

# Games and Sports

05-499/899 Fall 2024

Celebrating Accessibility

<https://cmu-05-499.github.io>

Andrew Begel and Patrick Carrington

# Administrivia

- Sign up for a weekly time with Kristen or Qiaoqiao with your project team
- How is P3: Project Spec going?

# Games and Play

## What games do we all play?

What is/was your favorite game to play with friends? Board games? Card games? Adventure games? Puzzle games? Imagination games?

All are fair game!

“It’s the things we play with and the people who help us play that make a great difference in our lives.”

- Fred Rogers

# Wikipedia Definition of Play

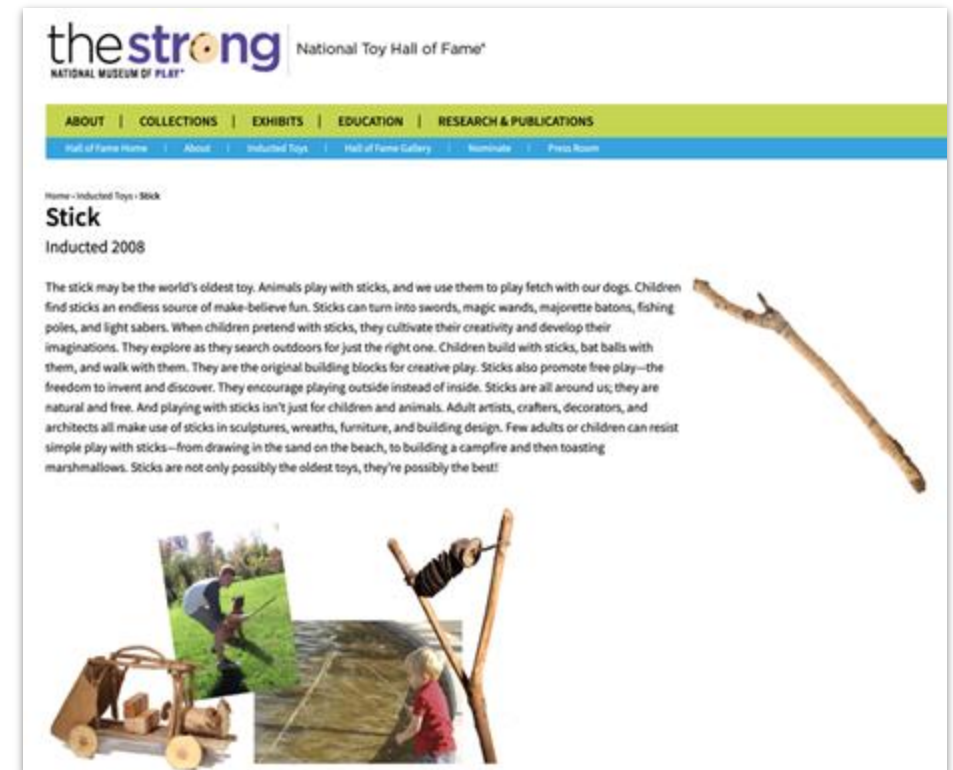
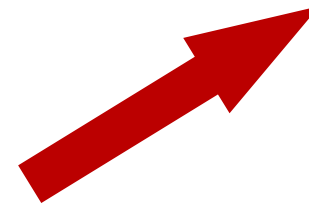
**Play is a range of intrinsically motivated activities done for recreational pleasure and enjoyment.** Play is commonly associated with children and juvenile-level activities, but play occurs at any life stage, and among other higher-functioning animals as well, most notably mammals and birds.



Photo Credit: Unsplash

# Aside: Toy Hall of Fame

It took a while to acknowledge but it was great to see the recognition.



“Playing a game together actually builds up bonds of trust and cooperation. We actually build stronger social relationships as a result.”

- Jane McGonigal, Game designer



# Wikipedia Definition of a Game

**A game is a structured form of play**, usually undertaken for entertainment or fun, and sometimes used as an educational tool. Games are distinct from work, which is usually carried out for remuneration, and from art, which is more often an expression of aesthetic or ideological elements.



Photo Credit: Caleb Compton, [Medium](#)



Photo Credit: ABC News

# Why talk about games?

- “Everyone” loves games
- Joyful, Competitive, Challenging, Immersive, Rewarding
- Something to do
- A way to escape

# Structure - The Challenge and Opportunity of Games

Structure gives us a way to utilize “play” in specific ways for our own benefit

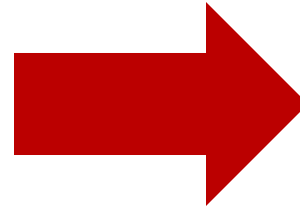
The structure and rules also dictate who can play and how

