Note: Many of these slides do not have notes or completed notes! Please watch the talk on the vault for the full experience. These slides mostly exist as a reference or archive for those who want it.

<3 Luke


$171000
Island
39
3 FRUIT COMBO
+3

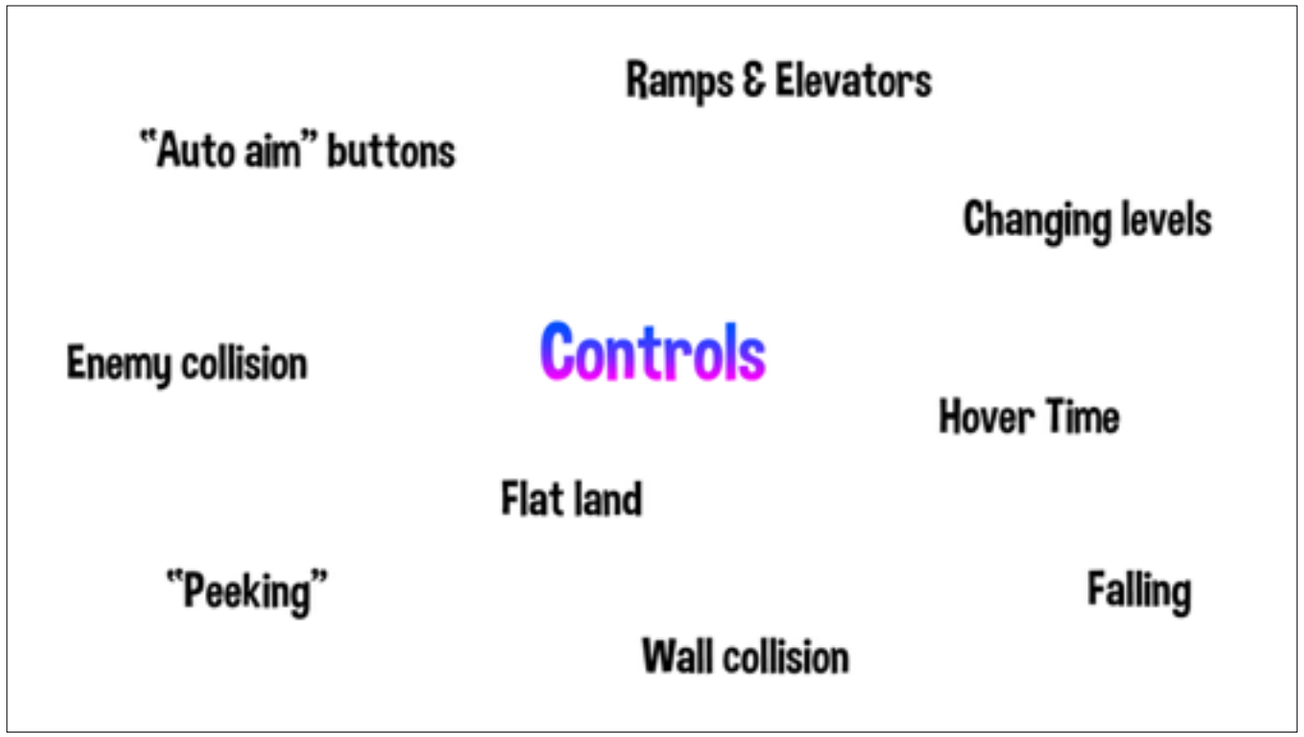

New York

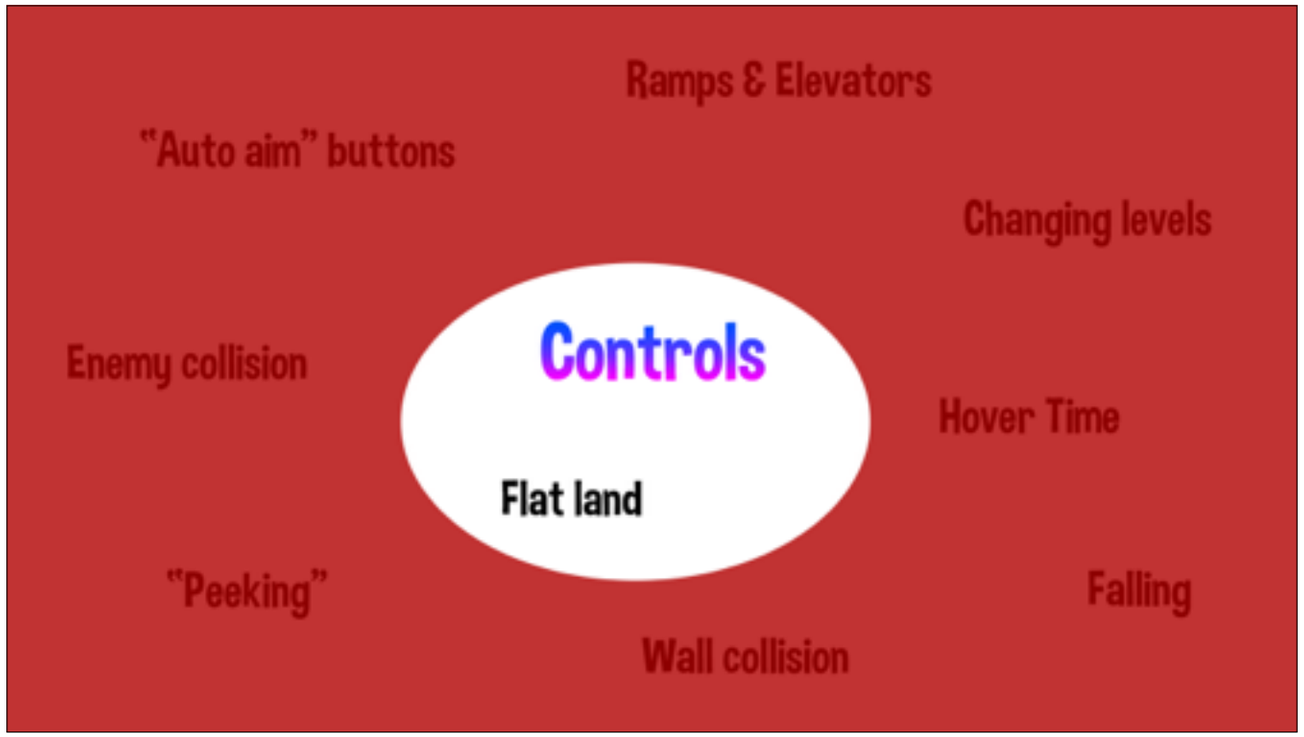

Prettygreat™

First game
3 developers, 4 months

Landsliders had a lot of interesting challenges and designs:
3D procedural generation, Real world integrated menu systems, ARG

Talking about all the challenges we faced when making a relatively “simple” touch screen interface.
Highlighting challenge of balancing feedback from different sources.


Ramps & Elevators
"Auto aim" buttons
Changing levels
Enemy collision
Controls
Hover Time
Flat land
"Peeking"
Falling
Wall collision



How difficult it can be to make something that seems so so simple. Going to look at the evolution of this design and all the little details that go into making it feel as good as possible.
How feedback often doesn't fit nicely into a “this is right and this is wrong”

84 slides

fast & dense

Drag the world
Collect stuff
Avoid baddies

Game allows for a lot of precision, speed etc.

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Collect stuff
Avoid baddies

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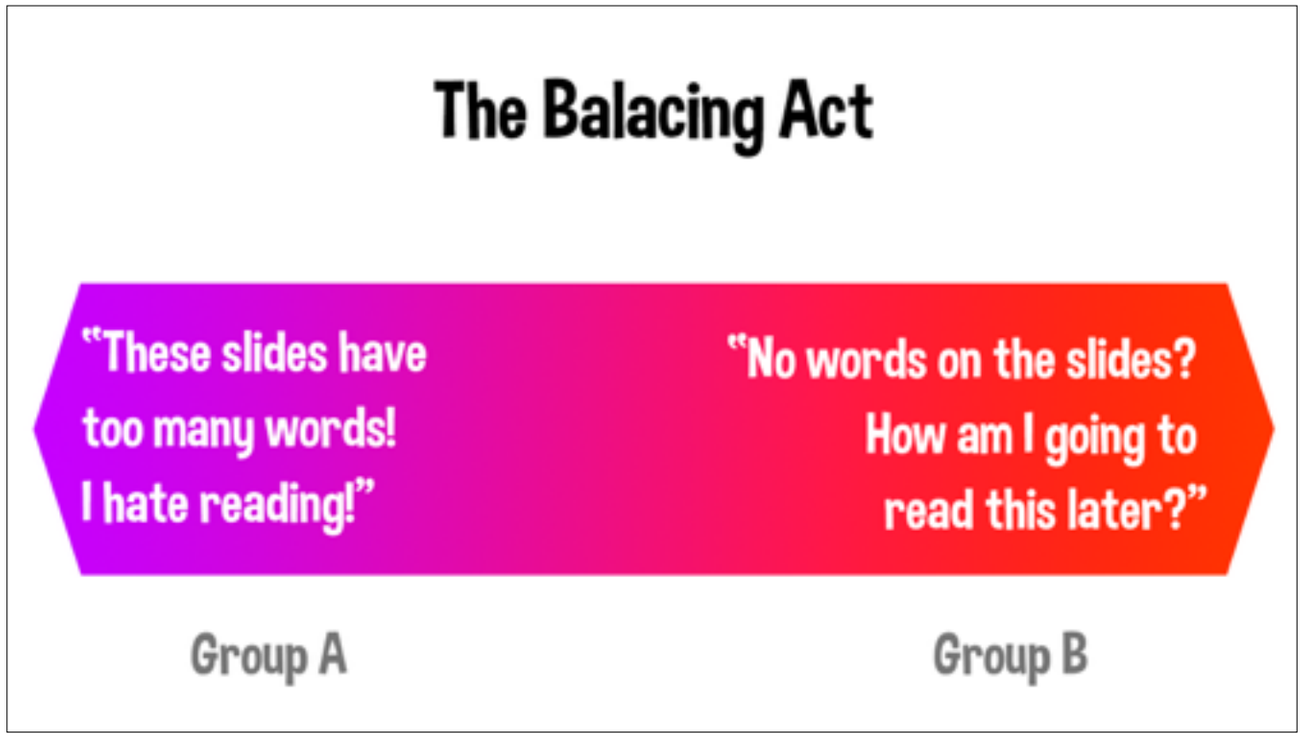

We did a LOT of play testing at every single step
Deeply expressive controls
So many different styles and preferences
Trying to make everyone happy but basically impossible

Game Goals

Novel Controls
Anyone can play

Basic design sketched up on a plane. Based on scrolling safari (next slide)

16 weeks dev


gdconf.com
GDC
GAME DEVELOPERS CONFERENCE
Moscone Center · San Francisco, CA
New session announced!
Classic Game Postmortem: Rez! Learn more here


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2 Phases

1) Dragging
2) Coasting

1) Dragging

While finger is down

Try and move world to match finger movemenet

1) Dragging

Apply smoothing

Apply Max Speed

2) Coasting

When finger is lifted
keep momentum from dragging phase

Apply drag

Effectively world gets turned into physics object

Emergent abilities

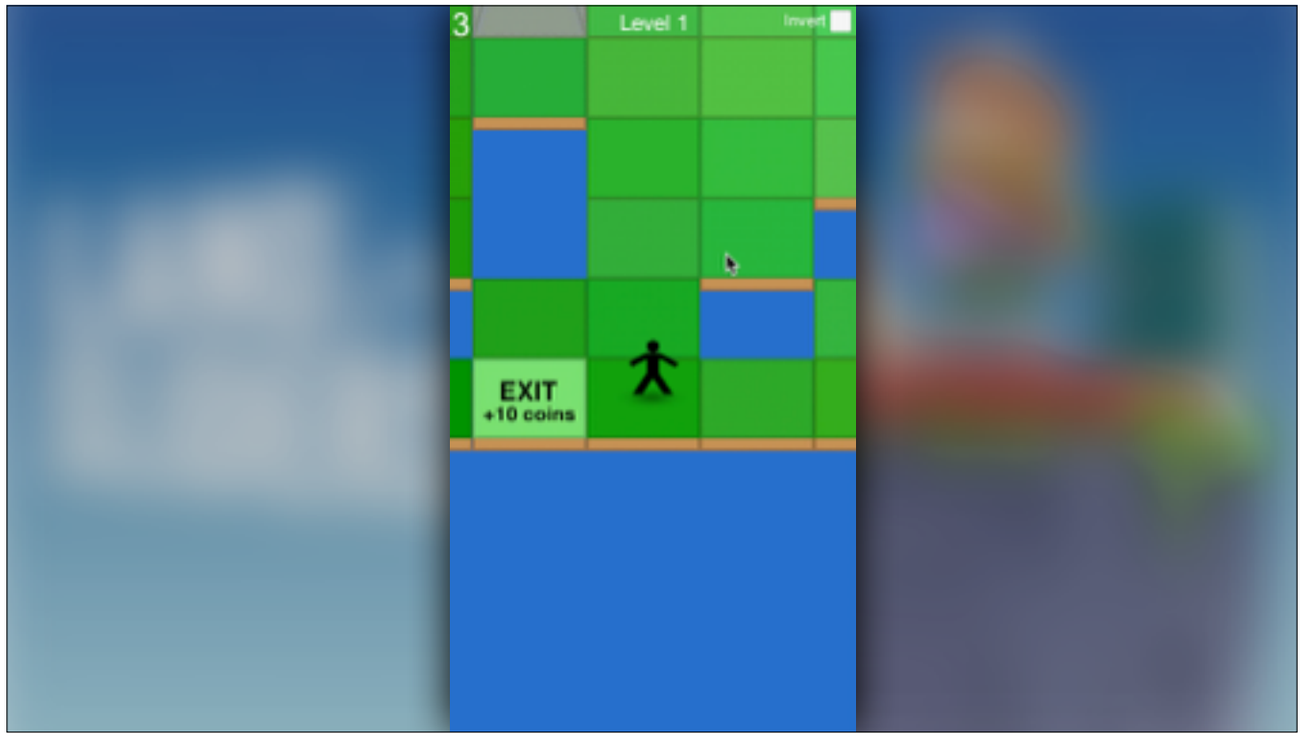
flick to move and coast

tap to stop

drag for precision

~3 days of prototyping

~3 days of prototyping



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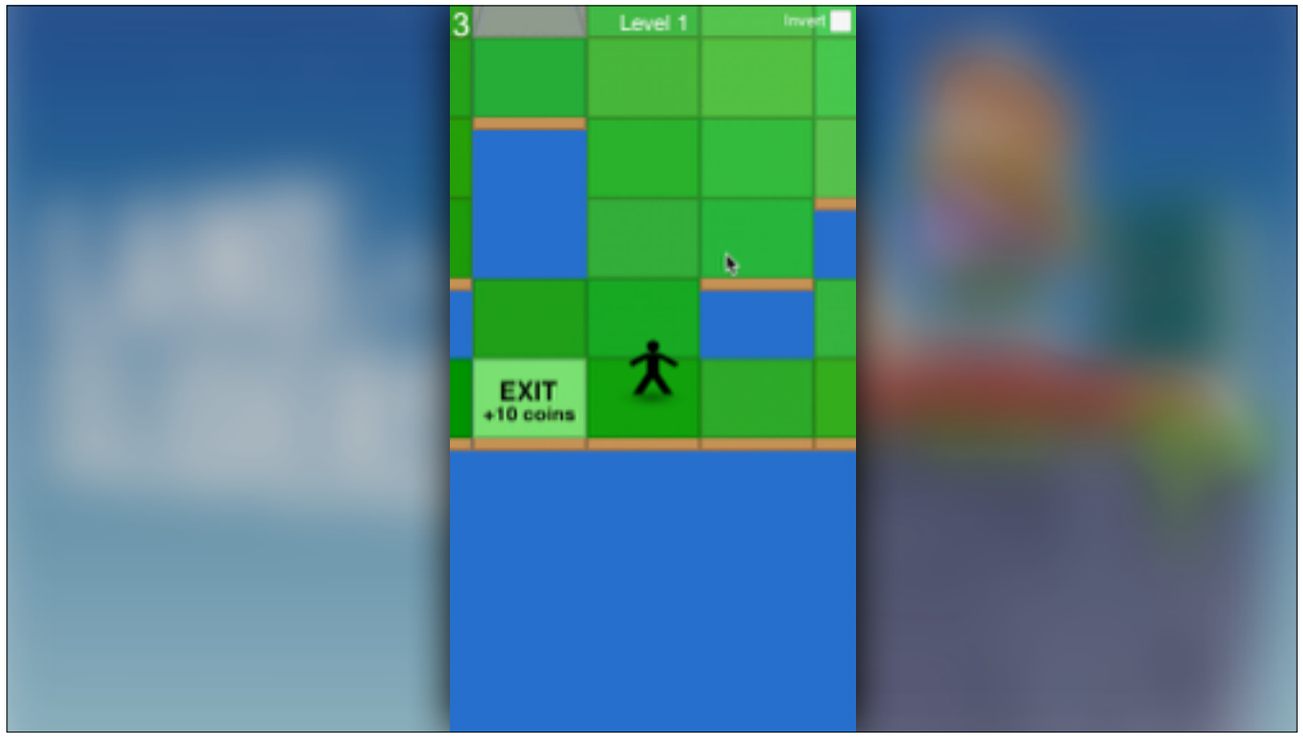

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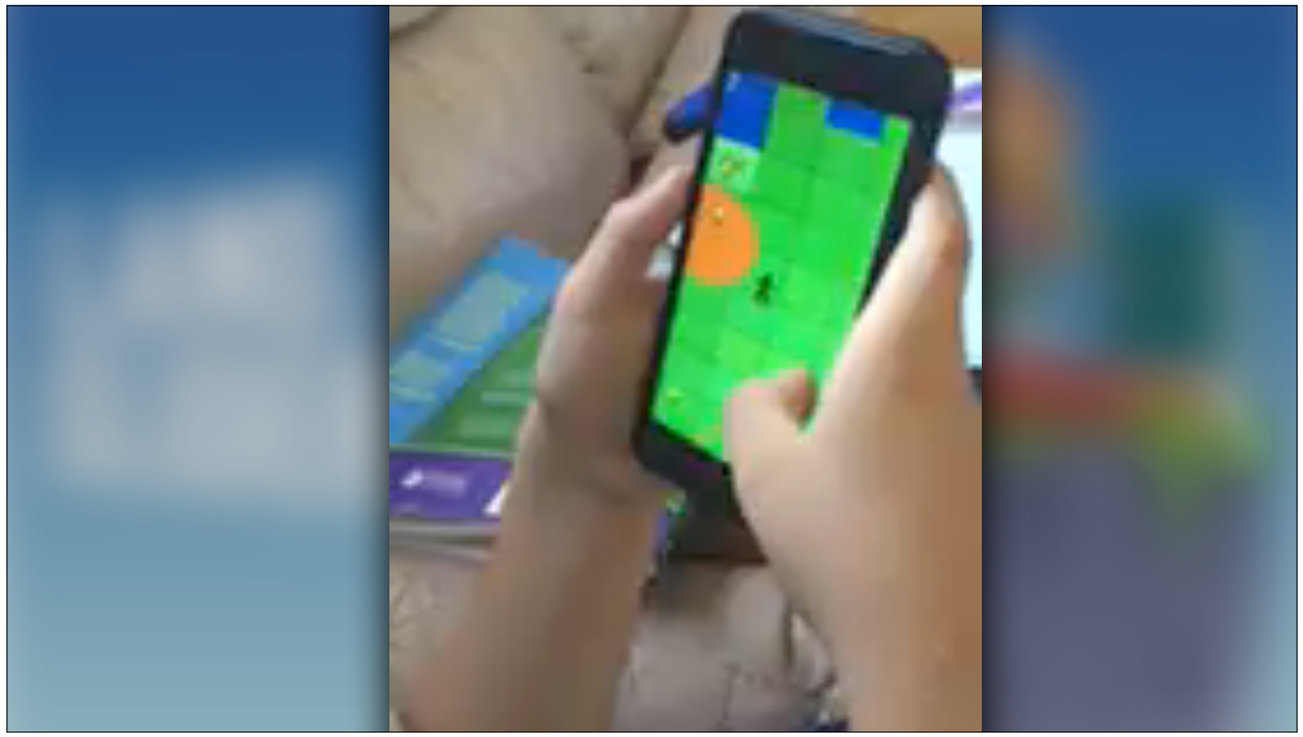
Aside: Laggy Input

