GDC | March 20-24, 2023 San Francisco, CA

Adrienne Arsht-Rockefeller Foundation Resilience Center

Atlantic Council

igda Climate SIG

USE YOUR GAME DEVELOPER **SUPERPOWERS** TO FIGHT THE **CLIMATE CRISIS**

#GDC23

Atlantic Council

Adrienne **Arsht-**
Rockefeller Foundation
Resilience Center

Atlantic Council | Adrienne Arsht-Rockefeller Foundation Resilience Center

WHAT ARE OUR GOALS?

MAKE PEOPLE MORE RESILIENT TO CLIMATE IMPACTS

- Work with AAA companies to include **climate and resilient messages/lessons**
- Work to **educate developers** on climate impacts and resilience.
- **Grant money** to indie qualifying titles

WHAT ARE OUR GOALS FOR TODAY?

HELP YOU HELP MAKE A DIFFERENCE

- **Help you understand** the climate crisis and related interventions
- Through both theory and practice, **teach you** fundamental design approaches for effective climate design
- **Empower you** with the knowledge, processes, and considerations you need to get started

WHO ARE WE?

Grant Shonkwiler

Commander & Shonk,
Shonkventures
he/him

Arnaud Fayolle

Art Director,
Ubisoft, Positive Play
he/him

Chance Glasco

Creative Director,
Good Dog Studios
he/him

Paula Escuadra

Sr Design Researcher,
Xbox Game Studios
she/her

Trevin York

Lead Game Designer,
Mindblown Labs
he/him

WHO ARE WE?

Shayne Hayes

Associate Director,
Video Game Initiative
he/him

Nidhi Upadhyaya

Deputy Director,
Strategic Initiatives
and Partnerships
Adrienne Arsht –
Rockefeller Foundation
Resilience Center
she/her

Rosemary Mann

Director,
Strategic Initiatives
and Partnerships,
Adrienne Arsht –
Rockefeller Foundation
Resilience Center
she/her

USE YOUR GAME DEVELOPER SUPERPOWERS TO **FIGHT THE CLIMATE CRISIS**

Join the Climate SIG Discord

tinyurl.com/ClimateSIGGDC

igda®
Climate SIG

INTRODUCING THE DAY

Grant Shonkwiler

Commander & Shonk,
Shonkventures
he/him

Arnaud Fayolle

Art Director,
Ubisoft, Positive Play
he/him

Chance Glasco

Creative Director,
Good Dog Studios
he/him

Paula Escuadra

Sr Design Researcher,
Xbox Game Studios
she/her

Trevin York

Lead Game Designer,
Mindblown Labs
he/him

MindBlown Labs

TRAKID
Explorer Quest

MilliporeSigma

RICHARD MYLES JOHNSON
FOUNDATION

TIAA

T.RowePrice®

Trevin York

Dire Lark

MindBlown Labs

TRAKID
Explorer Quest

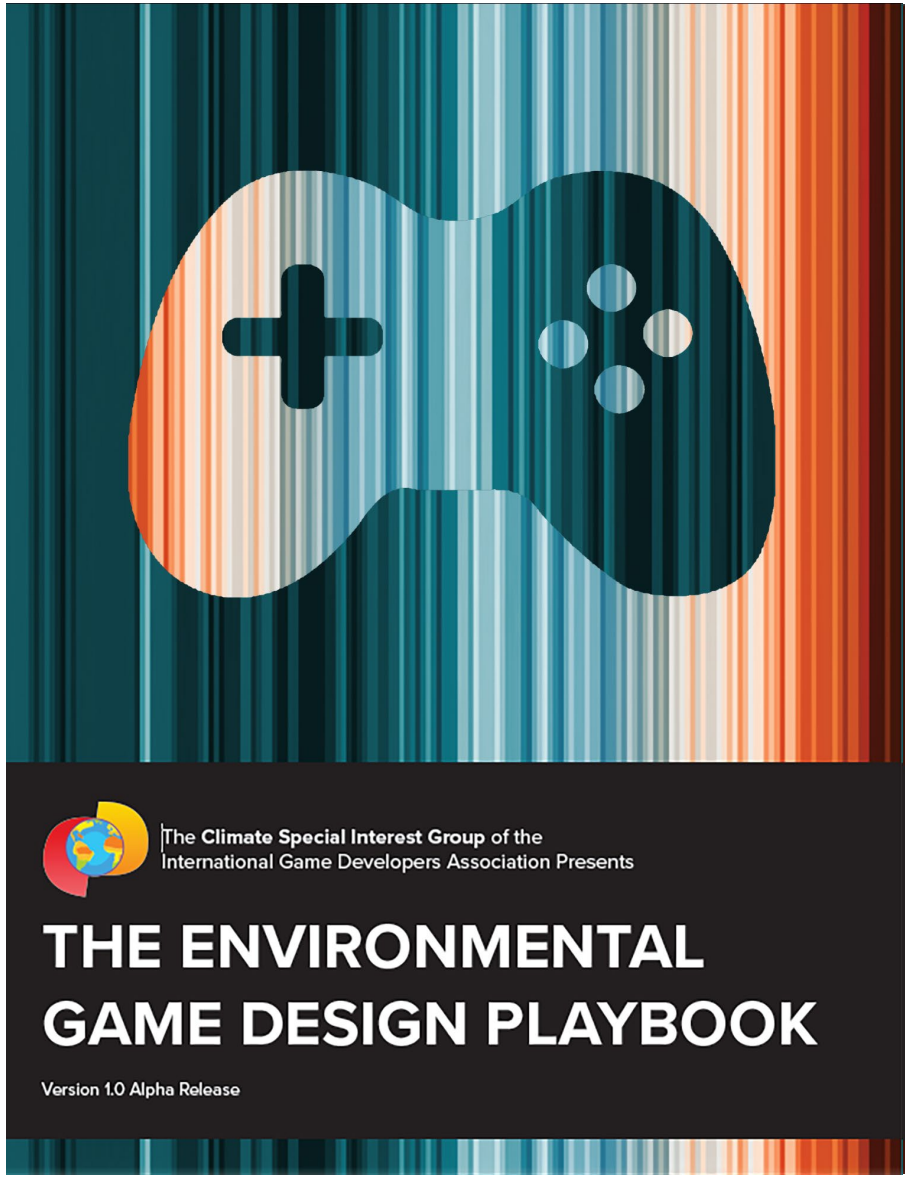
MilliporeSigma

RICHARD MYLES JOHNSON
FOUNDATION

TIAA

T.RowePrice®

Trevin York



igda®
Climate SIG

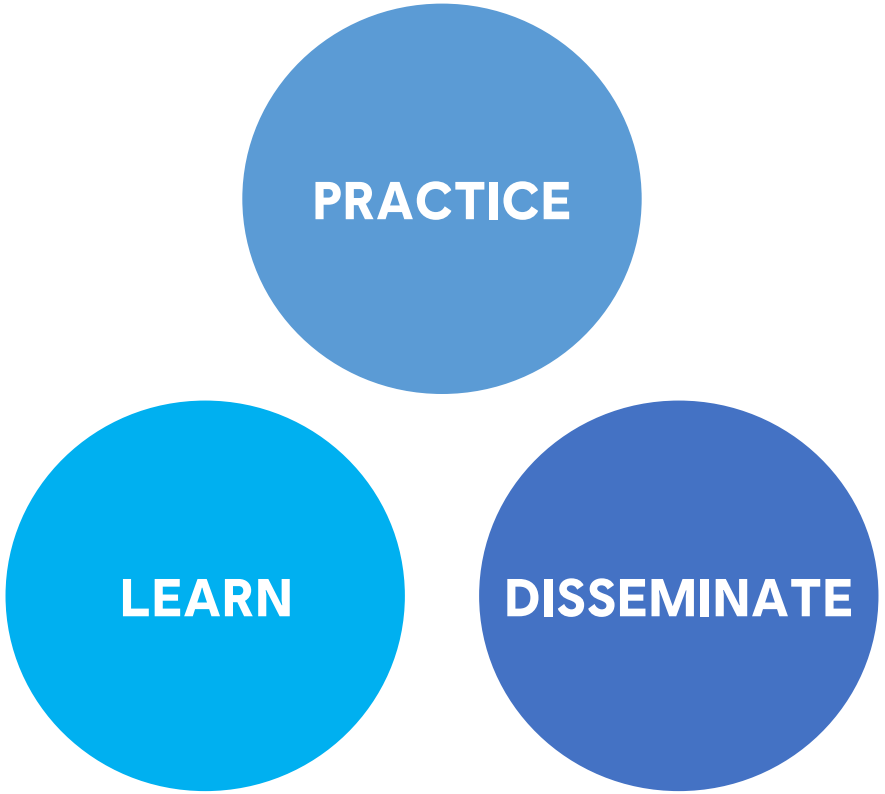
DESIGN FOR CHANGE

THE UNIVERSITY *of* EDINBURGH

Edinburgh College of Art

Transformational Games are those games developed with the intention of changing players in a specific way that transfers and persists beyond the game.

