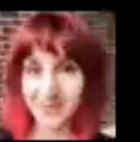
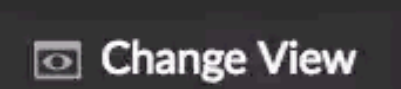


Choose Your Animation Adventure

Val Head • @vlh

Author of Designing Interface Animation
Design Advocate, Adobe



IT DEPENDS

You have encountered an interface that requires animation.

What would you like to use?

(1) CSS?

(2) JavaScript?

(3) SVG?

(4) ...?

THE WORLD OF WEB ANIMATION

JS

Canvas

Vanilla

Web GL

SVG

react

SVG
elements

DOM
elements

Libs

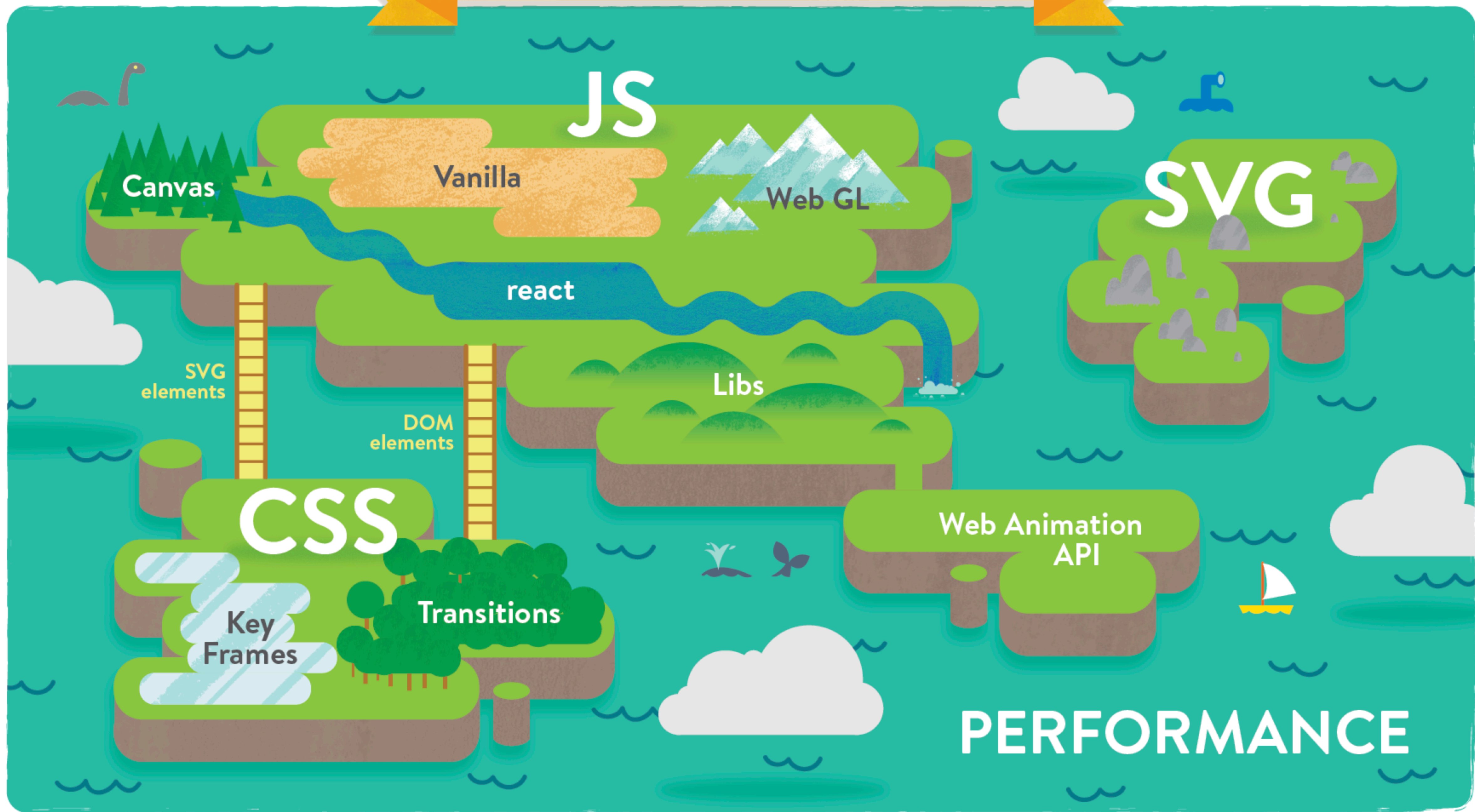
CSS

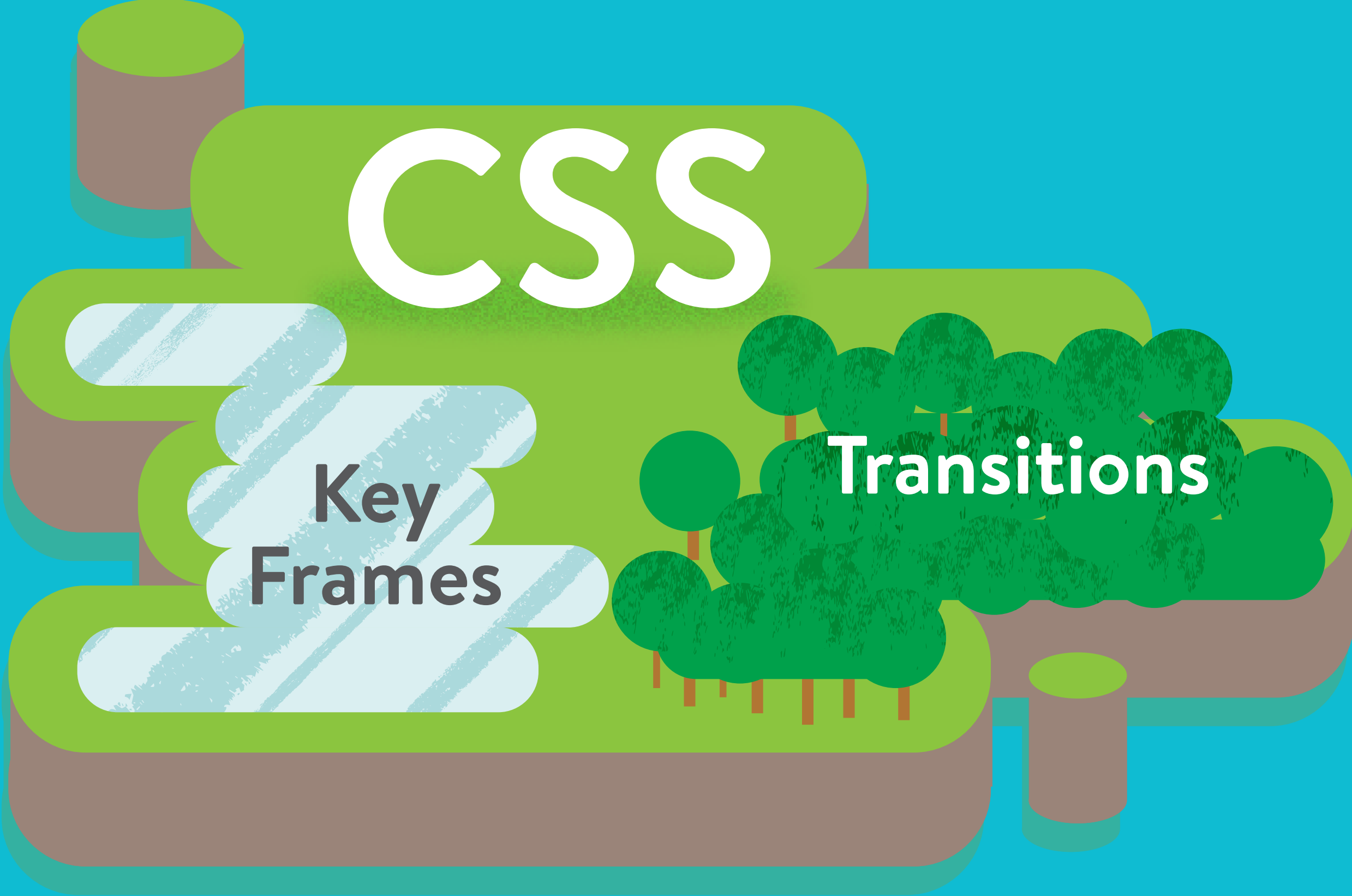
Key
Frames

Transitions

Web Animation
API

PERFORMANCE





CSS

Key
Frames

Transitions

CSS

What CSS is great at:

- Well-defined state transitions
- Loading animations, looping animations
- Animations on :hover, :focus and similar



ALWAYS IMPROVING

Stripe is an always-improving toolchain that gains new features every month. Our world-class engineering team constantly iterates upon every facet of the Stripe stack. And from Apple Pay to Bitcoin, building on Stripe means you get early access to the latest technologies.