**Play** should be inherently accessible, for **games** “it depends”

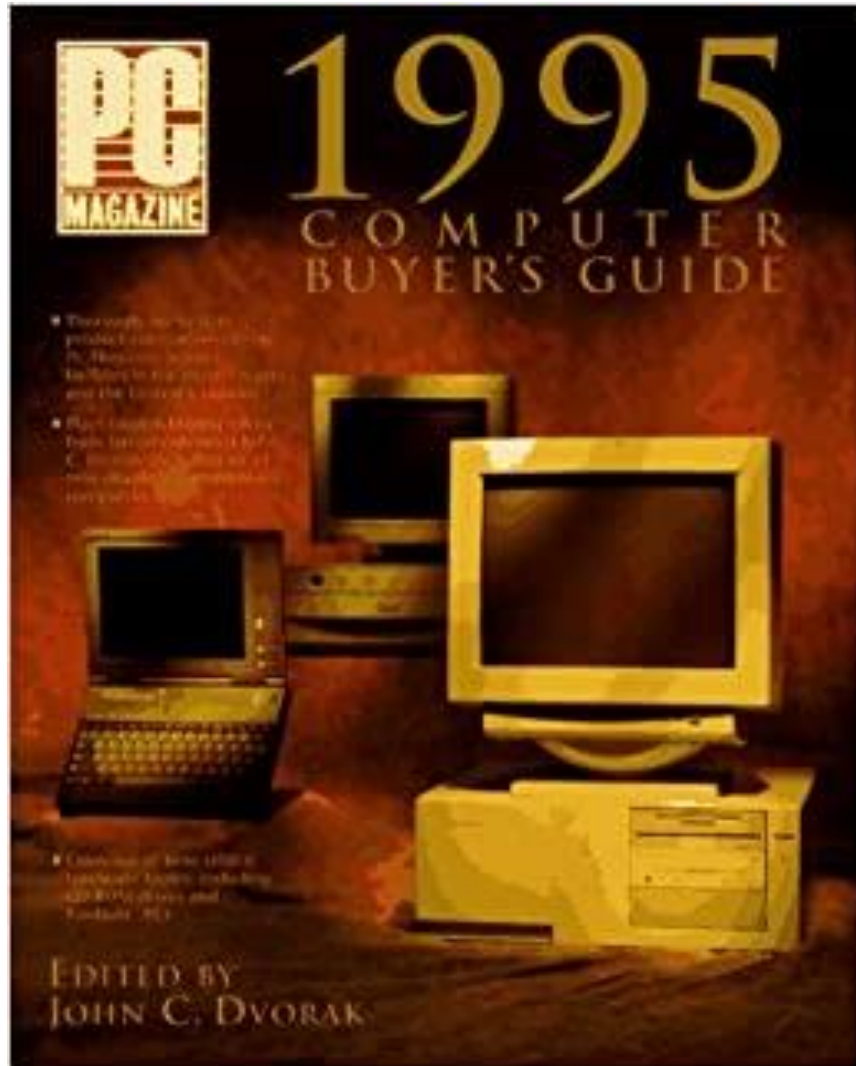
# Playstation



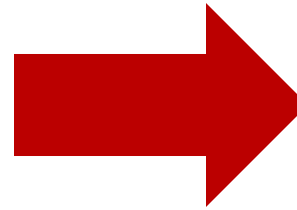
1995 - 2017



# PC Gaming



1995 - 2017



ROBIN WILLIAMS

# JUMANJI

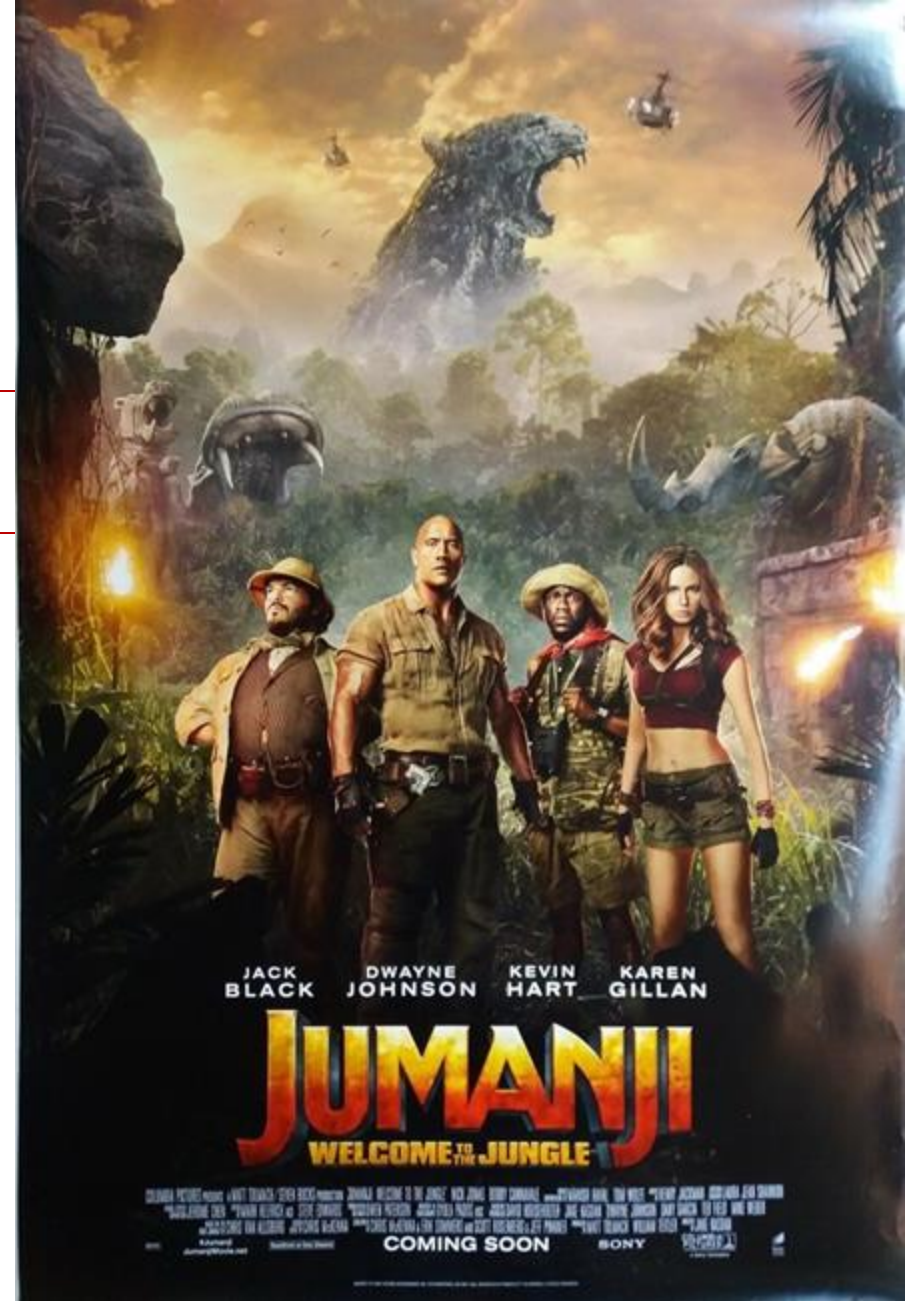
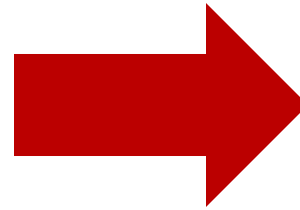
— AN —  
ADVENTURE  
FOR THOSE WHO  
SEEK TO FIND  
A WAY TO  
LEAVE THEIR  
WORLD BEHIND



IT'S A JUNGLE IN HERE

TRIStar Pictures presents an INTERSCOPE COMMUNICATIONS/ENTER FILM production a JOE JOHNSON film JUMANJI starring ROBIN WILLIAMS CAROL KERRI GUNZ DAVID ALAN COOPER DENZEL WASHINGTON JENNIFER ESTE  
BRYAN DUNN AND JAMES BROWN \*\*\*STYLING: INDUSTRIAL LIGHT & MAGIC \*\*\*COSTUME DESIGNER: ROBERT BROWN \*\*\*PRODUCTION DESIGNER: JAMES BROWN \*\*\*EXECUTIVE PRODUCERS: JONATHAN BUCKLEMAN  
JAMES VAN PETER LARRY J. FRANCHI AND ROBERT W. COOK \*\*\*PRODUCED BY CHRIS VAN ALLERTON JAMES VAN ALLERTON AND JON SHAW \*\*\*WRITTEN BY CHRIS VAN ALLERTON \*\*\*DIRECTED BY JOHANNAN HENSLER  
\*\*\*CASTING BY ALBERTO JAYRIS BARRERA \*\*\*COSTUME DESIGNER: ROBERT BROWN \*\*\*PRODUCTION DESIGNER: JAMES BROWN \*\*\*EXECUTIVE PRODUCERS: JONATHAN BUCKLEMAN  
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COMING SOON