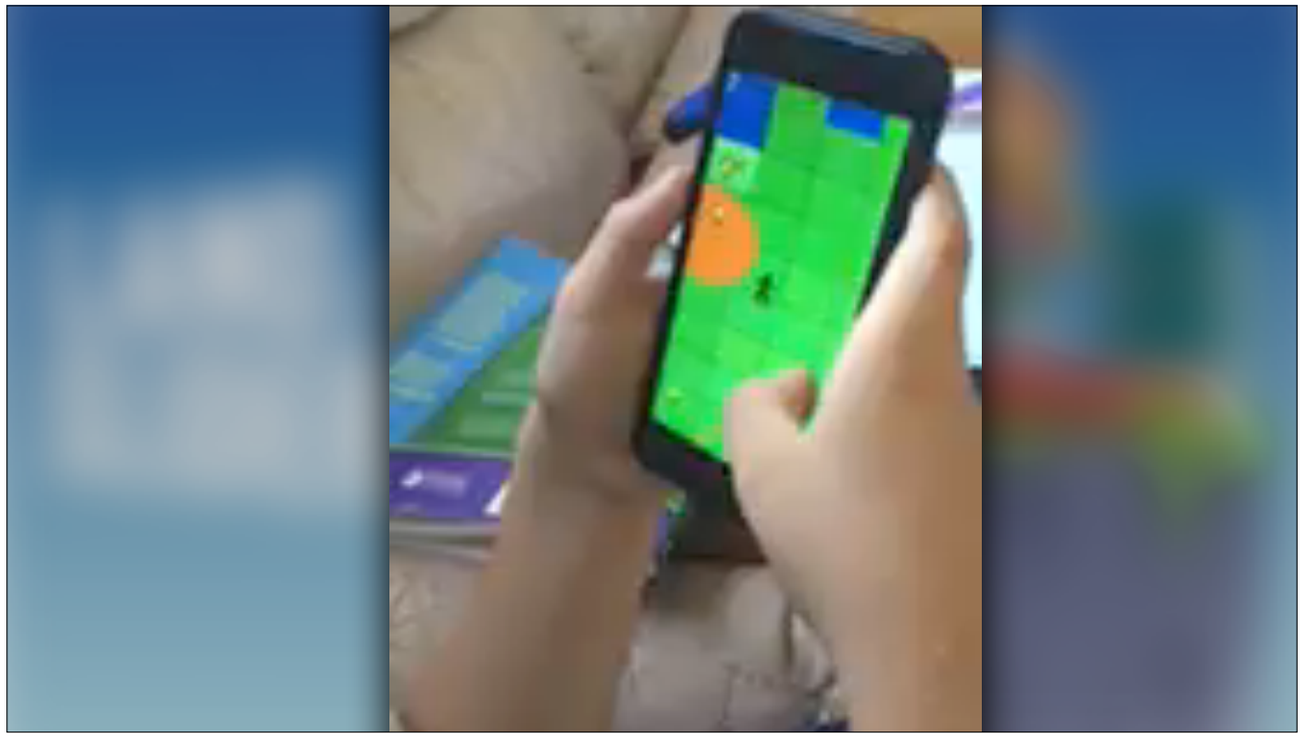
frame 1 — world speed (coasting) = 3

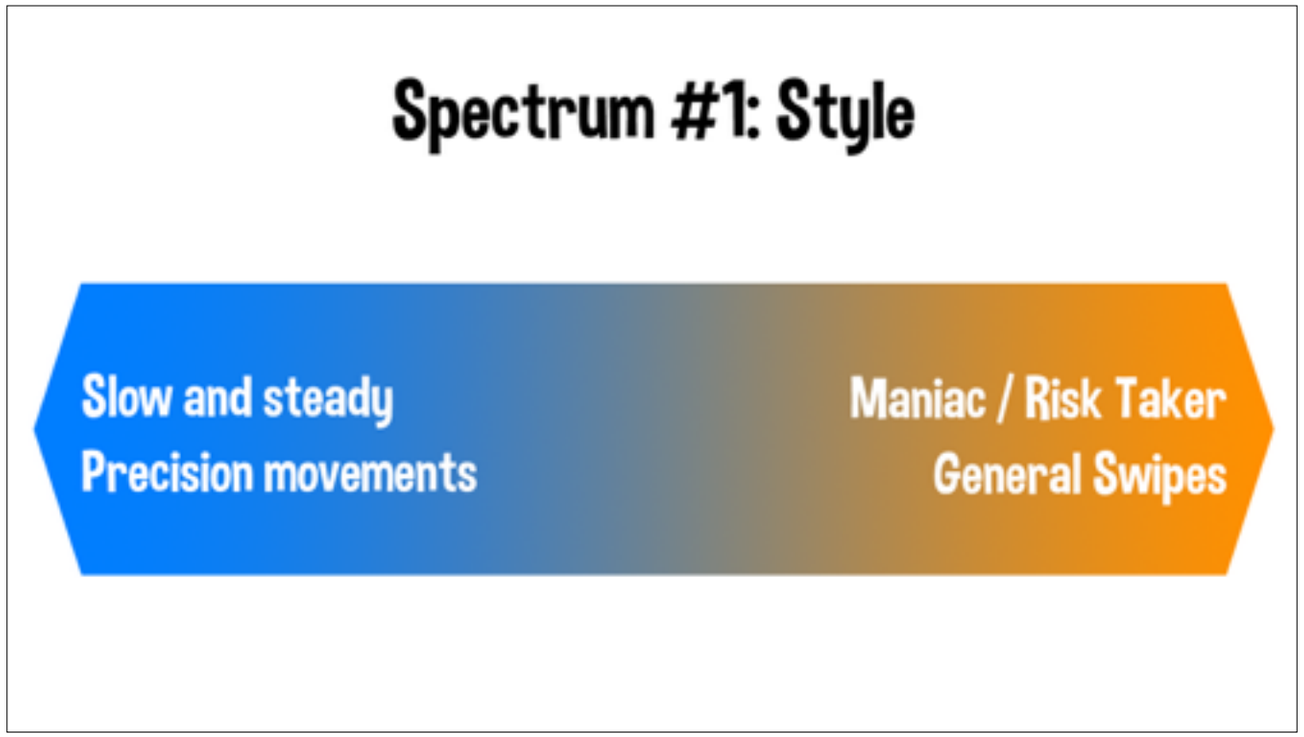
frame 2 — finger down (finger has moved 0)

frame 3 — finger down (finger has moved 4)

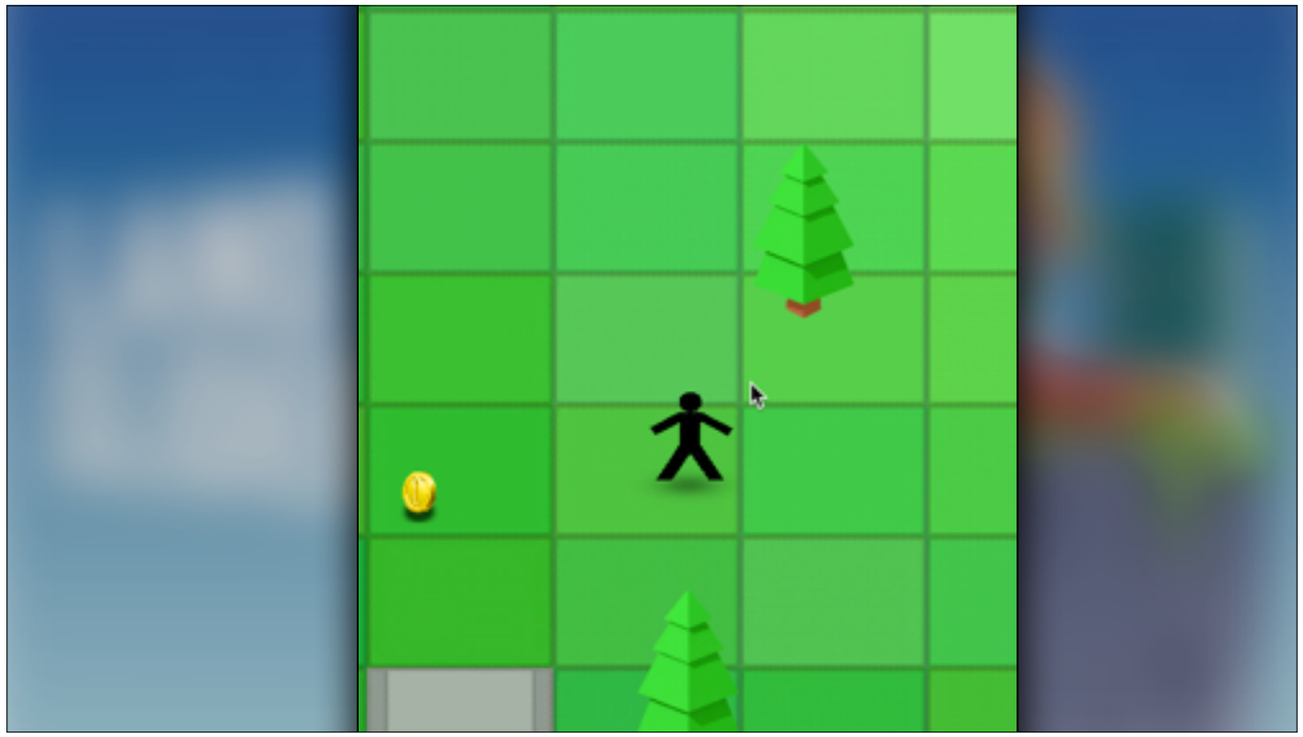
Player does not have any intent as far as the system is concerned at frame #1
Introduces 16 milliseconds of lag
Doesn't seem like much, but just you wait….



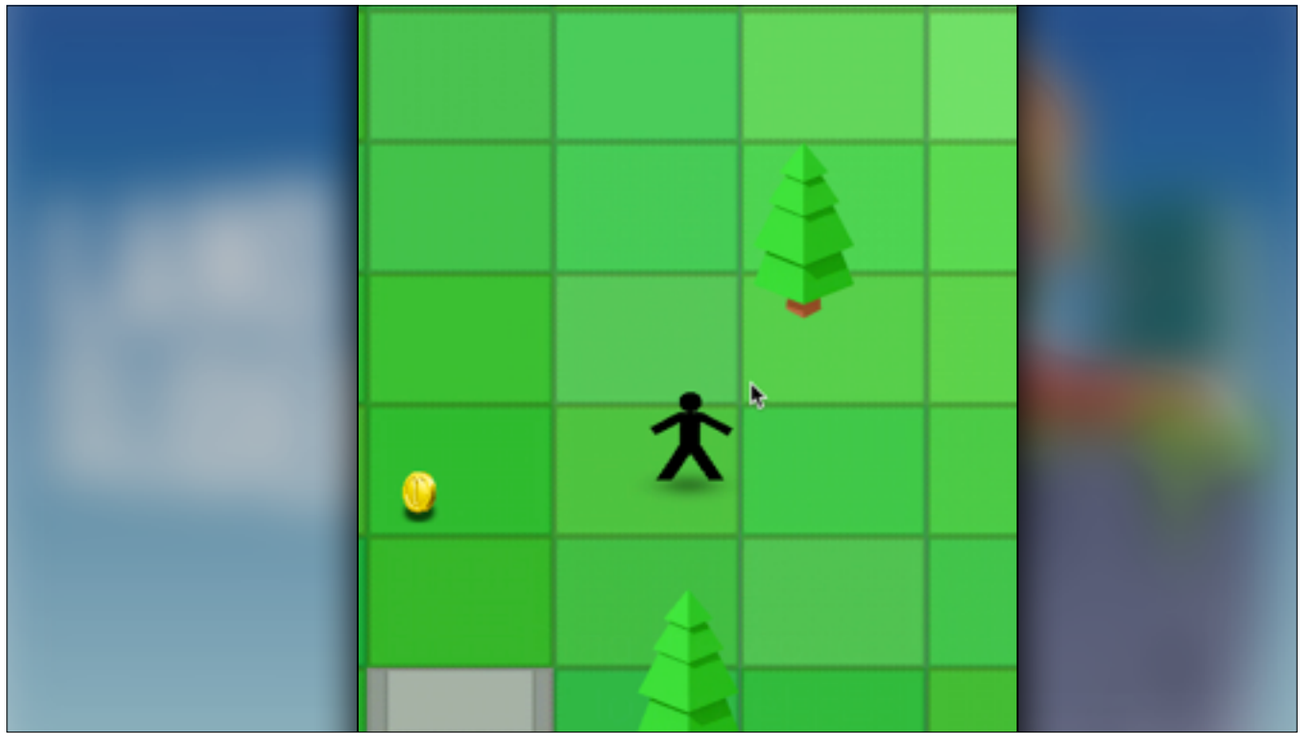




Started play testing on our selves and immediate friends and family
2 kinds of opposite styles emerged
Considered this to be good!
Slow and steady was kind of exhausting….



adding magnetism reduces the need for super fine control



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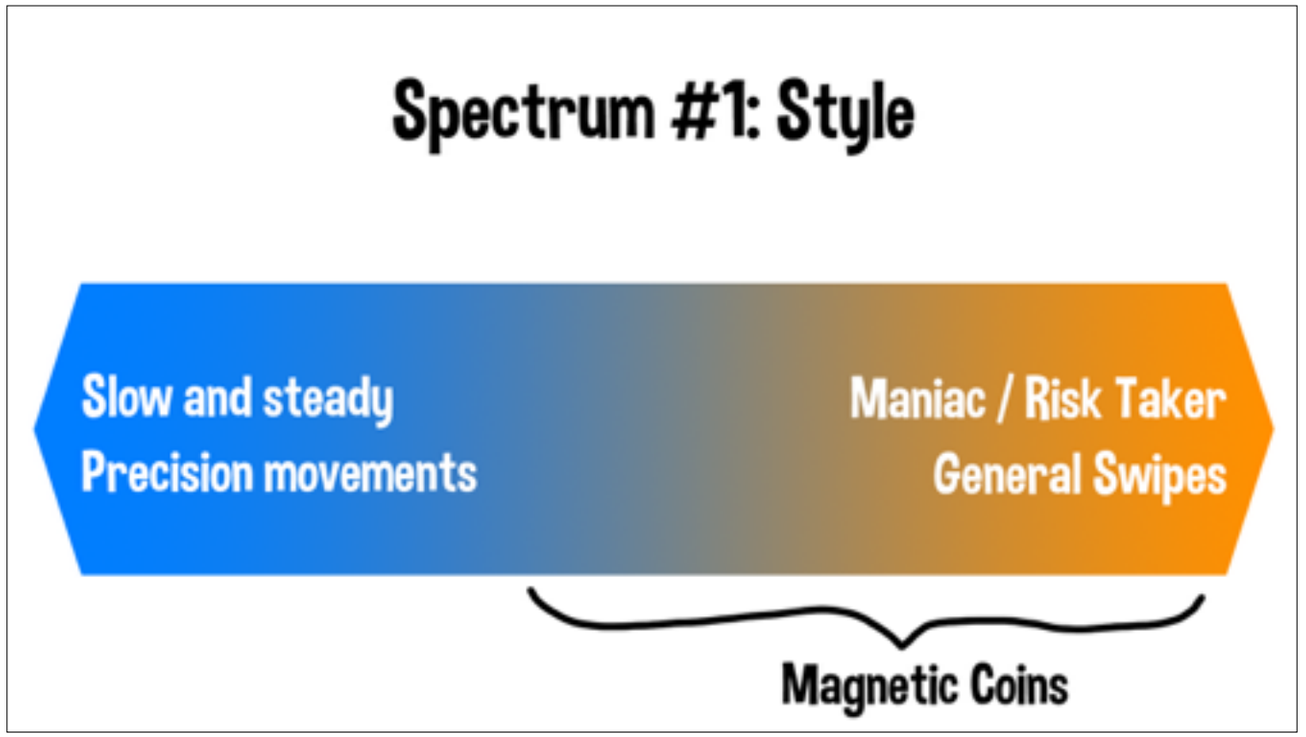
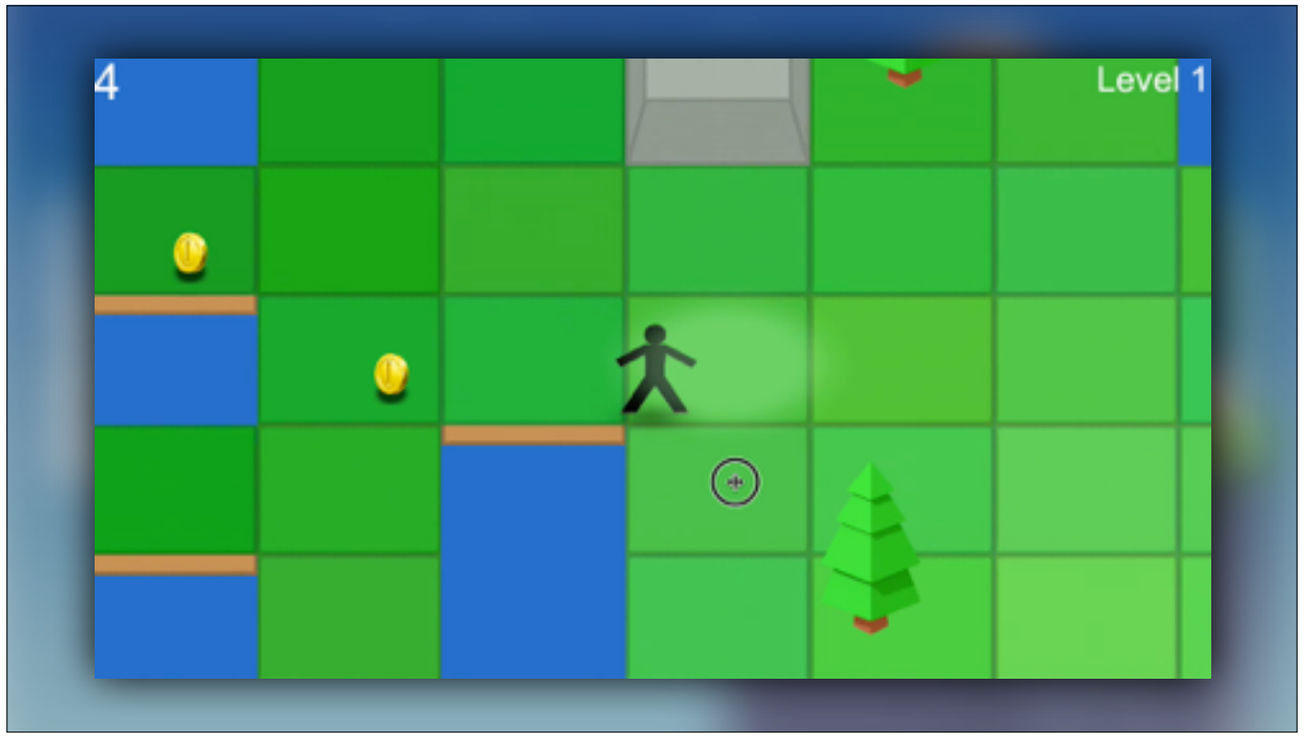
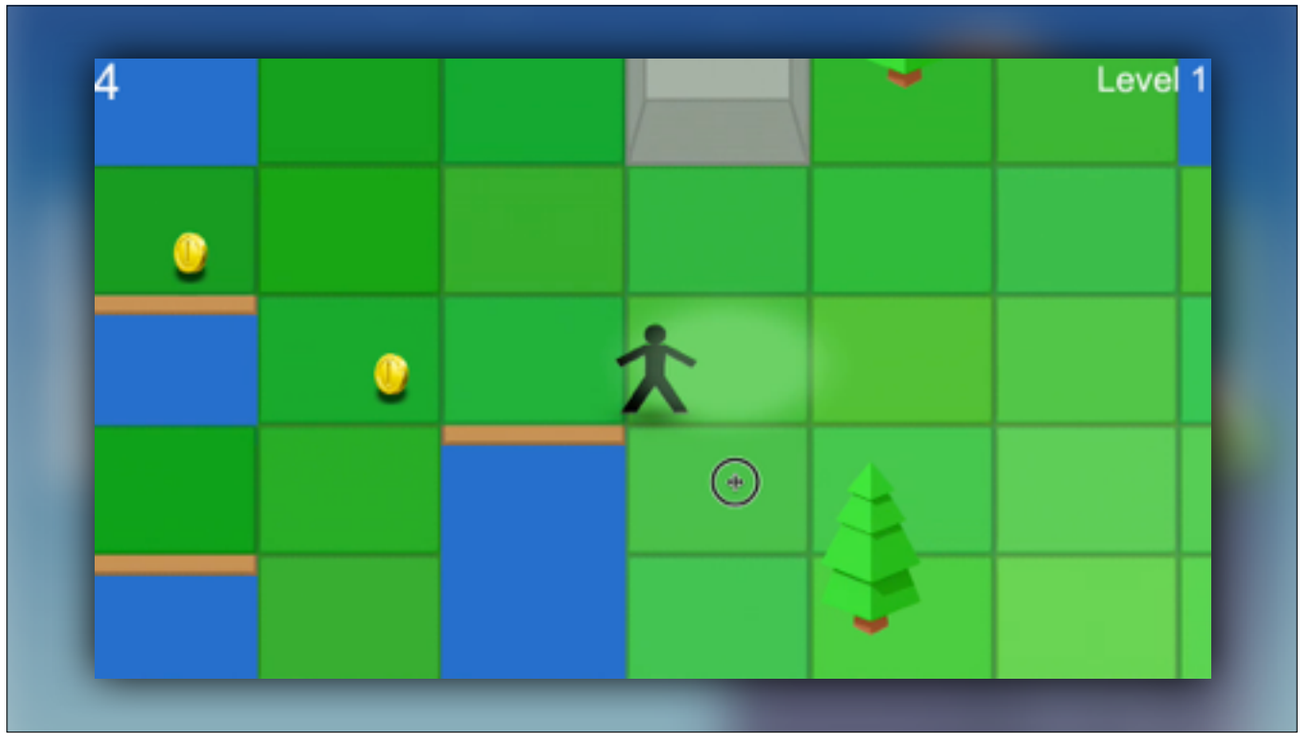