[Learn about Stripe's products →](#)



GLOBAL SCALE

We help power 100,000+ businesses in 100+ countries and across nearly every industry. Headquartered in San Francisco, Stripe has 9 global offices and hundreds of people working to help transform how modern businesses are built and run.

[More about us →](#)

KICKSTARTER

instacart



lyft

shopify

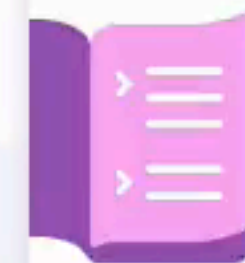
OpenTable

slack



INTRODUCING SIGMA →

Use SQL to explore your business' payments and revenue data, build and run custom reports, get insights, and more.



EXPLORE THE DOCS →

Start building your integration and accept your first payment in minutes. Stripe libraries are available in every language from Ruby to Go.

Ready to get started?
Get in touch, or create an account.

CREATE STRIPE ACCOUNT

CONTACT SALES

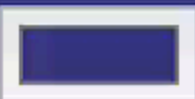


03/26/2017 → 04/01/2017

\$749

\$374

Single Element CSS Spinners

BG  FG 



< View Source >



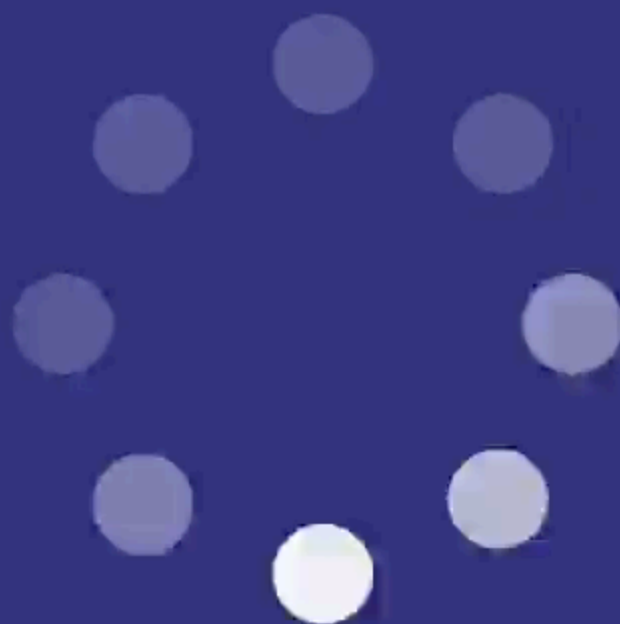
< View Source >



< View Source >



< View Source >



< View Source >



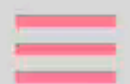
< View Source >



< View Source >



< View Source >



Shop /Travel Size

Cart (0) Sign In

Travel Size

R+Co



SUNSET BLVD
TRAVEL
SIZE
BLONDE
SHAMPOO

\$14

[More Info](#)

[+ Cart](#)



ATLANTIS
TRAVEL
SIZE
MOISTURIZING
CONDITIONER

\$14

[More Info](#)

[+ Cart](#)



ATLANTIS
MOISTURIZING
SHAMPOO
SHAMPOOING
HYDRATANT
50 ML / 1.7 FL.OZ e

Jump to:

[All](#)

[New Launches](#)

[Shampoos & Conditioners](#)

[Creams & Gels](#)

[Mousses](#)

[Waxes & Pastes](#)

[Sprays & Oils](#)

[Travel Size](#)

[Accessories](#)



CSS

Pros:

- No external library needed
- Great potential for performance without much effort
- Keyframes are reusable
- Can adjust properties in media queries for responsive animation when needed

CSS

Cons:

- Access to limited events
- Defined entirely ahead of time
- Can't separate transform properties*

CSS + JS = 🙌

Checkout

The best payment flow,
on web and mobile.

Show me >

Dribbble
Pro Account 1 Year

Email

Card number

MM / YY

CVC

☐ Remember me

Pay \$18.00

4:21 PM
humblebundle.com

Humble Bundle

PC and Android 7

youremail.com

**** *
MM / YY CVC 123

Remember me

✓ Pay \$50.00

The payment form done right



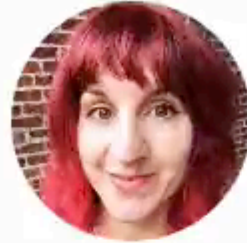
Draft

Share

Publish 



144



Val Head

Web/UI animation pro. Author of Designing Interface Animation. Curates the uianimationnewsletter.c...

Draft

Title



CSS

In Summary

Where it shines:

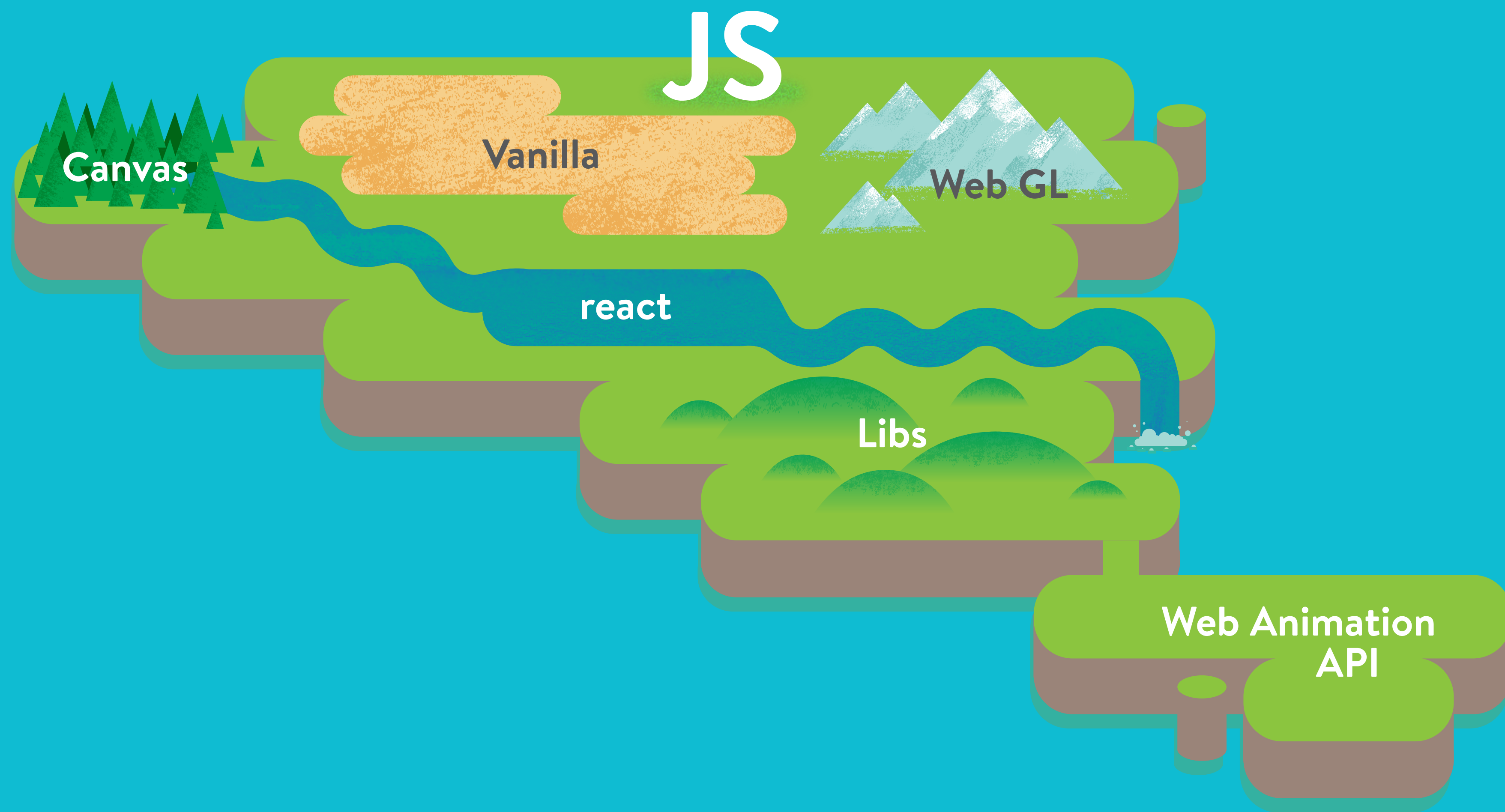
- Animated interactions with defined states
- Simple interactive animations