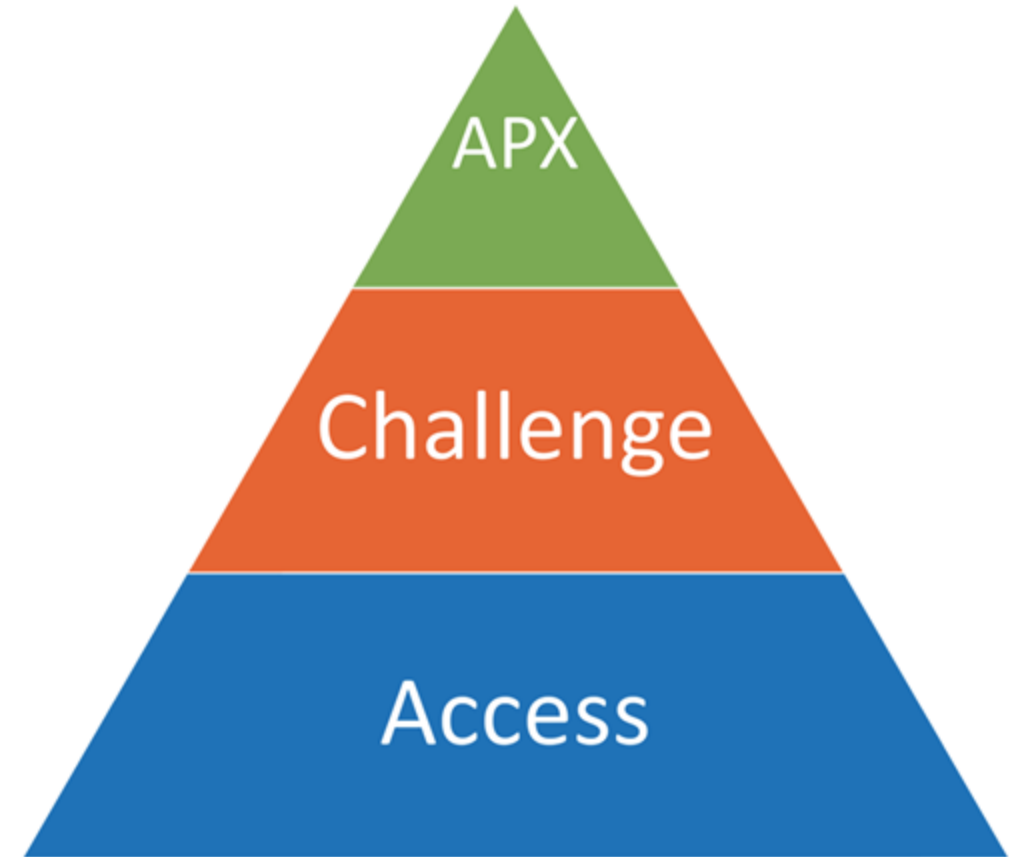
1995 - 2017



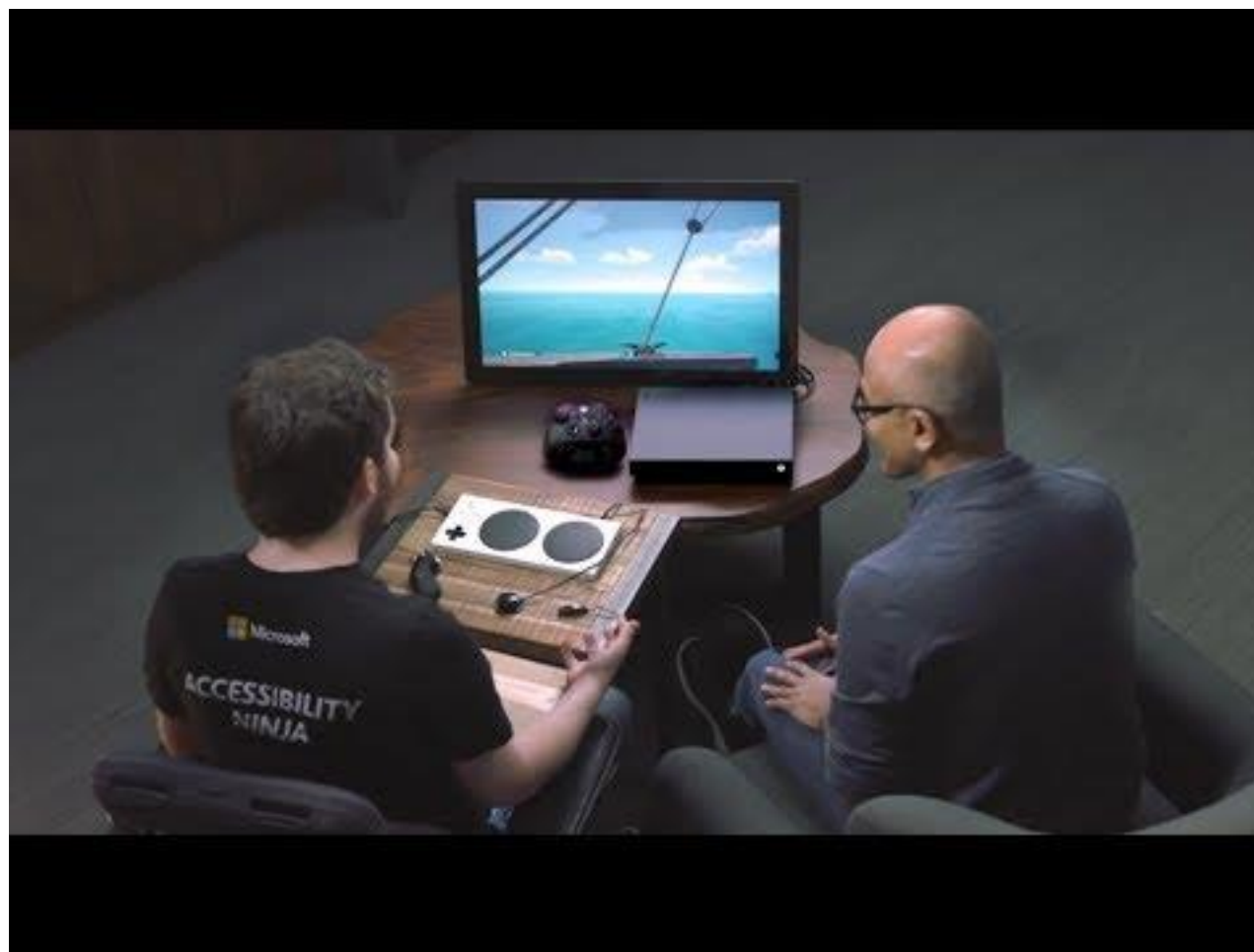
# Making (Video) Games more Accessible

<https://accessible.games/accessible-player-experiences/>

- Adaptive Controls
- Adaptive UIs



# Adapt the Controls - Xbox Adaptive Controller