Adding magnetic coins instantly pushed the whole spectrum towards generalised swipes, more in line with original vision



Because its so fast, you tend to die like this a lot:
Tried adding warning arrows etc, but was too messy and noisy



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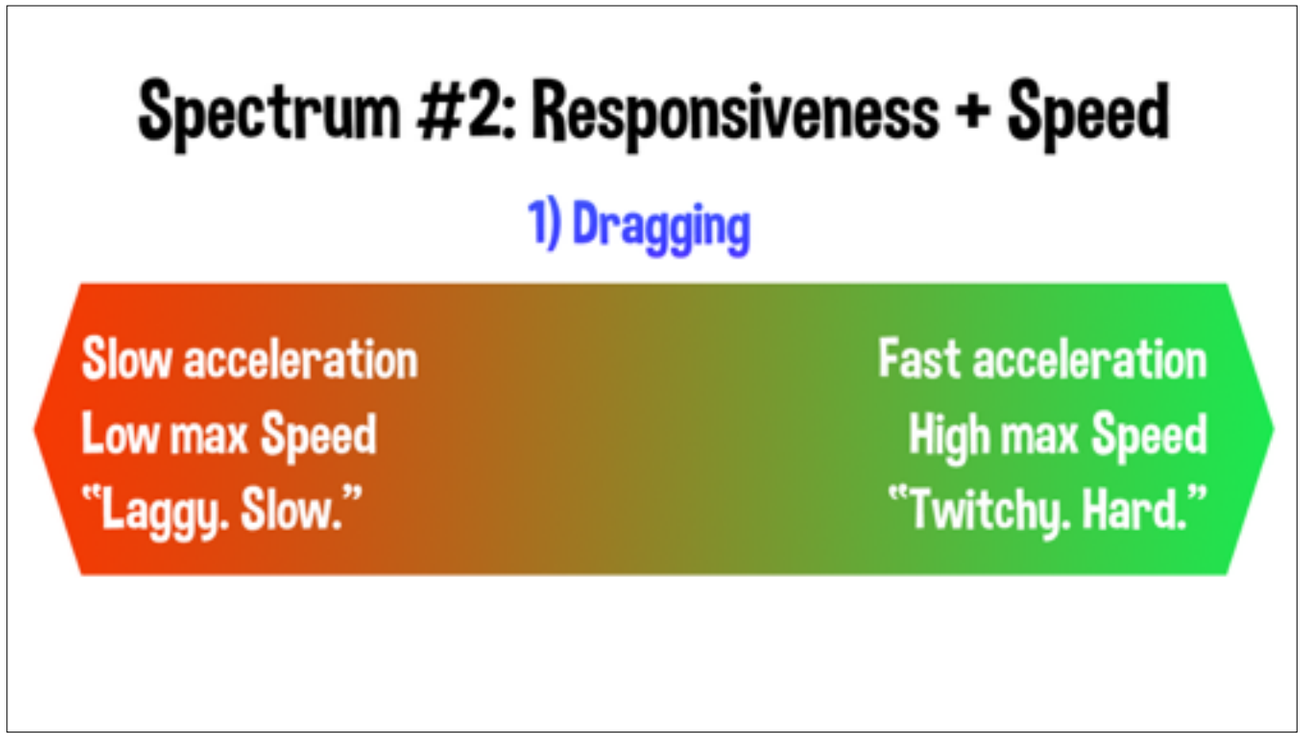
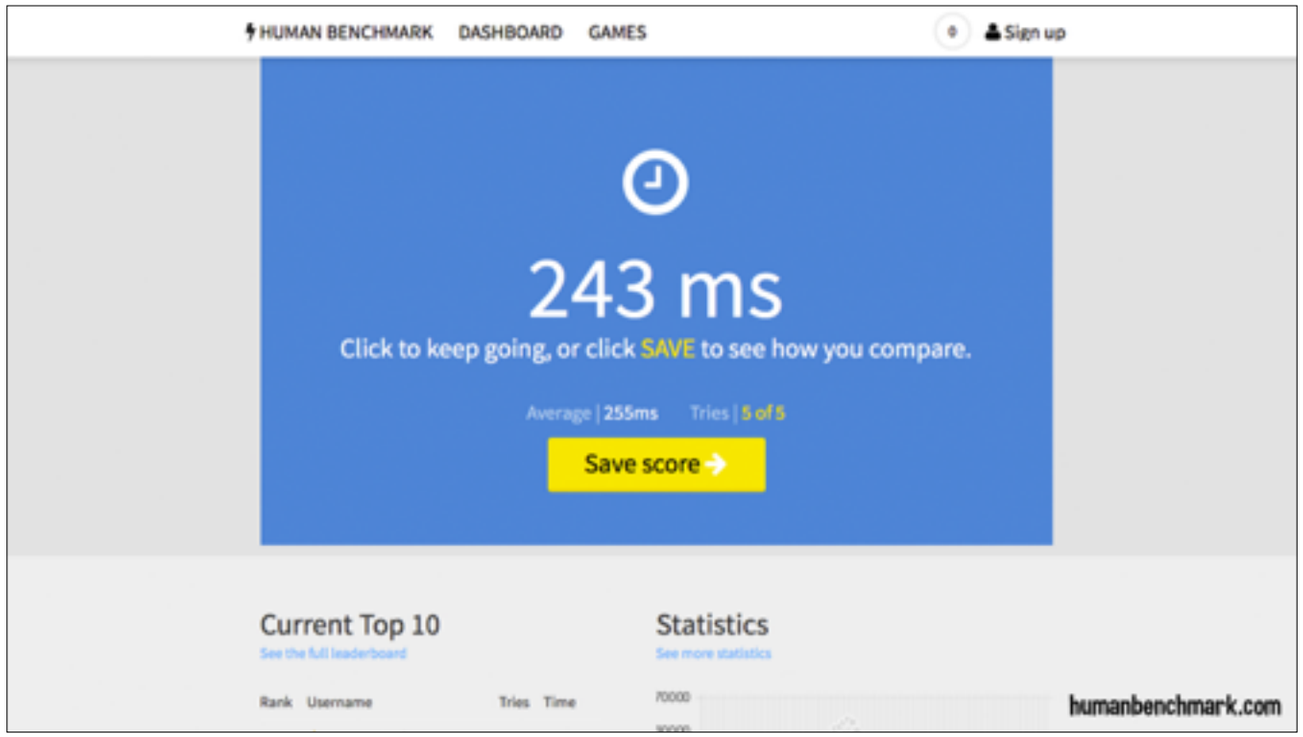


Slowing down the game made it much easier, but traded off for people saying it was too laggy
Zooming out the camera actually has the same effect as slowing the game around, based on the games core conceit

Setting Max Speed

Fast max speed
People don't HAVE to go full speed

totally false, everyone goes max speed always forever



Max speed is reasonably close to the max speed

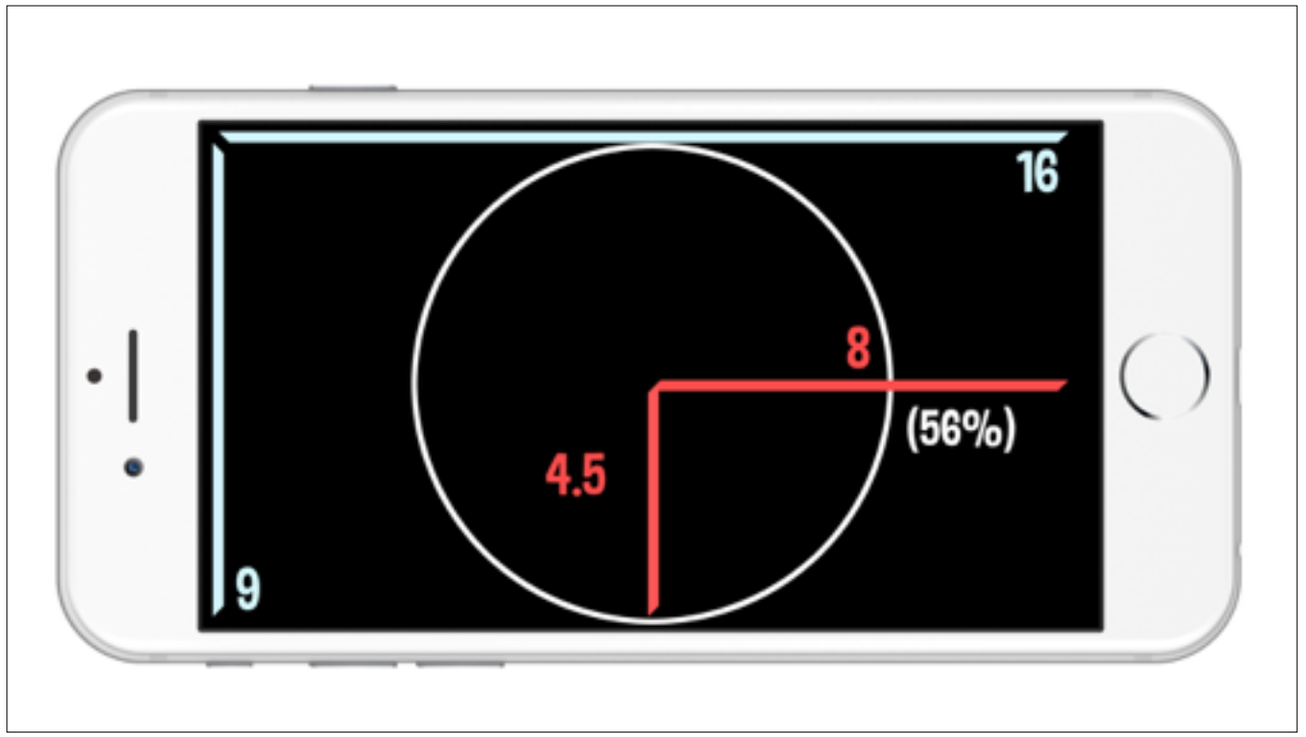
~260ms for visual stimulus

16 frames

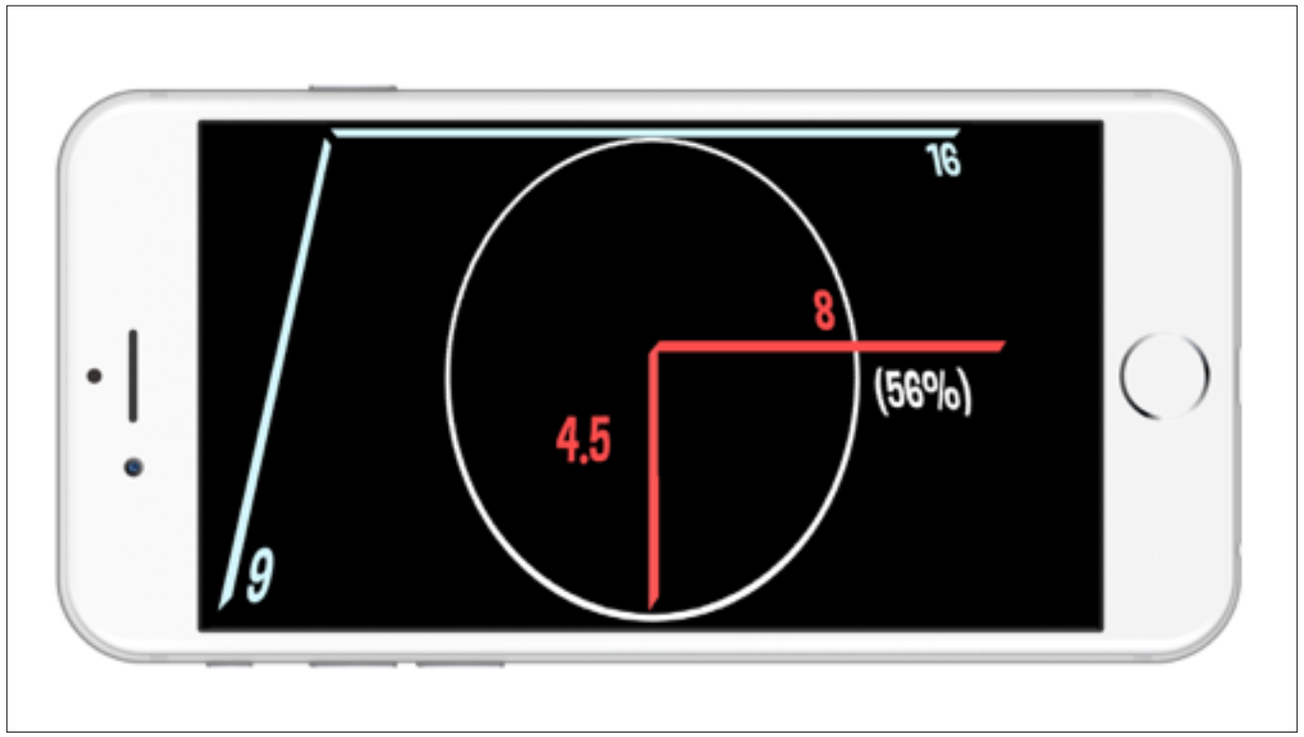
+1 frame because laggy input

+ 1 frame is non trivial (almost 6%!)

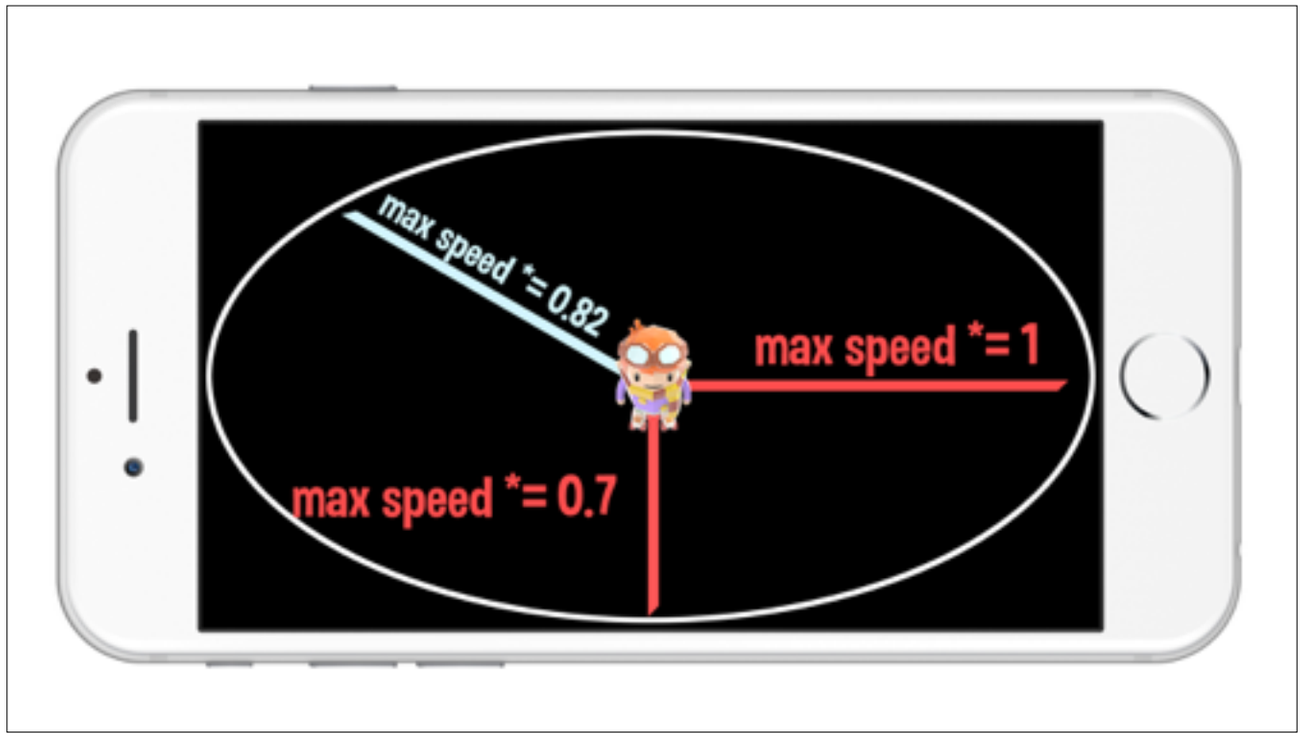
So need to provide a bare minimum of 17 frames of warning in the worse possible case

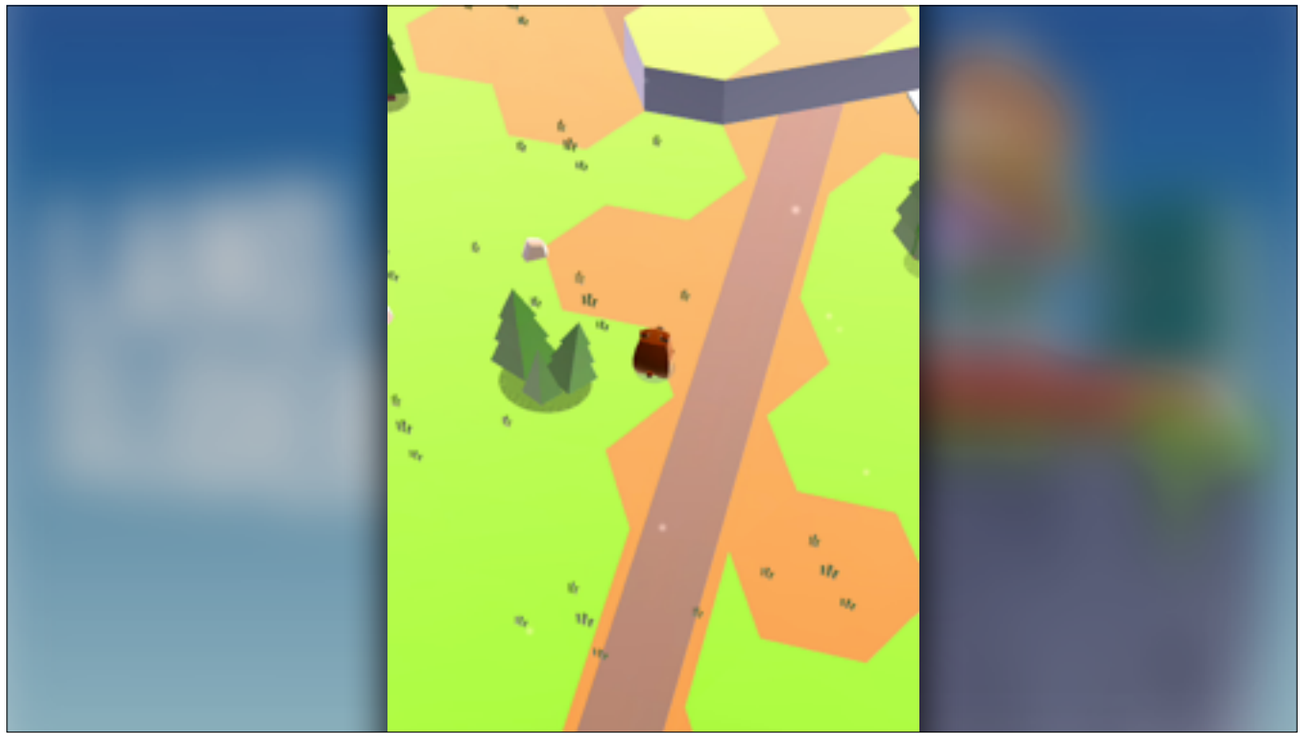


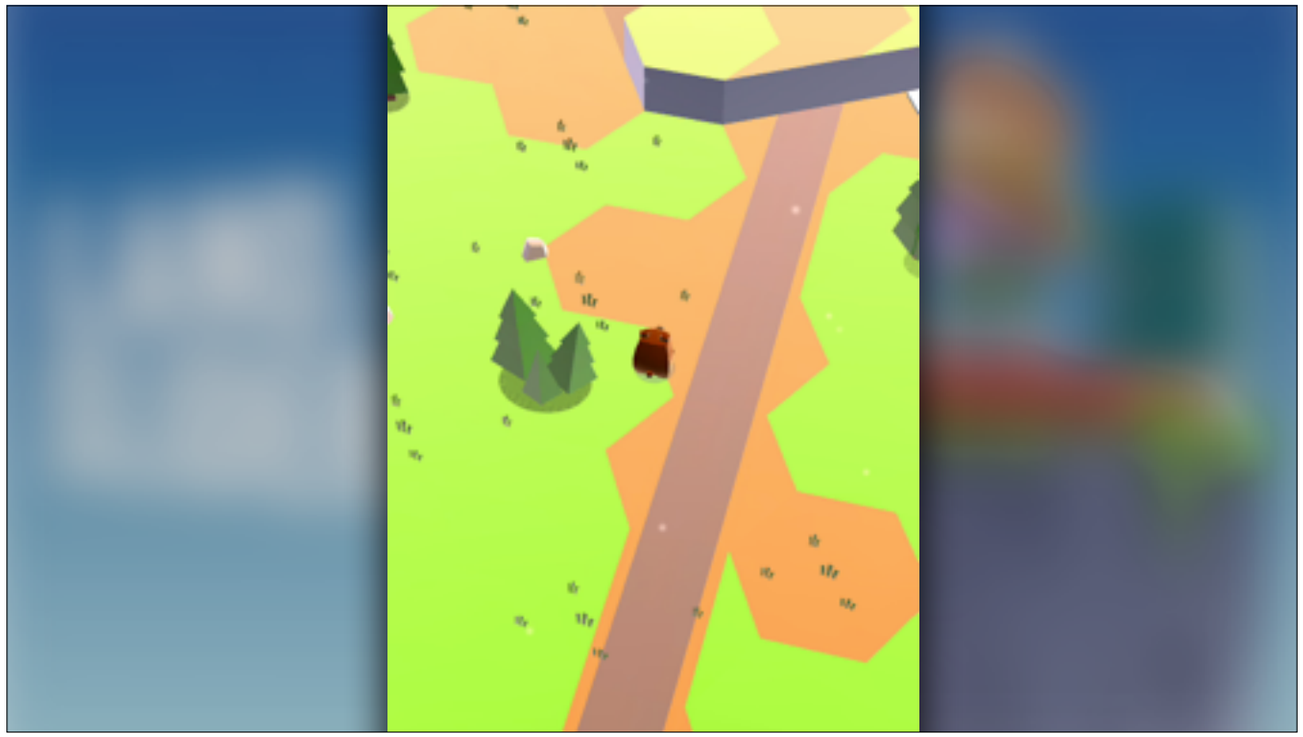
Problem is, the best and worst case are actually super different