Biggest Pro:

- Nearly effortless performance
- No additional requests

CSS is pretty great, but it might be time to move to JavaScript if:

- You'll be chaining more than 3-ish animations in a sequence
- The animation needs to change dynamically at runtime
- Need to animate transform properties separately
- Physics or other complex easing structures are required



JS

What javascript is great at:

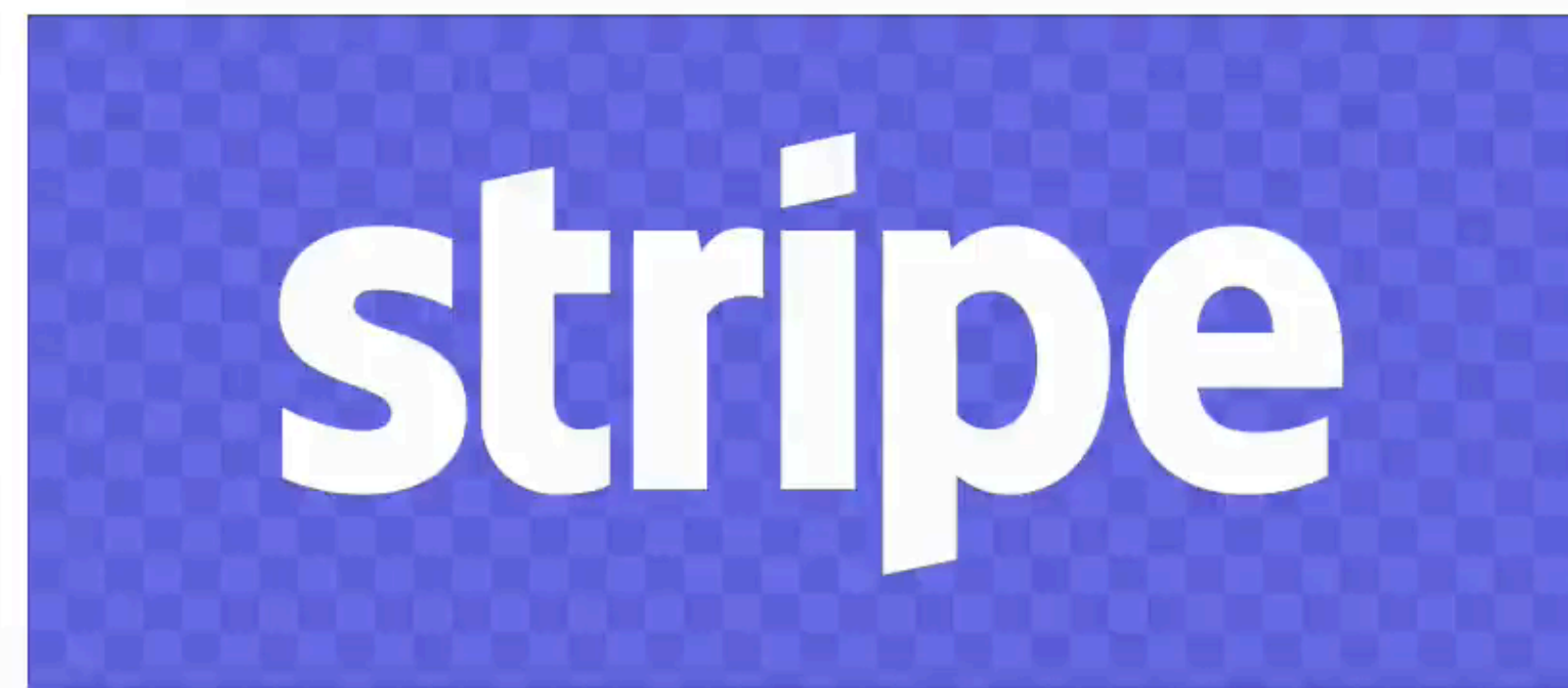
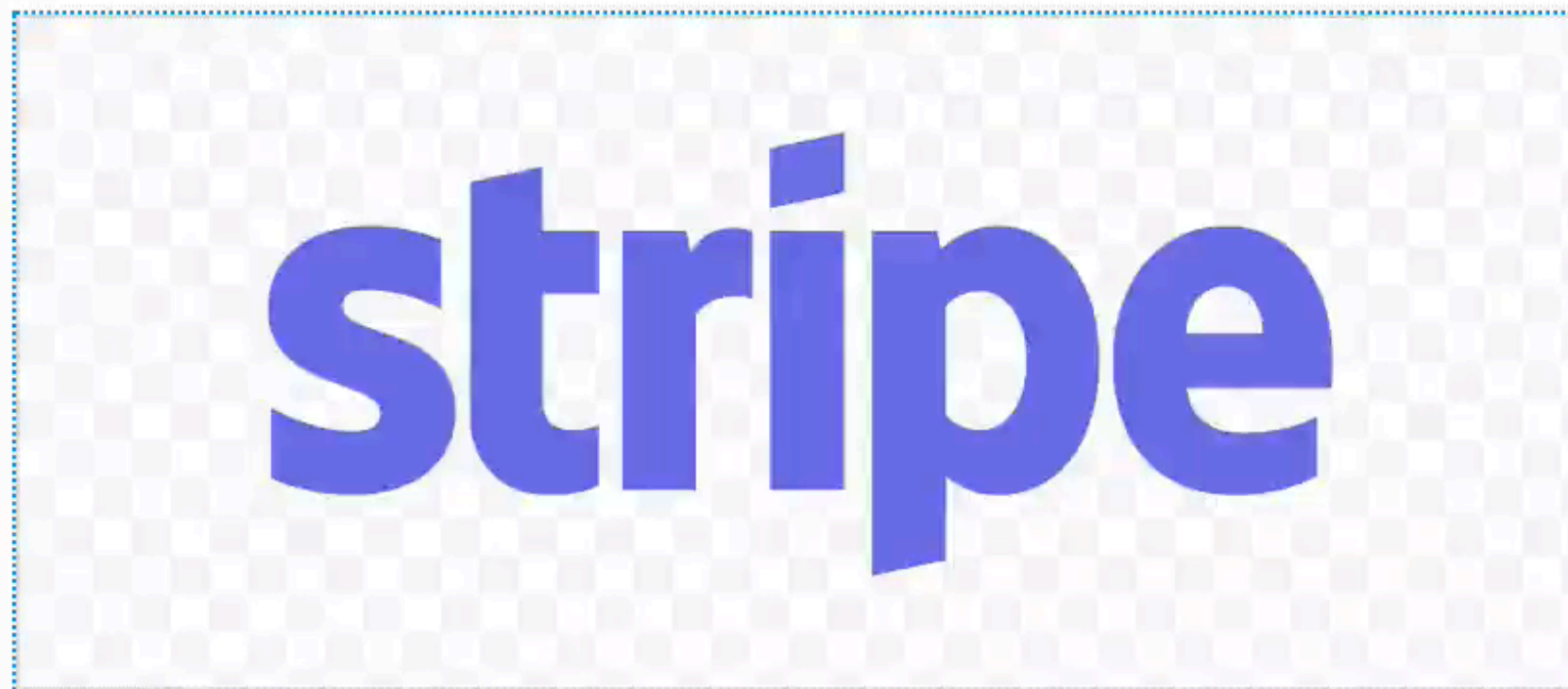
- Complex animated interactions
- Narrative or immersive animation
- Dynamic state transitions

Logos & resources

These are official Stripe graphical resources that you can include on your webpage, in your mobile application, or in printed material.

Stripe logo

The blue logo works best on light backgrounds; the white one is designed for dark backgrounds.

