Practical UI Physics

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@desandro

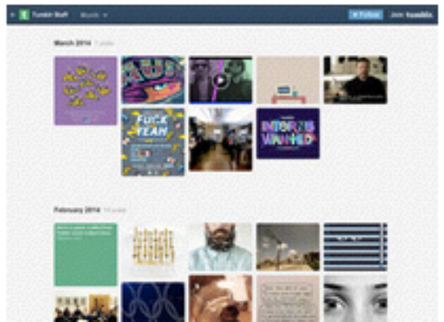

Meta
Fizzy

Masonry

Cascading grid layout library

What is Masonry?

Masonry is a JavaScript grid layout library. It works by placing elements in optimal position based on available vertical space, sort of like a mason fitting stones in a wall. You've probably seen it in use all over the Internet.



Erik Johansson

Download masonry.pkgd.min.js

Download these docs

Masonry on GitHub

RESIZE.THATSH.IT

Isotope

Filter & sort magical layouts


Download isotope.pkgd.min.js


Download these docs


Isotope on GitHub

Filter show all | metal | transition | -ium

Sort original order | name | symbol | number

```
$grid.isotope({
  itemSelector: '.element-item',
  layoutMode: 'fitRows',
  ...
})
```

Hg 80 Mercury 200.59	Te 52 Tellurium 127.6	Bi 83 Bismuth 208.980	Pb 82 Lead 207.2	Au 79 Gold 196.967	K 19 Potassium 39.0983	Na 11 Sodium 22.99	Cd 48 Cadmium 112.411	Ca 20 Calcium 40.078	Re 75 Rhenium 186.207
Tl 81 Thallium 204.383	Sb 51 Antimony 121.76	Co 27 Cobalt 58.933	Yb 70 Ytterbium 173.054	Ar 18 Argon 39.948	N 7 Nitrogen 14.007	U 92 Uranium 238.029	Pu 94 Plutonium (244)		

