plastic bag requires so little energy and produces far lower carbon dioxide emissions

compared to a reusable cotton bag that you need to use your cotton bag 7.100 times



Animation

0:00:30:09
01809 (60.00 fps)

30:00f 20f 30f 40f 50f

WalkcycleWorkflow_GIF < WalkcycleWorkflow_obtusospinosa_GIF

740 760 780 800 820 840 860 880 900 920 940 960 980 1000 1020 1040 1060 1080 1100 1120 1140 1160 1180 1200 1220 1240

Layer Name	30:00f	20f	30f	40f	50f
1 ★ # C Shoulders & Neck					
2 ★ # C Head					
3 ★ # C Spine Curve					
4 ★ # C Spine Root					
5 ★ # C Hips					
6 ★ # C Body					
7 ★ # C Tail					
8 ★ # C Hand_FF					
fx IK Hand_FF					
Auto-Shrink	X	X	X	X	X
fx Foot roll					
Tiptoe	X	X	X	X	X
Claws	X	X	X	X	X
Foot roll	X	X	X	X	X
Position	◇	X	◇	◇	◇
Rotation	X	●	X	X	X
9 ★ # C Hand_BF					
fx IK Hand_BF					
Auto-Shrink	X	X	X	X	X
fx Foot roll					
Tiptoe	X	X	X	X	X
Claws	X	X	X	X	X
Foot roll	X	X	X	X	X
Position	X	X	X	X	X
Rotation	X	●	X	X	X
10 ★ # C Foot_FM					
fx IK Foot_FM					
Auto-Shrink	X	X	X	X	X
fx Foot roll					
Tiptoe	X	X	X	X	X
Claws	X	X	X	X	X
Foot roll	X	X	X	X	X
Position	◇	◇	◇	◇	◇
Rotation	X	X	X	X	X
11 ★ # C Foot_BM					
fx IK Foot_BM					
Auto-Shrink	X	X	X	X	X
fx Foot roll					
Tiptoe	X	X	X	X	X
Claws	X	X	X	X	X
Foot roll	X	X	X	X	X
Position	◇	◇	◇	◇	◇
Rotation	X	X	X	X	X
12 ★ # C Foot_FB					
fx IK Foot_FB					
Auto-Shrink	X	X	X	X	X
fx Foot roll					
Tiptoe	X	X	X	X	X
Claws	X	X	X	X	X
Foot roll	X	X	X	X	X
Position	◇	X	◇	◇	◇
13 ★ # C Foot_BB					
fx IK Foot_BB					
Auto-Shrink	X	X	X	X	X
fx Foot roll					
Tiptoe	X	X	X	X	X
Claws	X	X	X	X	X
Foot roll	X	X	X	X	X
Position	◇	◇	◇	◇	◇

Animation



It takes time

~1200 hours



Script

Research
Script
Expert Feedback
Sources document
...

Illustration

Brainstorming
Sketching
Illustrating
Finalizing
...

Animation

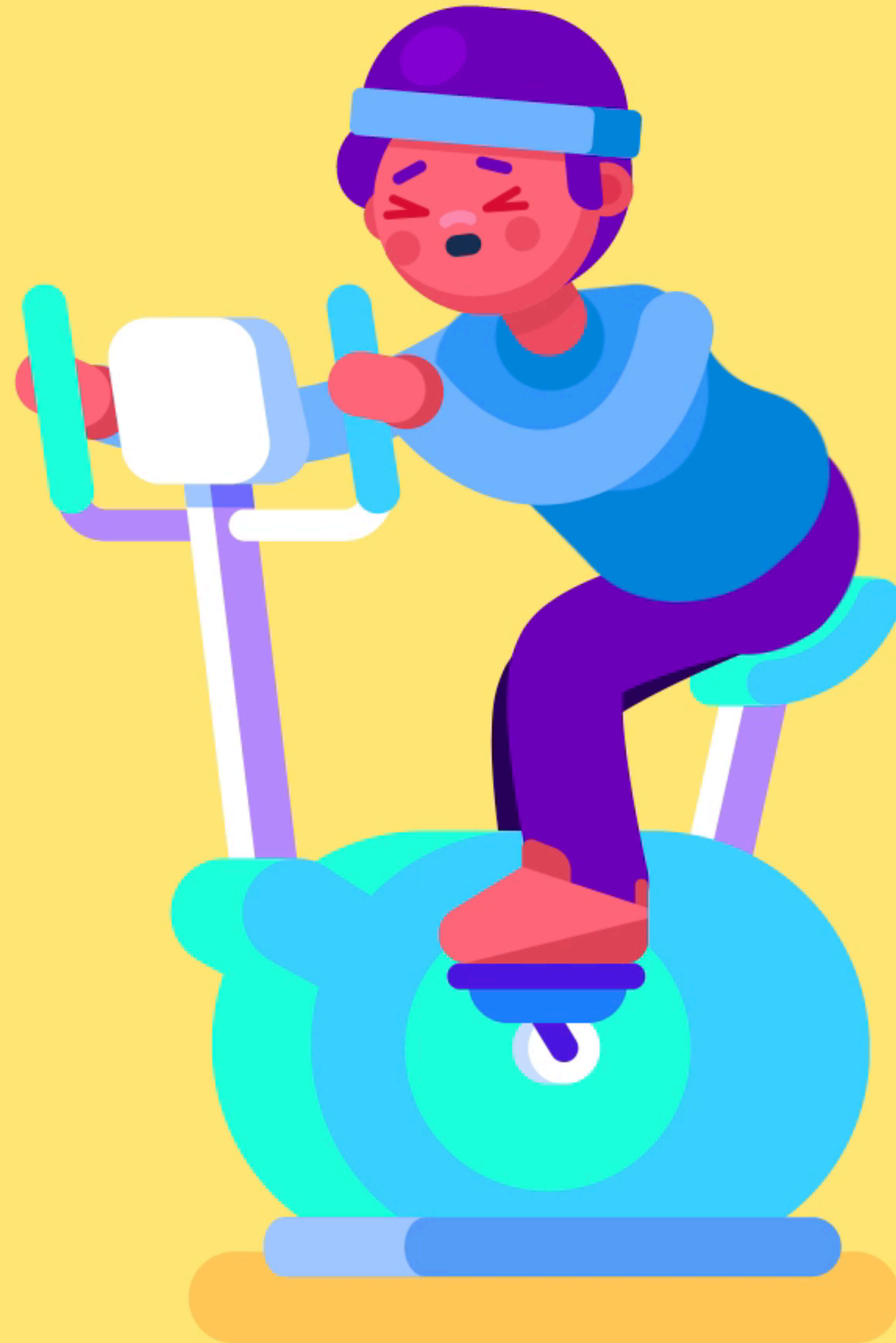
Voice Over
File Prep
Animating
Rendering
...