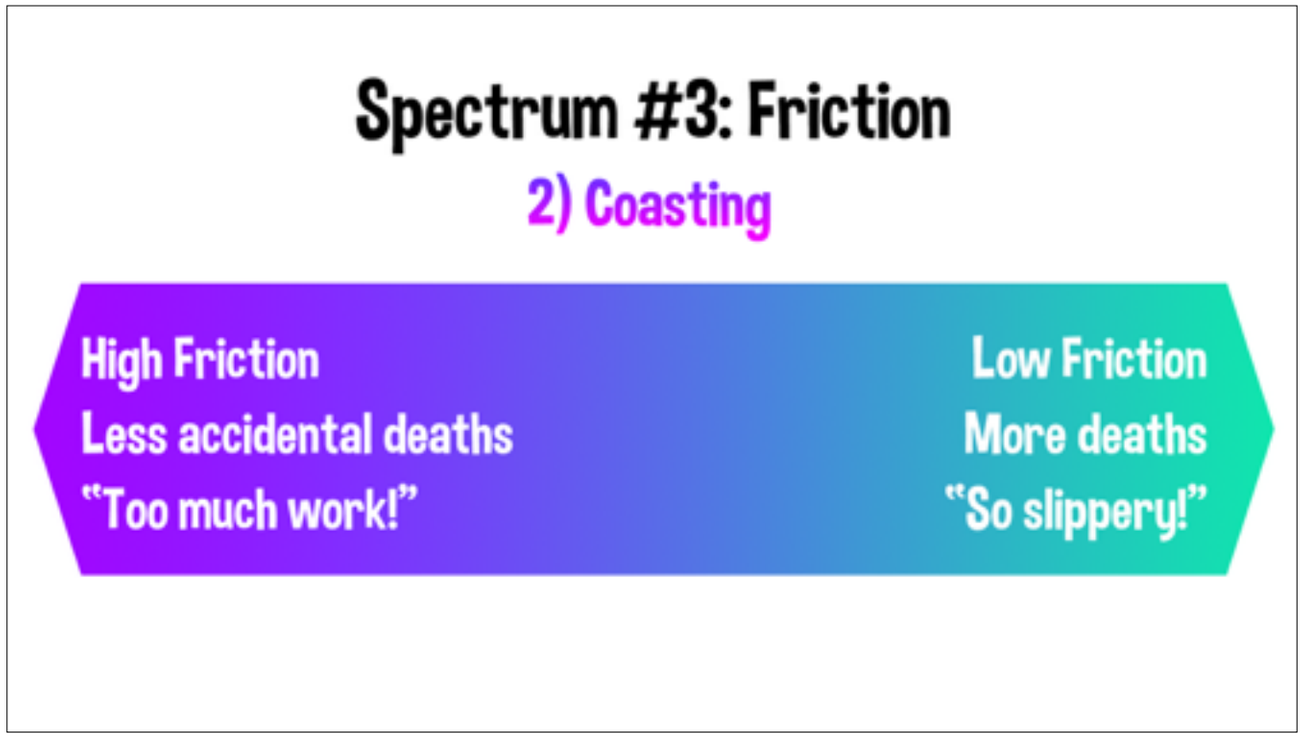


Technically much more complicated because perspective…

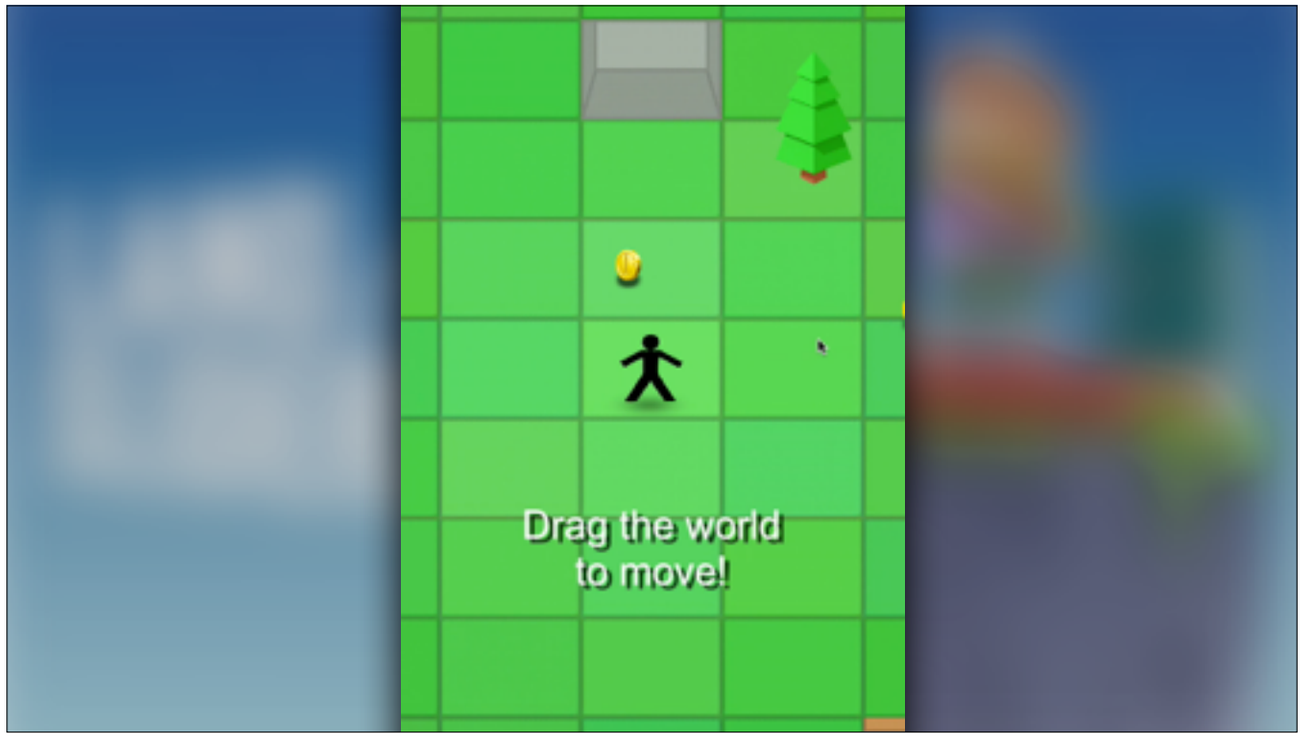

max speed *= 0.82
max speed *= 1
max speed *= 0.7



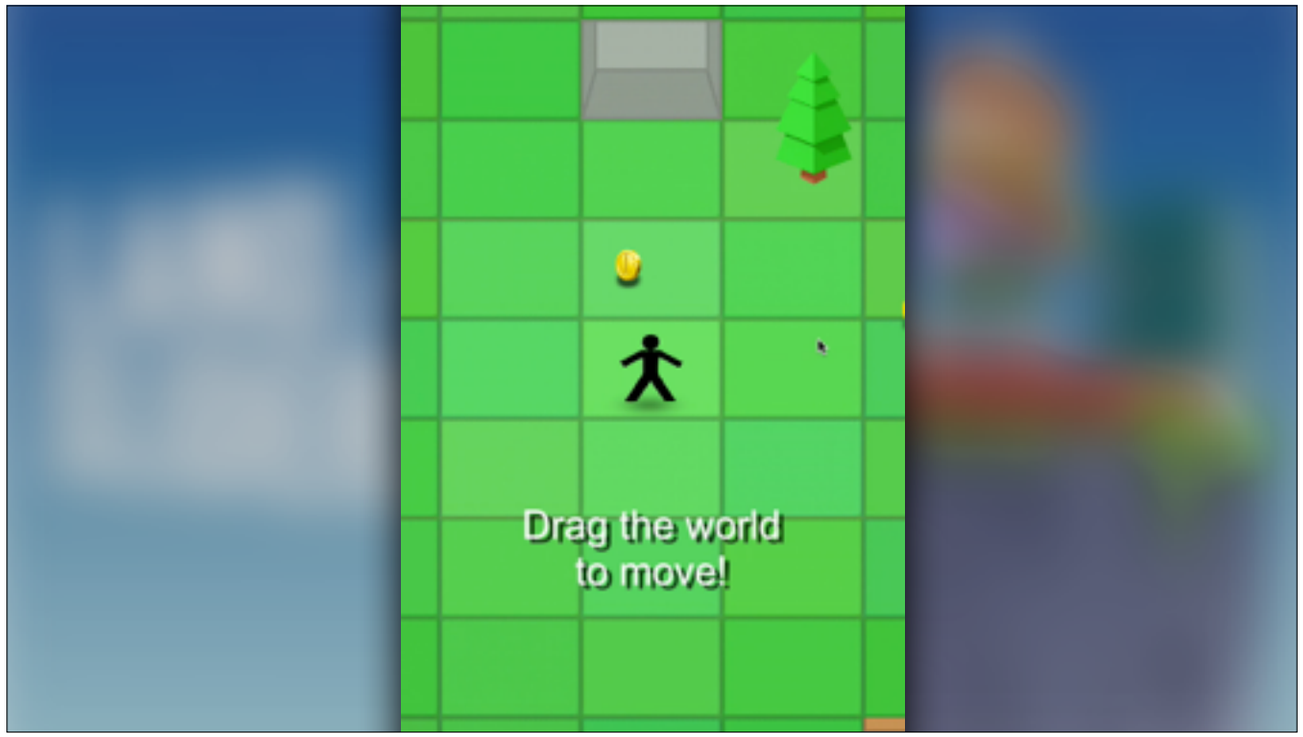




Related to specifically the physics behaviour after the player lifts their thumb



add a fake calorie counter here?



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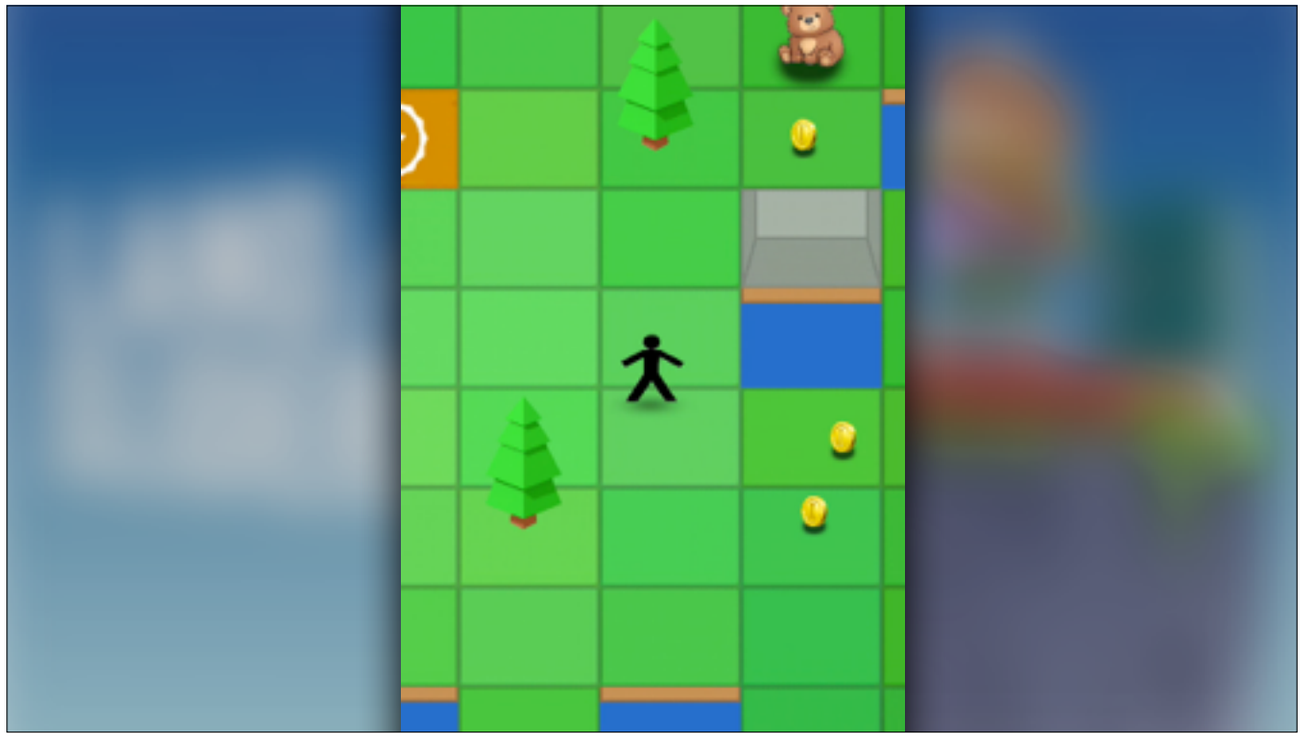

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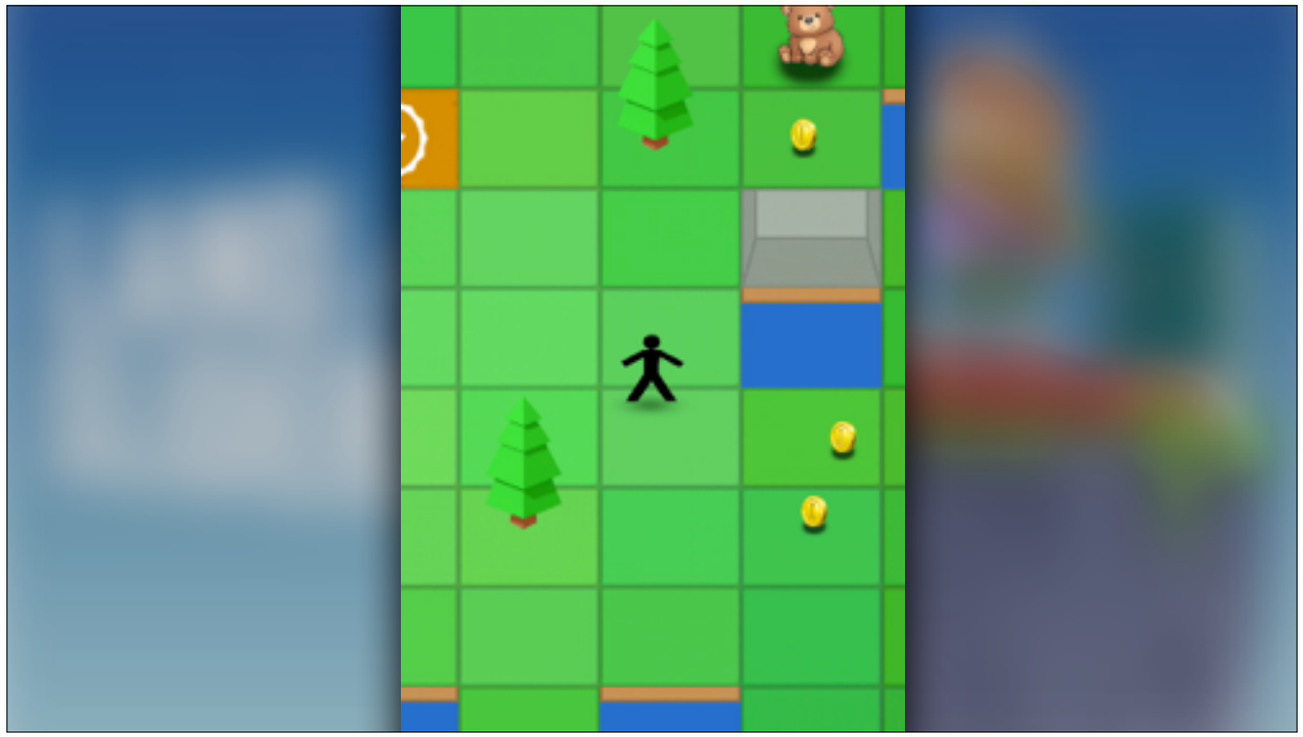