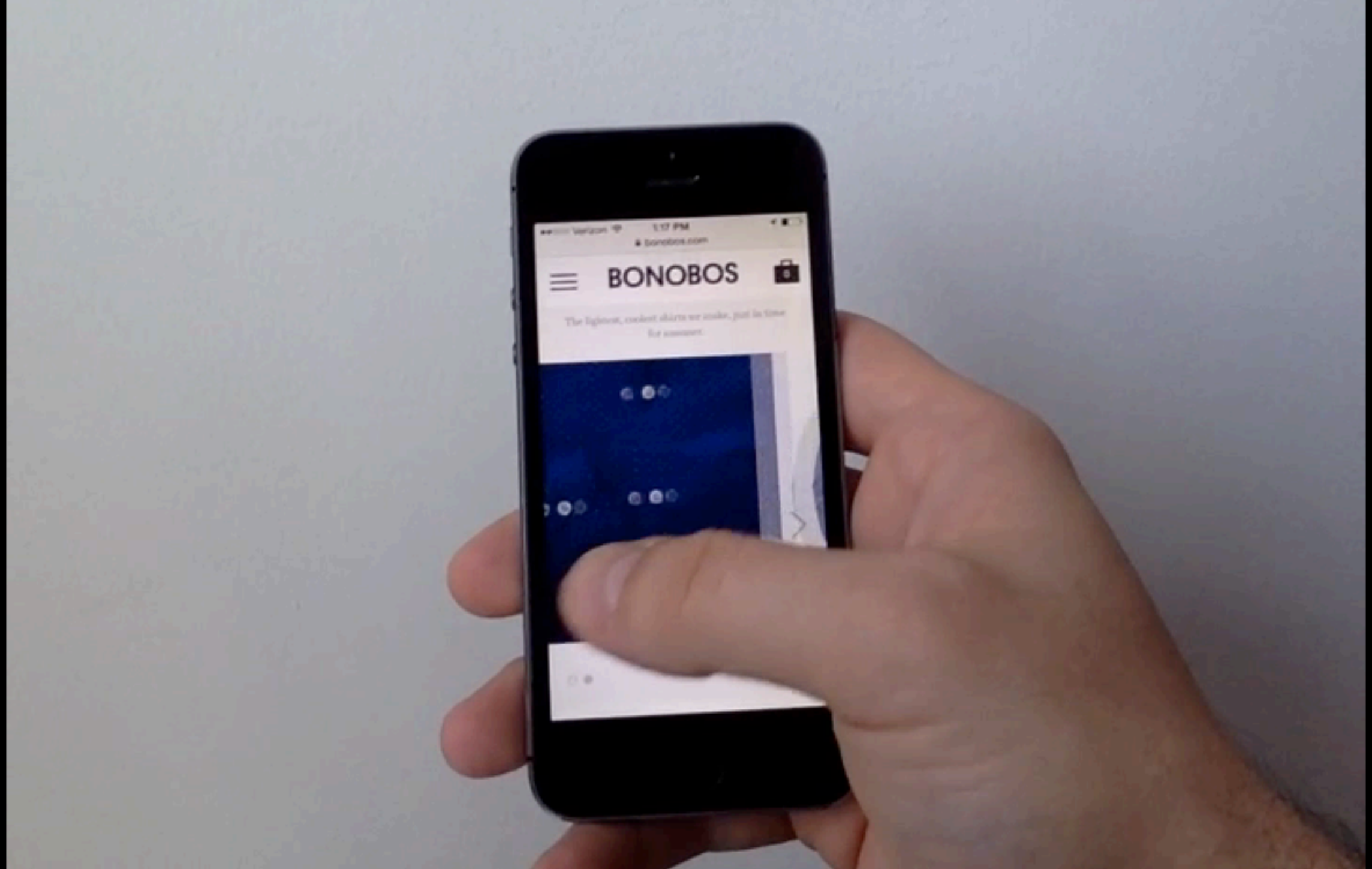
Edit this demo on CodePen

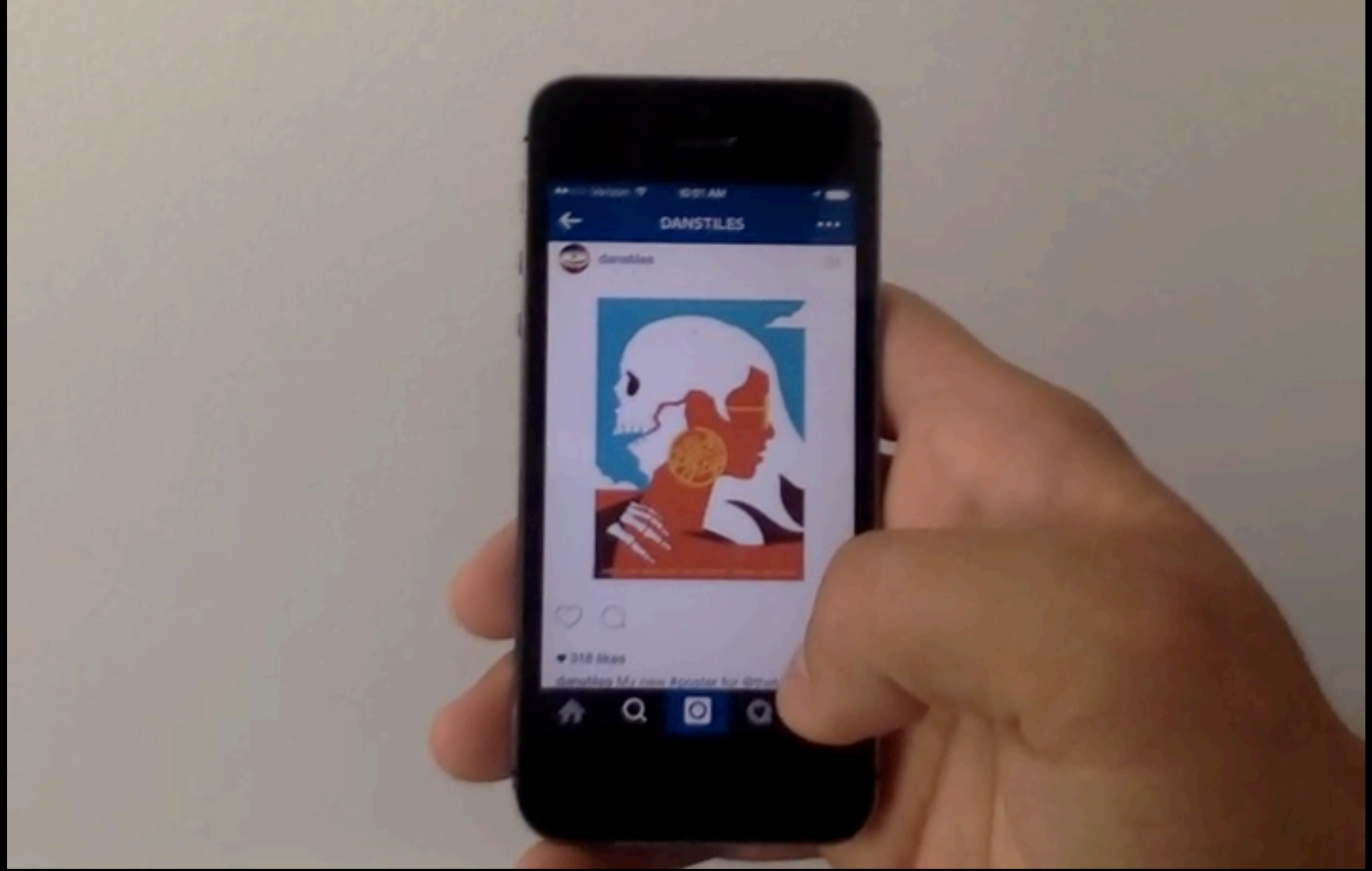
Filter show all | metal | transition | -ium **Sort** original order | name | symbol | number

Ar 18 Argon 39.948	Au 79 Gold 196.967	Bi 83 Bismuth 208.980	Ca 20 Calcium 40.078	Cd 48 Cadmium 112.411	Co 27 Cobalt 58.933	Hg 80 Mercury 200.59	K 19 Potassium 39.0983
N 7 Nitrogen 14.007	Na 11 Sodium 22.99	Pb 82 Lead 207.2	Pu 94 Plutonium (244)	Re 75 Rhenium 186.207	Sb 51 Antimony 121.76	Te 52 Tellurium 127.6	Tl 81 Thallium 204.383
U 92 Uranium 238.029	Yb 70 Ytterbium 173.054						

```
$grid.isotope({ filter: '*' })
```