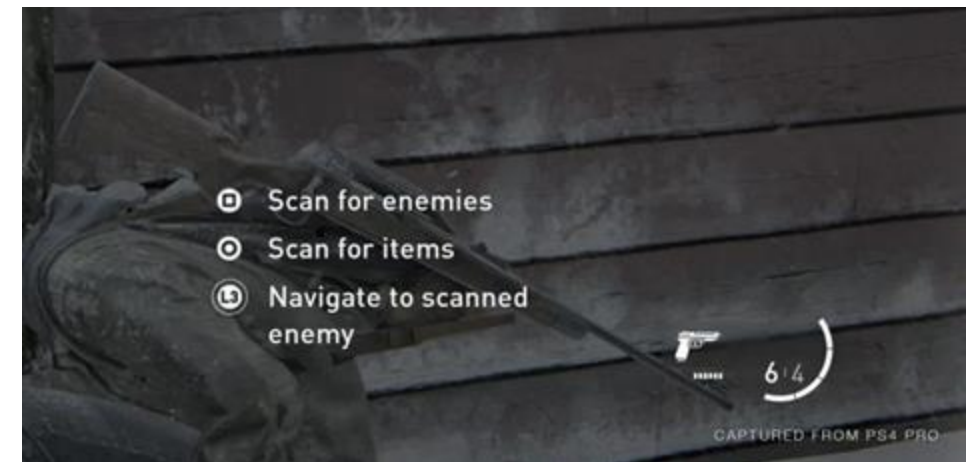
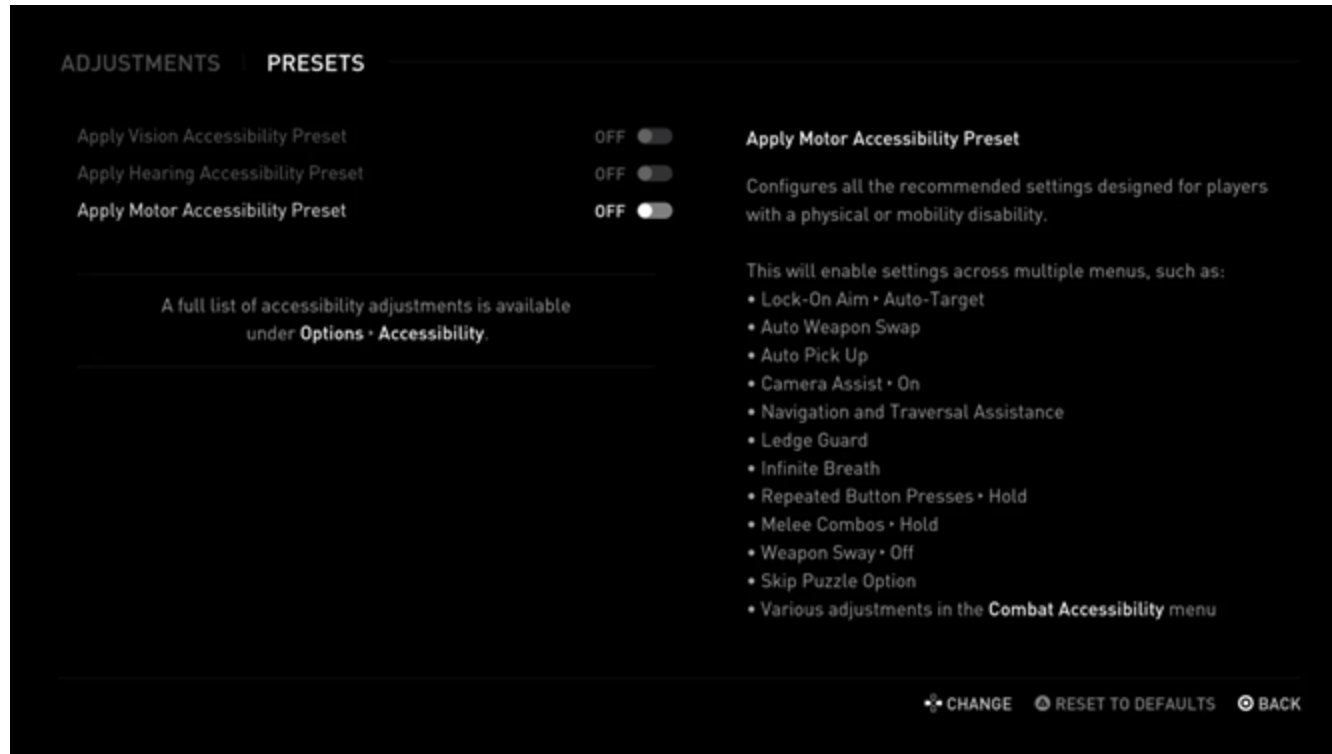
# Adapt the UI - Last of Us Part 2

Review of the “MOST. ACCESSIBLE. GAME. EVER!”

[The Last of Us 2 Discussion on Accessibility and Blind Impressions](#)  
- Steve Saylor, Courtney Craven