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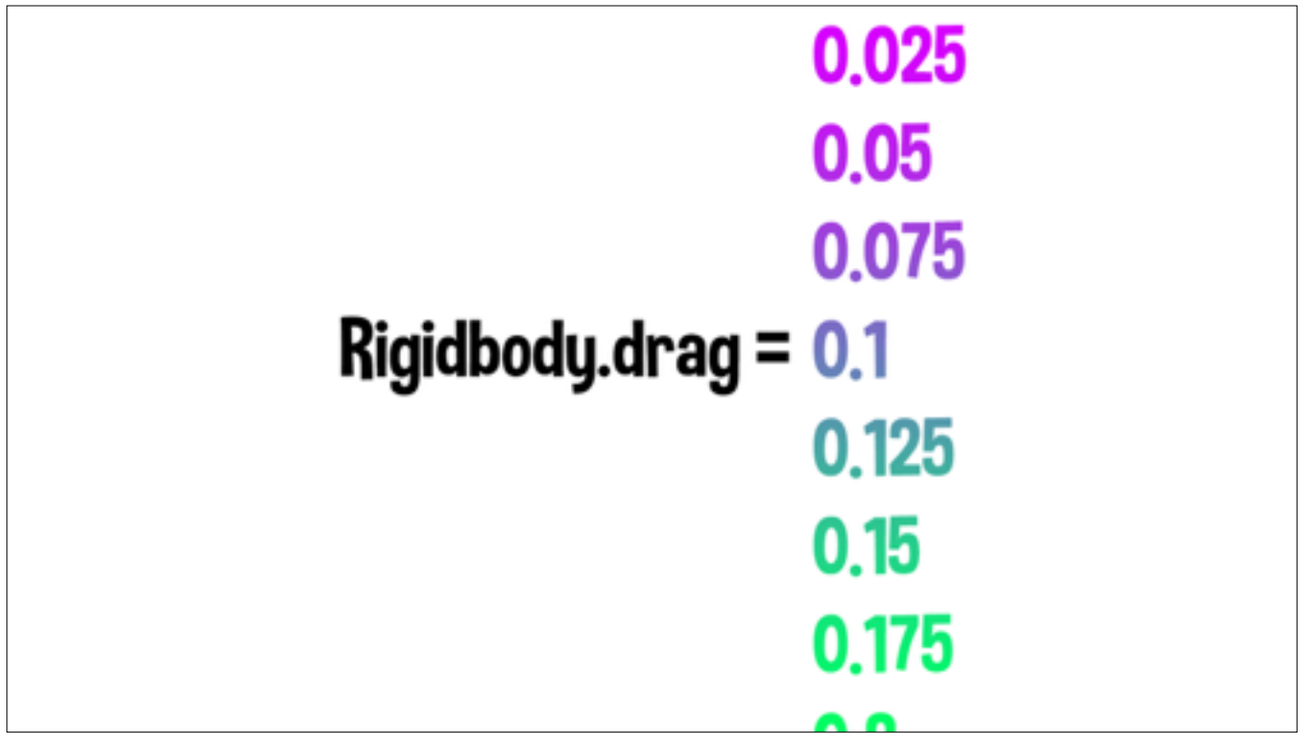
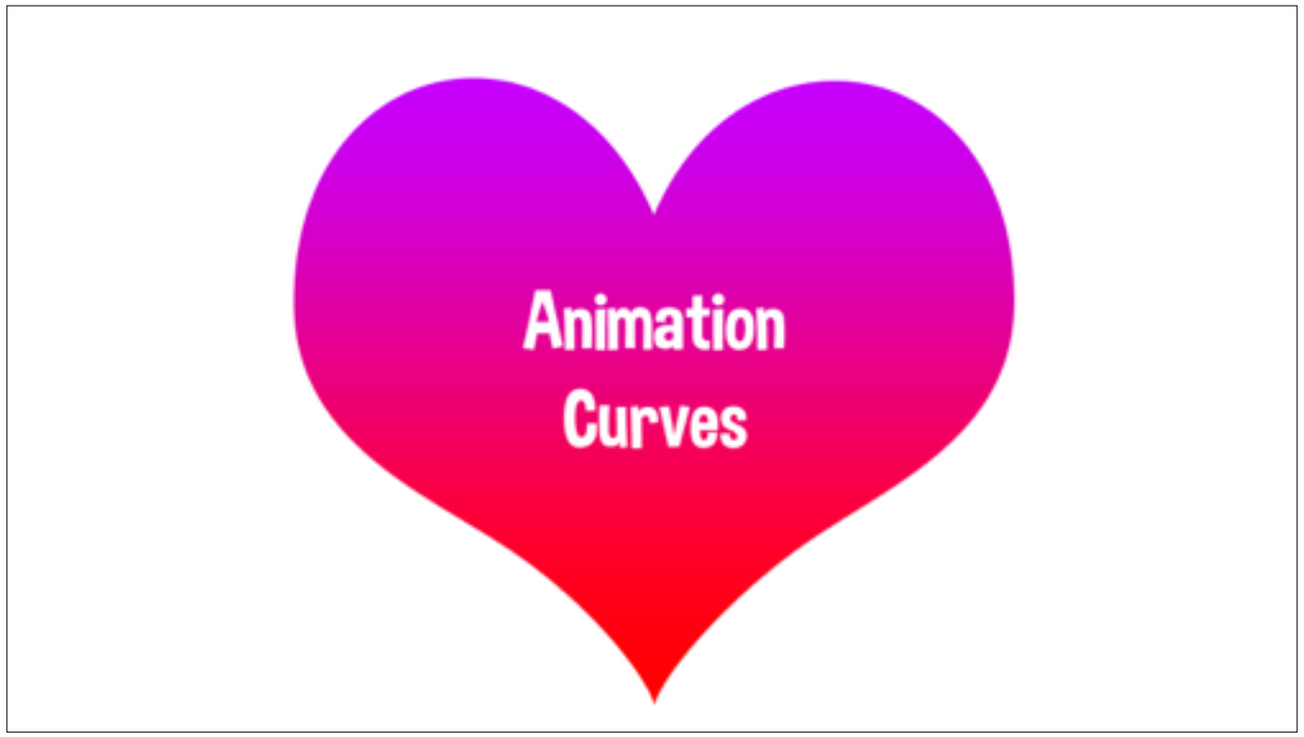
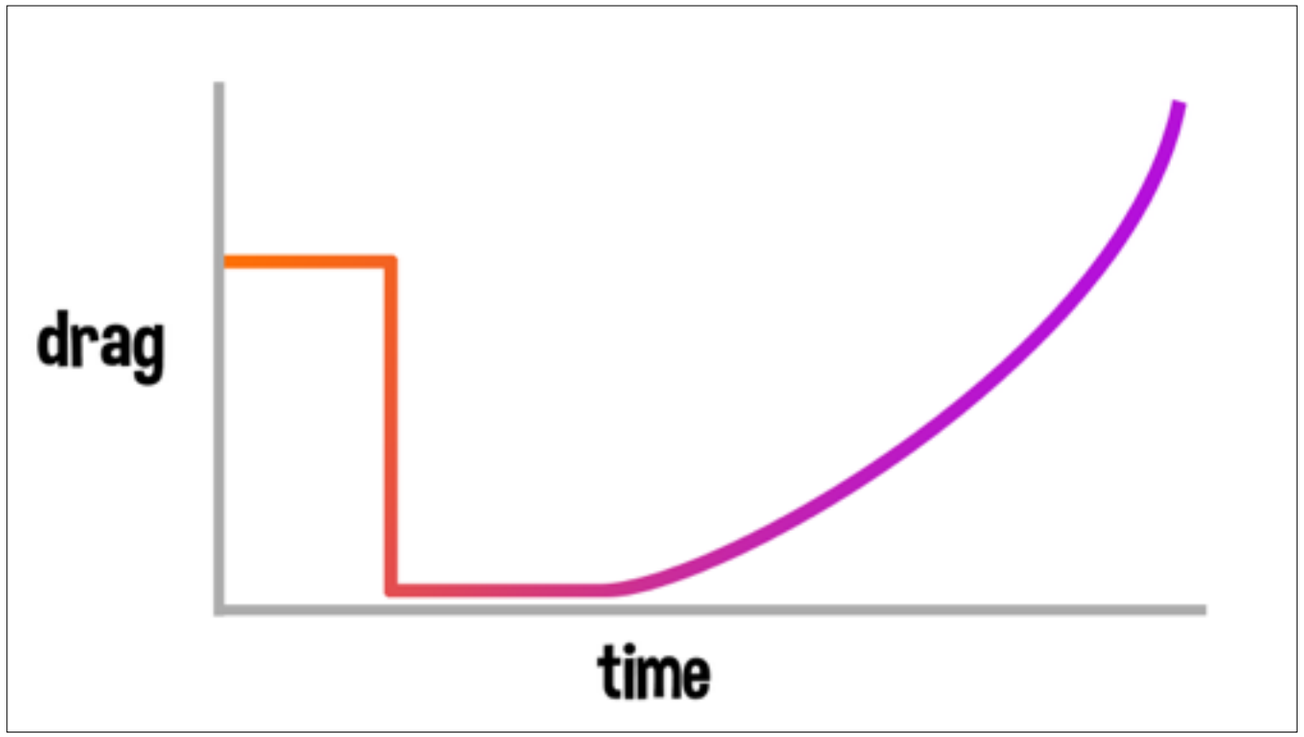
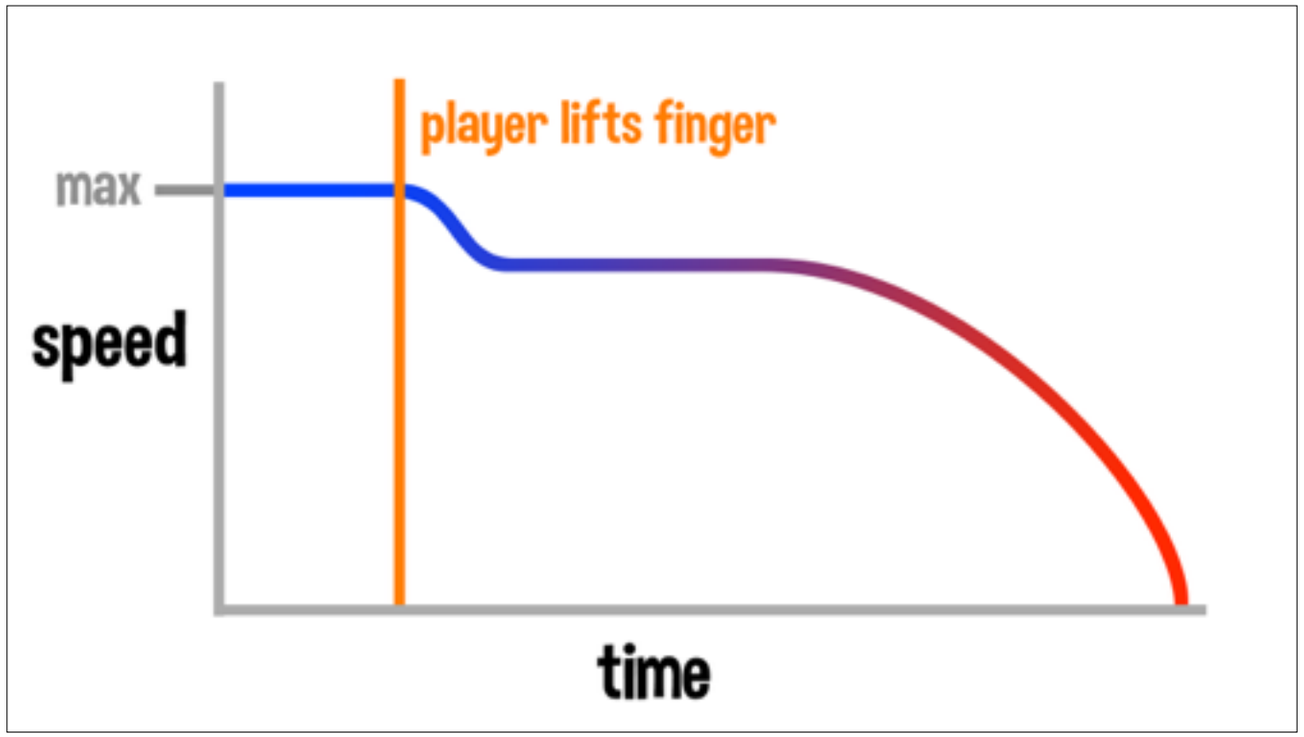


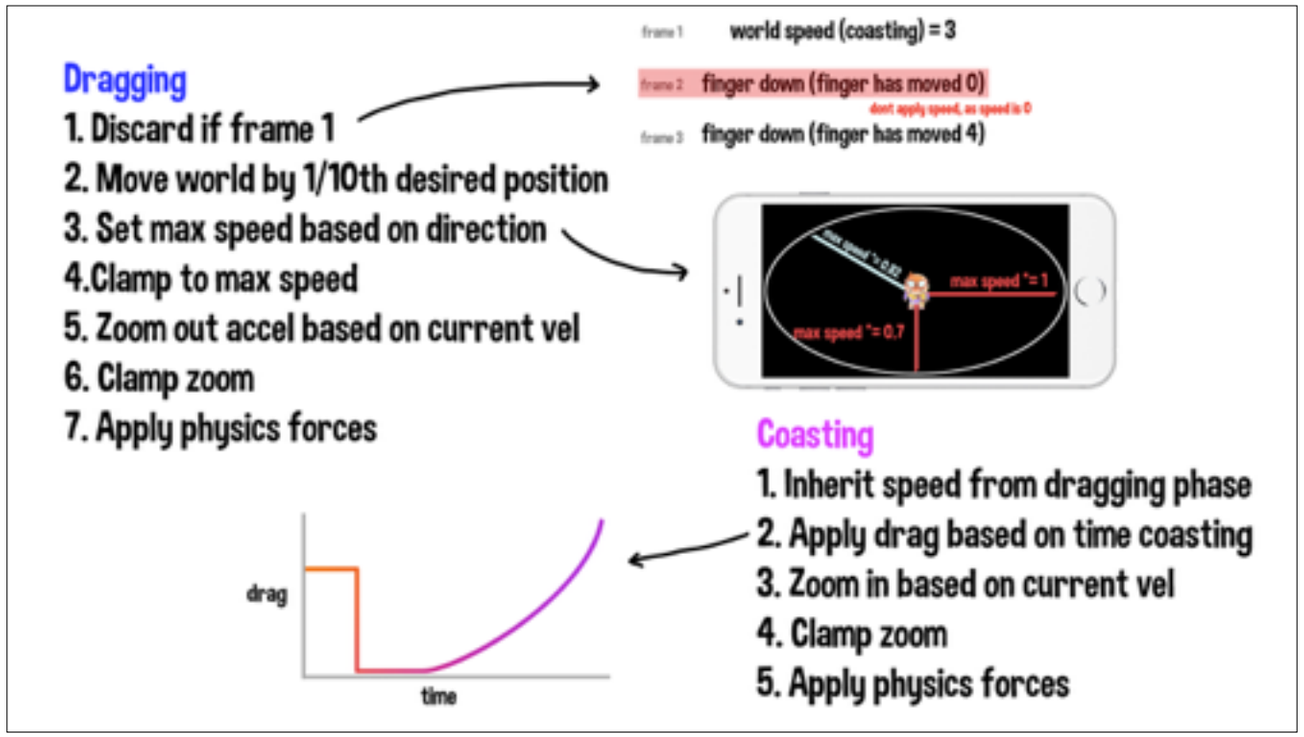
After adjusting friction up and down endlessly…

Linear
vs
Quadratic


Animation
Curves

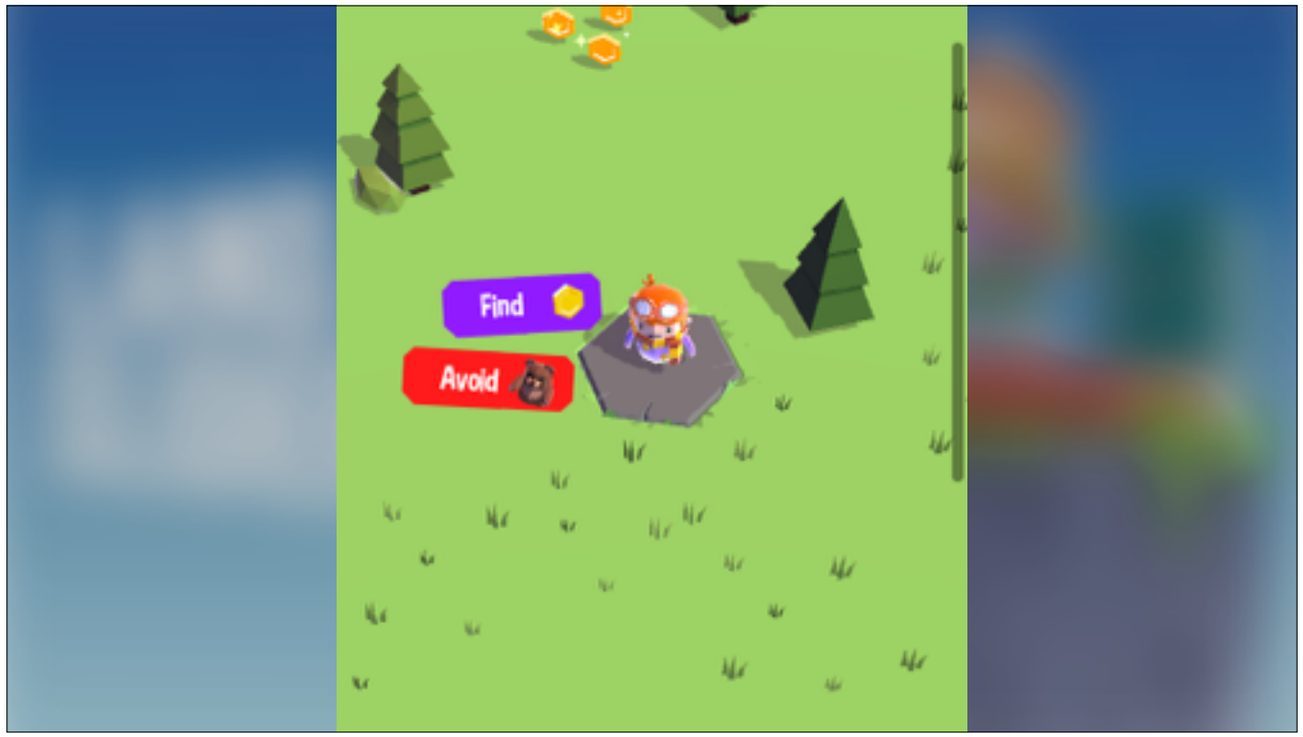

drag
time


player lifts finger
max
speed
time



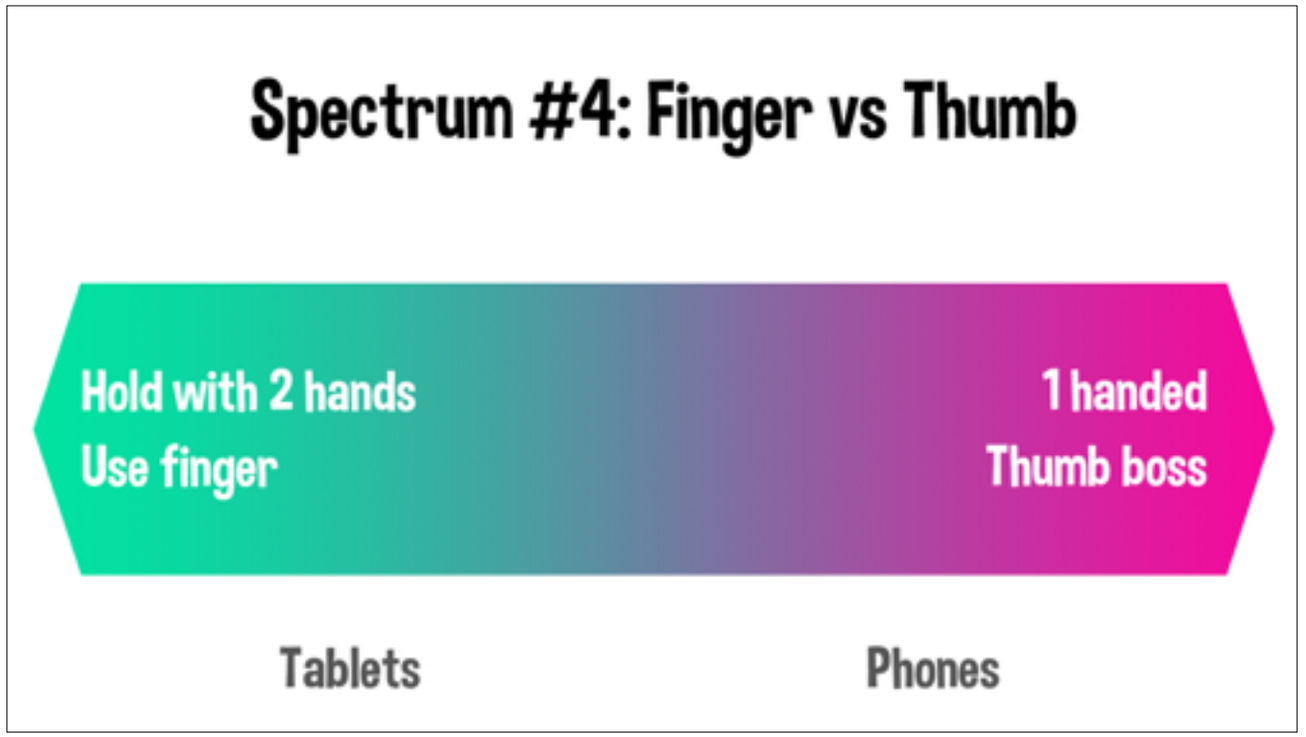
So just to recap, the system already looks like this:
Starting to get a lot of systems on top of systems on top of systems….

Some of these systems also had to interact with others that slowed down the game when pulling past objects, allowing camera peeking etc.



Game is beginning to look like an actual game… started to add all of the art

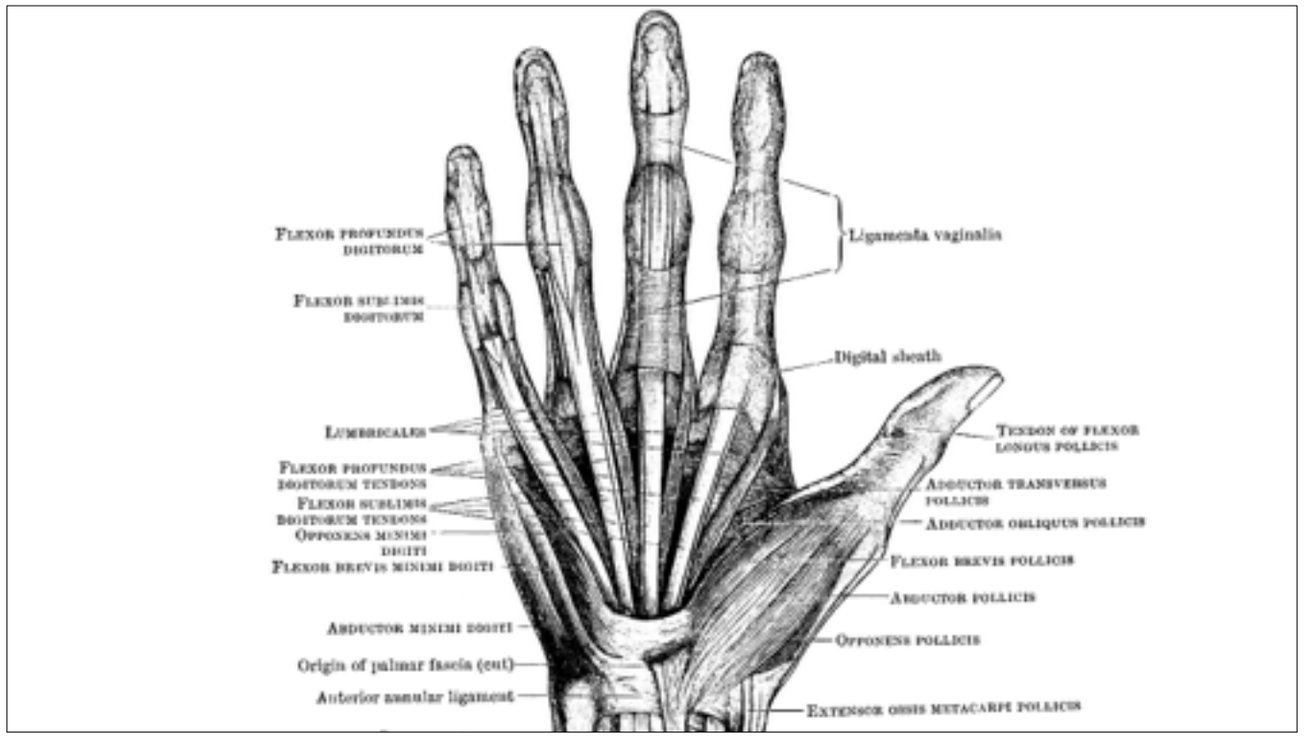
Took the game to WWDC and did a lot of testing, demoing to apple people. This time I took my iPad mini and something super interesting happened



Skews depending on device

Not nessecarily bad, but people who played with the thumb onboard faster

People with finger controls would sometimes panic and just jump off cliffs etc



Thumb joint acts very differently, has greater range of movement, primarily used in different activities to the fingers (first carpometacarpal joint)

Even Apple’s own ads have stuff all about how your thumb is the way to interact with their screens!