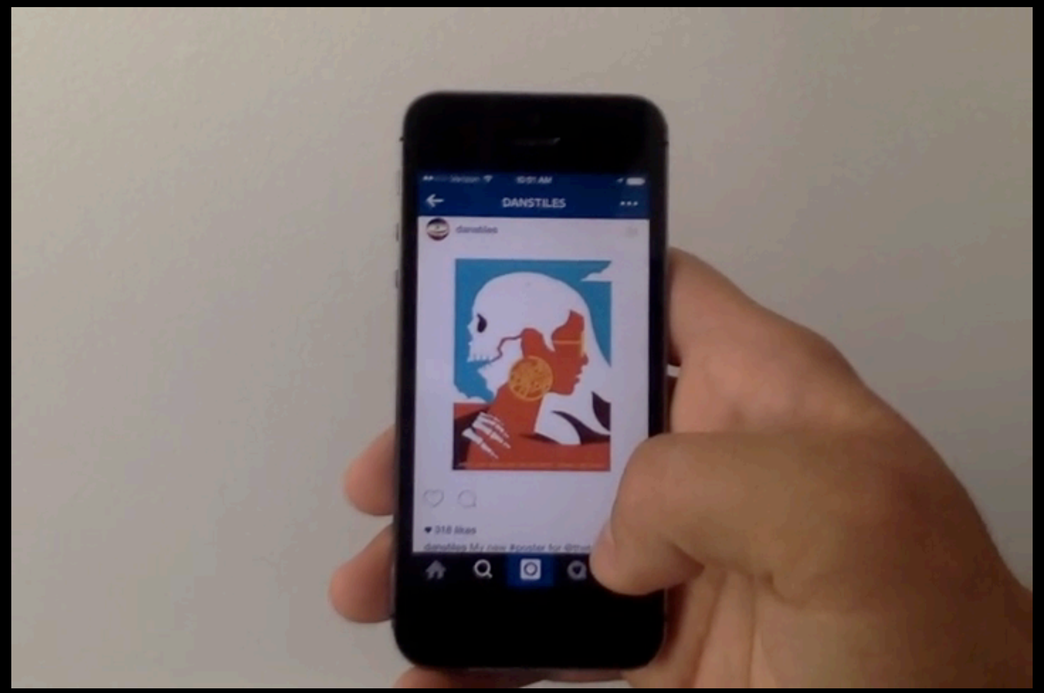
Edit this demo on CodePen


1:17 PM
BONOBOS


DANSTILES
danstiles
318 likes


MTA
MetroCard

Physics



Practical UI Physics

Why Physics?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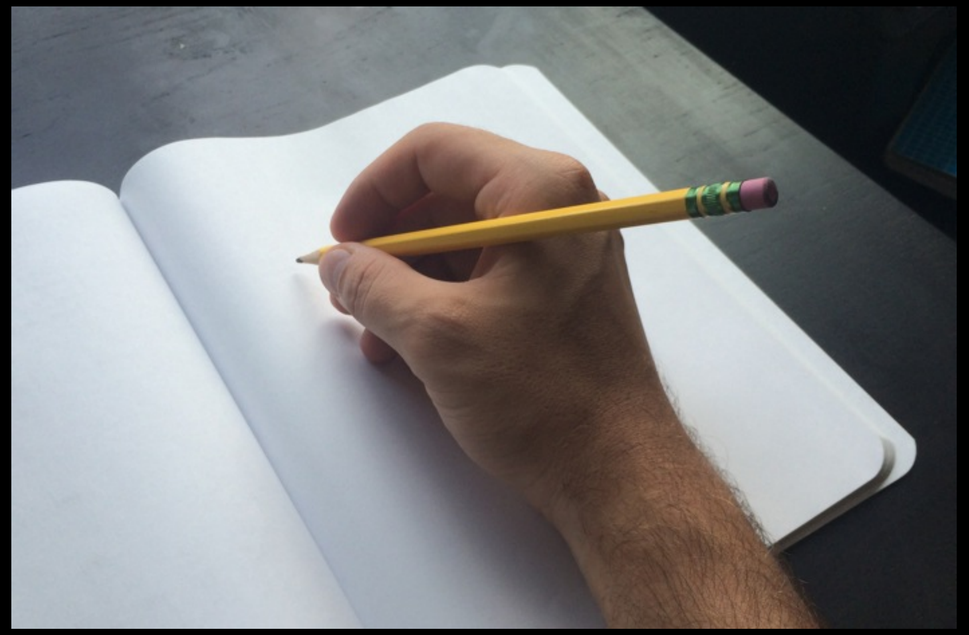
Mouse