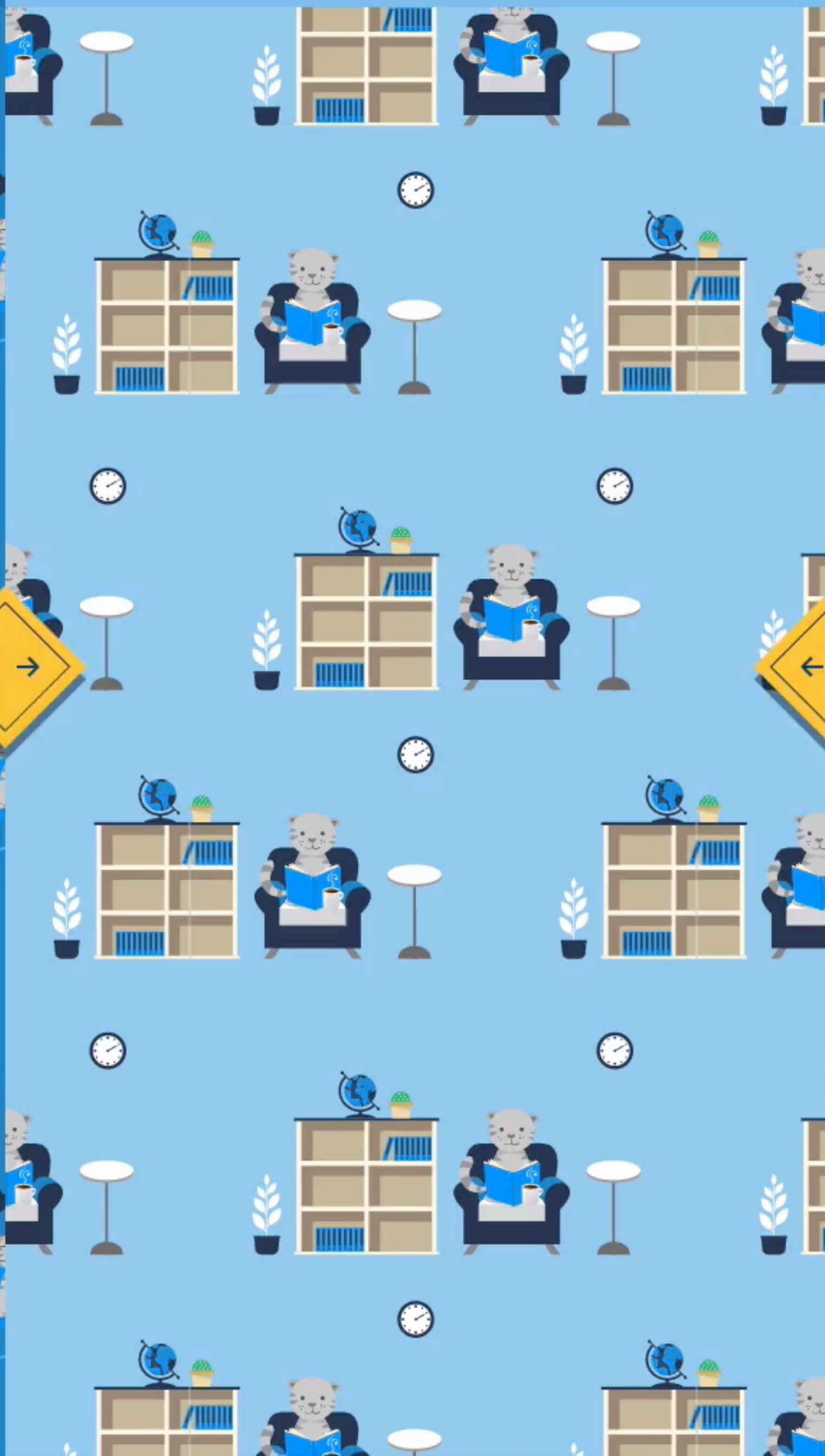
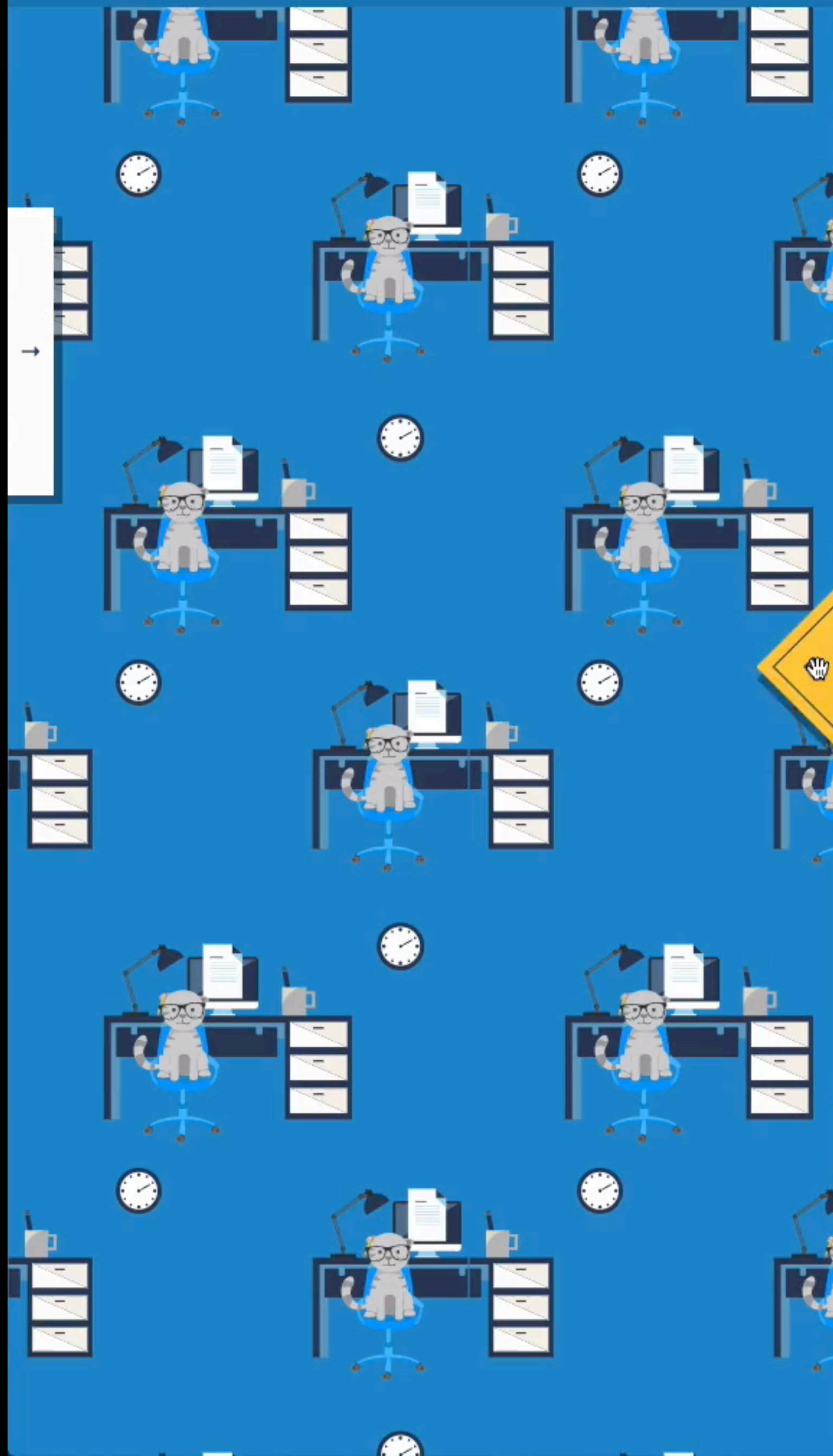


[Download logo kit](#) AI, SVG, PDF, PNG

8 1/2
WORK

8 1/2
SPARE TIME

8 1/2
SLEEP



CHILLAINESS



Chill the lion

REFRESH THE LION FROM THE BLISTERING HEAT

GO





God of War Game Site



Climber is currently building out the website for the next God of War video game installment. New website launching soon.

CLIENT: SONY, REAL PIE



CLIMBER





requestAnimationFrame



JS

Vanilla JS - requestAnimationFrame

```
const moveCat = () => {  
  . . .  
  currentValue = changeInValue * progress + startValue  
  cat.style.transform = `translate3d(${currentValue}px, 0, 0)`  
  . . .  
  requestAnimationFrame(moveCat);  
}  
moveCat();
```

JS

Vanilla JS - requestAnimationFrame

```
const moveCat = () => {  
    . . .  
    currentValue = changeInValue * progress + startValue  
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JS

Vanilla JS - requestAnimationFrame

```
const moveCat = () => {  
    . . .  
    currentValue = changeInValue * progress + startValue  
    cat.style.transform = `translate3d(${currentValue}px, 0, 0)`  
    . . .  
    requestAnimationFrame(moveCat);  
}  
moveCat();
```

 HTML



 CSS



 JS



```
21 const moveCat = () => {  
22   if (currentIteration <  
    totalIterations) {  
23     var progress = currentIteration /  
    totalIterations  
24     currentValue = changeInValue *  
    progress + startValue  
25     cat.style.transform =  
    `translate3d(${currentValue}px, 0, 0)`  
26     currentIteration++  
27   } else {  
28     currentIteration = currentIteration  
29   }  
30  
31   requestAnimationFrame(moveCat)  
32 }  
33  
34 moveCat()  
35
```



JS animation libraries



Comparing JavaScript animation libraries...



Velocity.js