# Adapt the UI - Last of Us Part 2



# Aside: How Accessible were 2021's biggest games?

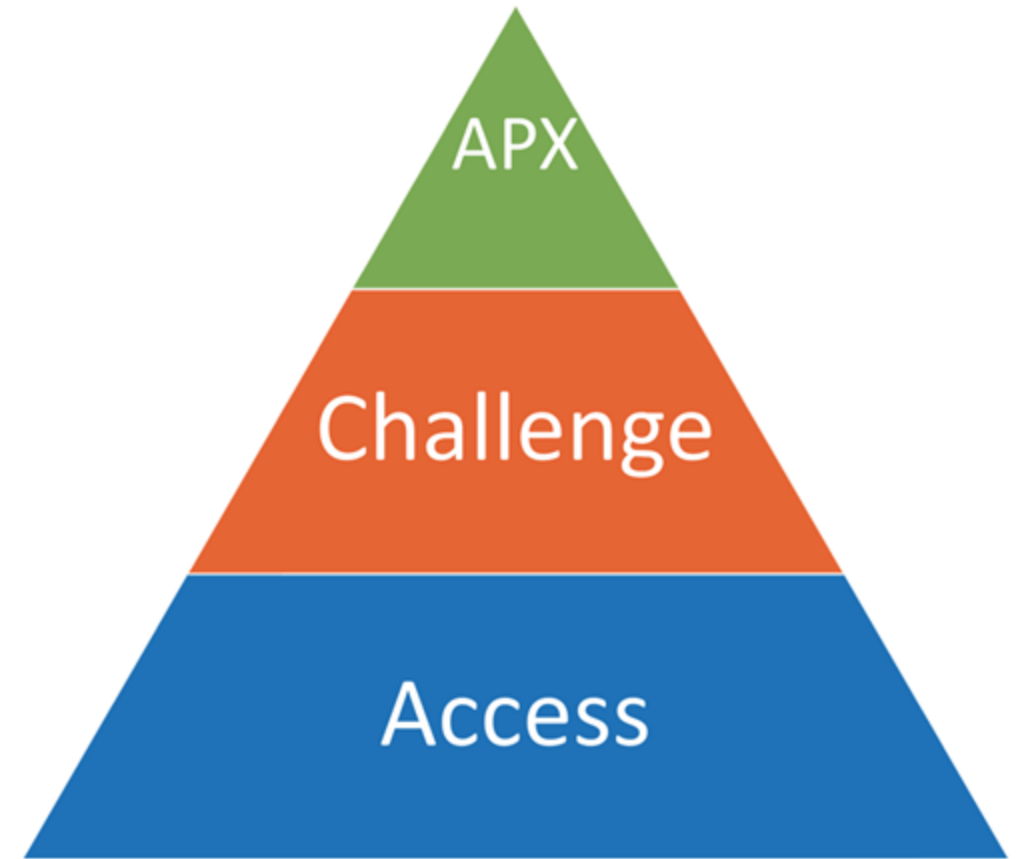
Game Makers Toolkit does an annual review of game accessibility and if you're interested in getting a look at the progression you can just sit and watch through them on YouTube. Here's the one from 2021:

<https://youtu.be/-lhQl1CBj9U>

# Accessible Player Experiences - APX

<https://accessible.games/accessible-player-experience>

- Adaptive Controls
- Adaptive UIs
- Adapt the Gameplay/Design



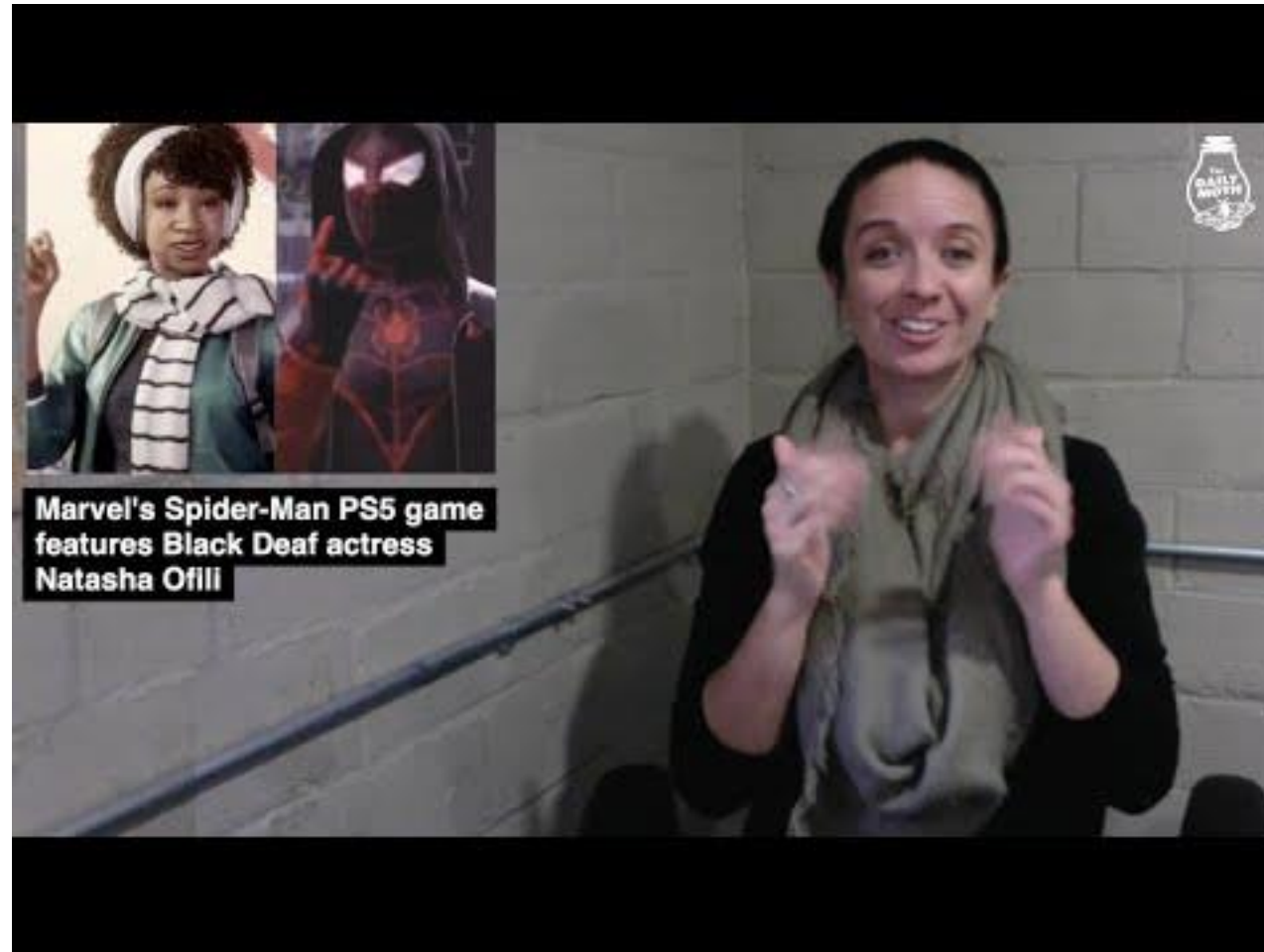
# Adapt the gameplay but Maintain the Challenge!

Challenge Patterns from the APX

- > [Helping Hand](#)
- > [Moderation In All Things](#)
- > [Slow It Down](#)
- > [Save Early, Save Often](#)



Also just include more kinds of people into the stories



Let's play a game!

# Let's go back to the games we talked about...

Let's see if we can turn this into a "game"!

Choose a game.

Find an example of how the game supports each design pattern OR come up with how that design pattern could be applied to the game.

How many can you find!?