- Sabrina Culyba


PRACTICE
LEARN
DISSEMINATE

OUR TOPICS

Grant Shonkwiler

Arnaud Fayolle

Chance Glasco

Paula Escuadra

Trevin York

OUR TOPICS

Grant Shonkwiler

Exploring Climate Impacts

Arnaud Fayolle

Climate Game Toolkit For Content Creators

Chance Glasco

Examples of Climate Design

Paula Escuadra

Let's Build A Theory of Action

Trevin York

Designing Games That Transform Players

OUR TOPICS

Grant Shonkwiler

Exploring Climate Impacts

Arnaud Fayolle

Climate Game Toolkit For Content Creators

Chance Glasco

Examples of Climate Design

Paula Escuadra

Let's Build A Theory of Action

Trevin York

Designing Games That Transform Players

OUR TOPICS

Grant Shonkwiler

Exploring Climate Impacts

Arnaud Fayolle

Climate Game Toolkit For Content Creators

Chance Glasco

Examples of Climate Design

Paula Escuadra

Let's Build A Theory of Action

Trevin York

Designing Games That Transform Players

OUR TOPICS

Grant Shonkwiler

Exploring Climate Impacts

Arnaud Fayolle

Climate Game Toolkit For Content Creators

Chance Glasco

Examples of Climate Design

Paula Escuadra

Let’s Build A Theory of Action

Trevin York

Designing Games That Transform Players

OUR TOPICS

Grant Shonkwiler

Exploring Climate Impacts

Arnaud Fayolle

Climate Game Toolkit For Content Creators

Chance Glasco

Examples of Climate Design

Paula Escuadra

Let's Build A Theory of Action

Trevin York

Designing Games That Transform Players

YOUR TASK

Grant Shonkwiler

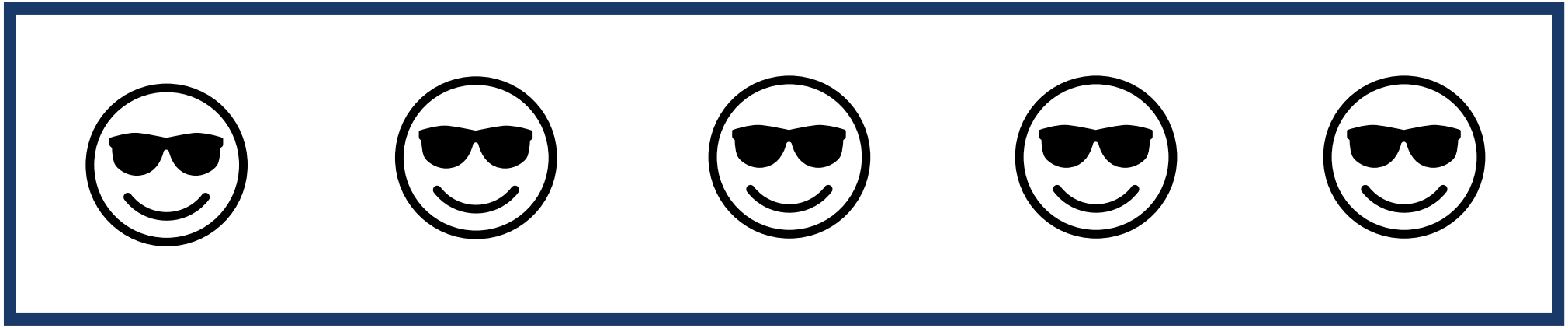
Arnaud Fayolle

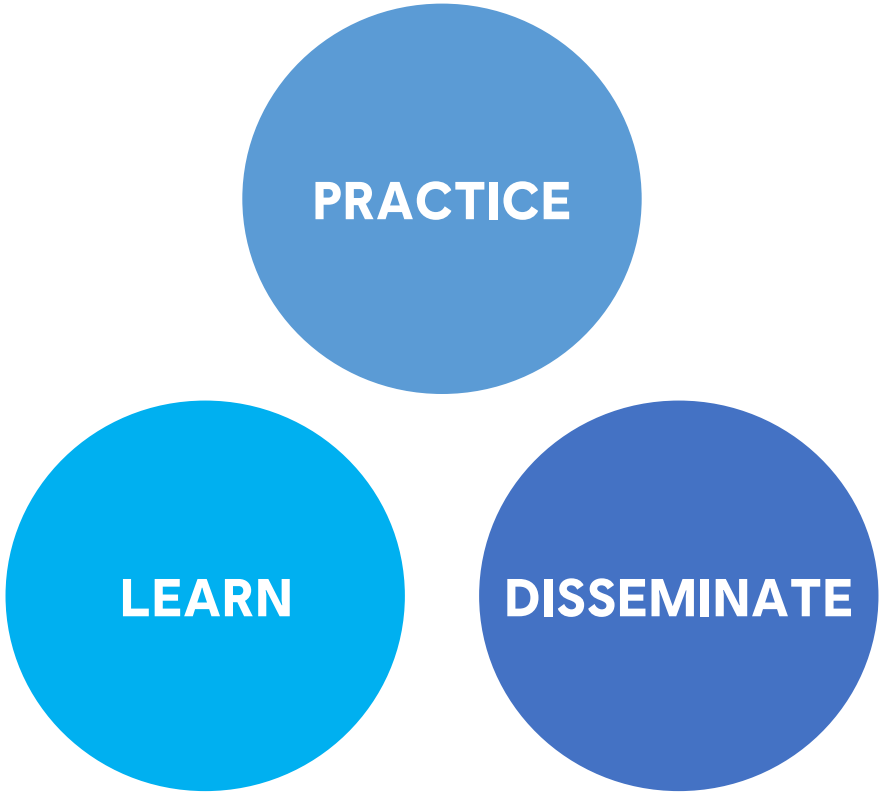
Chance Glasco

Paula Escuadra

Trevin York

All of you!




PRACTICE
LEARN
DISSEMINATE

DOES ANYTHING WE DO MATTER?

Los Angeles Times

CLIMATE & ENVIRONMENT

As California drought retreats, threat of spring flooding rises

Workers use shovels to clear storm drains at a flooded orchard in Porterville, Calif., recently. (Gina Ferazzi / Los Angeles Times)

BY HAYLEY SMITH | STAFF WRITER

MARCH 17, 2023 5 AM PT

Seriousness Playfulness

-Dr. Joost Vervoort

Seriousness

Playfulness

Los Angeles Times

Latest on drought | Storms ease drought | Lawn and other guides | Restriction rules | Tracking the drought

CLIMATE & ENVIRONMENT

As California drought retreats, threat of spring flooding rises

Workers use shovels to clear storm drains at a flooded orchard in Porterville, Calif., recently. (Gina Ferazzi / Los Angeles Times)

BY HAYLEY SMITH | STAFF WRITER

MARCH 17, 2023 5 AM PT

-Dr. Joost Vervoort

Los Angeles Times

Latest on drought | Storms ease drought | Lawn and other guides | Restriction rules | Tracking the drought

CLIMATE & ENVIRONMENT

As California drought retreats, threat of spring flooding rises

Workers use shovels to clear storm drains at a flooded orchard in Porterville, Calif., recently. (Gina Ferazzi / Los Angeles Times)

BY HAYLEY SMITH | STAFF WRITER

MARCH 17, 2023 5 AM PT

Seriousness ⟷ Playfulness

-Dr. Joost Vervoort

Los Angeles Times

Latest on drought | Storms ease drought | Lawn and other guides | Restriction rules | Tracking the drought

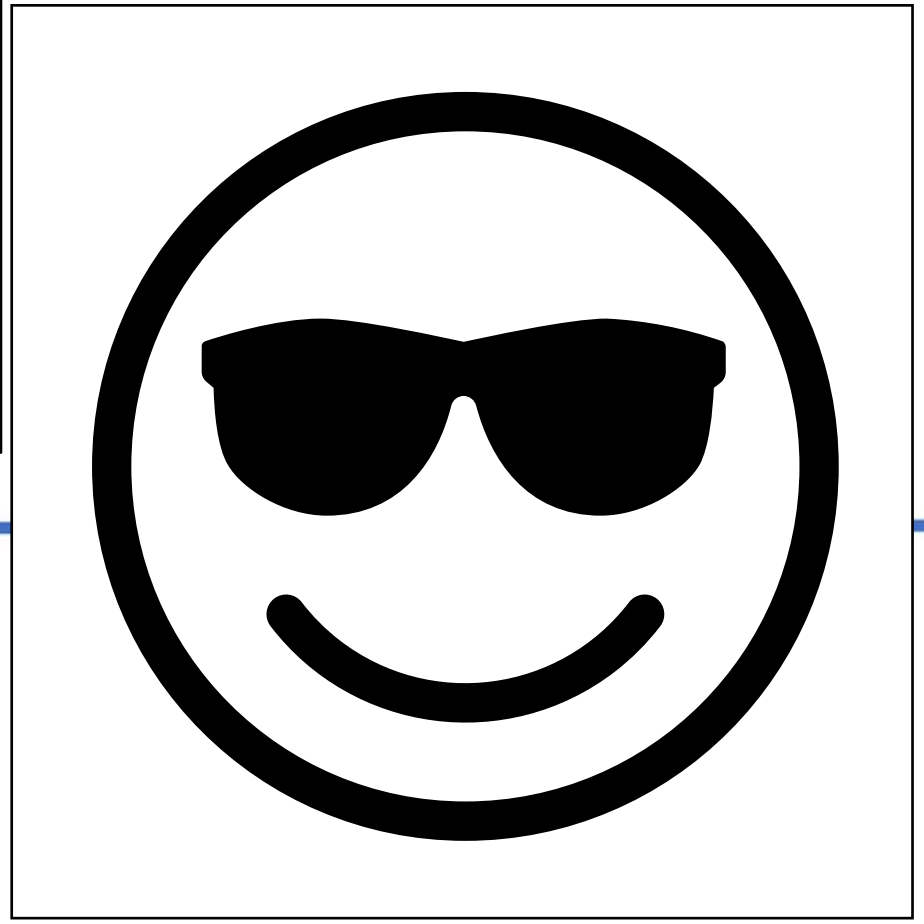
CLIMATE & ENVIRONMENT

As California drought retreats, threat of spring flooding rises

Workers use shovels to clear storm drains at a flooded orchard in Porterville, Calif., recently. (Gina Ferazzi / Los Angeles Times)