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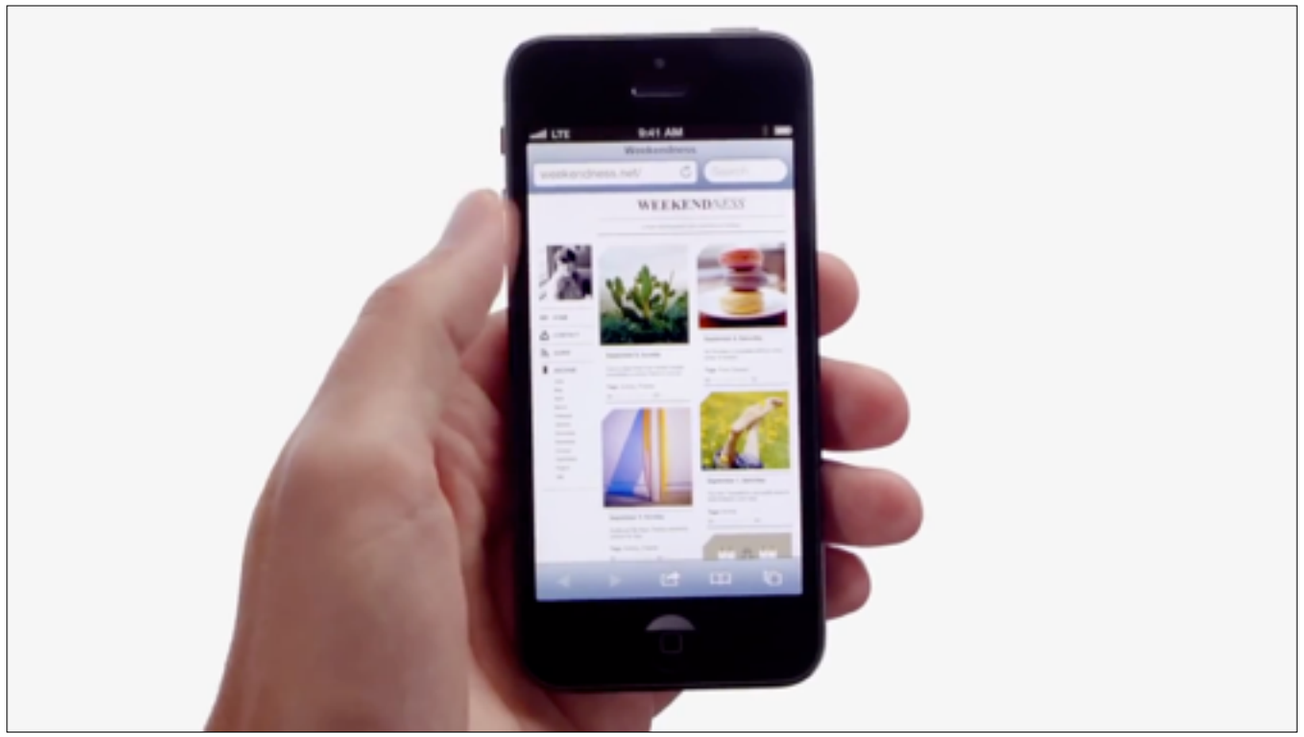

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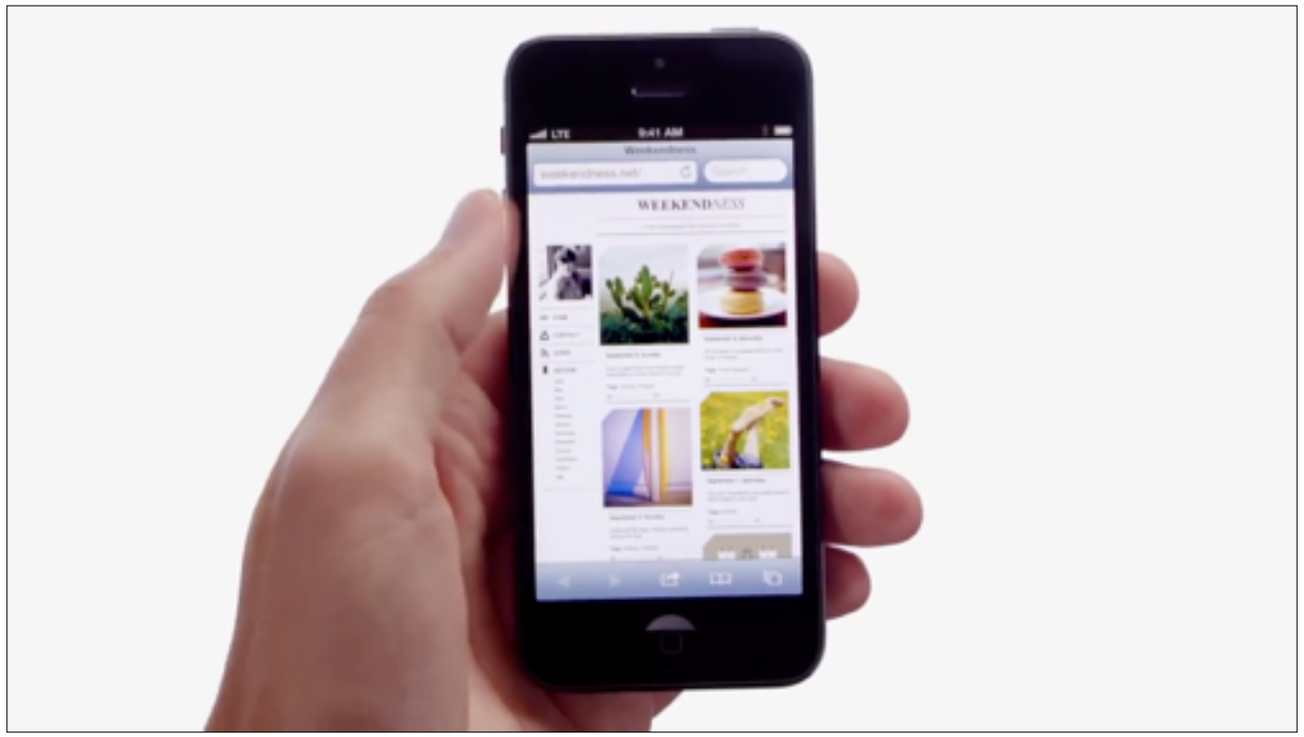
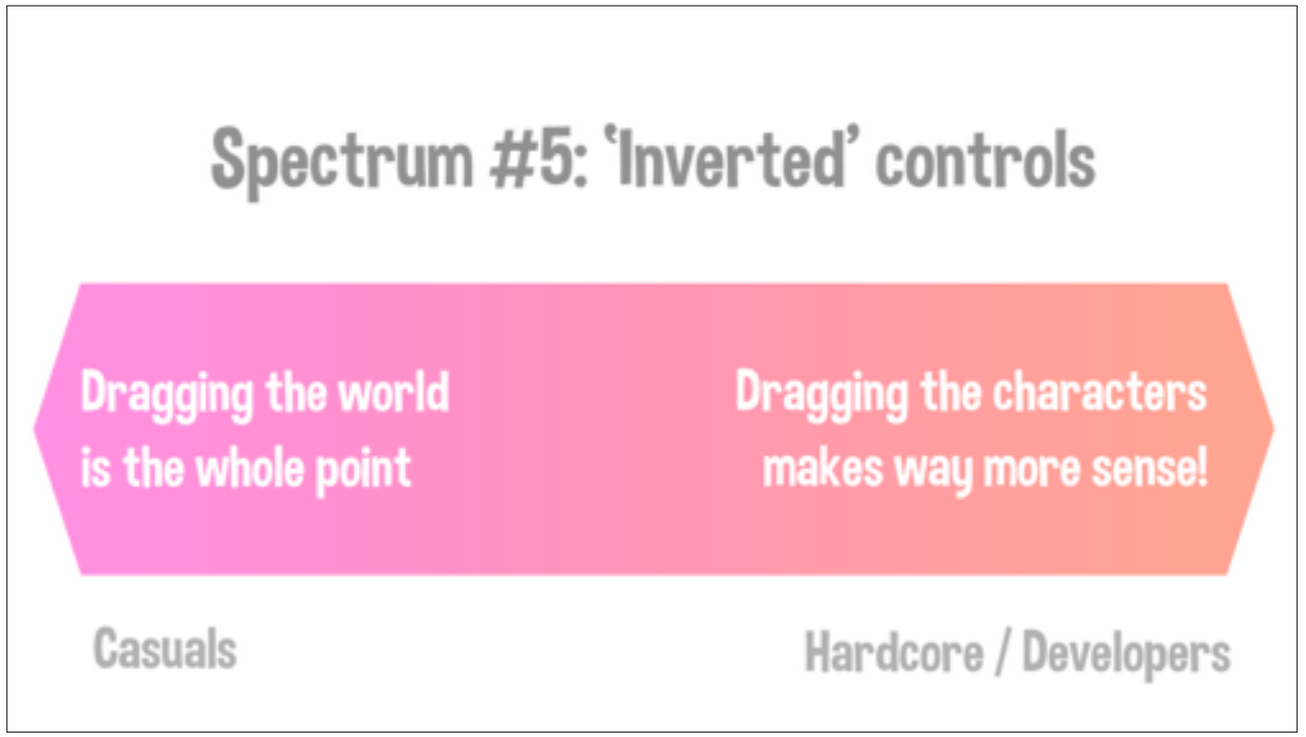


Even Apple’s own ads have stuff all about how your thumb is the way to interact with their screens!

Thumb tutorial start world
want to gently nudge
but also careful not to flatten out personal play styles and prefs

Fences to stop panic reversal
Slowly get removed in later levels as players skill improves
After we added, realises how terrifying no fences are!



First hints of the next big issue!

Pumping up the feedback to make the world feel like its being dragged around

Started adding life to the characters.

Didn't want to animate and make character feel “in control”

Focus on secondary motion

Because the character moves and not the world, we actually feed in forces to the player based on the inverse of the player velocity…

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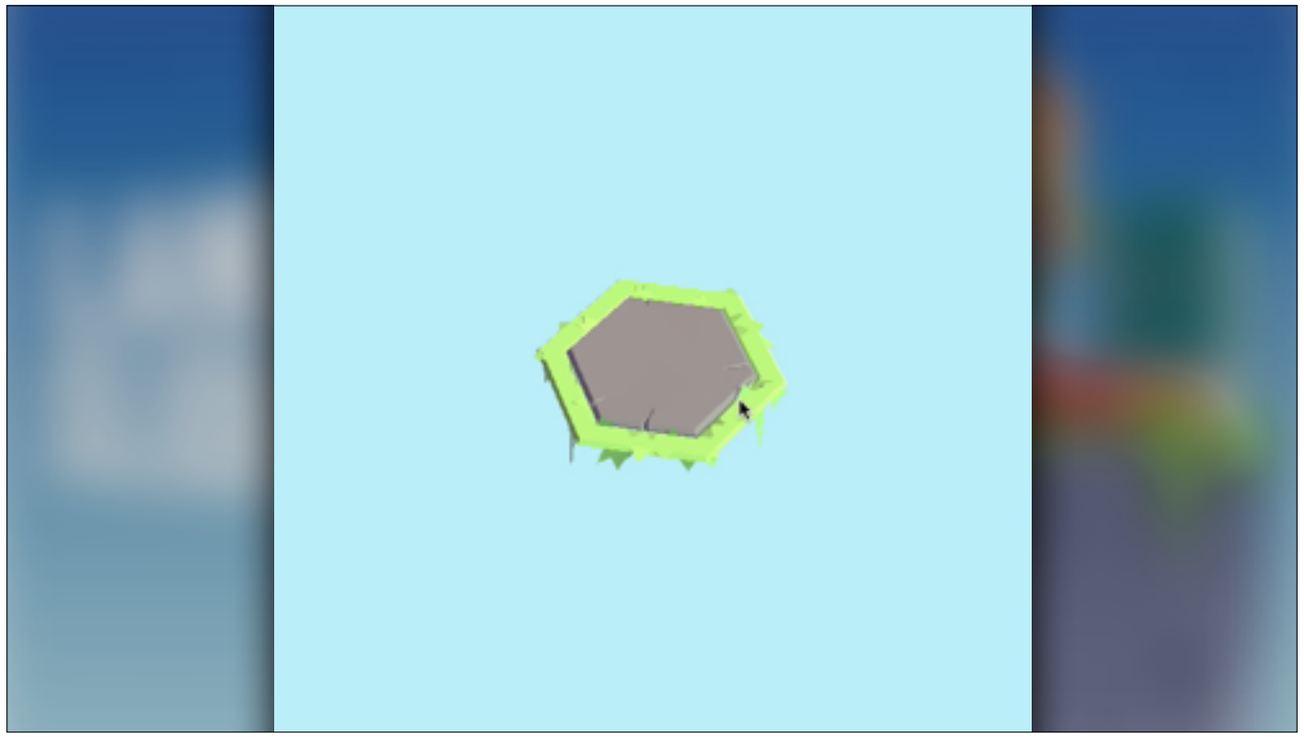
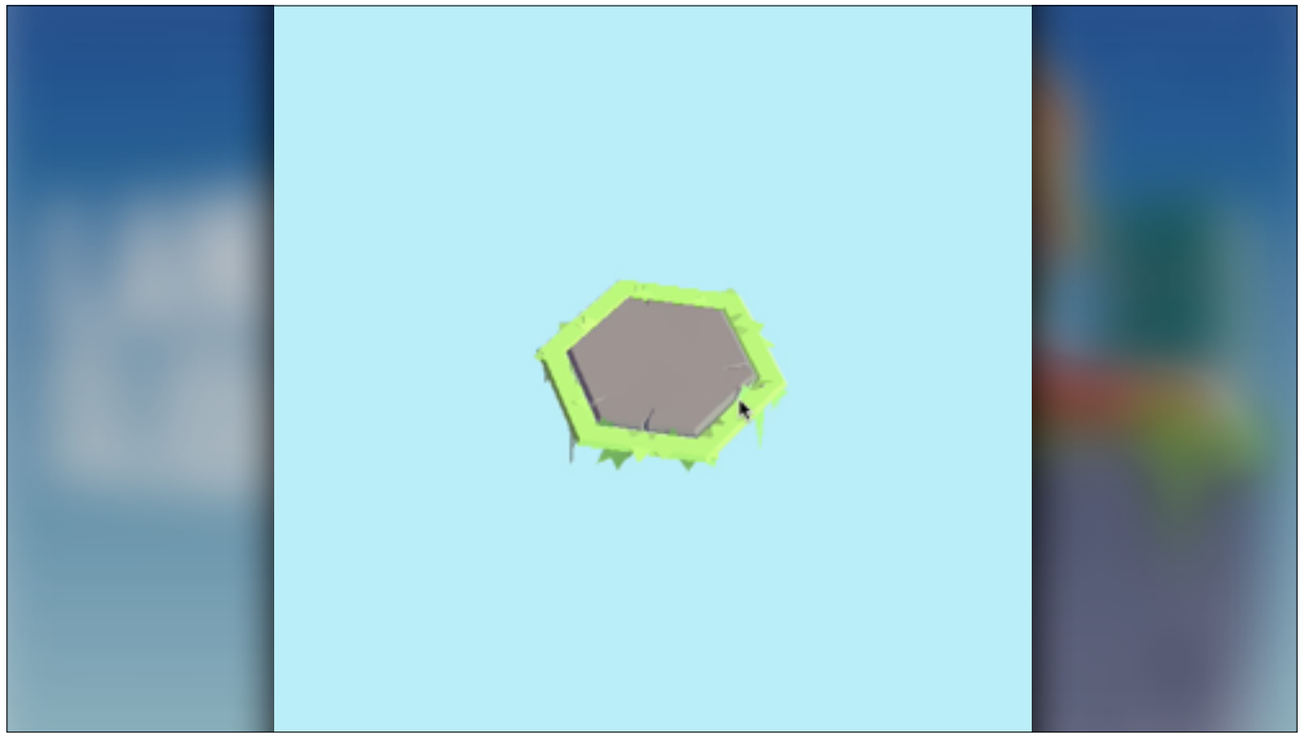


Also gave us the idea of trying inanimate objects that should effectively have no agency



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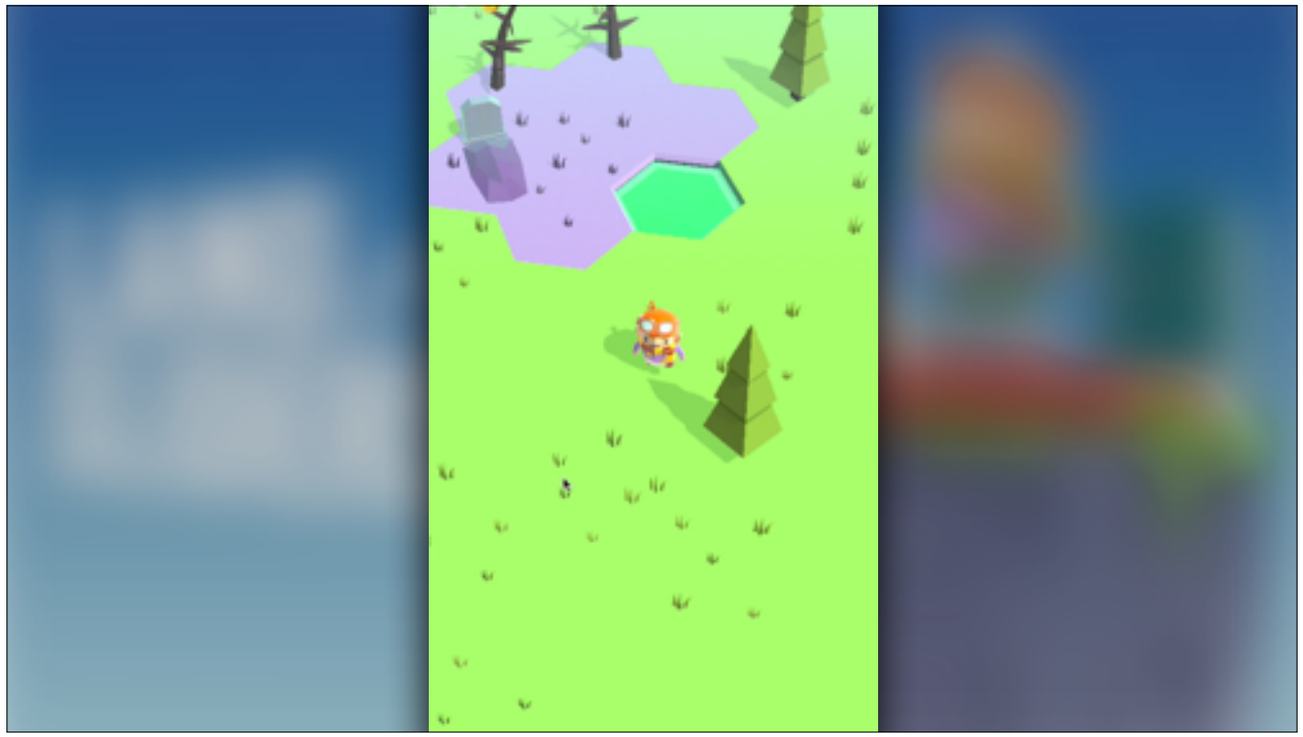
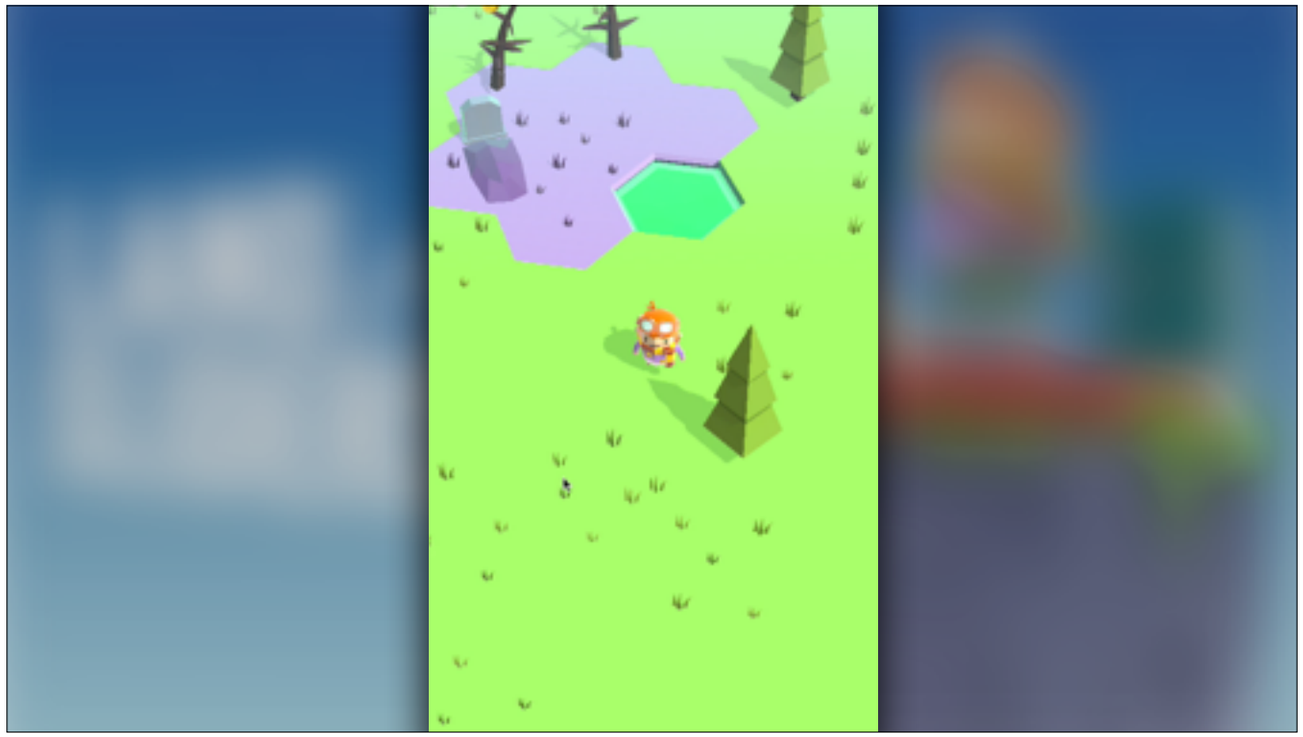