```
TweenMax.to( box, 1,  
{opacity:1, x:800, ease:Power2.easeIn}  
);
```

```
Velocity(box,  
{opacity: 1, translateX:"+=800"},  
{duration: 1000, easing:"easeInQuad"});
```

```
anime({  
  targets: box,  
  opacity:1,  
  translateX: 800,  
  duration: 1000,  
  easing: 'easeInQuad'  
});
```



Velocity.js





~9 - 29kb

back to IE8*

Docs + forums

drawSVG, morphSVG, Draggable

Some features and licensing
requires \$

Velocity.js

~14.4kb

back to IE8

Docs + SO

drop-in replacement for jQuery

MIT license



JAVASCRIPT ANIMATION ENGINE

~4.7kb

back to IE10

Docs

very lightweight

MIT license

**These are not the only JS animation libraries out there.*

JavaScript

In Summary

Where it shines:

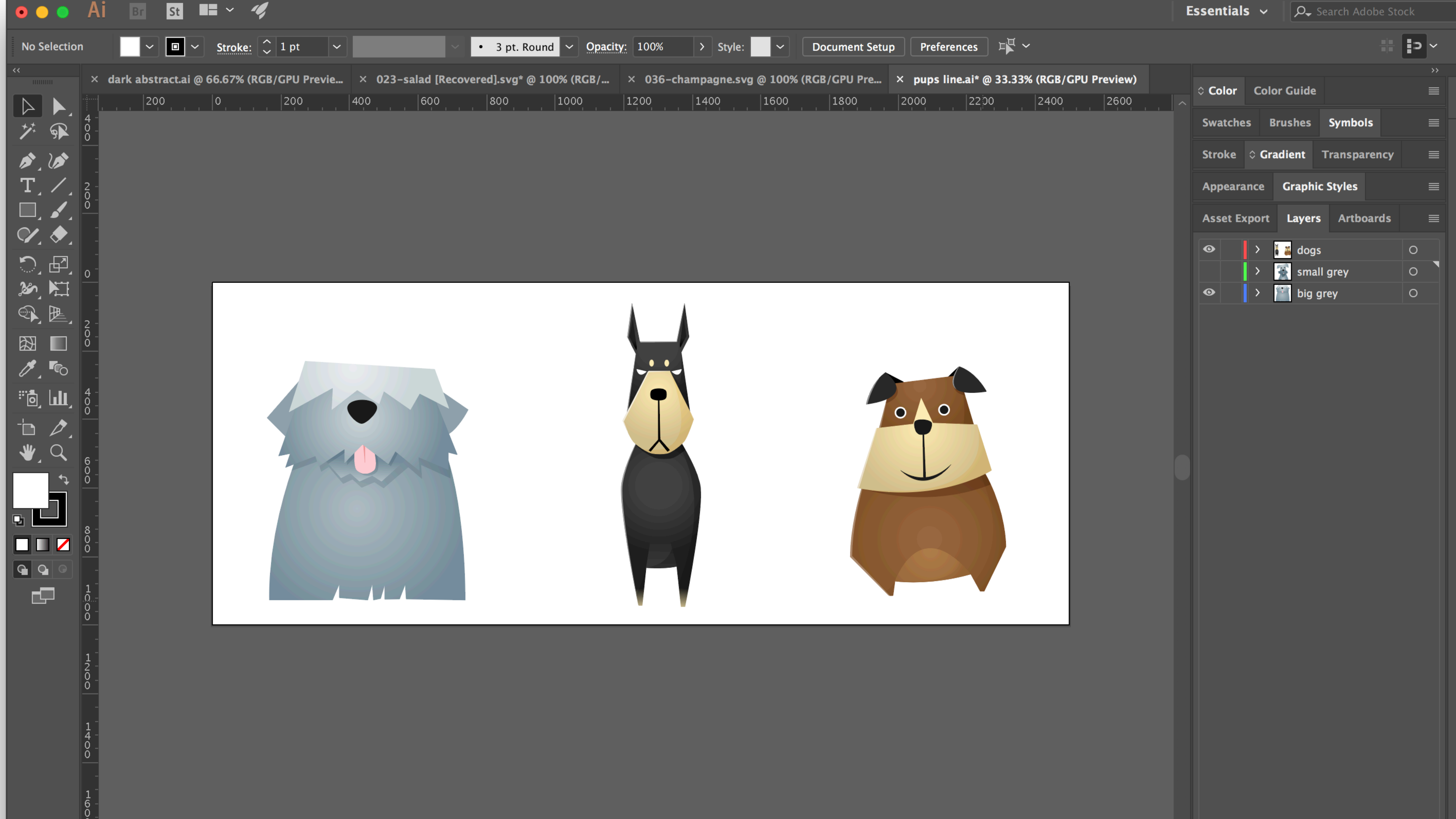
- Complex UI animation
- Animation with dynamic states
- Immersive animation

Biggest Pro:

- Lots of options for how to get it done
- Can animate DOM, SVG, canvas

SVG



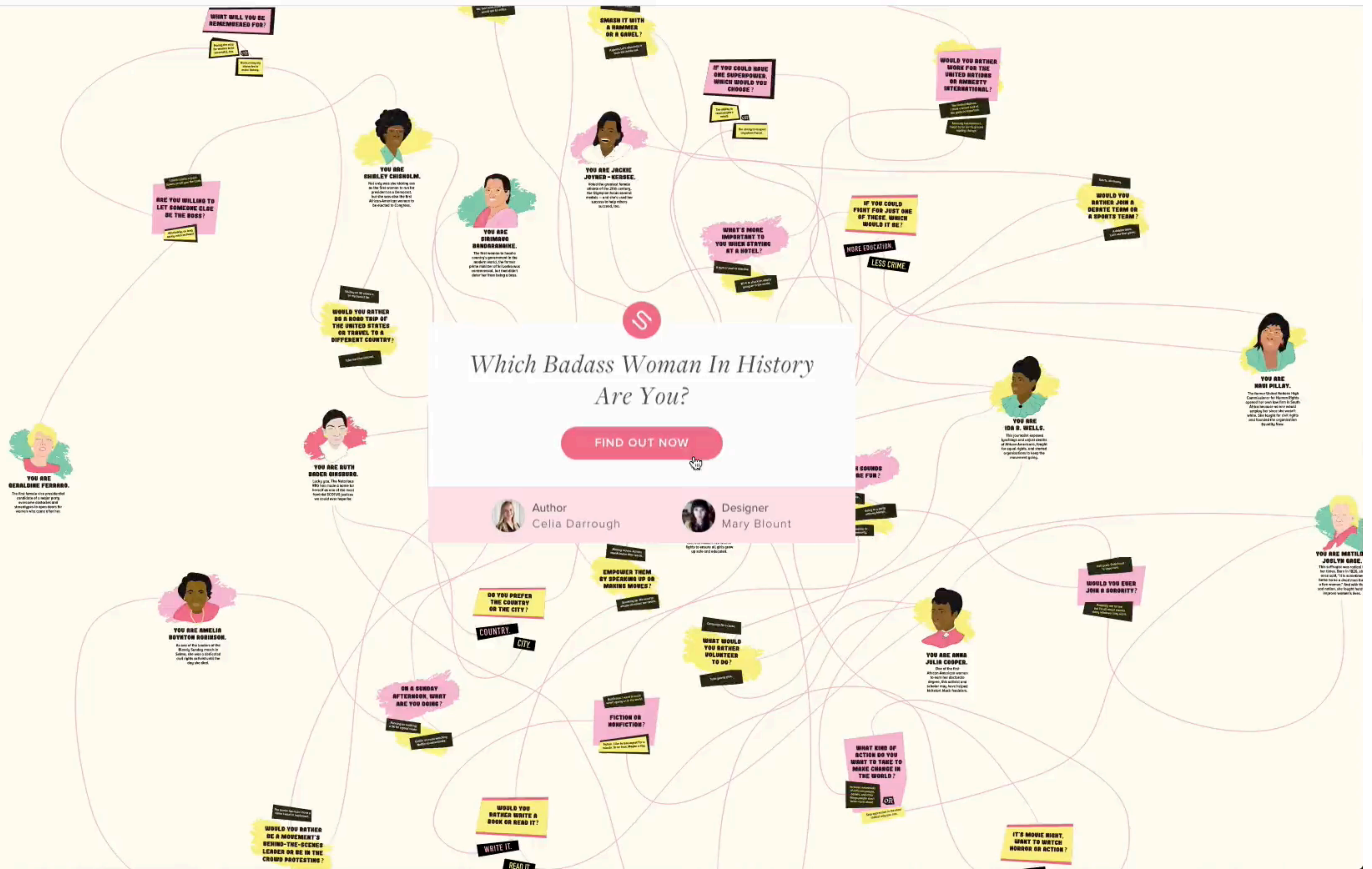