Precision – pen

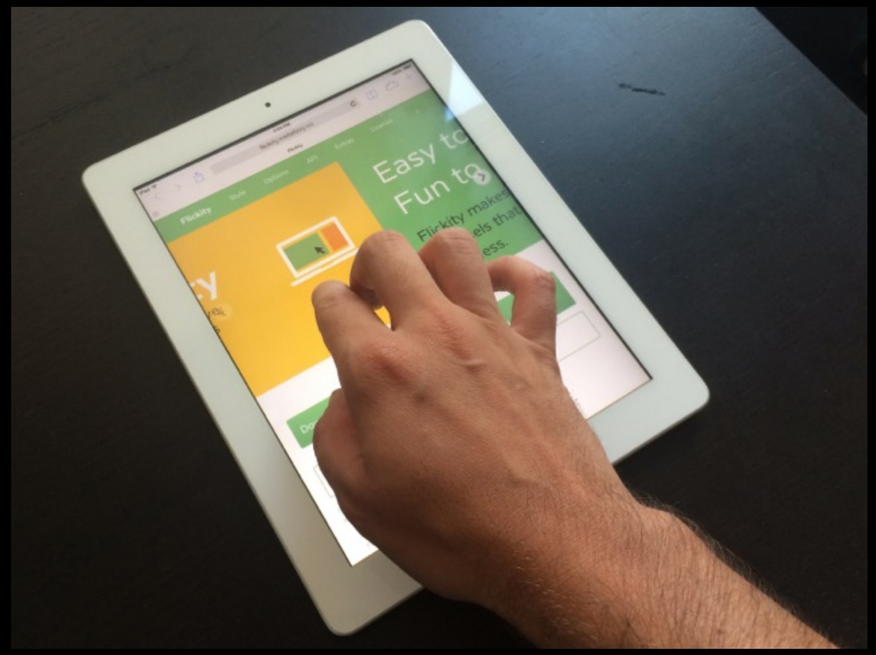
Might not need physics

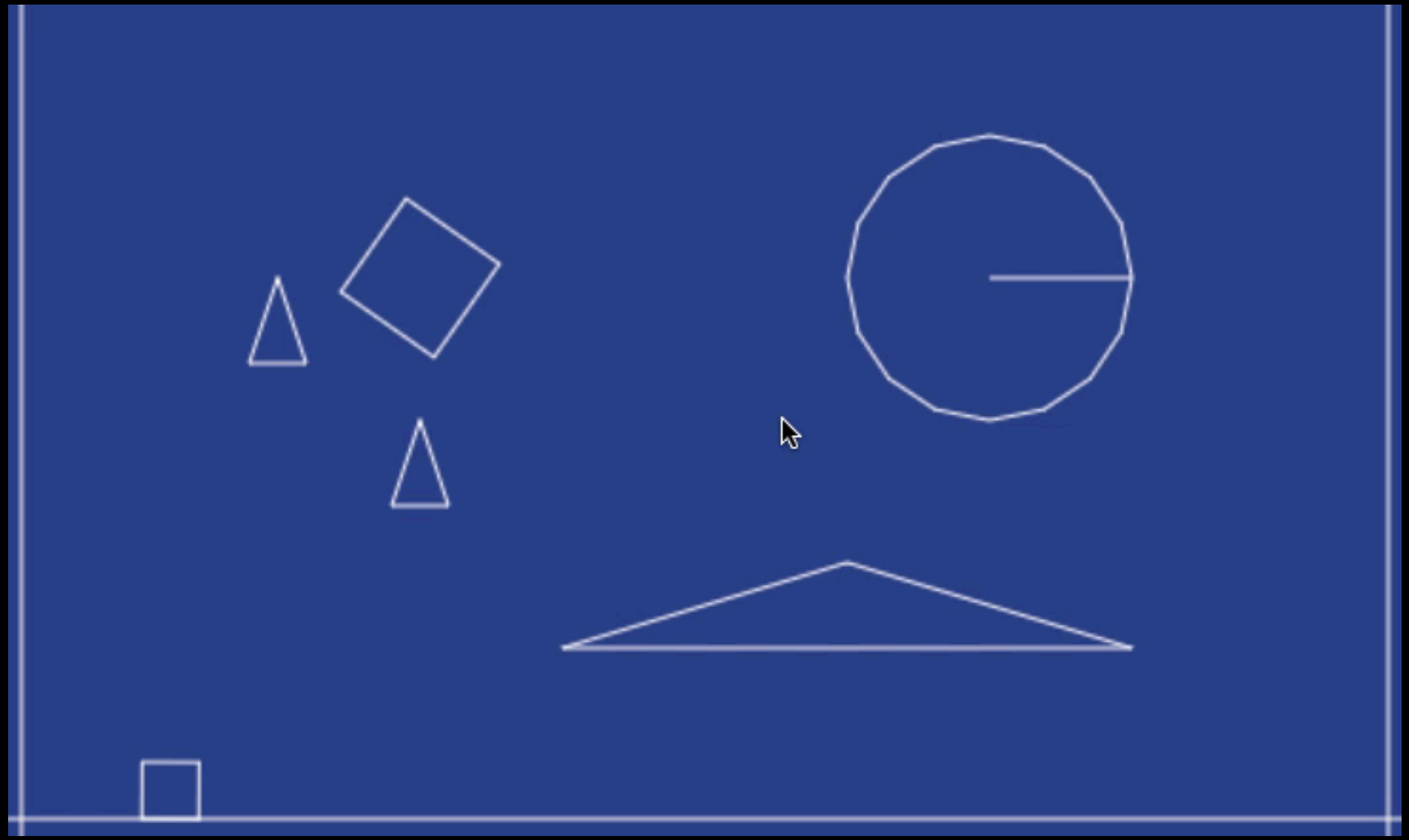


Touch

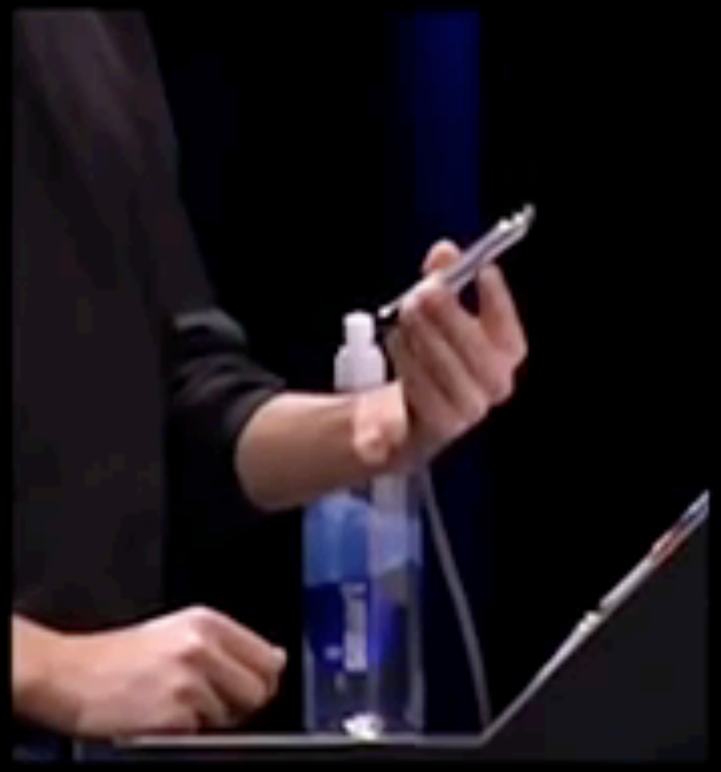
General – finger

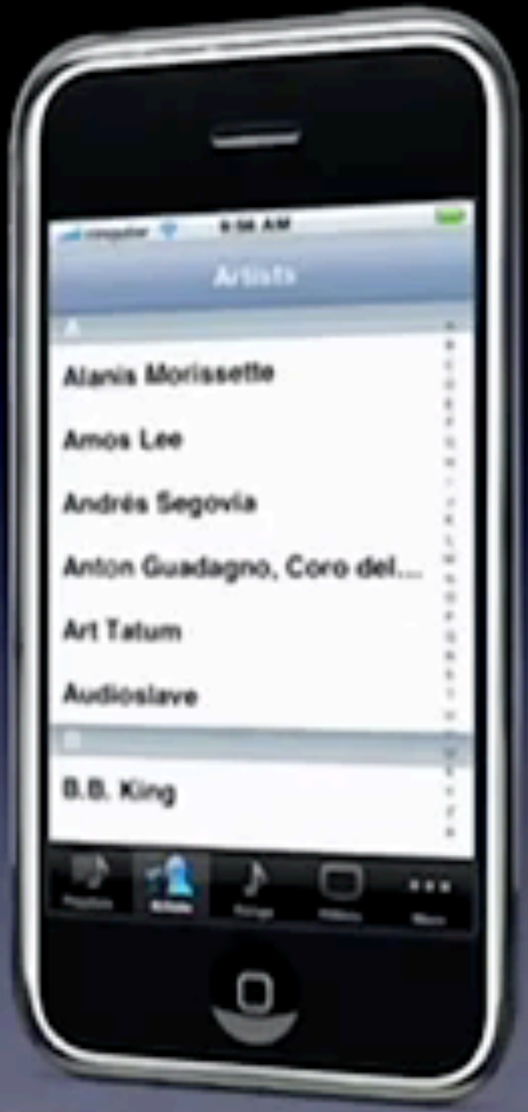
Physics feels right





Box2D JS




Artists
Alanis Morissette
Amos Lee
Andrés Segovia
Anton Guadagno, Coro del...
Art Tatum
Audioslave
B.B. King

Practical