Music & SFX

Why?

What's important to us

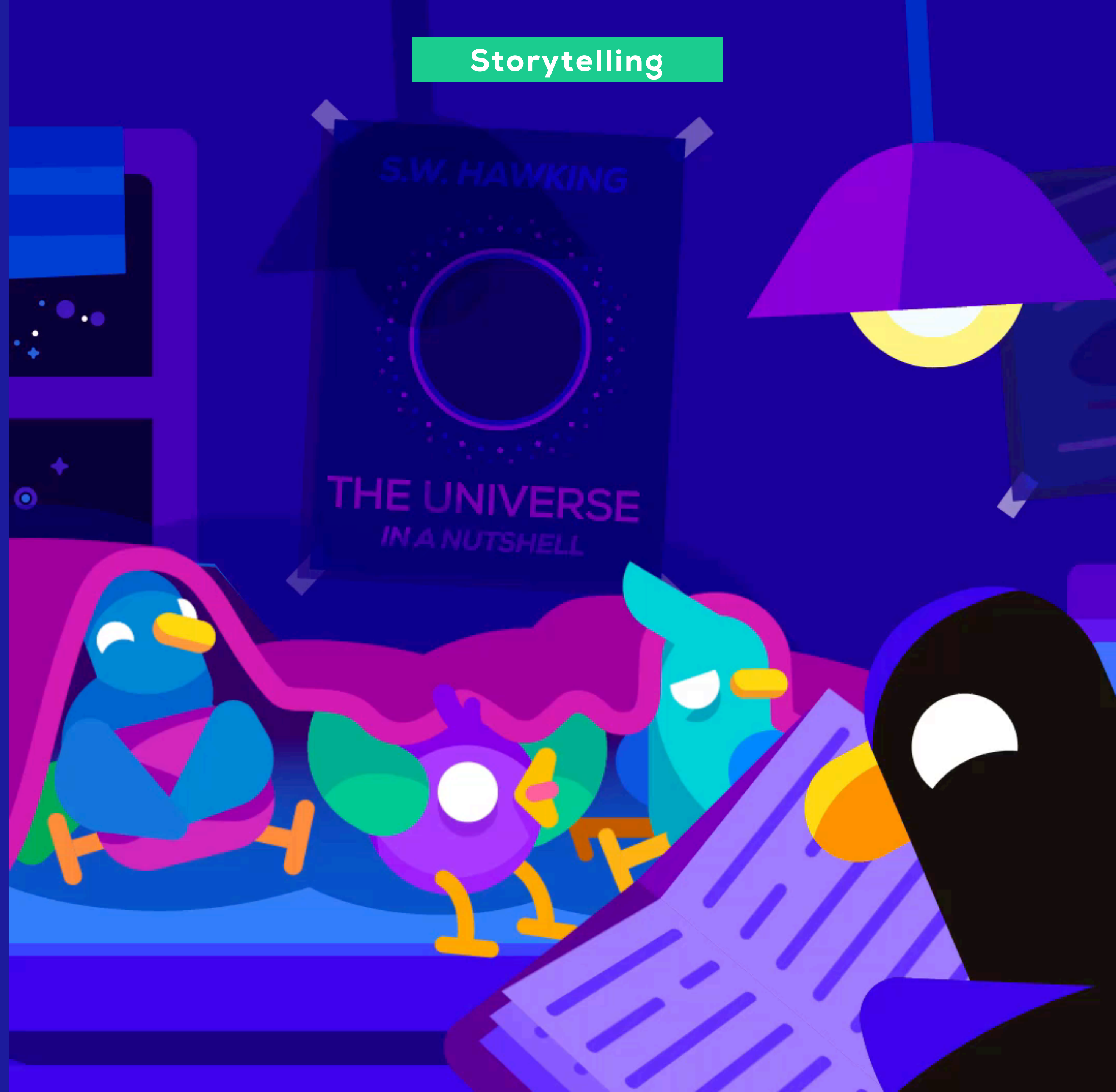
Work until its perfect



Use all the tools