BY HAYLEY SMITH | STAFF WRITER
MARCH 17, 2023 5 AM PT

Seriousness



Playfulness

-Dr. Joost Vervoort

Los Angeles Times

Latest on drought | Storms ease drought | Lawn and other guides | Restriction rules | Tracking the drought

CLIMATE & ENVIRONMENT

As California drought retreats, threat of spring flooding rises

Workers use shovels to clear storm drains at a flooded orchard in Porterville, Calif., recently. (Gina Ferazzi / Los Angeles Times)

BY HAYLEY SMITH | STAFF WRITER

MARCH 17, 2023 5 AM PT

Seriousness ⟷ Playfulness

-Dr. Joost Vervoort

Los Angeles Times

Latest on drought | Storms ease drought | Lawn and other guides | Restriction rules | Tracking the drought

CLIMATE & ENVIRONMENT

As California drought retreats, threa
spring flooding rises

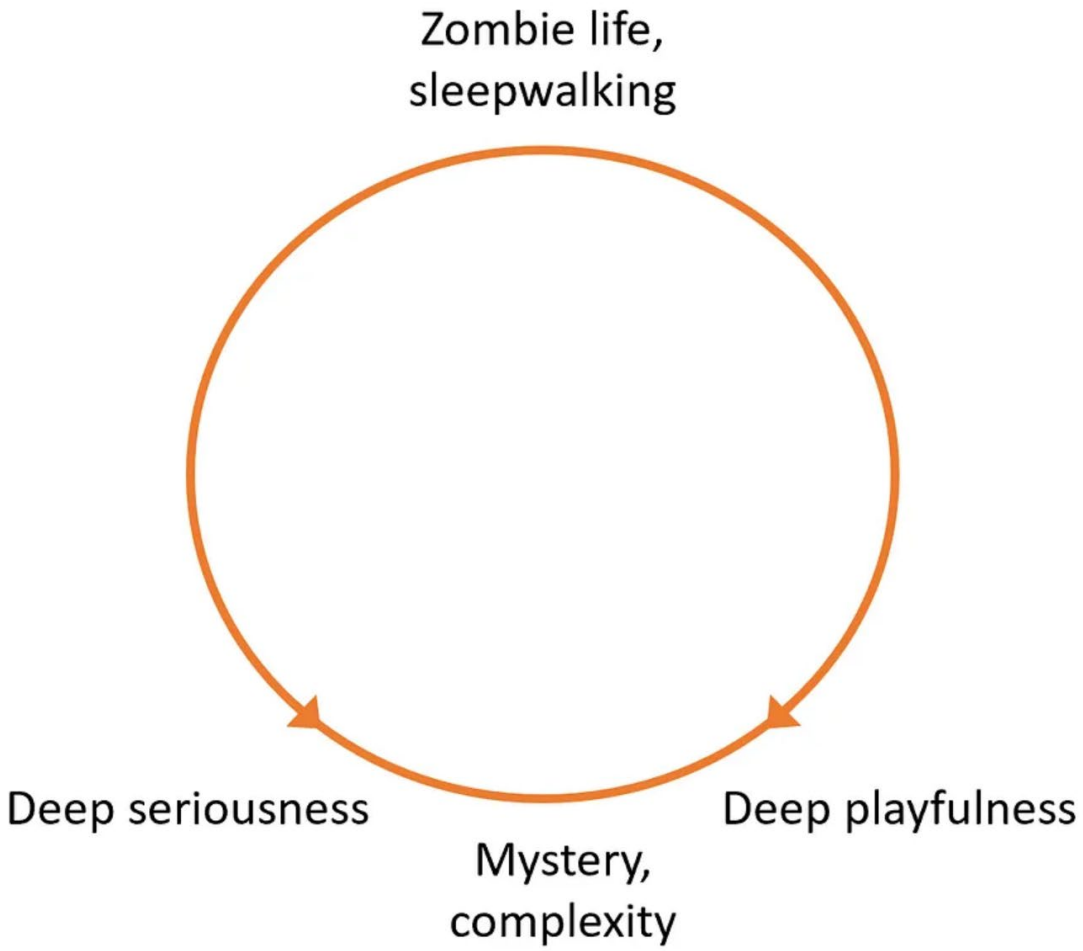
Workers use shovels to clear storm drains at a flooded orchard in Porterville, Calif., recently. (Gina Ferazzi / Los Angeles Times)

BY HAYLEY SMITH | STAFF WRITER
MARCH 17, 2023 5 AM PT

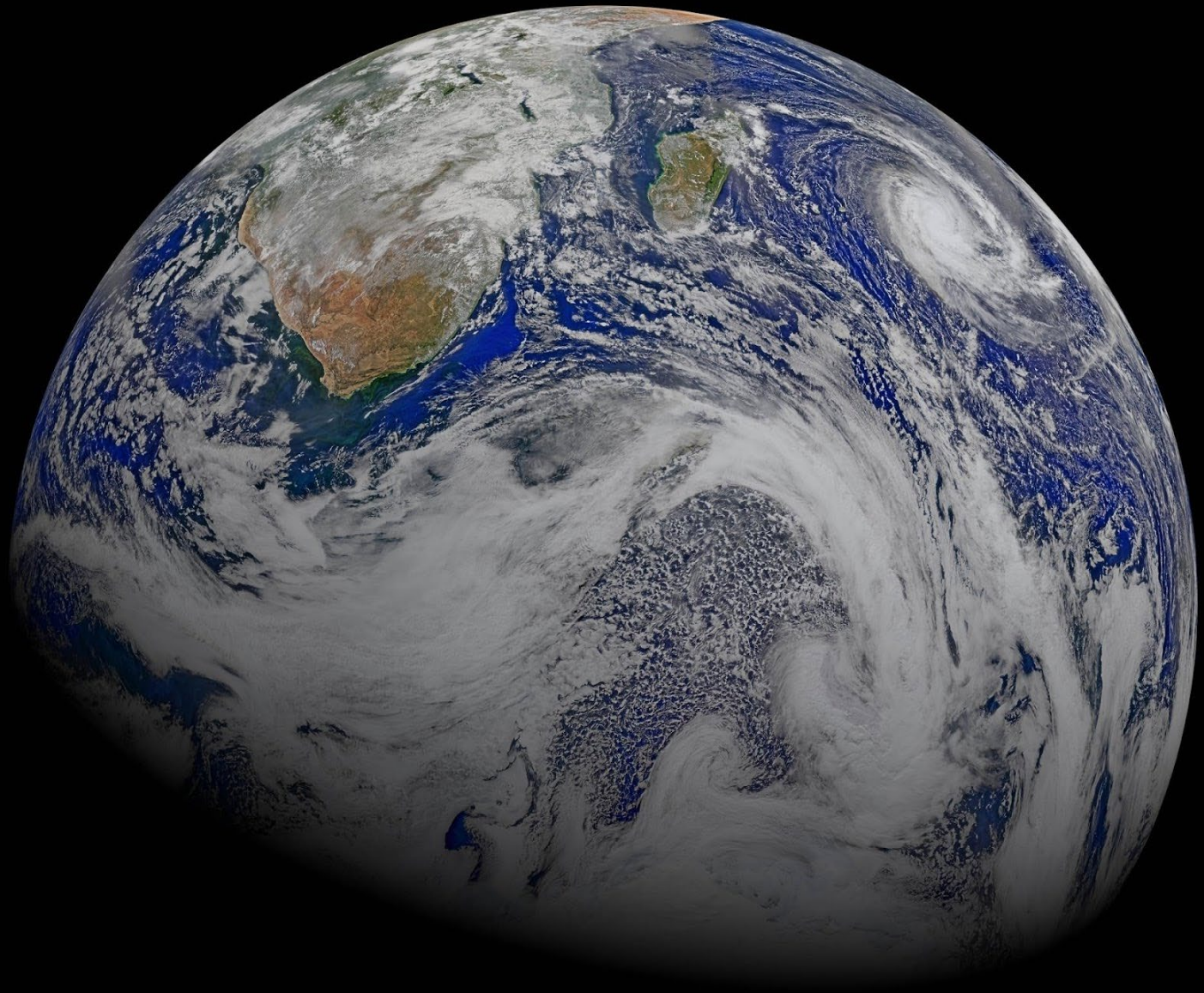
Seriousness ← → Playfulness

-Dr. Joost Vervoort

More useful – deep seriousness and playfulness as closely related



Vervoort, J. (2022) *Deep seriousness and deep playfulness are not opposites*, Anticiplay. Available at: https://anticiplay.medium.com/deep-seriousness-and-deep-playfulness-are-not-opposites-c57ee718105



THANK YOU!