You understand it

User interface

For the benefit of your users

Practical UI physics

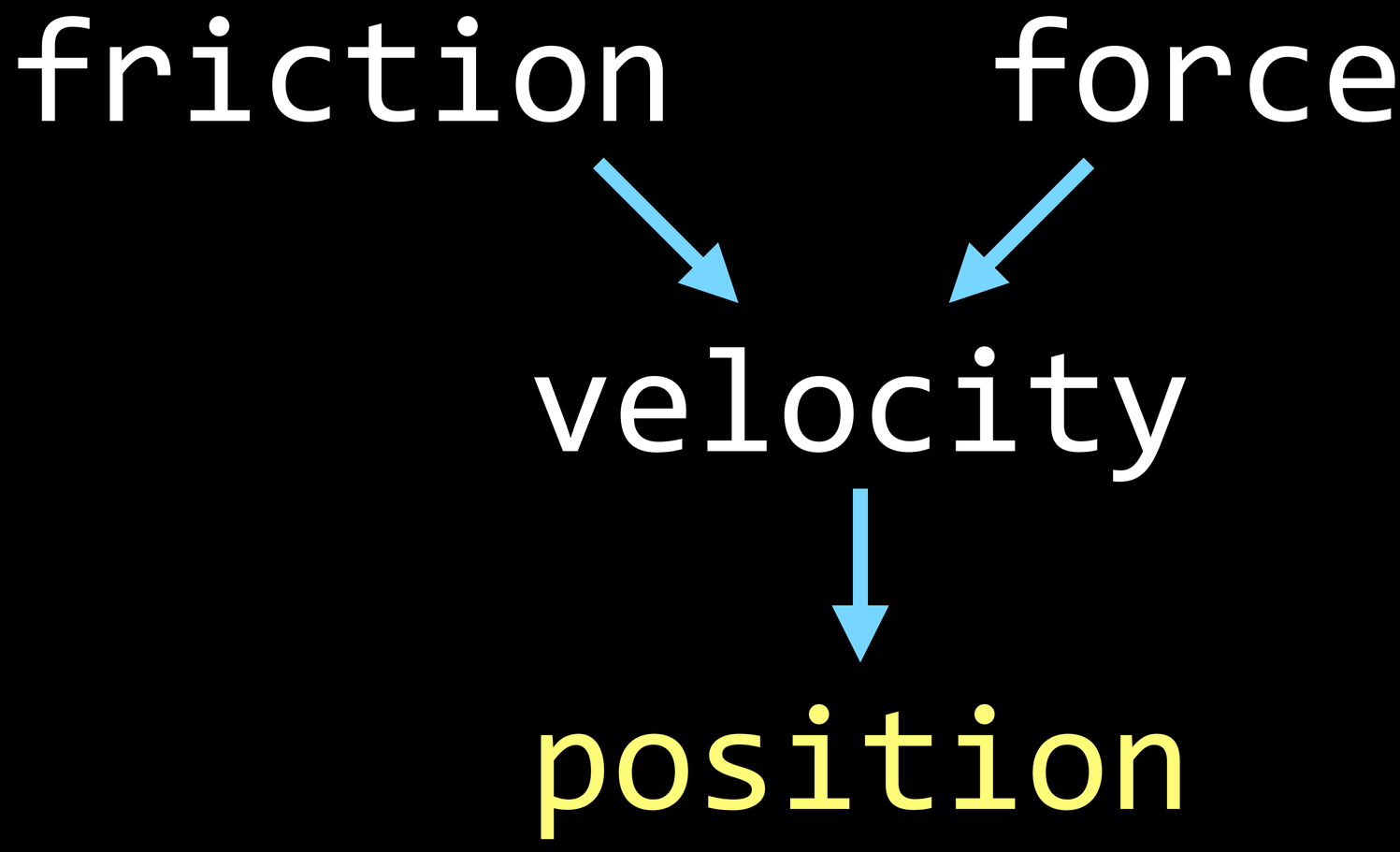
Change position with drag

Keep moving after flick

Flick movement slows

Rubber band at ends

Physics basics


friction
force
velocity
position

```
function update() {
  velocity *= friction
  position += velocity
}

function applyForce( force ) {
  velocity += force
}
```