```
<g>
  <g id="big_grey" data-name="big grey">
    <g id="big-grey">
      <path id="body" d="M277,434.5S163,668.8,166.4,927H350.8l19.4-45.8v39.4l83.4,6.7,12.7-46.1,3.5,46.1,21.3-4.5,11.5-39V925l43.6-.7,16.2-42,2.9,42,172.3,3s4.5-355.3-93-508.2Z" transform="translate(-159.6 -61.2)" fill="url(#radial-gradient)"/>
      <path id="ear-right" d="M613.9,280.9l132.6,91.1s-40.5,80.9-80.9,77.6Z" transform="translate(-159.6 -61.2)" fill="#90a4ae"/>
      <path id="chin-shadow" d="M695,542.4c-12.7-46.9-29.1-89.9-50.3-123.3L277,434.7s-21.4,43.9-45.4,114.7l77.2-27.7,9,30.6,22.1-14,41.9,49.2,27.3-12.8,26.4,24.2,37.5-16,26.6,17.5L571.5,539l39.6,33.8-2.8-40.5,86,39.1Z" transform="translate(-159.6 -61.2)" fill="#90a4ae" opacity="0.3" style="mix-blend-mode: multiply"/>
      <polygon id="ear-left" points="114.7 202.8 0 334.3 67.4 402.1 114.7 202.8" fill="#90a4ae"/>
      <polygon id="chin" points="131.5 415.3 215.8 509.7 242.8 496.2 269.8 519.8 306.9 502.9 333.9 519.8 431.7 432.1 367.6 374.8 178.7 378.2 131.5 415.3" fill="url(#linear-gradient)"/>
      <path id="beard-shadow" d="M527.2,436l-188.9,3.4-47.2,37.1,46.9,52.8,55.2-36.9v40.5l28.8-29.8c-.9,12.8-1.5,38,5,49.1,2.3,3.9,11,9.3,15.7,10.7s15.5,1.4,20.3,0,15-6.9,17.3-11.1c6.2-11,2.4-34.1-.2-46.3l40.5,30.8L540.9,499,564,517.8l27.3-24.5Z" transform="translate(-159.6 -61.2)" fill="#90a4ae" opacity="0.3" style="mix-blend-mode: multiply"/>
      <g id="tongue">
        <path d="M415.8,489.4s-4.6,41.7,4.3,56.8c2.3,3.9,10.9,9.3,15.6,10.7s15.5,1.4,20.3,0,15-6.9,17.3-11.1c8.6-15.4-2.1-54.2-2.1-54.2l-28.7-28.3Z" transform="translate(-159.6 -61.2)" fill="#ffcdd2"/>
        <polygon points="280.3 403.8 285.7 466.3 285.7 404 280.3 403.8" fill="#ef9a9a"/>
      </g>
      <polygon id="face" points="123.7 189.3 461.5 209.5 555.3 442.2 529 435.5 529 486.1 441.5 449 445 489.4 374.3 432.1 354.1 469.2 278.3 411.9 226.2 465.8 226.2 425.4 150.7 476 141.1 445.6 53.7 479.3 67.3 438.9 33.7 445.6 123.7 189.3" fill="url(#radial-gradient-2)"/>
      <path id="nose" d="M394.7,362.6c7.3-25.5,77.3-25.3,85,0,5,16.4-29.6,49.1-43.3,49.8S389.5,380.6,394.7,362.6Z" transform="translate(-159.6 -61.2)" fill="#1d1d1b"/>
      <polygon id="top-fur" points="111.3 169.1 489 192.7 530.7 307.3 445.2 263.5 418.2 310.7 340.6 256.8 327.1 293.9 263 253.4 188.9 310.7 192.2 246.6 64.1 317.5 111.3 169.1" fill="url(#radial-gradient-3)"/>
    </g>
  </g>
</g>
<g id="dogs">
```

SVG

What SVG is great at:

- Animated illustrations
- Animated icons
- Infographics and dataviz
- Fluidly scaling, responsive animation





Backtracks.io logo

A PEN BY Chris Gannon **PRO**



Fork



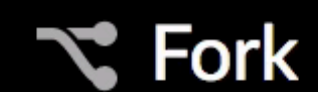
Change View





SVG Pizza Menu

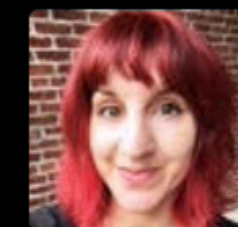
A PEN BY Chris Gannon **PRO**



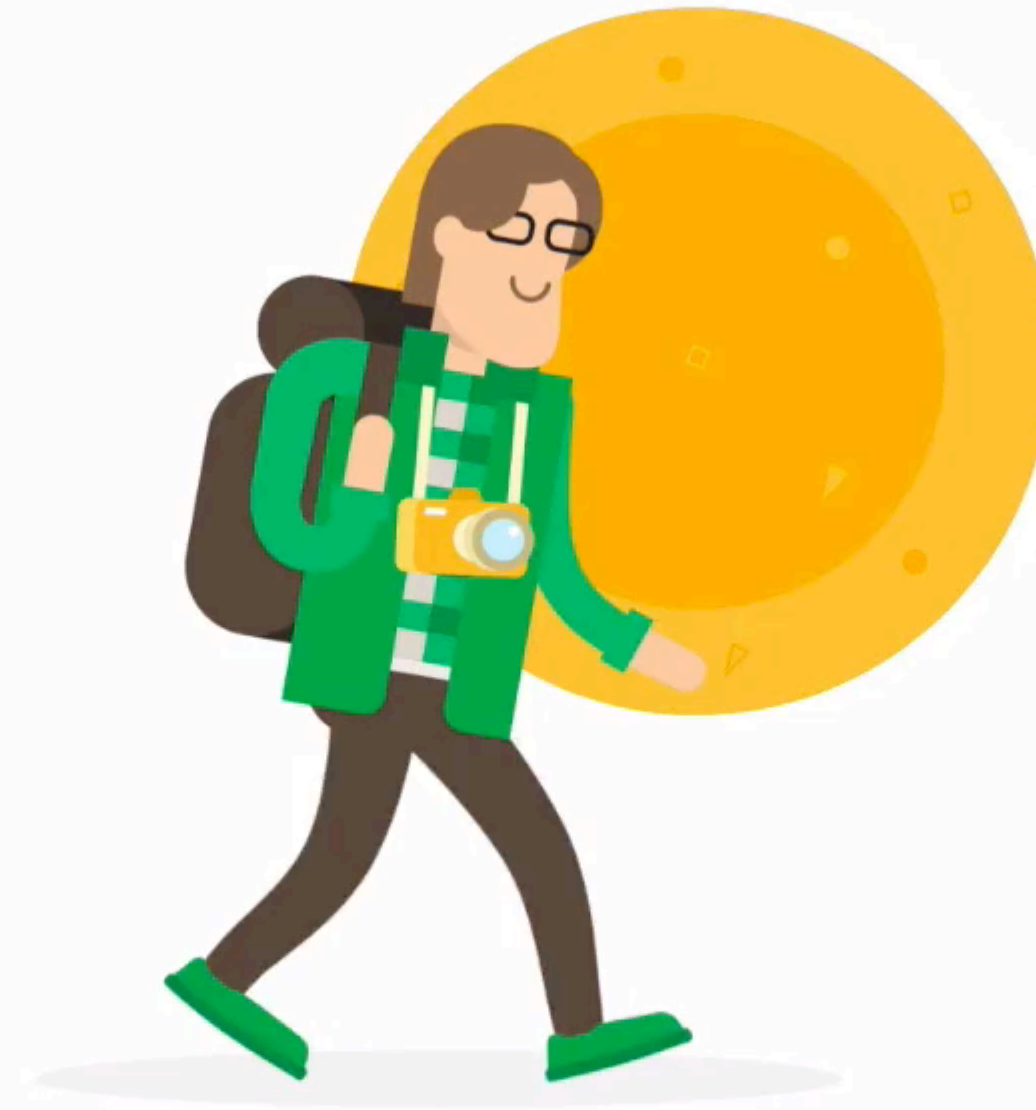
Fork



Change View



Welcome to Storytrail