NEXT PART

1

EXPLORING
CLIMATE IMPACTS

Grant SHONKWILER

GDC | March 20-24, 2023 San Francisco, CA

Adrienne Arsht-Rockefeller Foundation Resilience Center

Atlantic Council

igda Climate SIG

Use Your **Game Developer Superpowers** to Fight the **Climate Crisis**

1

EXPLORING

CLIMATE IMPACTS

Grant SHONKWILER

#GDC23

Grant Shonkwiler

Production/Leadership Consultant @ Shonkventures
Senior Fellow @ AARFRC-Atlantic Council
Former Producer: Epic Games, id Software, Megatouch Games
Former Lead Designer & Programmer
Shipped 65+ games
20 years making games, 13 professionally

Plan/Agenda

Intro

Focus

20 minutes of presentation

10 minutes of group breakouts to brainstorm ideas

Shout it out

What are Climate Impacts?

Any downstream effect of Climate Change

- Heatwaves
- Flooding and Drought Cycles
- Ocean Destruction
- Air Pollution
- Food & Water Security
- Financial
- Migration

Heatwaves

Heatwaves - Forest Fires

- **Interventions: Understanding of how forest fires start, Understanding of how to prevent them, Understanding how to escape them**

Heatwaves - Heat Islands

- **Interventions: Urban Forests, Urban Horticulture**

Heatwaves - Urban Heatwaves

- **Interventions: Heat Action Plan, Educate the Populus, Educate Policy Makers**

Heatwaves - Construction Site/Laborers

- **Interventions: Manage Exposure, Educate on Symptoms, Educate on Treatments**

Heatwaves - Poor Construction Practices

- **Interventions: Urban Planning, Identifying heat radiating materials, LEED and Green building practices**

Heatwaves - Urban Disasters

- **Interventions: Trained Emergency Services, Disaster Kits**

Heatwaves - Poor Access to Drinking Water

- **Interventions: Access to clean drinking water**

Heatwaves - Human Health Effects

- **Interventions: Access to public healthcare, Information on new illnesses**

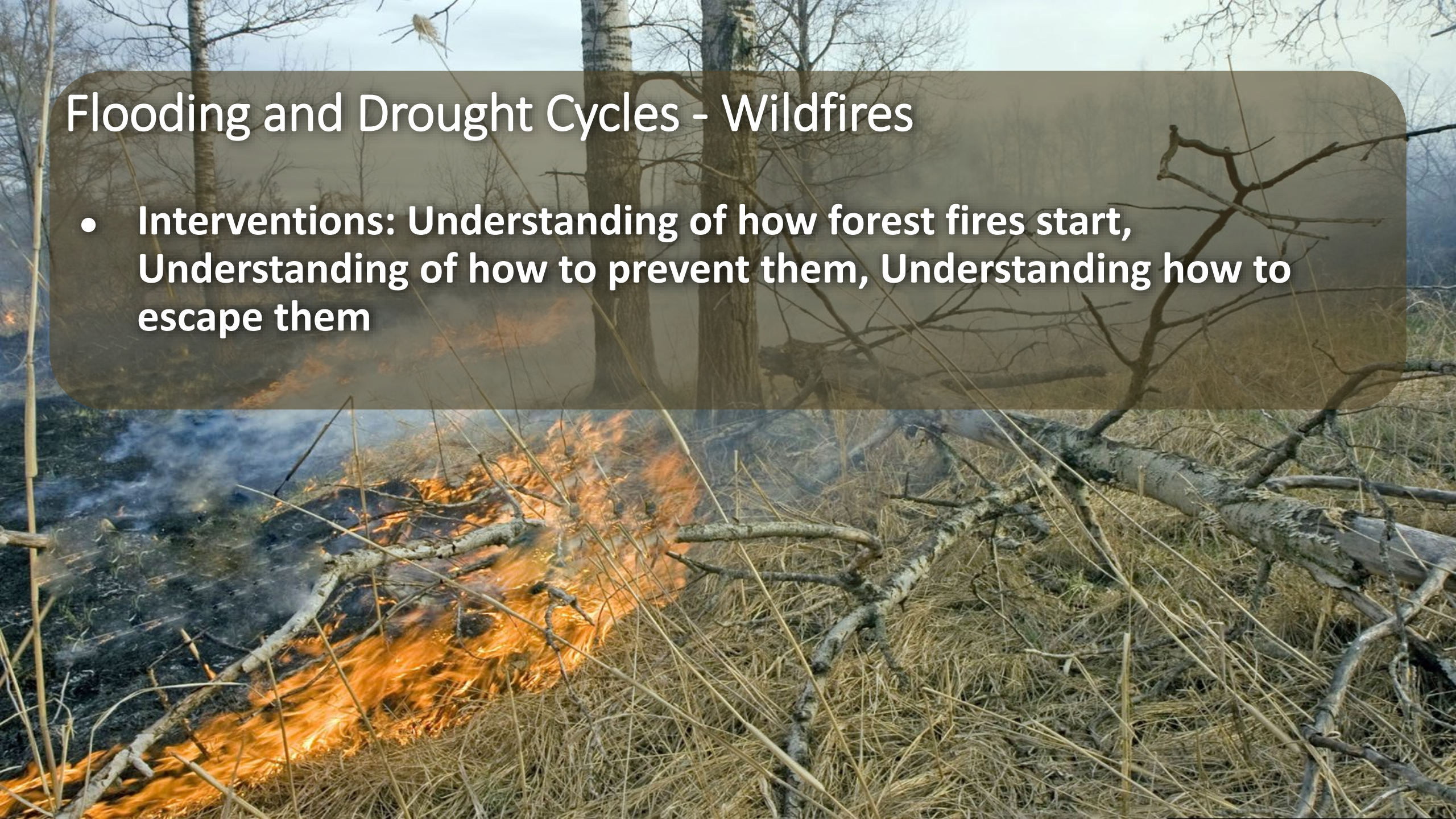
Heatwaves - Poor Communication

- **Intervention: Communication strategy**

Flooding and Drought Cycles

Flooding and Drought Cycles - Wildfires

- **Interventions: Understanding of how forest fires start, Understanding of how to prevent them, Understanding how to escape them**



Flooding and Drought Cycles - Water Shortage

- **Interventions: Urban Horticulture, Drip irrigation, Plumbing, Water Rationing, Rainwater Collection**

Flooding and Drought Cycles - Urban flooding

- **Interventions: Urban Planning, Drainage Networks**

Oceans

Oceans - Damage to Wetlands & Infrastructure

- Interventions: Planting wetlands, Understanding their benefits

Oceans - Island Nations

- **Interventions: Urban planning, Preparing for floods, tsunamis, rising water levels**

Oceans - Fish/Aquatic Life Conservation/Coral Reefs

- **Interventions: Gaining awareness of the damage, Learning ways to reduce and reverse the damage, Simple things like ocean safe sunscreen**