Basics demo

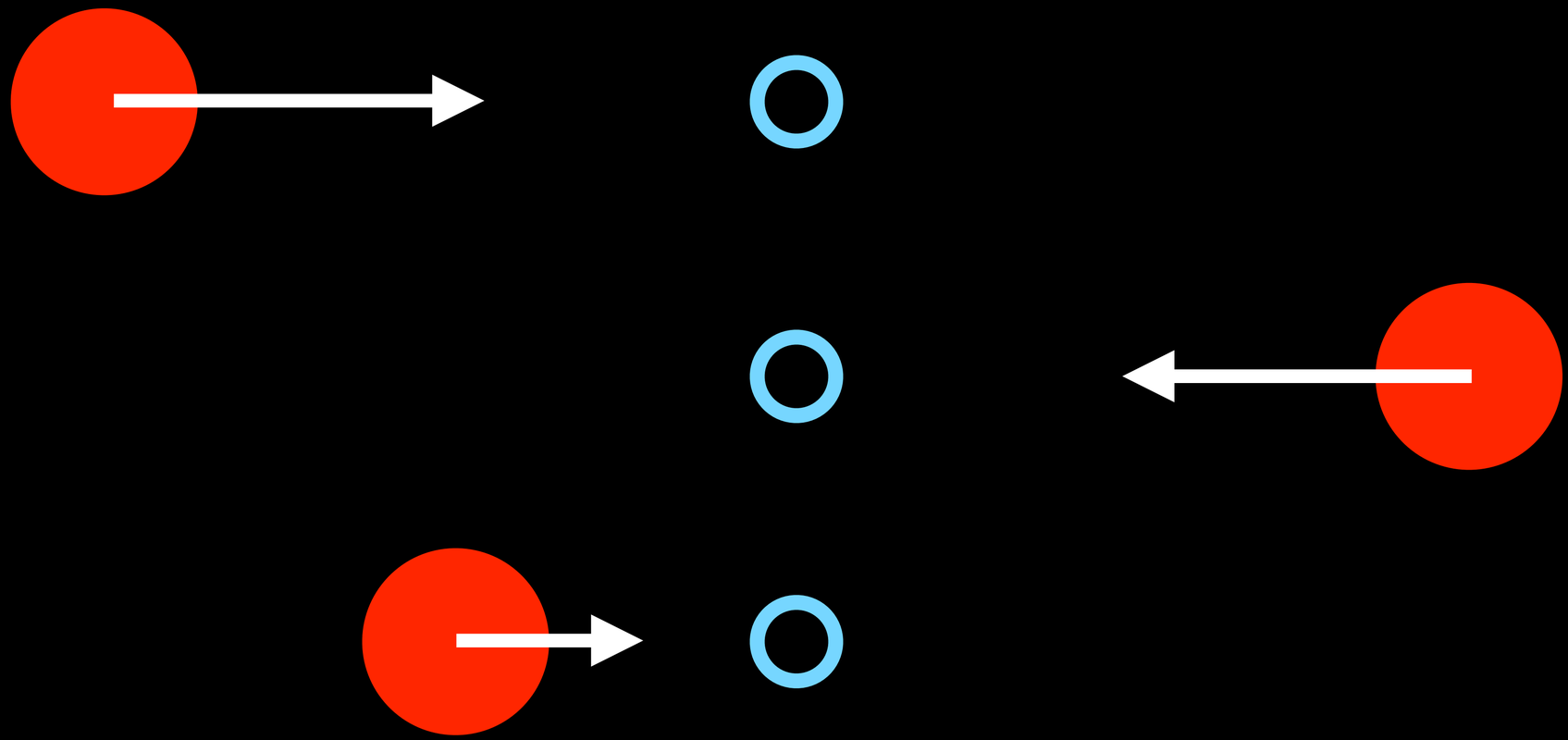
Drag demo

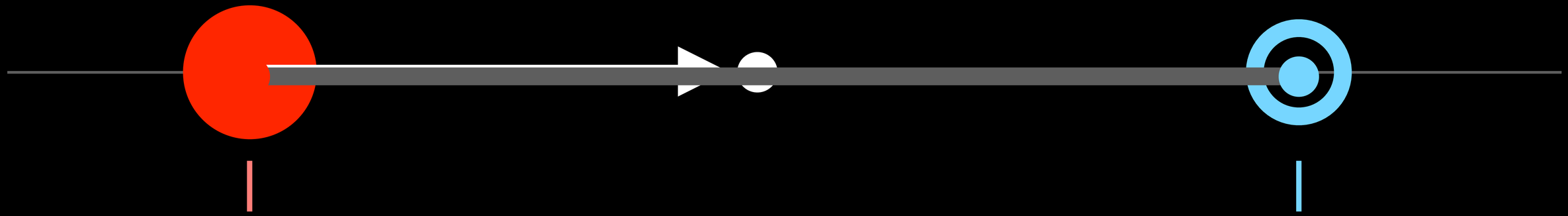
Forces

```
function update() {
  velocity *= friction
  position += velocity
}

function applyForce( force ) {
  velocity += force
}
```

```
var wind // particle force

function update() {
  applyForce( wind )
  velocity *= friction
  position += velocity
}

function applyForce( force ) {
  velocity += force
}
```