# To earn points you must:

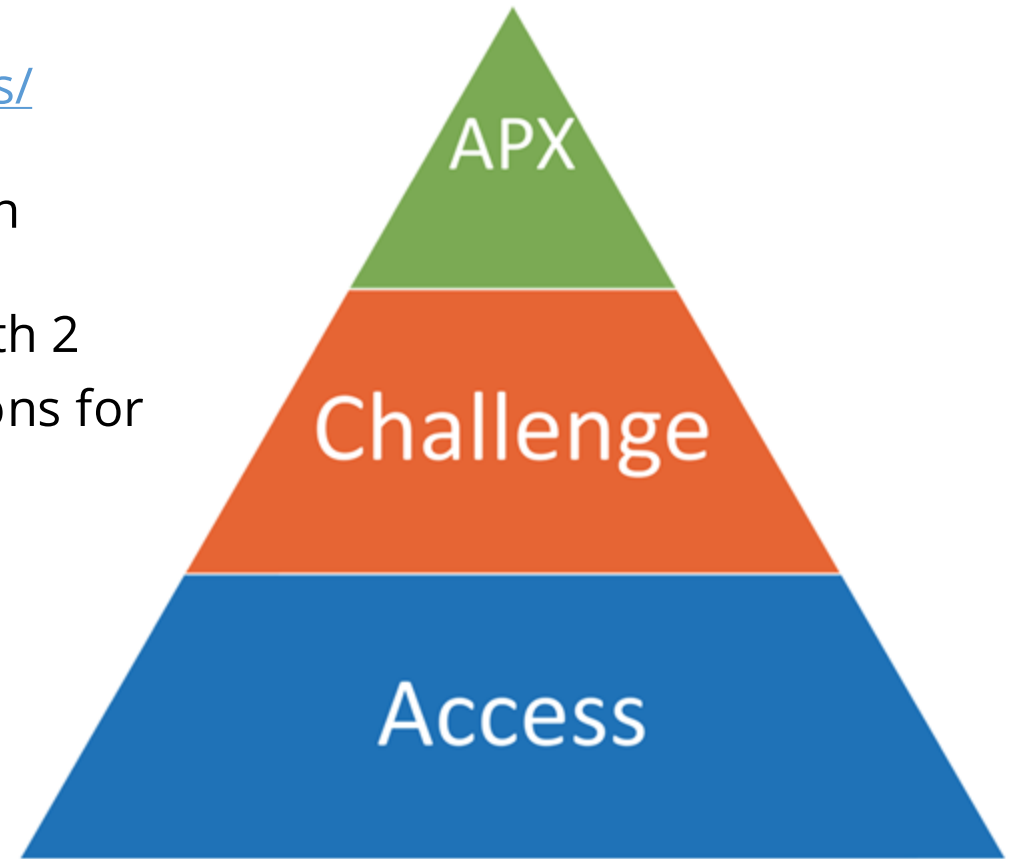
<https://accessible.games/accessible-player-experiences/>

- Identify the access pattern or challenge pattern
- State whether it is exemplified or needs a solution
- Describe the example or your solution

Access Patterns worth 1 point, Challenge Patterns worth 2

Half points for repeated examples or additional solutions for the same design pattern

Instructions: [bit.ly/game-apx](http://bit.ly/game-apx)



# Sports and Recreation

What is your favorite sport?

# There are 28 Paralympic Sports -

<https://www.paralympic.org/sports>

Track and Field

Goalball/Football

Swimming

Powerlifting

Sitting Volleyball

And more...

# Running and Cycling



How can you adapt  
running or cycling?

No-tech, low-tech, high-tech



# Discussion of Readings

Discussion Leader: Ezra Awumey

1. **Computing technologies to increase access to physical activity for people with visual impairments** | XRDS: Crossroads, The ACM Magazine for Students - <https://dl.acm.org/doi/10.1145/3331067>
1. **Beyond Adaptive Sports** ASSETS '21 - <https://dl.acm.org/doi/10.1145/3441852.3471223>

How can you adapt  
running or cycling?

No-tech, low-tech, high-tech





# Variations and Adaptations - Running



Blind Running



Oscar Pistorius

# Variations and Adaptations - Racing Wheelchair



# Variations and Adaptations - Handcycle



[Pittsburgh hand cyclist Attila Domos has big ideas, starting with a 24-hour world record](#)



# Kayaking



Photo: [L.L. Bean](#)

# Adaptive Kayaking Equipment



What is fair?

What is permissible?

# Soundscape Kayaking Scavenger Hunt!

October 2018

<https://aka.ms/Soundscape>



# Hockey





# Adaptations - Blind Hockey



# Blind Hockey Puck vs Standard Hockey Puck



# Adaptations - Sled Hockey



# Skiing



# Adaptive Skiing



# TetraSki - ASSETS 2019

Powered-Ski Hardware controlled by sip-and-puff



[Alsalem et al. \(2019\) Leveraging Shared Control to Empower People with Tetraplegia to Participate in Extreme Sports](#)

# Rugby



Photo: <https://tokyo2020.org/en/sports/rugby/>

# Wheelchair Rugby -> Formerly known as MurderBall

Created in 1976

Not an adaptation of Rugby  
Murderball was actually the official name of the sport