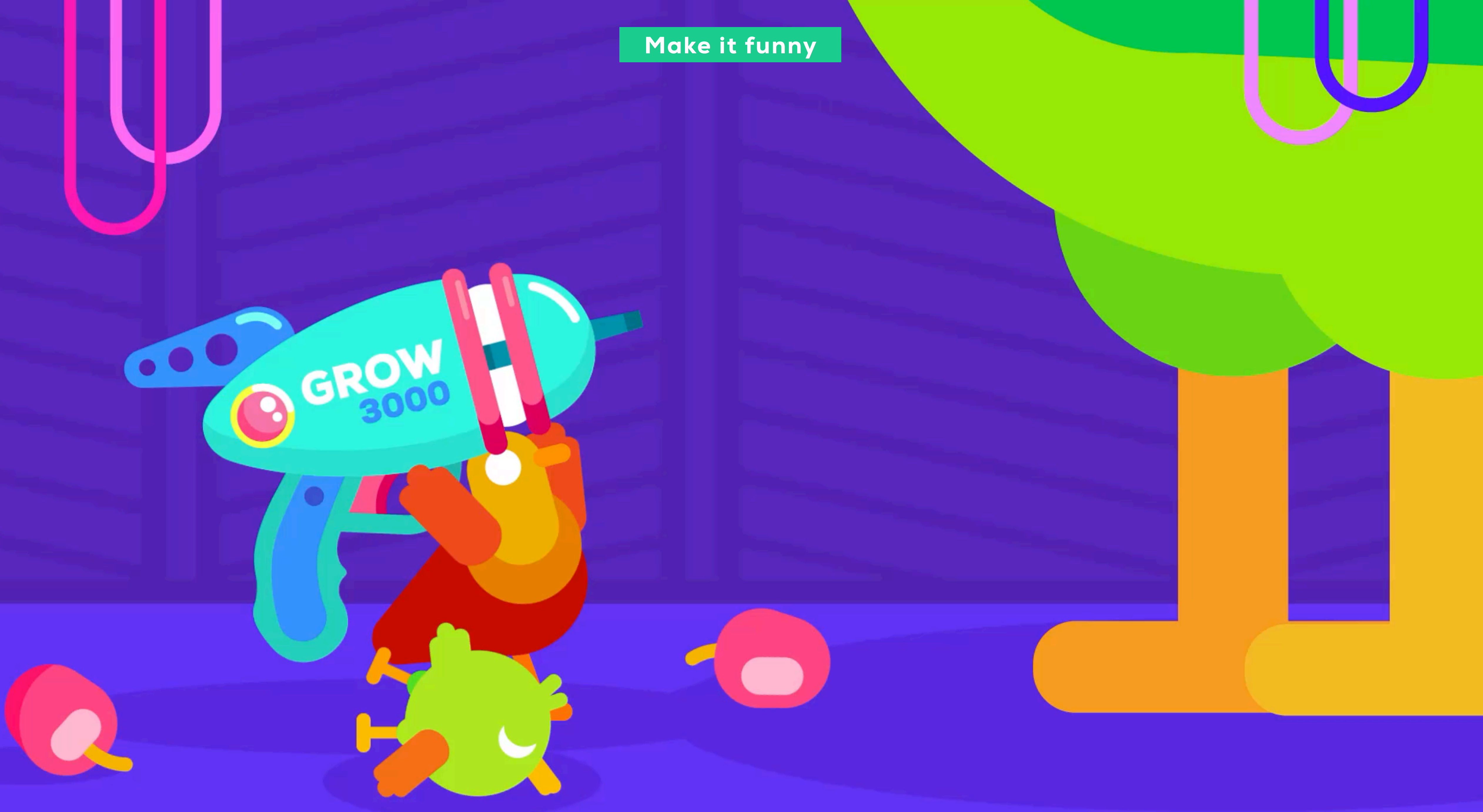
Storytelling



Context



Make it funny





<https://youtu.be/RS7IzU2VJIQ>



Thank you!