Wind force demo





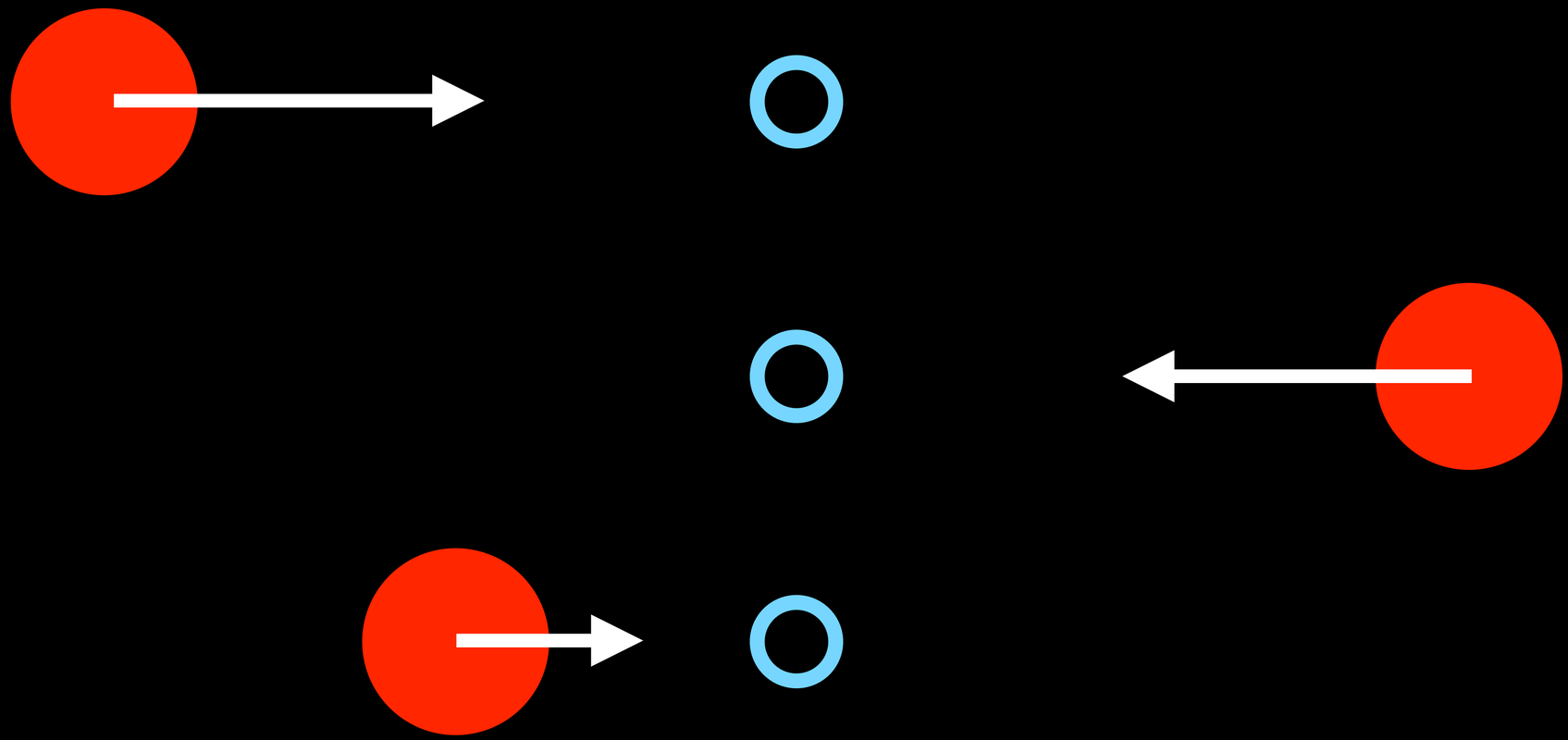
position

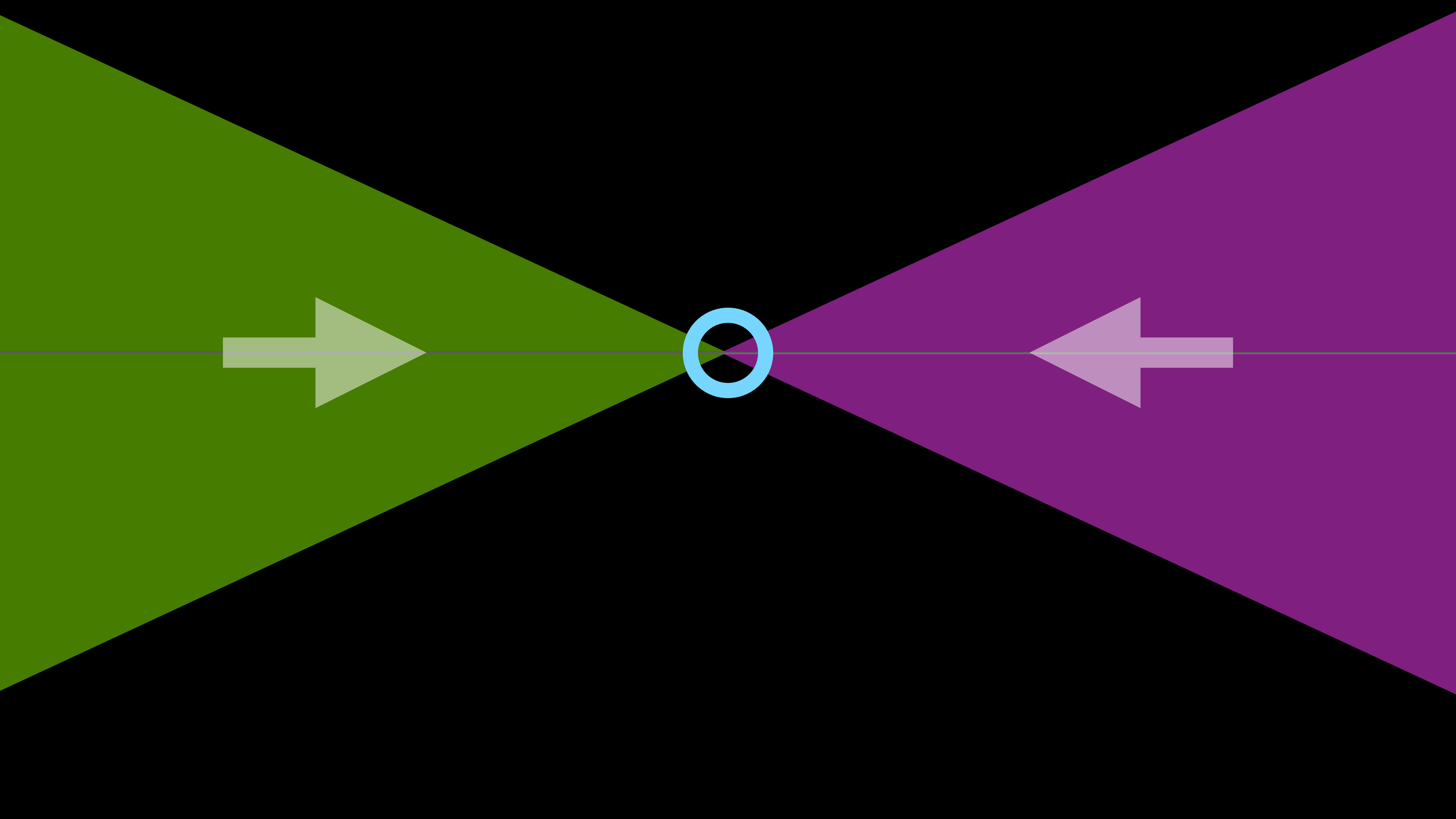
target

distance = target - position

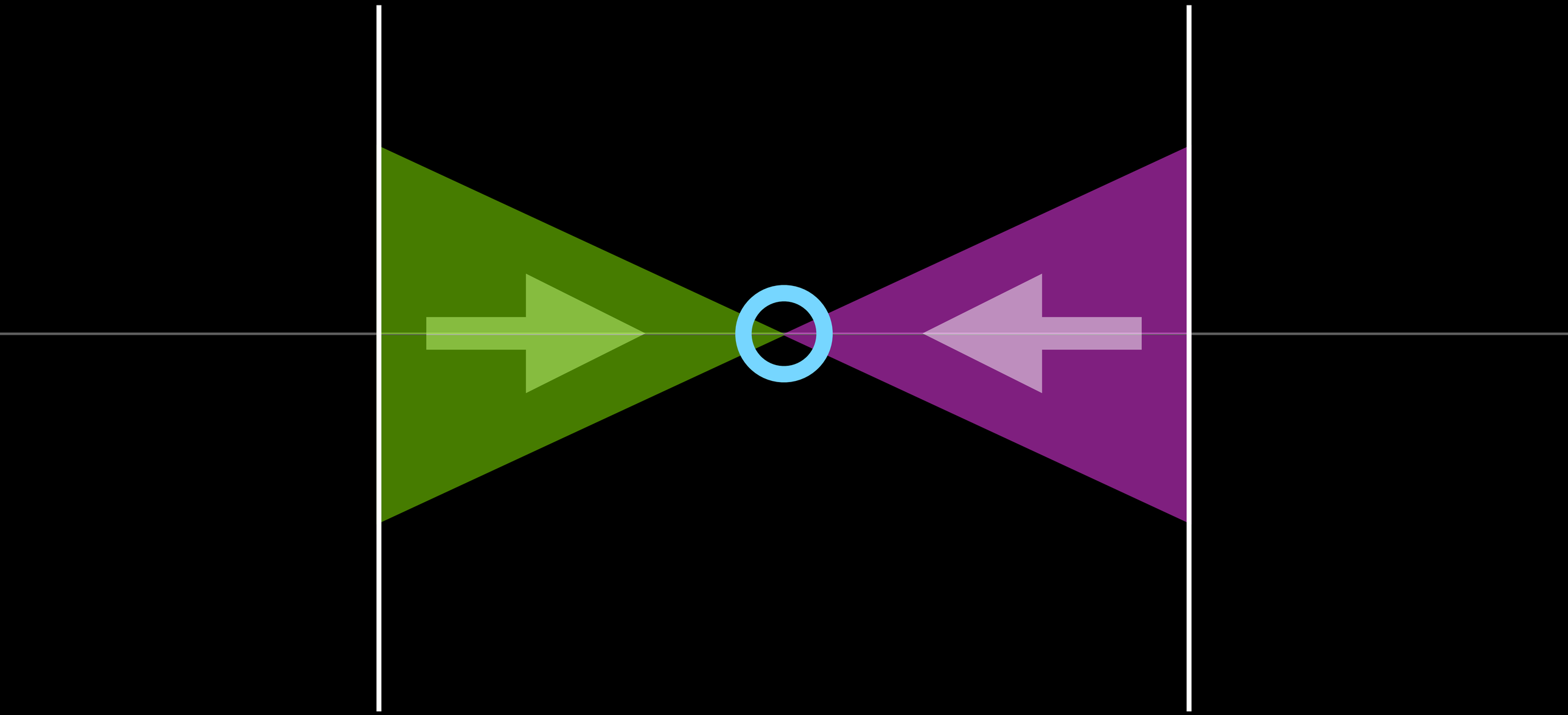
force = distance * strength

```
var attractionStrength = 0.02;

function update() {
  // attract particle to target
  var distance = target - positionX;
  var attraction = distance *
    attractionStrength;
  applyForce( attraction );

  // integrate physics
  velocity *= friction;
  position += velocity;
}
```





Attraction demo



Conditional demo

Flickity demo

Bonus:
Rubber band bounds

Rubber band bounds demo

```
// calculate resting position
rest = position +
  velocity / ( 1 - friction )
```

```
function update() {
  velocity *= friction
  position += velocity
}

function applyForce( force ) {
  velocity += force
}
```

More resources

Nature of Code (Ch. 1 & 2)
natureofcode.com

Coding Math
youtube.com/user/codingmath

These demos

codepen.io/desandro/tag/practical-ui-physics

github.com/desandro/practical-ui-physics

Thank you! – @desandro

Try Flickity