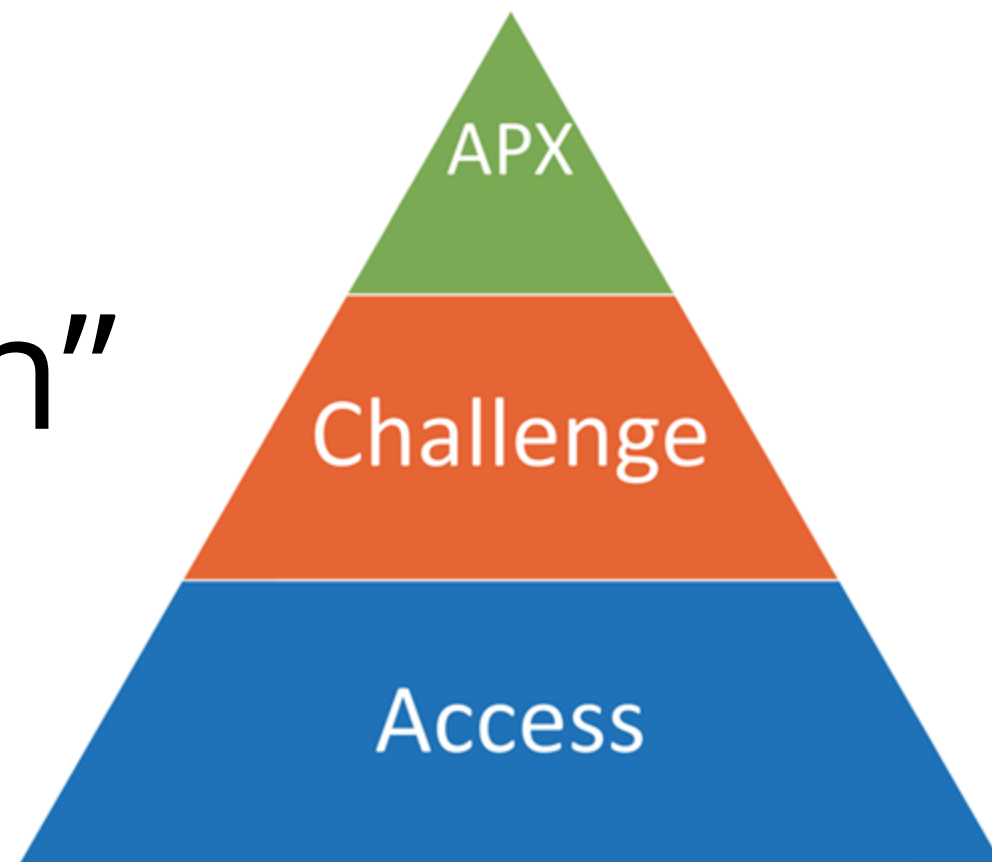
# Basketball



# Wheelchair Basketball



“Challenge Pattern”  
...sort of



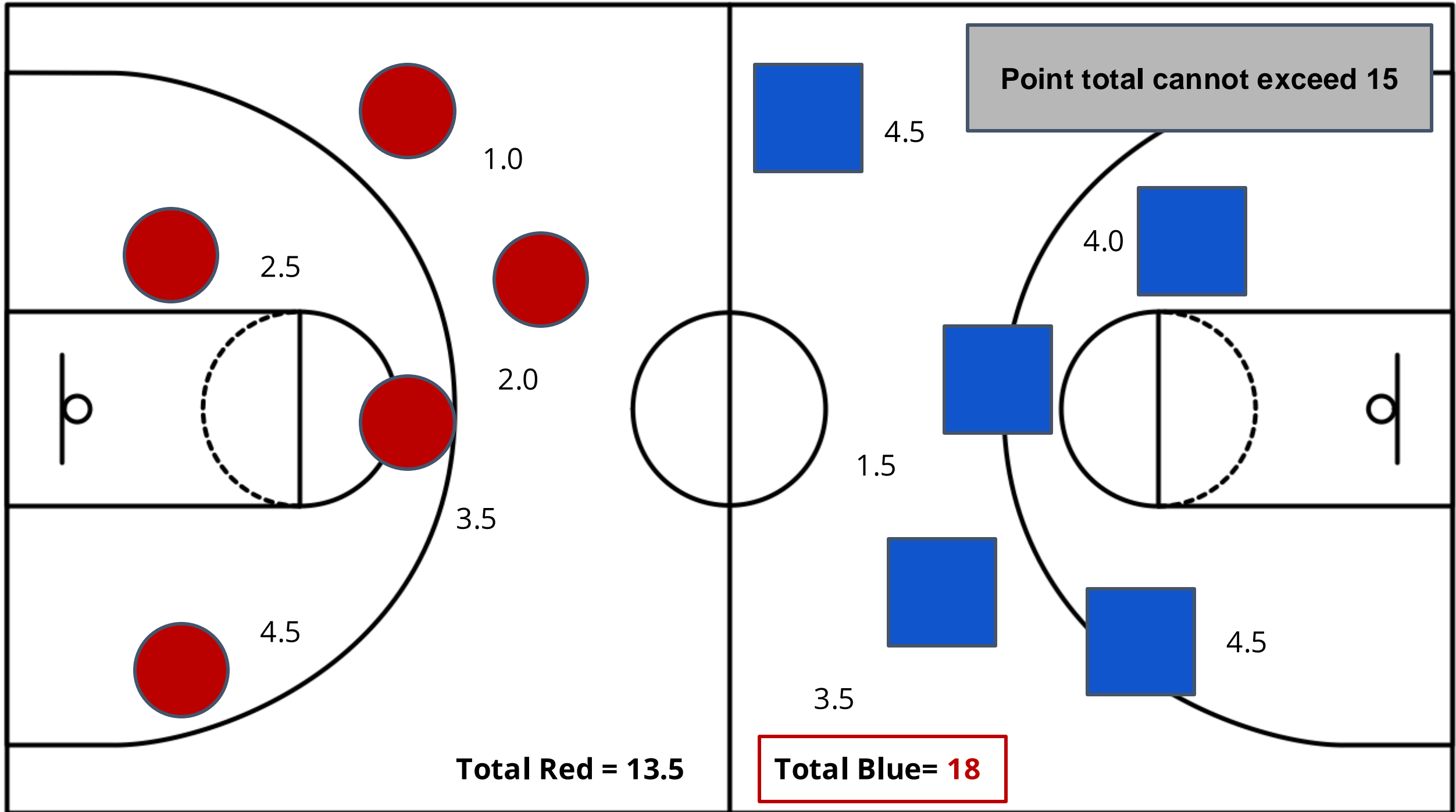
# Basketball Functional Classification System

1.0 - No active movement of the trunk in the vertical, forward or sideways plane

2.5 - Has characteristics of class 1.0, but able to lean forward 90 degrees and return to upright sitting position without proper upper extremity assist with knees higher than hips, able to lean forward and rotate the upper trunk simultaneously, Able to lean forward and rotate the upper trunk simultaneously, active movement of both the Upper and Lower Trunk but not coordinated or as one unit, lower Trunk is not against the backrest at all times, may have a lordosis (Curve in low back) to assist in returning to upright, and more stable than a Class 2.0 player but still has loss of stability in trunk.