Oceans - Hurricanes

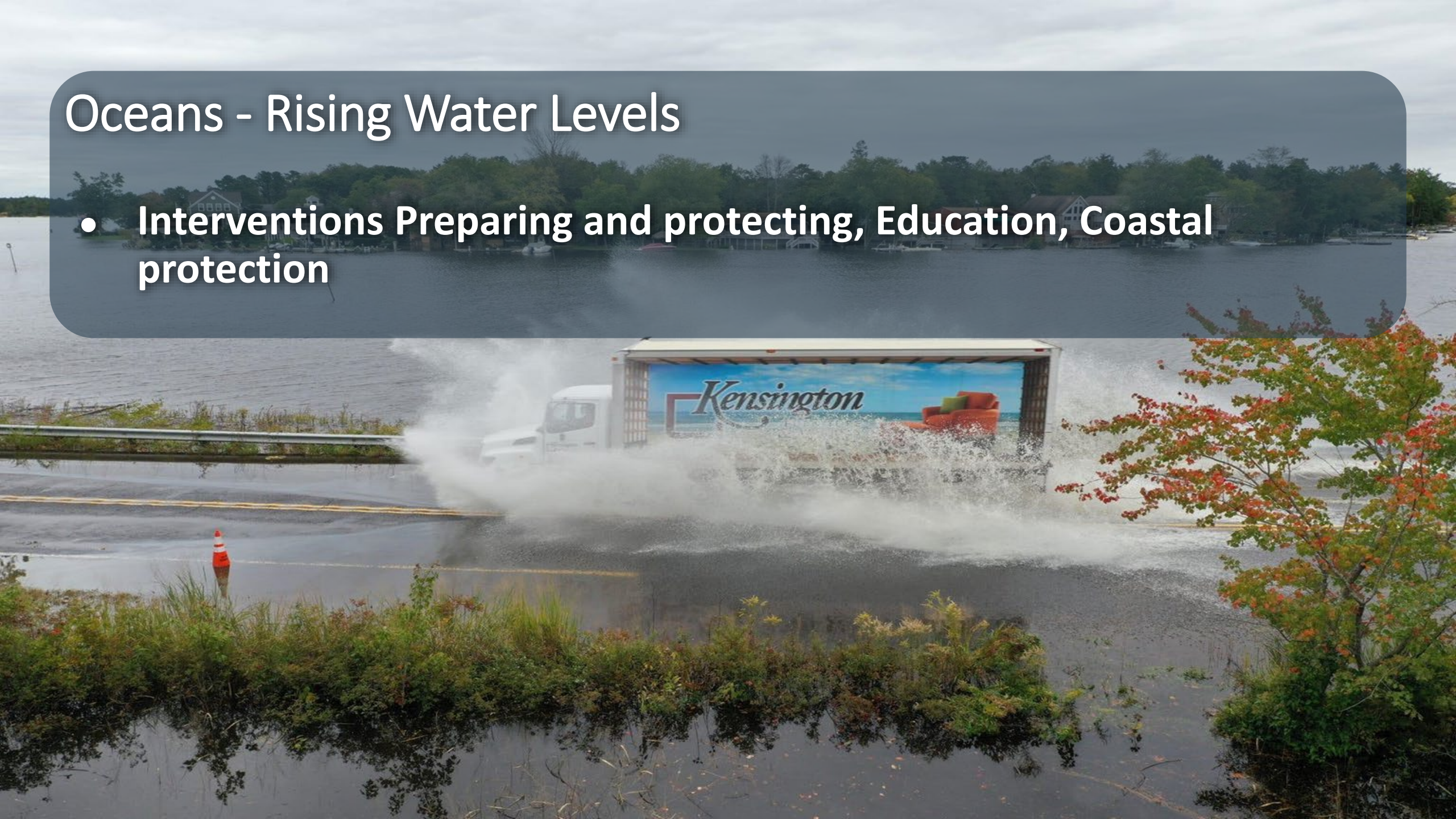
- **Hurricane: Preparing and organizing, Education, Disaster Kits**

Oceans - Water Pollution

- **Interventions: Managing water temperatures, Increased laws around disease-causing agents, Education on water quality**

Oceans - Rising Water Levels

- **Interventions Preparing and protecting, Education, Coastal protection**



Food & Water Security

Food & Water Security - Land

- **Intervention: Proper Land management, Proper crop rotation, Understanding how a changing climate impacts the soil and nutrients present in it.**

Food & Water Security - Agricultural Yield

- **Intervention: Proper Land management, Proper crop rotation, Understanding how a changing climate impacts the soil and nutrients present in it, Gardening, Indoor Agriculture**

Finance

Finance - Wildfires & RECA Tool

- **Interventions: Understanding the causes of wildfires and how to prevent them, Proper Evacuation Plans, Using RECA to plan for financial impacts**

Migration

Migration - Mass Migration

- **Interventions: Awareness of Mass Migration, Welcoming Countries, Understanding what causes it**

Migration - Vulnerable Communities/Slums

- **Interventions: Education on the areas, Education for the people, Basic Housing and Sanitation**

Migration - Human Trafficking

- **Interventions: Awareness of Human Trafficking, Laws, Training Professionals to help reintegrate trafficked people**

Migration - Hosts for Migrants

- **Interventions: Welcoming Countries, Livelihood Tools, Financial Support**

Migration - Personal Security

- **Interventions: Making MIgration Safe, Teaching Self Defense/Protection**

Migration - Animal Migration

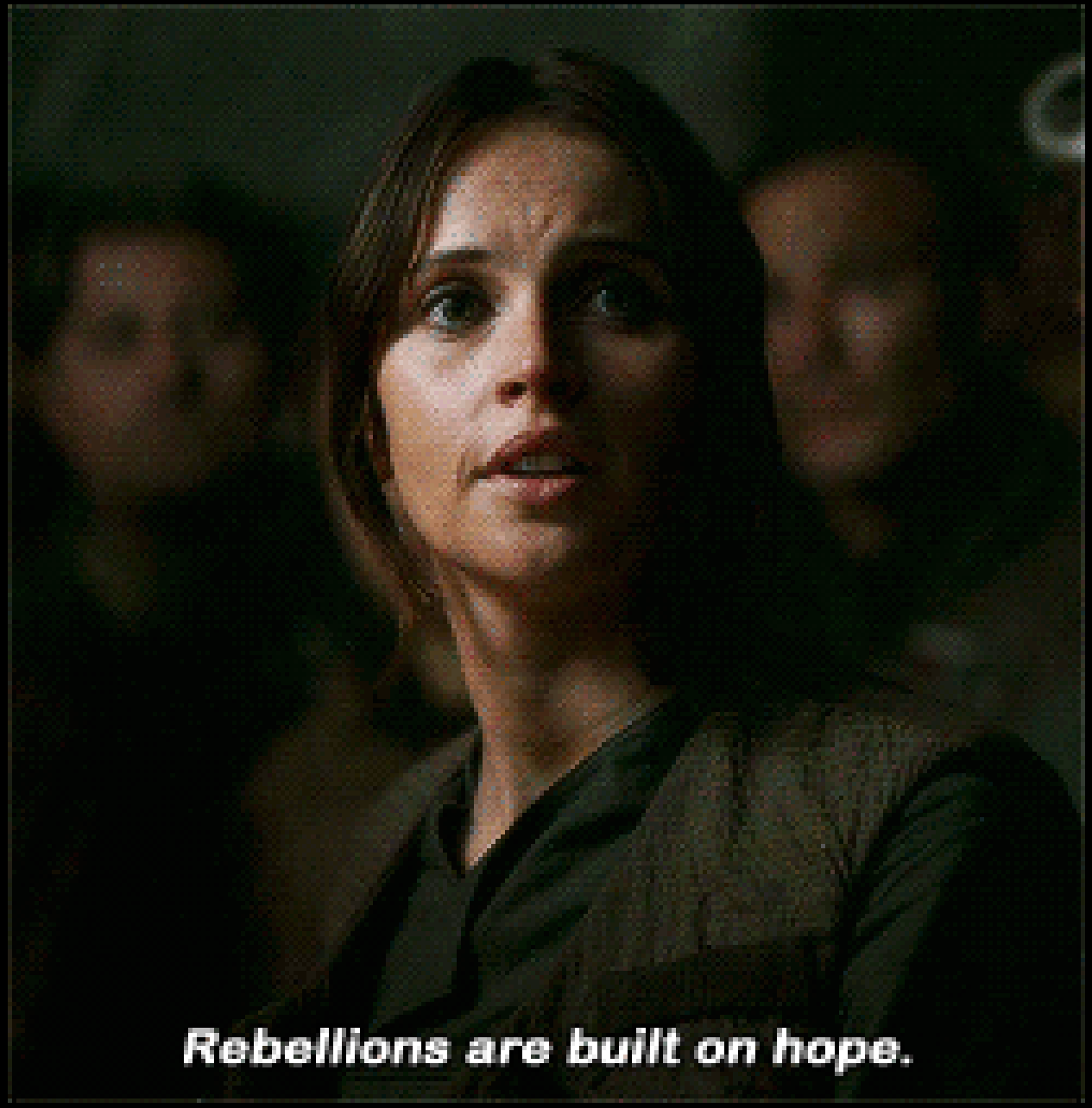
Migration - Water Scarcity

- **Interventions: Learning how to conserve water, Awareness of issues with lack of water.**

Migration - Terrible Working Conditions

- **Intervention: Understanding abuse of migrants in workplaces**

Hope



Atlantic Council

Adrienne Arsht-Rockefeller Foundation Resilience Center

igda Climate SIG

Use Your Game Developer Superpowers to Fight the Climate Crisis

1 BREAKOUT

For More Info on Interventions go to

tinyurl.com/ClimateInter

Image darkened and used with permission under CC2.0 from https://commons.wikimedia.org/wiki/File:Amazon_Downpour_-_Flickr_-_treegrow.jpg

THANK YOU!

NEXT PART

2 CLIMATE GAME TOOLKIT
FOR CONTENT CREATORS

Arnaud FAYOLLE

GDC March 20-24, 2023 San Francisco, CA

Adrienne Arsht-Rockefeller Foundation Resilience Center

Atlantic Council

igda Climate SIG

Use Your **Game Developer Superpowers** to Fight the **Climate Crisis**

2 CLIMATE GAME TOOLKIT

FOR CONTENT CREATORS

Arnaud FAYOLLE

#GDC23

FORZA HORIZON 4
FORZA HORIZON 4 FORTUNE ISLAND
RESIDENT EVIL Operation Raccoon City
AGE OF EMPIRES Castle Siege
CRIMINAL CASE
MIGHT & MAGIC HEROES VI SHADES OF DARKNESS
Disney INFINITY
DEUS EX MANKIND DIVIDED
FORZA HORIZON 4 LEGO SPEED CHAMPIONS
Disney EPIC MICKEY THE POWER OF 2
FORZA HORIZON 3
FORZA HORIZON 3 HOT WHEELS
TOM CLANCY'S GHOST RECON ONLINE
FORZA HORIZON 3 BLIZZARD MOUNTAIN
RAINBOW SIX
Wii
PS4
KILLZONE SHADOW FALL
FINAL FANTASY X | X2 HD REMASTER
KNACK
TOM CLANCY'S THE DIVISION 2
TOM CLANCY'S THE DIVISION 2 WARLORDS OF NEW YORK EXPANSION
TOM CLANCY'S GHOST RECON FUTURE SOLDIER
THE WITCHER
METRO CONFLICT
FANG
Disney INFINITY PLAY WITHOUT LIMITS 2.0
BATMAN ARKHAM ORIGINS
THE LAST OF US
Only On PlayStation.
NAUGHTY DOG
ARNAUD FAYOLLE (He/him)
ART DIRECTOR – UBISOFT
IGDA Climate SIG
UBISOFT POSITIVE PLAY
PLAYING FOR THE PLANET

NOW YOU KNOW
WHY WE MUST ADAPT TO CLIMATE CHANGE

WE WANT TO HELP!
Progressive
Complex Problem Solvers
Want to keep making games!