Explore the world's greatest cities with our fun little videos! World traveller & founder, Jason, will guide you through the must-sees, the hidden gems, and the curious stories behind them.

Skip & Start using Storytrail





SMIL

- Tag-based animation within SVG
- No IE or Edge support
- Future in Chrome uncertain



CSS

- Transitions and keyframe animations can be applied to SVG elements
- Limited number of properties are exposed to CSS
- Transforms on child elements not supported in IE*



JS

- Can access/animate native SVG properties
- Can do motion along path, shape morphing and more just like SMIL



SVG (basic support) - REC

Usage

Global

% of all users

97.23% + 0.23% = 97.45%

Method of displaying basic Vector Graphics features using the embed or object elements. Refers to the SVG 1.1 spec.

Current aligned

Usage relative

Date relative

Show all

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			49		10.3				
	² 16	59	65		11.2				4
² 11	² 17	60	66	11.1	11.3	all	66	11.8	6.2
	² 18	61	67	12					
		62	68	TP					
			69						

- Notes
- Known issues (4)
- Resources (7)
- Feedback

² IE9-11 desktop & mobile don't properly scale SVG files. Adding height, width, viewBox, and CSS rules seem to be the best workaround.

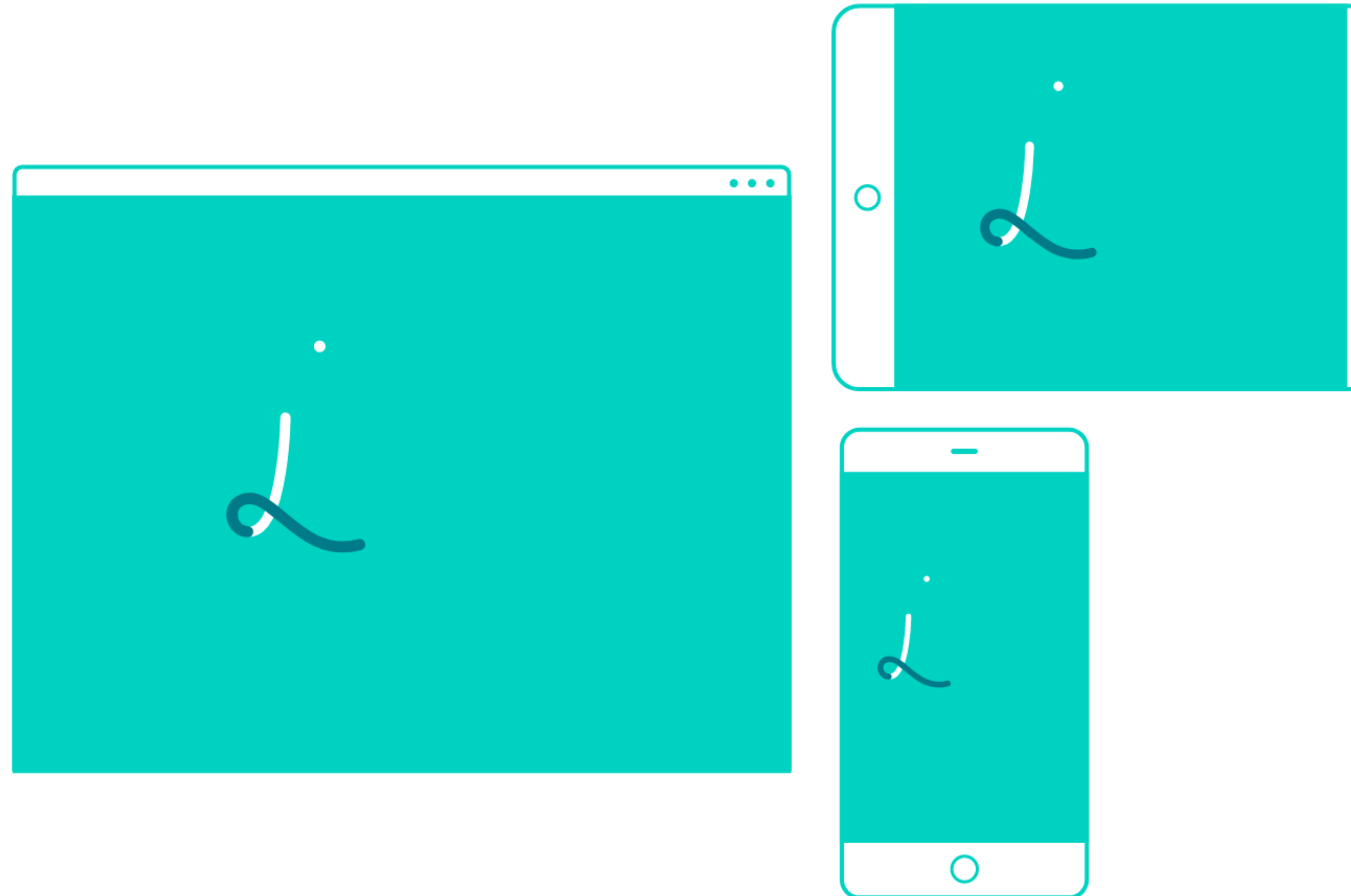
Lottie

Easily add high-quality animation to any native app.

Lottie is an iOS, Android, and React Native library that renders After Effects animations in real time, allowing apps to use animations as easily as they use static images.

[Get Started](#)

[Learn more ›](#)



lottiefiles.com



What is Lottie?

Lottie is an open-source animation tool by the amazing folks at [Airbnb](#). Its an iOS, Android, and React Native library that renders After Effects animations in real time, allowing apps to use animations as easily as they use static images.

Notify me when new files are added

[Recent](#)[Popular](#)[Android](#)[iOS](#)[Learn AfterEffects](#)

Tags:

[AEP](#)[loading](#)[animation](#)[ui](#)

AEP



github.com/airbnb/lottie-web

airbnb / lottie-web

Watch

333

Star

11,183

Fork

874

Code

Issues 239

Pull requests 11

Projects 0

Wiki

Insights

Render After Effects animations natively on Web, Android and iOS, and React Native. <http://airbnb.io/lottie/>

1,653 commits

49 branches

106 releases

29 contributors

MIT

Branch: master

New pull request

Create new file

Upload files

Find file

Clone or download



bodymovin version 5.1.13

Latest commit 8eb2993 3 days ago

.github	add screenshot note	10 months ago
build	version 5.1.13	3 days ago
demo	fix script path of demos	2 months ago
docs/json	add object type to all root objects	a year ago
gifs	Update readme	5 months ago
player	version 5.1.13	3 days ago
projects	adding bodymovin project	3 years ago
.gitignore	version 5.0.5	5 months ago
.npmignore	reversing text path	2 years ago