Physics trees
Also tried: leaving trails on particle systems (too intensive)
Shaking and rumbling effects (too exhausting)



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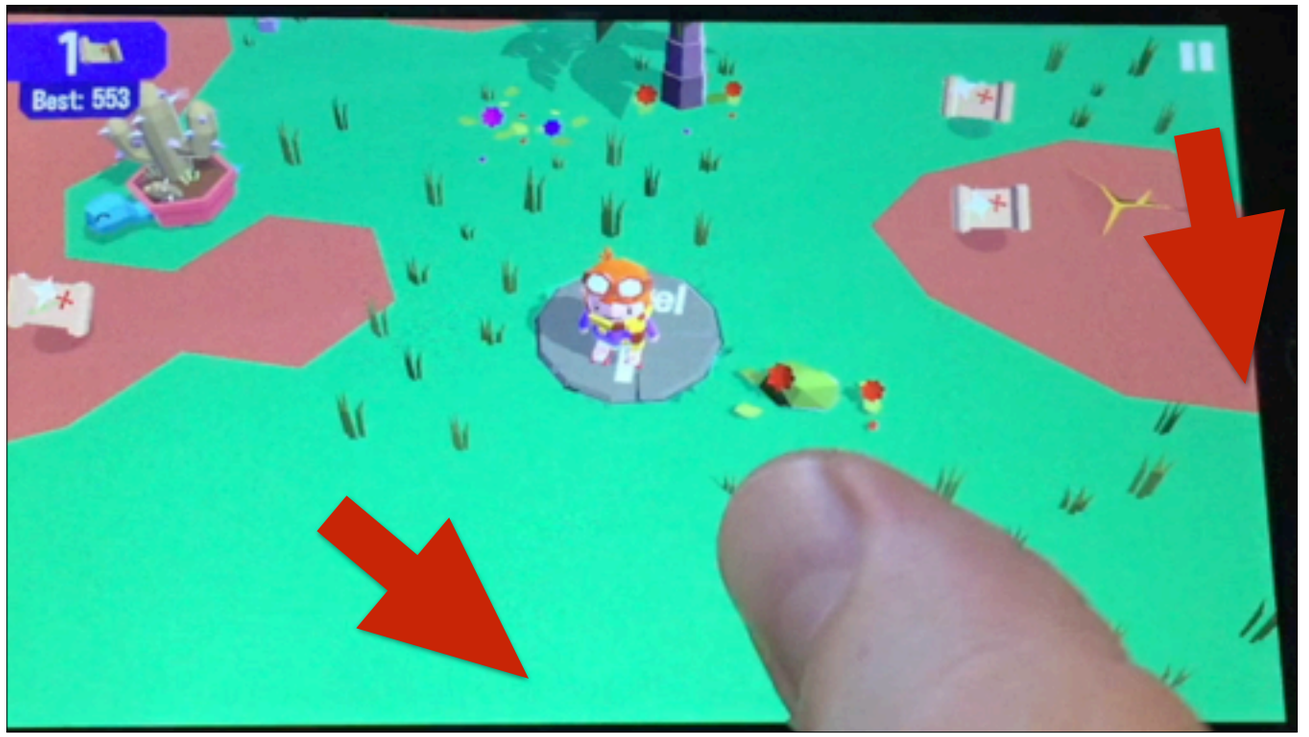
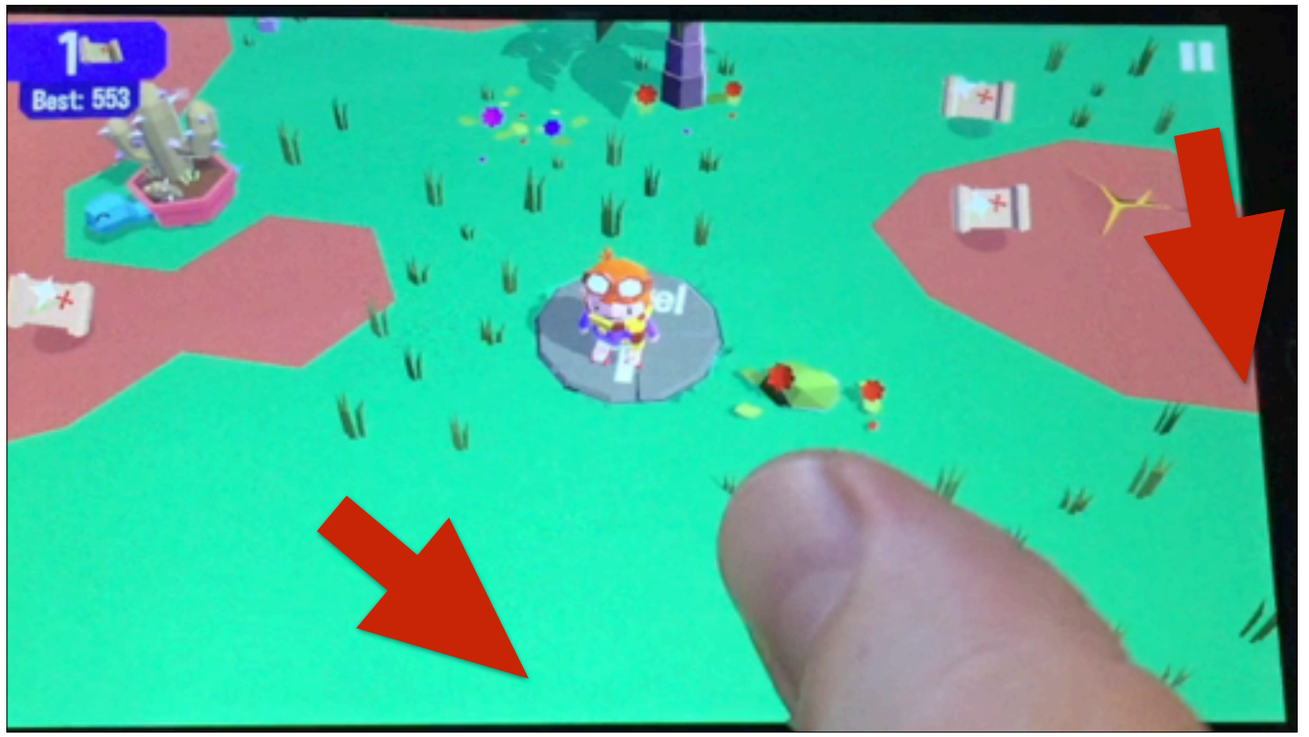

1
Best: 553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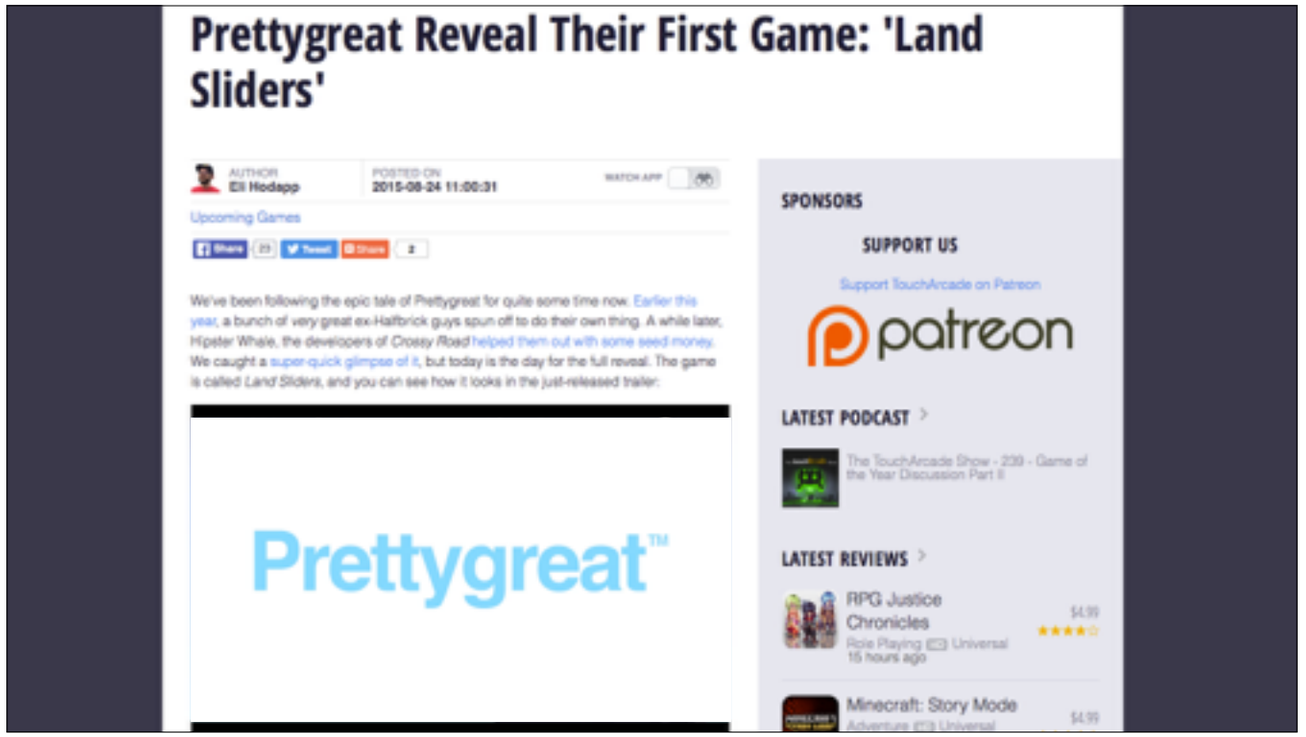
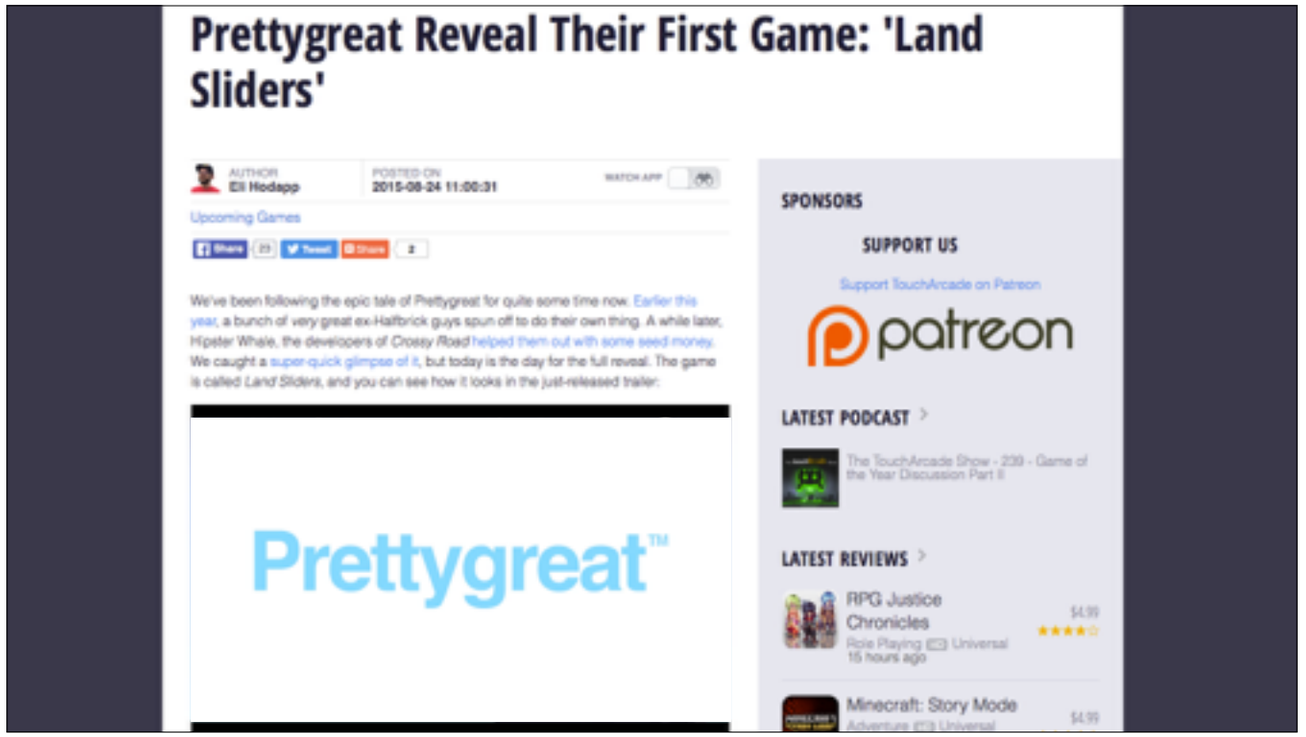


Posted trailer online
Immediately caught some flack for the characters not looking animated enough
Started trying to do some of the suggestions



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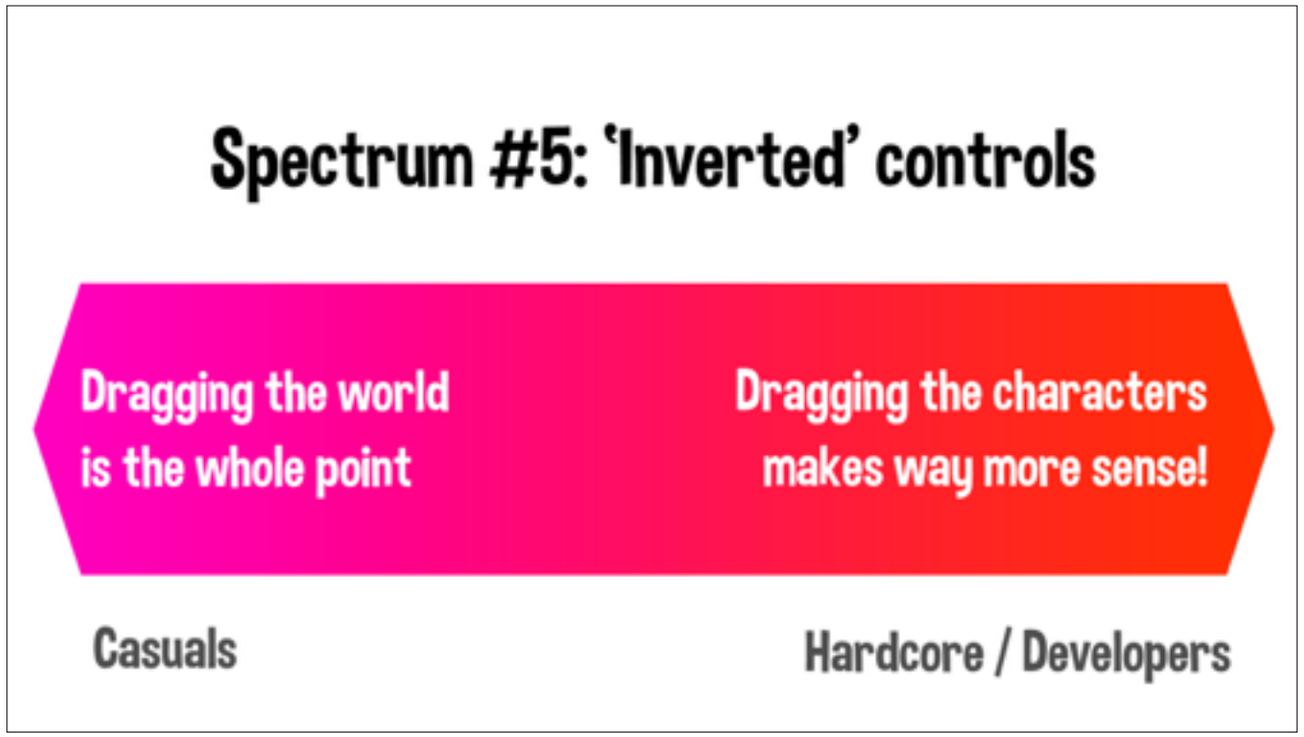

The problem here is **agency**.

Tried turning the player to face the direction, but now you feel like you are controlling the player, not the world

This solution is a half way inbetween…

This should have been just a nice visual change but it ties into all the previous issues.

Spectrum #5: 'Inverted' controls

Dragging the world is the whole point

Dragging the characters makes way more sense!

Casuals

Hardcore / Developers

Like the Y axis war that has waged eternal


TECH

Here's Why Mac OS X Lion's "Natural Scrolling" Feels So Horribly Unnatural

ELLIS HAMBURGER JUL 21 2011, 11:17 PM 1

FACEBOOK 1 TWITTER REDDIT LINKEDIN GOOGLE+

I was really excited to take the virtual gift wrap off of Mac OS X Lion when I downloaded it last

And to a lesser extent “Natural” scrolling

found this in one of my old videos, notice the invert button up the top right! The button nobody wanted…