WHAT CAN GAMES DO FOR CLIMATE?

WHO CAN MAKE A DIFFERENCE?

HOW CAN GAMES POSITIVELY IMPACT CLIMATE ?

WHAT CAN GAMES DO FOR CLIMATE?

OUR AREAS OF IMPACT

CULTURAL INFLUENCE

Maximize our cultural impact

CARBON INFLUENCE

Minimize our environmental impact

WHO CAN MAKE A DIFFERENCE?

THE GAME INDUSTRY'S KEY PLAYERS

CULTURAL INFLUENCE

Maximize our cultural impact

CARBON INFLUENCE

Minimize our environmental impact

HOW CAN GAMES POSITIVELY IMPACT CLIMATE?

TOOLKIT FOR CONTENT CREATORS

HOW CAN GAMES POSITIVELY IMPACT CLIMATE?

TOOLKIT FOR CONTENT CREATORS

MESSAGE

WHY IT MATTERS

- Every **creative product** convey one or multiple **messages**
- Ignoring it often **default to destructive messages** (colonialism, capitalism, domination…)
- Weaving **relevant themes** in narratives can turn every game into a **force for good**
- The more **engaging** the game is, the more **attention** players pay to the message

Never Alone (Upper One Game / E-line media, 2014)

MESSAGE

HOW TO USE IT?

- Tell stories from **climate front lines**

Never Alone (Upper One Game / E-line media, 2014)

MESSAGE

HOW TO USE IT?

- Tell stories from **climate front lines**
- Raise **awareness** about unfamiliar topics

Save a Rhino (Hello There, 2014)

MESSAGE

HOW TO USE IT?

- Tell stories from **climate front lines**
- Raise **awareness** about unfamiliar topics
- **Educate** in fun, non-judgmental ways

Beyond Blue (E-line media, 2020)

MESSAGE

HOW TO USE IT?

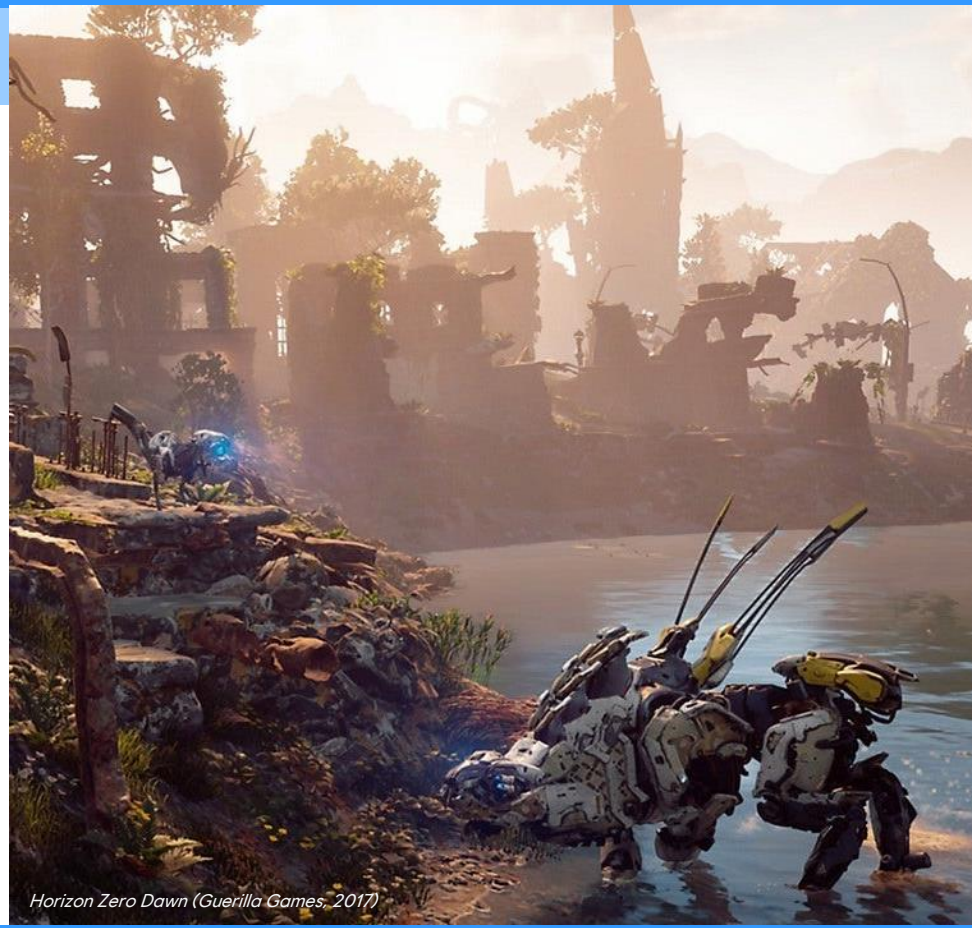
- Tell stories from **climate front lines**
- Raise **awareness** about unfamiliar topics
- **Educate** in fun, non-judgmental ways
- **Restore trust** in others to foster a culture of collaboration

Signs of the Sojourner (Echo Night Games, LLC, Bromio, 2020)

MESSAGE

HOW TO USE IT?

- Tell stories from **climate front lines**
- Raise **awareness** about unfamiliar topics
- **Educate** in fun, non-judgmental ways
- **Restore trust** in others to foster a culture of collaboration
- Describe Climate Change as a **legitimate threat to humanity**



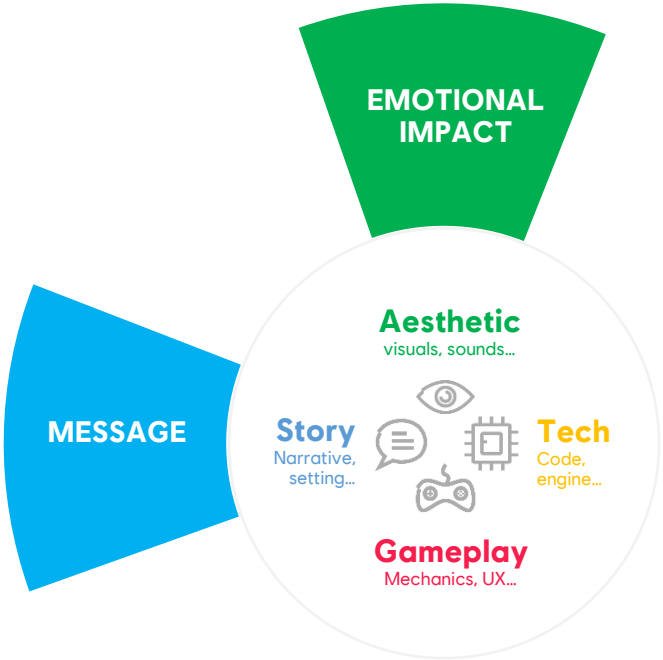
Horizon Zero Dawn (Guerilla Games, 2017)

MESSAGE

HOW TO USE IT?

- Tell stories from **climate front lines**
- Raise **awareness** about unfamiliar topics
- **Educate** in fun, non-judgmental ways
- **Restore trust** in others to foster a culture of collaboration
- Describe Climate Change as a **legitimate threat to humanity**
- Instil **indirect messages** in games labelled as pure escapism

The Outer Worlds (Obsidian Entertainment / Private Division, 2019)


EMOTIONAL IMPACT
MESSAGE
Aesthetic
visuals, sounds...
Story
Narrative, setting...
Tech
Code, engine...
Gameplay
Mechanics, UX...

EMOTIONAL IMPACT

WHY IT MATTERS

- *"The role of the artist is to make revolution irresistible"*
  (Toni Cade Bambara)

- Emotions make **abstract** or **remote events relatable** on a personal level

- Emotions **drive decision-making** more than cognition

Gibbons: Beyond the trees (Broken Rules, 2022)

EMOTIONAL IMPACT

HOW TO USE IT?

- Leverage **aesthetics codes** to increase the message impact

Gibbons: Beyond the trees (Broken Rules, 2022)

EMOTIONAL IMPACT

HOW TO USE IT?

- Leverage **aesthetics codes** to increase the message impact

- Associate **desirable outcomes** with ***feel-good*** aesthetics

Terra Nil (11 bits, 2022)

EMOTIONAL IMPACT

HOW TO USE IT?