SVG

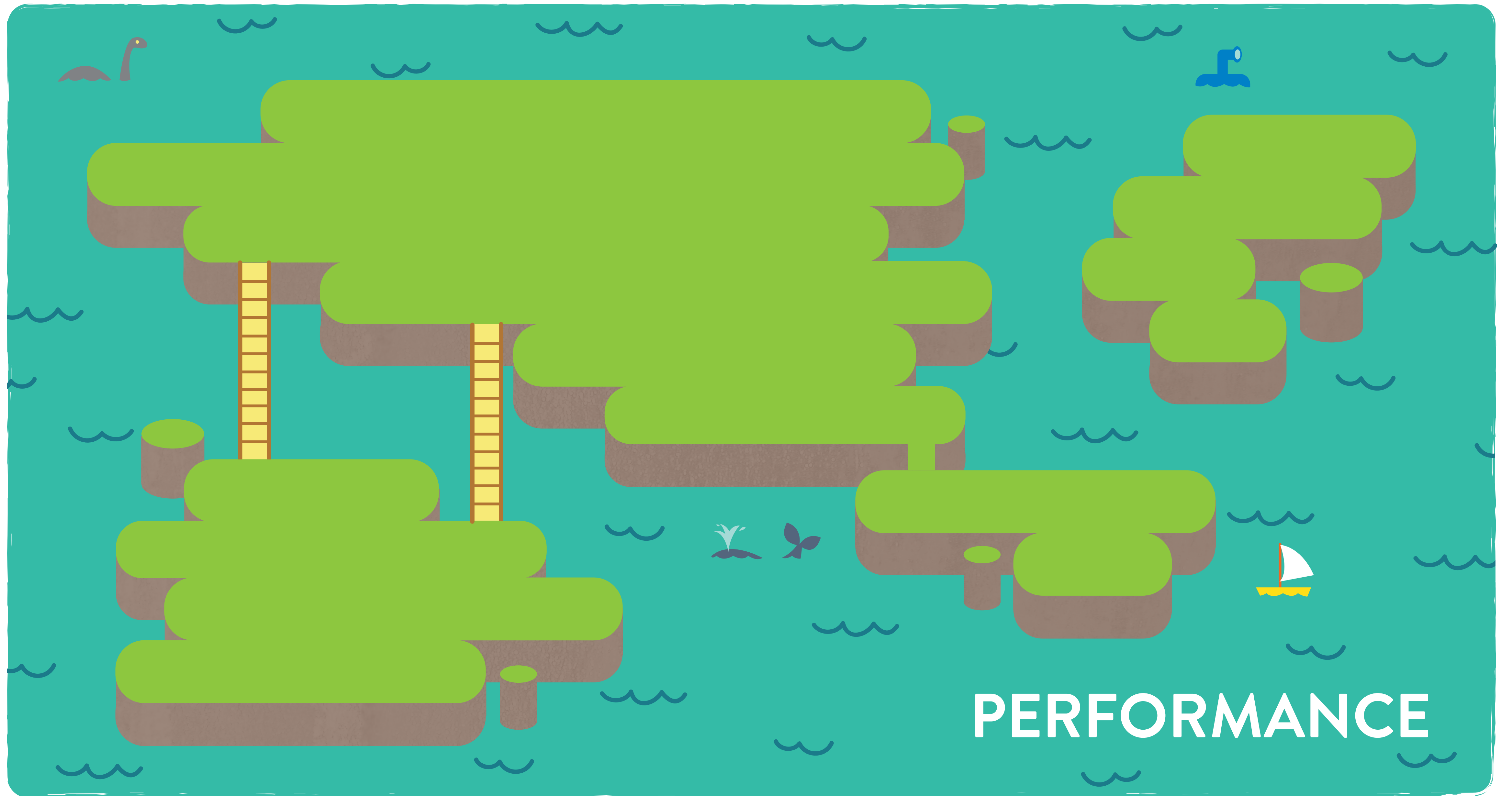
In Summary

Where it shines:

- Animated illustrations & infographics
- Shape morphing
- Motion along a path

Biggest Pro:

- Responsive by nature
- Potential for tiny file sizes



PERFORMANCE

size - transform: scale()

position - transform: translate()

rotation - transform: rotate()

opacity





Memory

Elements

Console

Sources

Network

Performance

Security

Application

Audits

<!DOCTYPE html>

...<html class="-webkit-"> == \$0

▶<head>...</head>

▶<body translate="no">...</body>

html.-webkit-

Styles

Computed

Event Listeners

DOM Breakpoints

>>

Filter

:hov .cls +

element.style {

}

Animations

Console

What's New

Rendering ×

☐

Paint Flashing

Highlights areas of the page (green) that need to be repainted

☐

Layer Borders

Shows layer borders (orange/olive) and tiles (cyan)

☐

FPS Meter

Plots frames per second, frame rate distribution, and GPU memory

☐

Scrolling Performance Issues

Highlights elements (teal) that can slow down scrolling, including touch & wheel event handlers and other main-thread scrolling situations.

☐

Emulate CSS Media

Forces media type for testing print and screen styles



Inspector

Console

Debugger

Style Editor

Performance

Memory

Network

+

Search HTML

✎

📄

<!DOCTYPE html>

<html class="-moz-" ev

><head></head>

><body translate="no">

><div class="boxy control"></div>

><div class="boxy h-a"></div>

></body>

></html>

Rules

Computed

Animations

Fonts

⏮

⏪

1x

00:02.835

	0ms	250ms	500ms	750ms	1000ms	1250ms	1500ms	1750ms	2000ms	2250ms	2500ms	2750ms	3000ms
div.boxy.h-a	h-a-animation												

html..-moz-

body

CSS

- CSS is declarative
(whole animation is known ahead of time)
- CSS animations with transform & opacity won't be impacted by the main thread

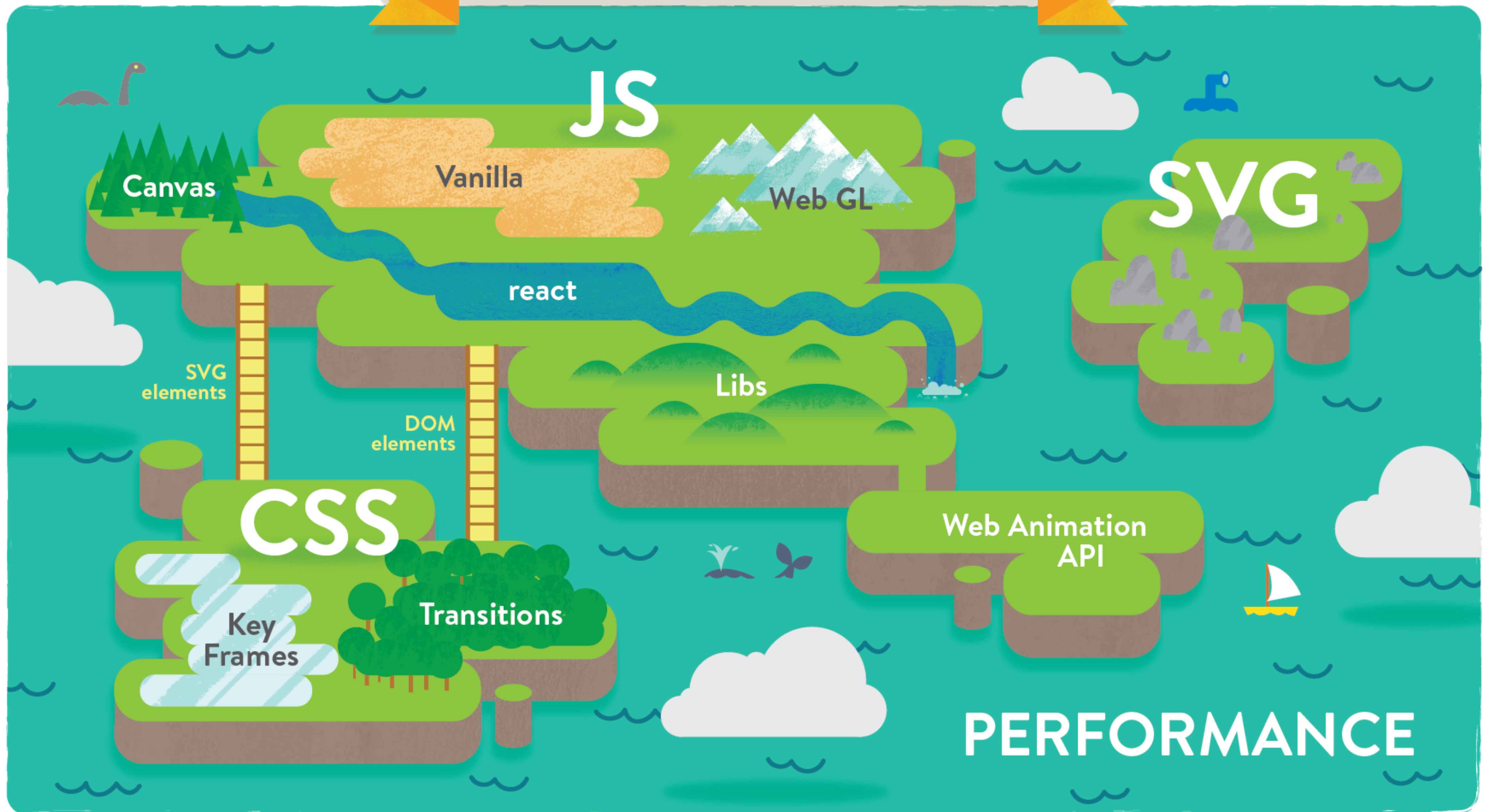
JavaScript

- JS is imperative
(browser only really aware of the current frame)
- Hardware acceleration isn't automatic

SVG & Hardware Acceleration?

- Not all browsers support it
- Good performance in general without it though

THE WORLD OF WEB ANIMATION



You have encountered an interface that requires animation.

What would you like to use?

(1) ...?

Designing Interface Animation

designinginterfaceanimation.com

FIGURE 2.12
Safari's save file
animation follows an
arced path from
the download link
to the downloads
folder in your dock.
I've superimposed
the approximate arc
followed in this image,
and you can see it in
action in this video:
<https://vimeo.com/162712118>.

32

CHAPTER 2

 Rosenfeld

DESIGNING INTERFACE ANIMATION
Meaningful Motion for User Experience
by VAL HEAD Foreword by Ethan Marcotte

Thank you!

Newsletter: uianimationnewsletter.com

Let's chat on twitter: [@vlh](https://twitter.com/vlh)

Typeface: Brandon Text | Illustrations by Rachel Sager