# Basketball Functional Classification System

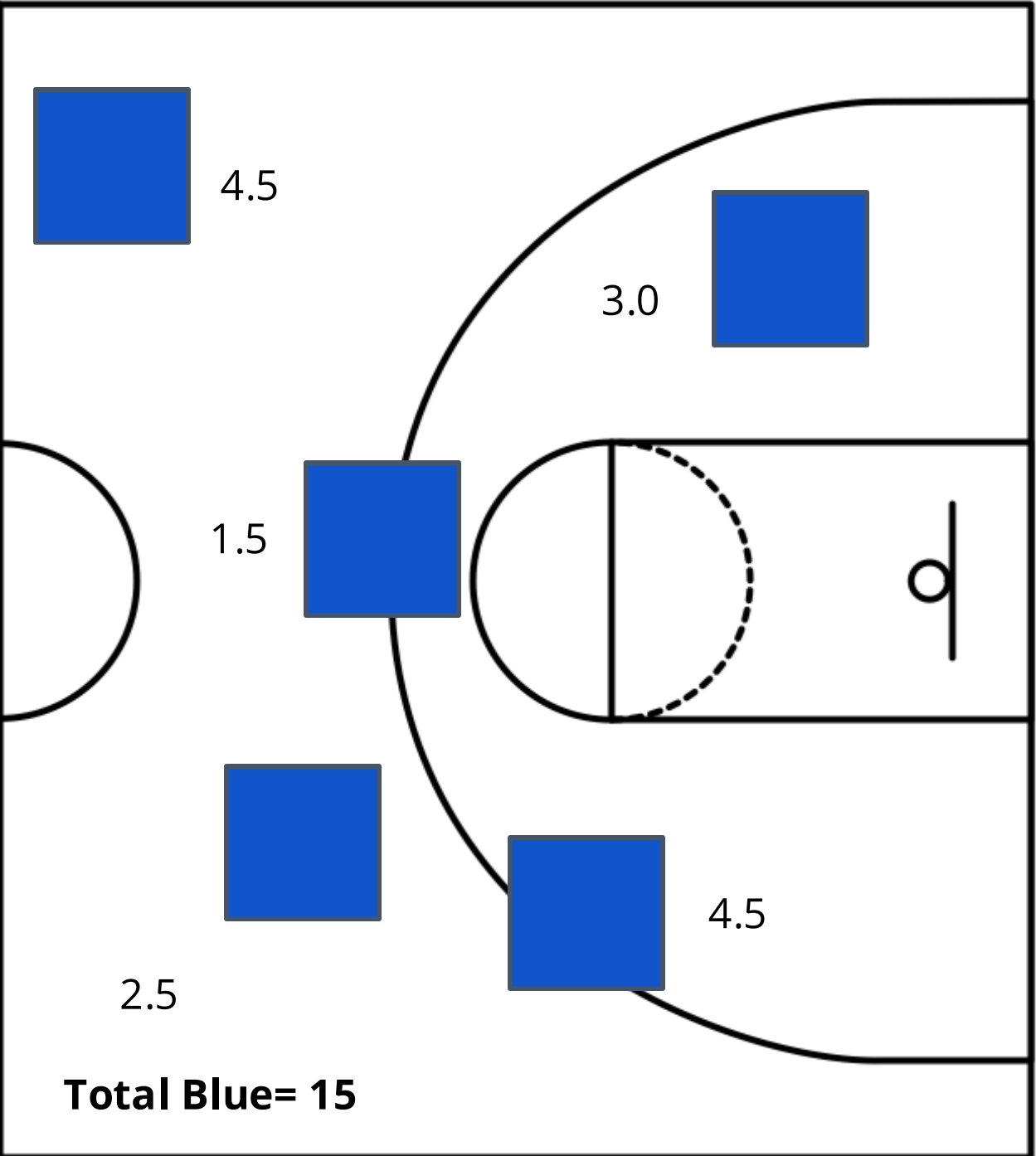
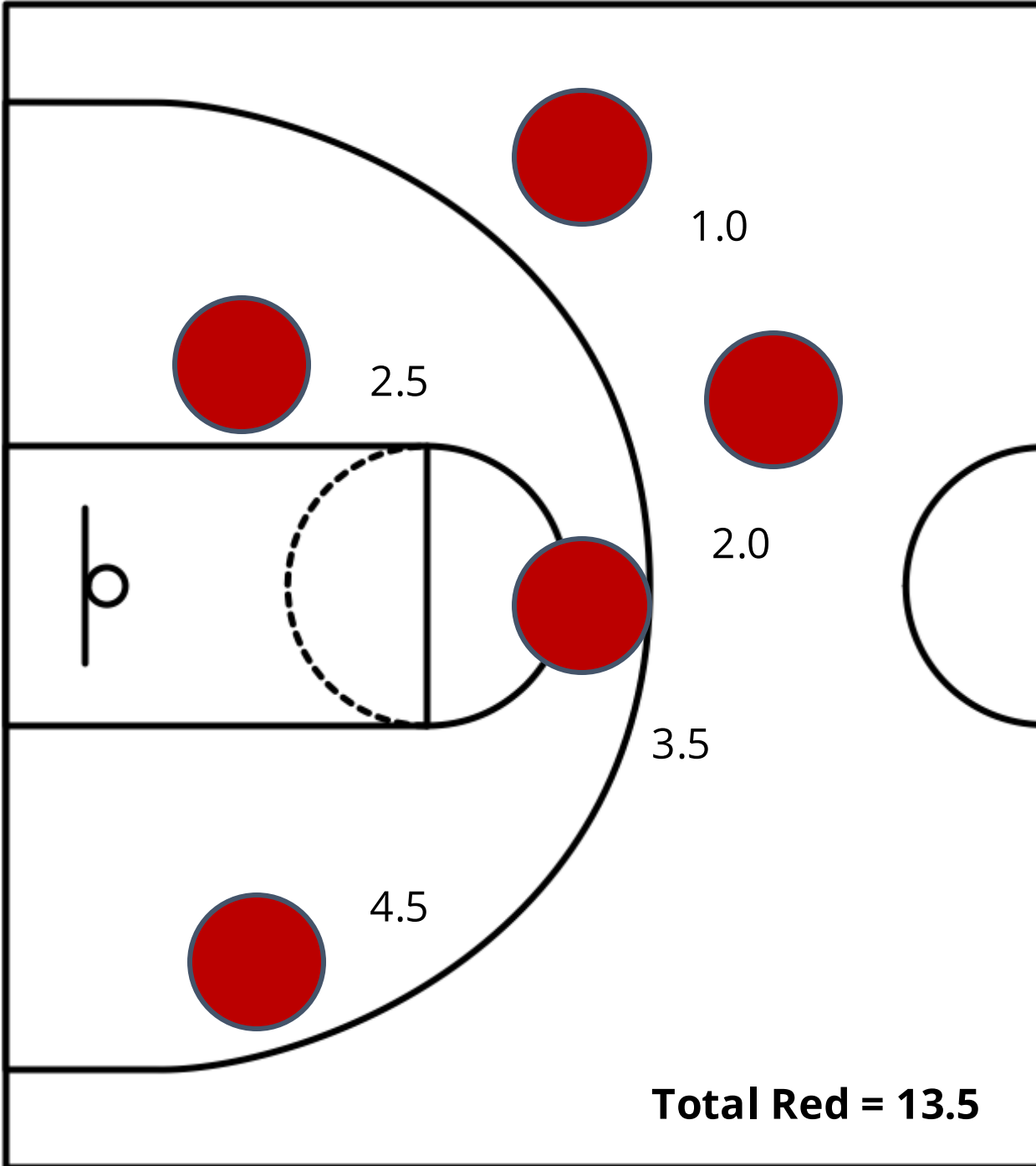
4.5 - Displays the ability to move the trunk maximally in all planes of movement with no significant weakness in any direction, full volume of action in all planes, displays ability to lean to either side during shooting, passing, contesting a shot or trying to intercept a pass.



Point total cannot exceed 15

Total Red = 13.5

Total Blue = 18



How could you make your favorite sport more accessible? Equitable?