- Leverage **aesthetics codes** to increase the message impact
- Associate **desirable outcomes** with ***feel-good*** aesthetics
- Associate **destructive trends** with **unsettling** aesthetics

Final Fantasy VII Remake (Square Enix, 2020)

EMOTIONAL IMPACT

HOW TO USE IT?

- Leverage **aesthetics codes** to increase the message impact
- Associate **desirable outcomes** with ***feel-good*** aesthetics
- Associate **destructive trends** with **unsettling** aesthetics
- Engage players around **hard topics** by making them **visually appealing**

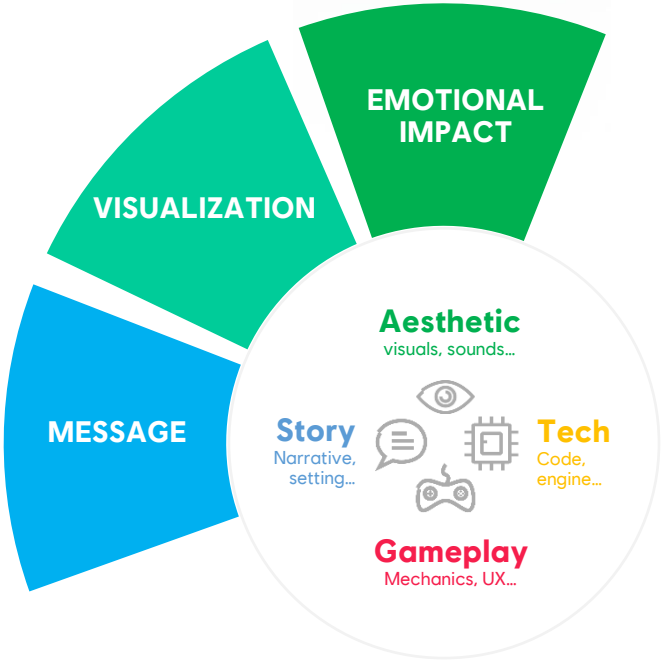
GRIS (Nomad studio, blitzworks, 2018)

EMOTIONAL IMPACT

HOW TO USE IT?

- Leverage **aesthetics codes** to increase the message impact
- Associate **desirable outcomes** with ***feel-good*** aesthetics
- Associate **destructive trends** with **unsettling** aesthetics
- Engage players around **hard topics** by making them **visually appealing**
- Make players **want to care** & reflect on the **meaning of life**

Firewatch (Campo Santo, 2016)


EMOTIONAL IMPACT
VISUALIZATION
MESSAGE
Aesthetic
visuals, sounds...
Story
Narrative, setting...
Tech
Code, engine...
Gameplay
Mechanics, UX...

VISUALISATION / REPRESENTATION

WHY IT MATTERS

- It's **hard to imagine** things we've **never seen**
- Our brains don't relate to **long-term** or **geographically distant** problems
- Give players **a vision to embrace** and make their own

Overwatch (Blizzard Entertainment, 2016)

VISUALISATION / REPRESENTATION

HOW TO USE IT?

- Show what a **regenerative future** looks like

Overwatch (Blizzard Entertainment, 2016)

VISUALISATION / REPRESENTATION

HOW TO USE IT?

- Show what a **regenerative future** looks like
- Illustrate **what's at stake** if we don't act

Plasticity (Plasticity Games, 2019)

VISUALISATION / REPRESENTATION

HOW TO USE IT?

- Show what a **regenerative future** looks like
- Illustrate **what's at stake** if we don't act
- Inspire and **normalize** sustainable ways of living

Cities: Skyline - Green Cities (Colossal Order Ltd, 2017)

VISUALISATION / REPRESENTATION

HOW TO USE IT?

- Show what a **regenerative future** looks like
- Illustrate **what's at stake** if we don't act
- Inspire and **normalize** sustainable ways of living

Forza Horizon 4 (Playground Games, 2018)

VISUALISATION / REPRESENTATION

HOW TO USE IT?

- Show what a **regenerative future** looks like
- Illustrate **what's at stake** if we don't act
- Inspire and **normalize** sustainable ways of living
- Represent **happiness** that's **not relying on consumerism**

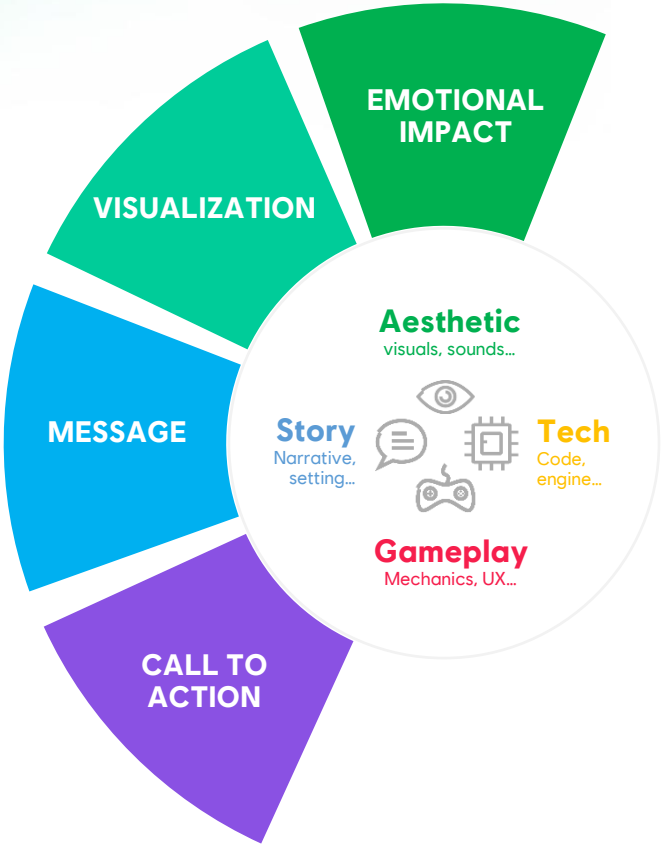
Stardew Valley (Eric Barone, 2016)

VISUALISATION / REPRESENTATION

HOW TO USE IT?

- Show what a **regenerative future** looks like
- Illustrate **what's at stake** if we don't act
- Inspire and **normalize** sustainable ways of living
- Represent **happiness** that's **not relying on consumerism**
- Inspire **reconnecting with Nature** by showing its **beauty**

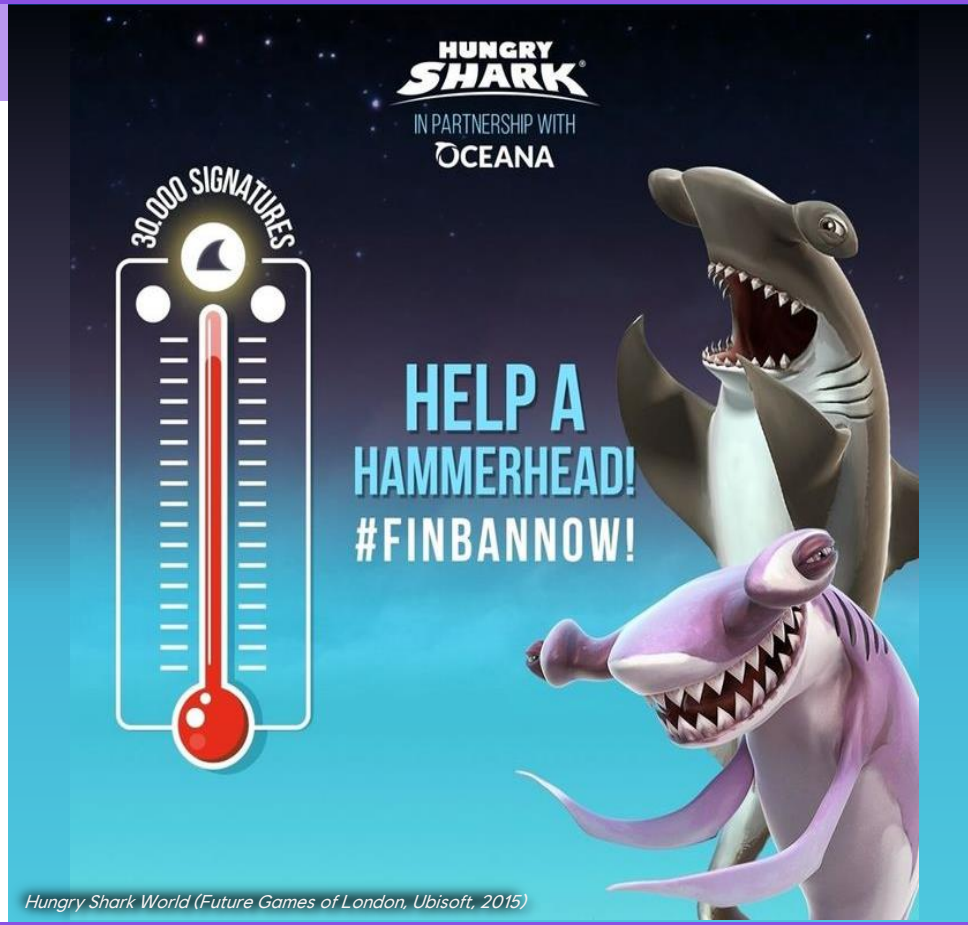
HOA (Skrollcat Studio, 2021)


EMOTIONAL IMPACT
VISUALIZATION
MESSAGE
CALL TO ACTION
Aesthetic
visuals, sounds...
Story
Narrative, setting...
Tech
Code, engine...
Gameplay
Mechanics, UX...