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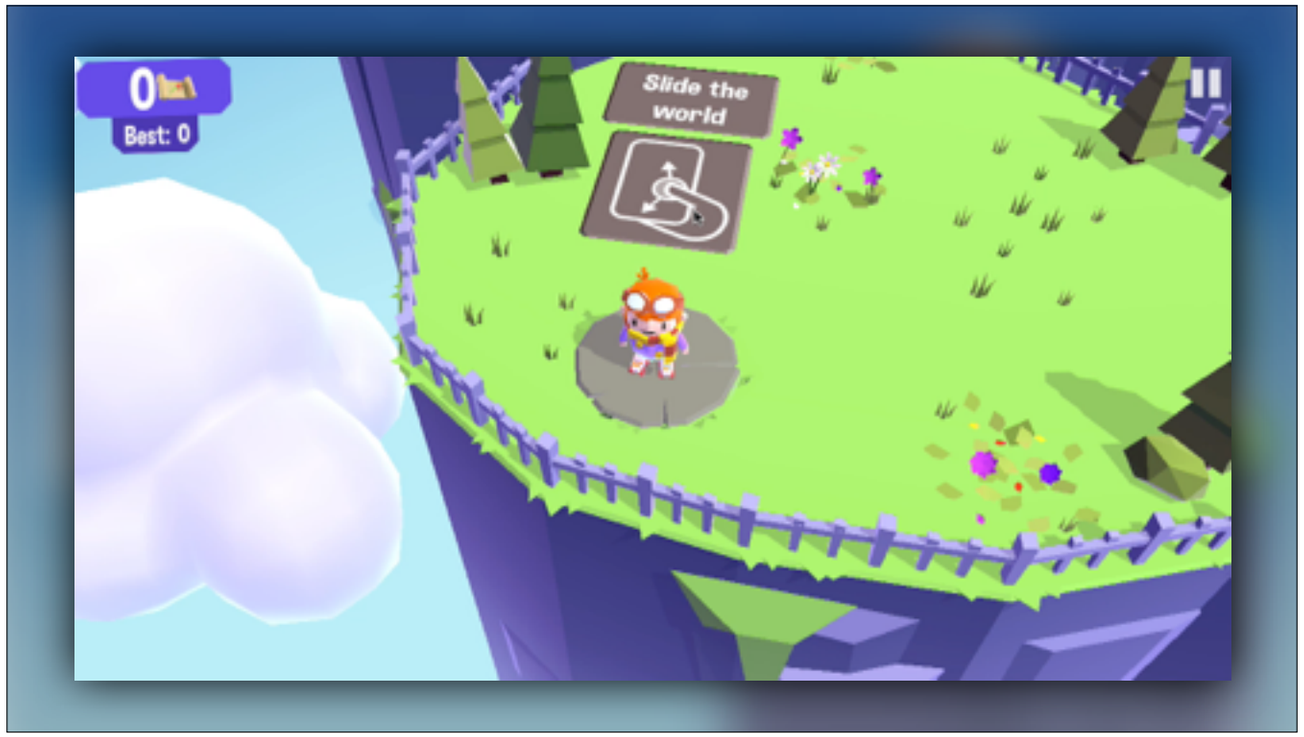
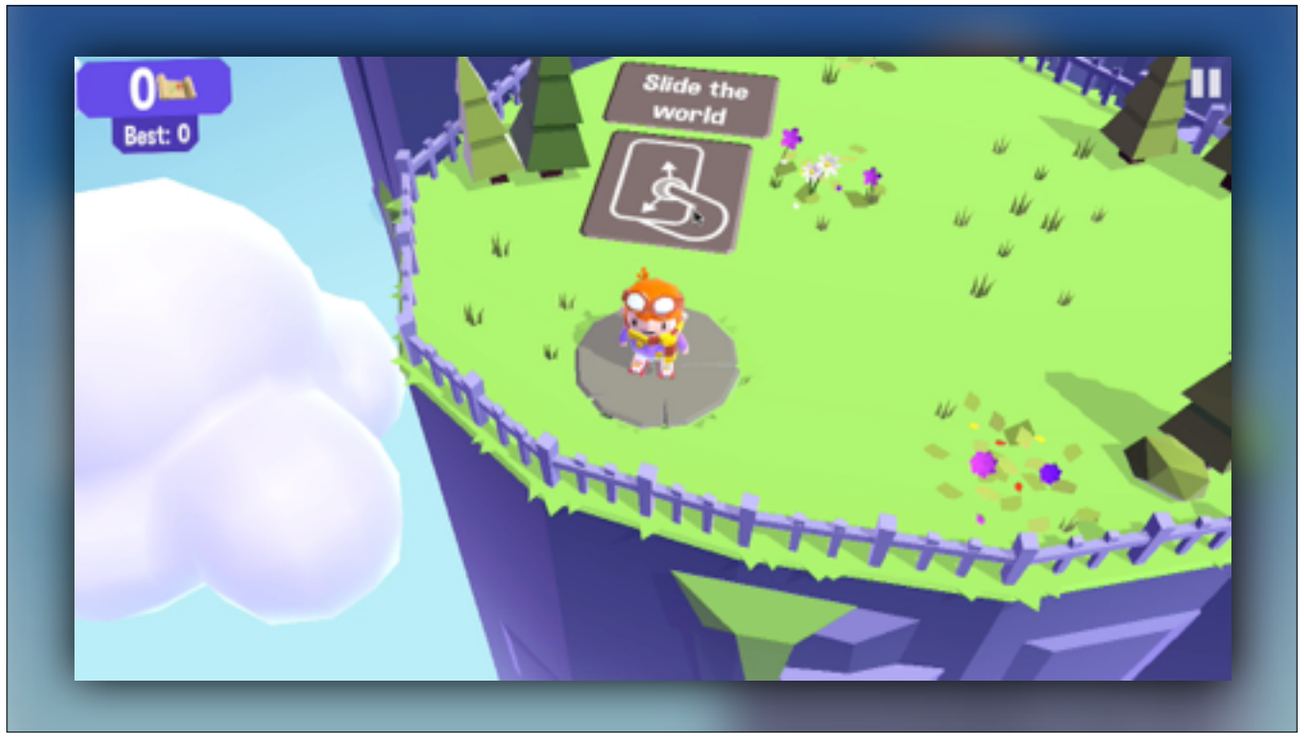
Agency



Tried adding a tutorial world to help people get acclimated

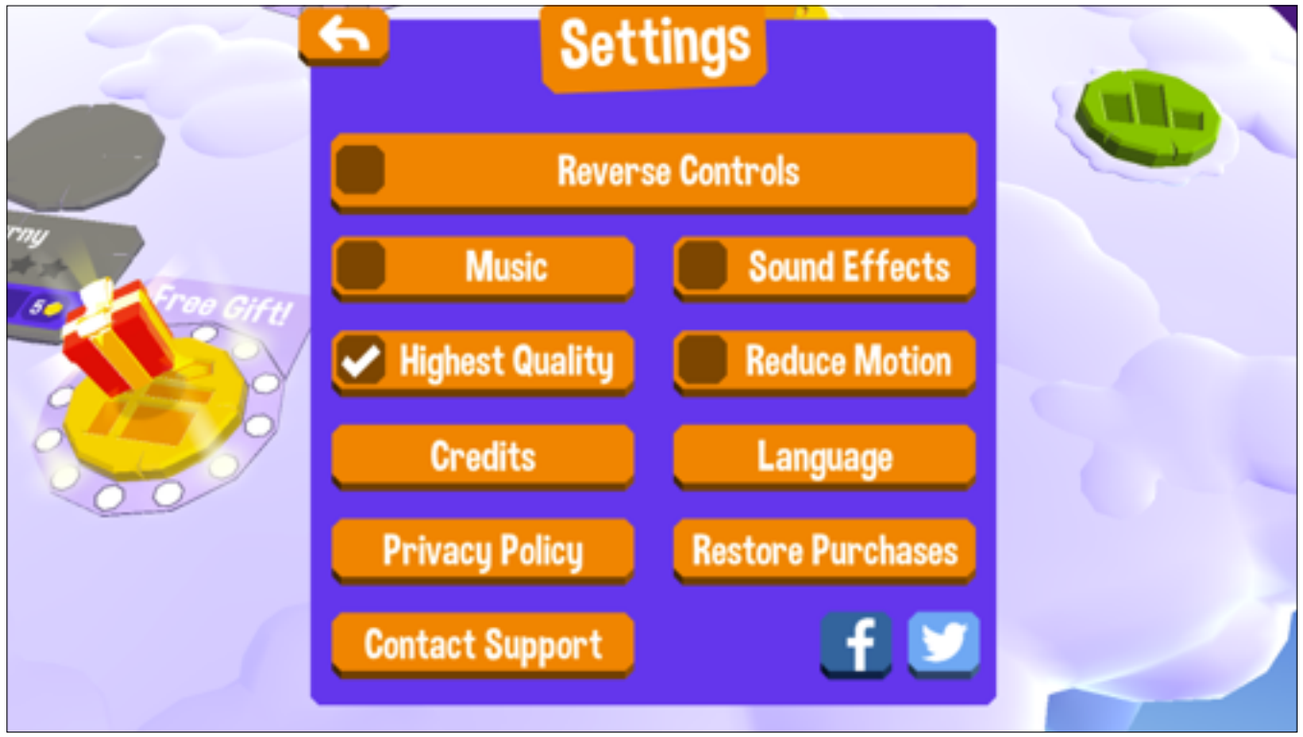
We are REALLY ruining out of time for the release date of this game now

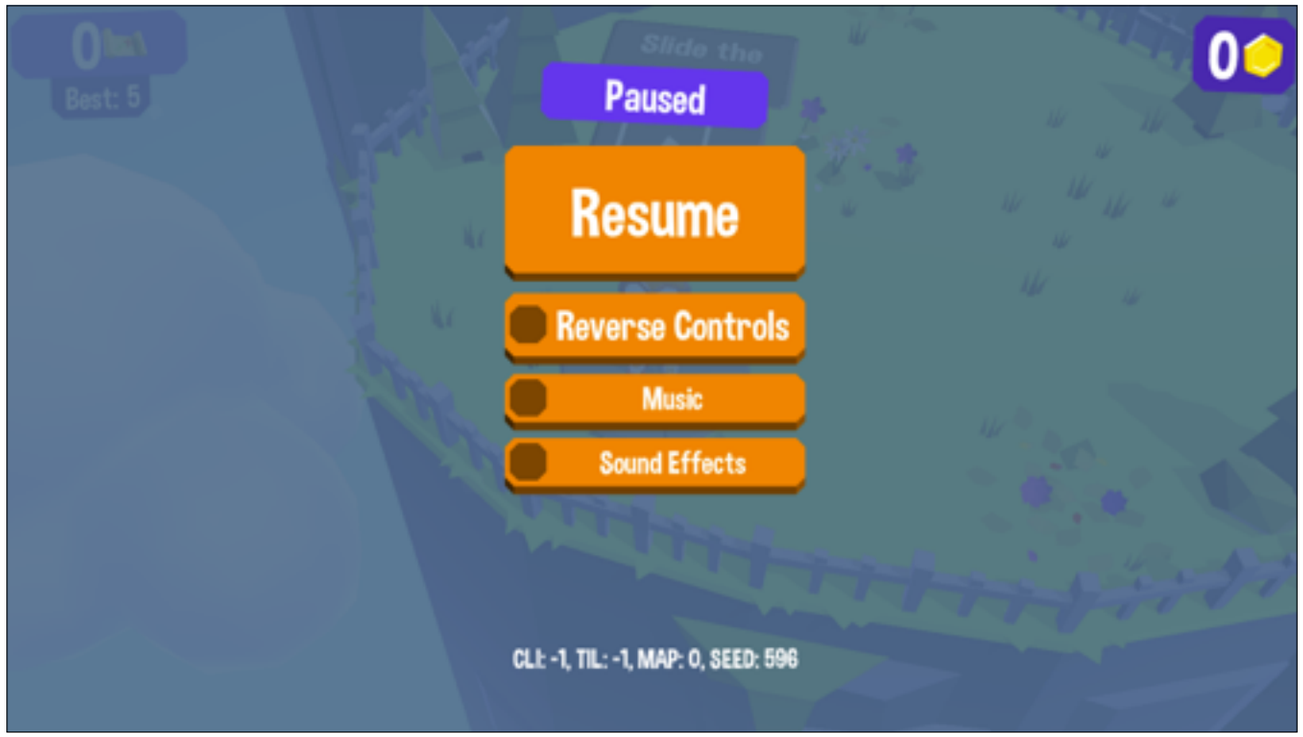


Tried adding a tutorial world to help people get acclimated

We are REALLY ruining out of time for the release date of this game now

```
264                 if(Game.Instance.Player.IsInverted == true)
265                 {
266 
267                     //also need to offset it 2x based on how far the original position as moved.
268                     Vector3 camDiff = m_invertedCameraTouchDownPos - Game.Instance.VisualCamera.Camera.tra
269 
270                     //move towards the original position 2X of how far it has move...
271                     m_touchDownCurrentPos = m_touchDownCurrentPos + camDiff + camDiff;
272 
273                     //NOW INVERT IT
274                     Vector3 locDiff = m_touchDownPos - m_touchDownCurrentPos;
275                     m_touchDownCurrentPos = m_touchDownCurrentPos + locDiff + locDiff;
276                 }
277 
278                 m_totalMouseMovement += (m_previousMousePosition - Input.mousePosition).magnitude;
279                 m_previousMousePosition = Input.mousePosition;
280 
```


Settings
Reverse Controls
Music
Sound Effects
Highest Quality
Reduce Motion
Credits
Language
Privacy Policy
Restore Purchases
Contact Support
Free Gift!


0
Best: 5
0
Paused
Resume
Reverse Controls
Music
Sound Effects
CLI: -1, TIL: -1, MAP: 0, SEED: 596

Game Submitted!

...right?


2
Best: 5
Controls
Slide the world
Default
Slide the character
Reversed
You can change controls at any time in the pause menu.
Let's Go!

Game Submitted!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REVIEWS
'Land Sliders' Review - It's Pretty Great
★★★★★
AUTHOR
Carter Dotson
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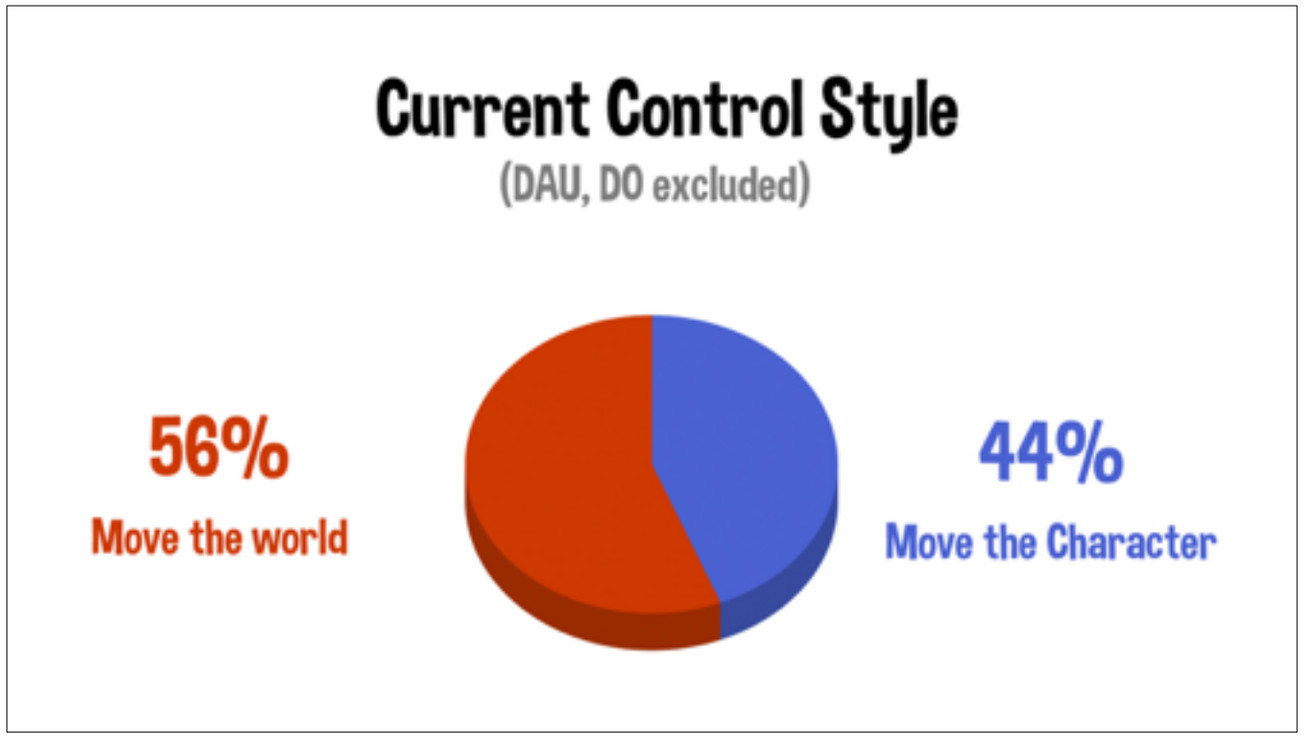
So in the end the game release went totally fine. We won some awards.

Some Analytics

100,000 player sample
iOS + Android

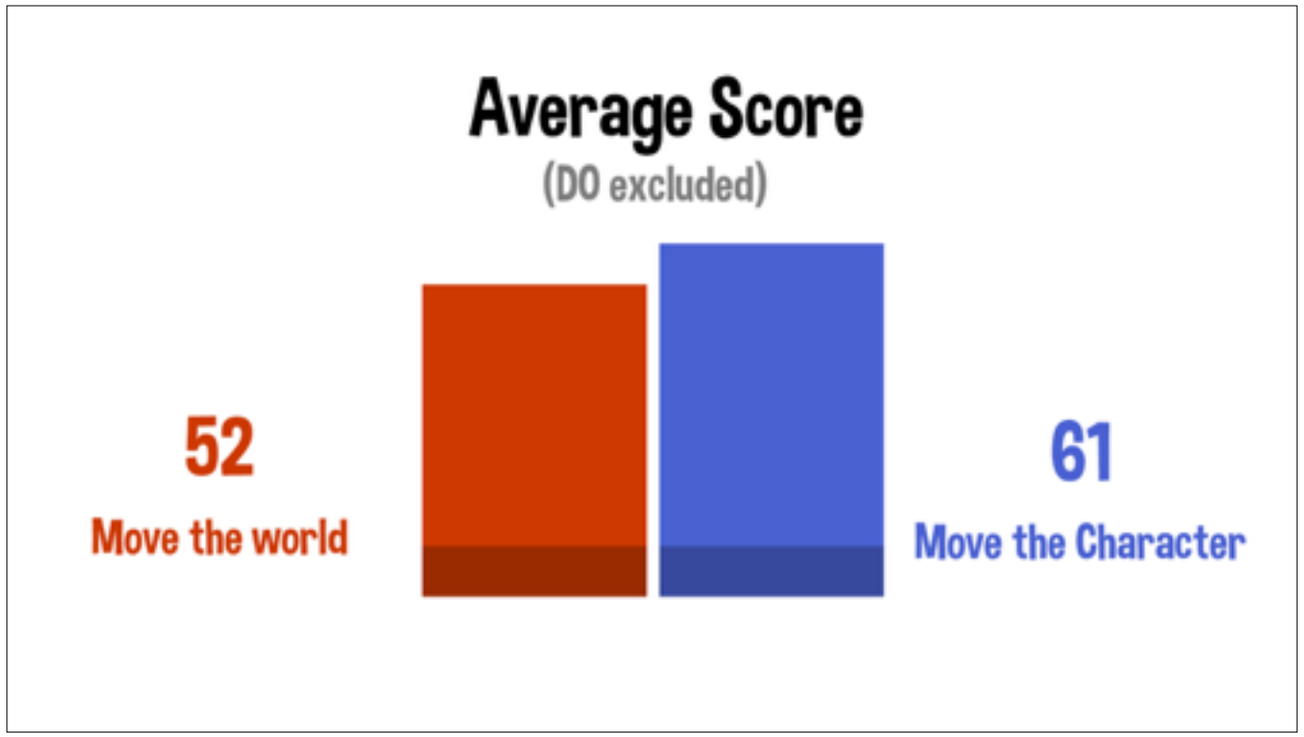
Current Control Style

(DAU, DO excluded)


Current Control Style
(DAU, DO excluded)
56%
Move the world
44%
Move the Character

Average Score

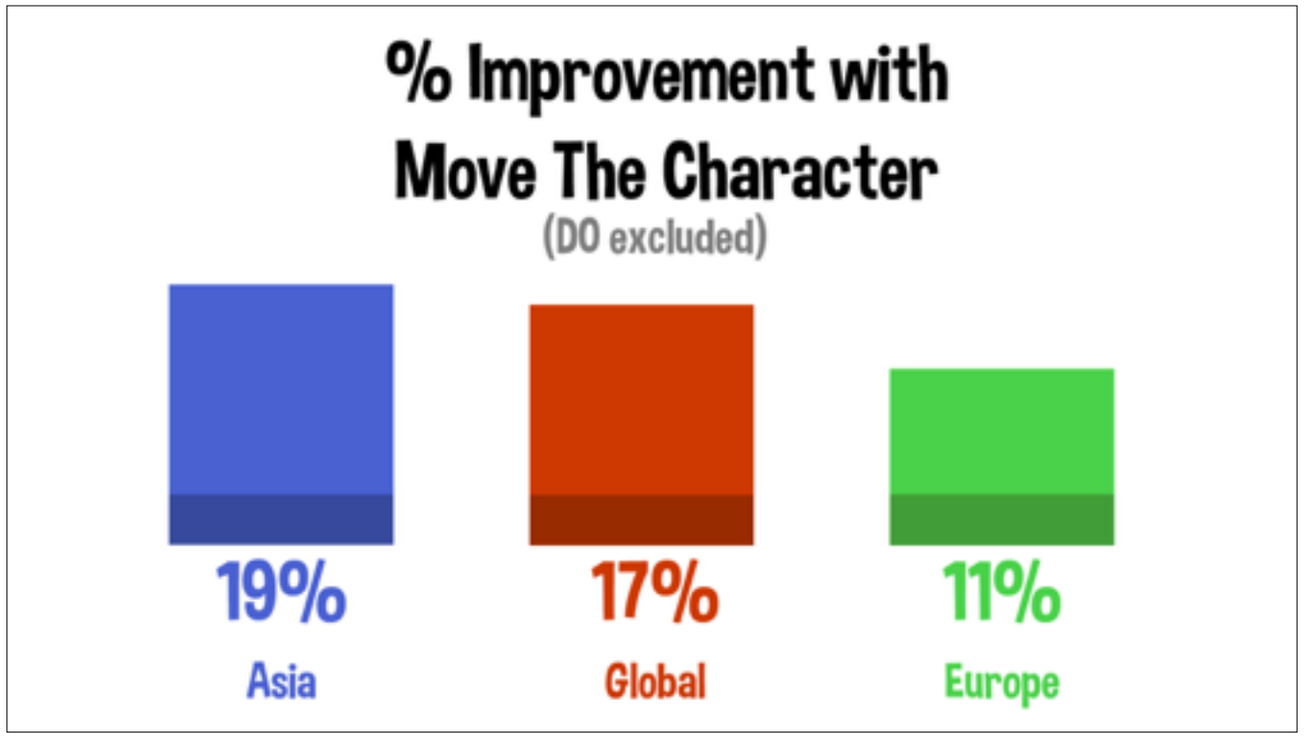
(DO excluded)


Average Score
(DO excluded)
52
Move the world
61
Move the Character

% Improvement with Move The Character

(DO excluded)

Comparing different regions



Comparing different regions

Lessons Learned

pro tip: don’t make a game

Lessons Learned

Don't assume everything you learn
in prototyping will hold up

Lessons Learned

Pay close attention to where
your feedback is coming from

Lessons Learned

Player expectations are
extremely difficult to overcome

Lessons Learned

Analytics won't help with everything

Lessons Learned

Animation curves solve all
of lifes problems

Thanks!

@pgmuscat