CALL TO ACTION

WHY IT MATTERS

- Players want to act but **don't know how**
- Games can **prime players** to take action in real life
- Repeated **exposure to Calls to Action** prime our brains, making us **more likely to answer the call** later
- Players already primed can be activated by **the right nudge** at **the right time**!



Hungry Shark World (Future Games of London, Ubisoft, 2015)

CALL TO ACTION

HOW TO USE IT?

- **Motivate players** to take action in the real world

Hungry Shark World (Future Games of London, Ubisoft, 2015)

CALL TO ACTION

HOW TO USE IT?

- **Motivate players** to take action in the real world
- **Point to available solutions** at an individual level

The SIMS 4: Eco-Lifestyle (Maxis, 2017)

CALL TO ACTION

HOW TO USE IT?

- **Motivate players** to take action in the real world
- **Point to available solutions** at an individual level
- **Connect with other players** to amplify impact

Pokemon Go (Niantic, Nintendo, 2016)

CALL TO ACTION

HOW TO USE IT?

- **Motivate players** to take action in the real world
- **Point to available solutions** at an individual level
- **Connect with other players** to amplify impact
- Encourage **support/contribution to climate orgs**

Monument Valley 2 – The Lost Forest (UsTwo games, 2021)

CALL TO ACTION

HOW TO USE IT?

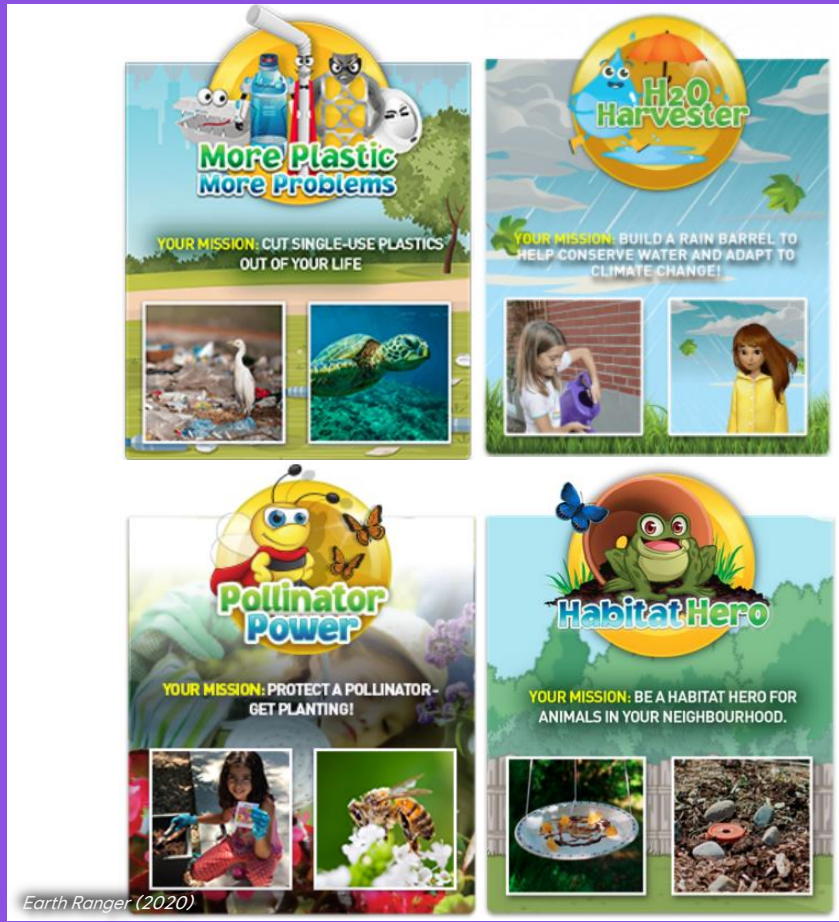
- **Motivate players** to take action in the real world
- **Point to available solutions** at an individual level
- **Connect with other players** to amplify impact
- Encourage **support/contribution to climate orgs**

Ghost Recon Breakpoint (Ubisoft Paris, 2019)

CALL TO ACTION

HOW TO USE IT?

- **Motivate players** to take action in the real world
- **Point to available solutions** at an individual level
- **Connect with other players** to amplify impact
- Encourage **support/contribution to climate orgs**
- **Reward positive behaviours** in real-life



Earth Ranger (2020)

EMOTIONAL IMPACT
VISUALIZATION
MESSAGE
CALL TO ACTION
BEHAVIORAL TRANSFERENCE
Aesthetic
visuals, sounds...
Story
Narrative, setting...
Tech
Code, engine...
Gameplay
Mechanics, UX...

BEHAVIORAL TRANSFERENCE

WHY IT MATTERS

- For our brain, **solving problems** in games or in real-life are **undistinguishable**
- **Repeated actions** in games become **habits**
- Habits acquired in game can **transfer to real life**

Spiritfarer (Thunder Lotus Games, 2020)

BEHAVIORAL TRANSFERENCE

HOW TO USE IT?

- Build **emotional resilience**

Spiritfarer (Thunder Lotus Games, 2020)

BEHAVIORAL TRANSFERENCE

HOW TO USE IT?

- Build **emotional resilience**
- Push players **out of their comfort zone**

Spec Ops: The Line (Yager Development, Darkside Game Studios, 2012)

BEHAVIORAL TRANSFERENCE

HOW TO USE IT?

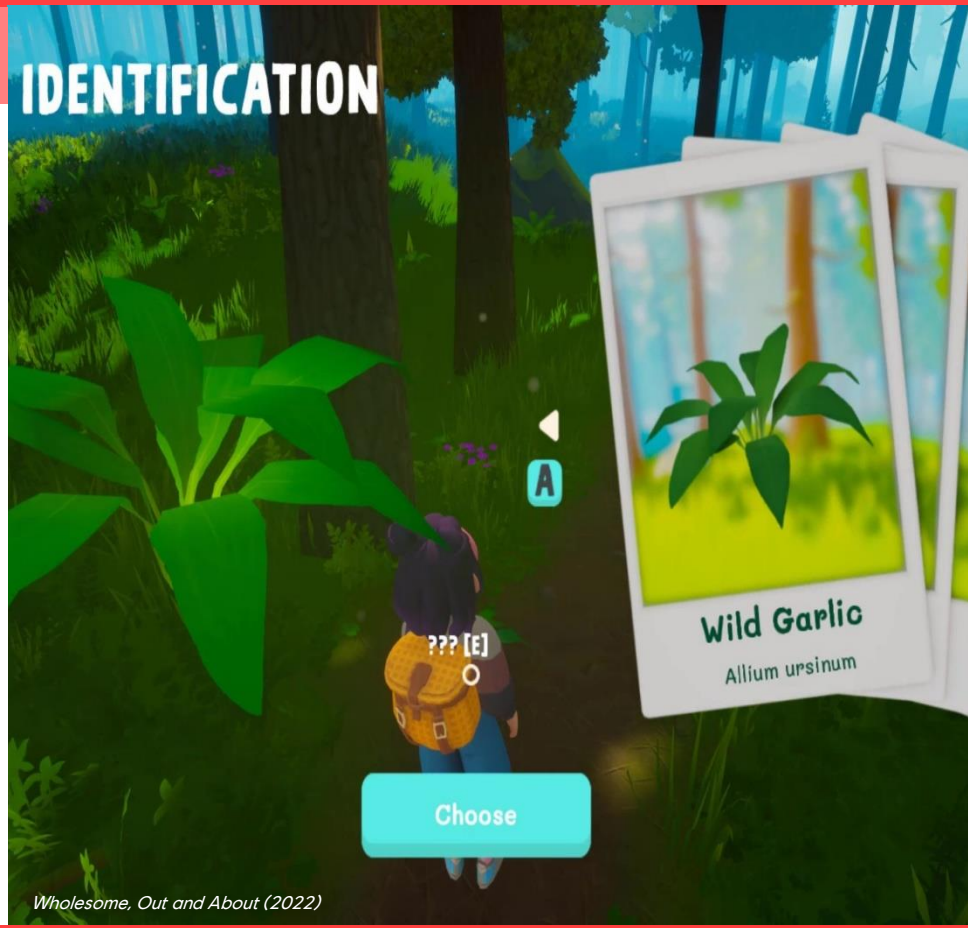
- Build **emotional resilience**
- Push players **out of their comfort zone**
- Normalize **eco-conscious** behaviours

A short hike (Adamgryu, 2019)

BEHAVIORAL TRANSFERENCE

HOW TO USE IT?

- Build **emotional resilience**
- Push players **out of their comfort zone**
- Normalize **eco-conscious** behaviours
- Teach **useful life skills** for the future



Wholesome, Out and About (2022)

BEHAVIORAL TRANSFERENCE

HOW TO USE IT?

- Build **emotional resilience**
- Push players **out of their comfort zone**
- Normalize **eco-conscious** behaviours
- Teach **useful life skills** for the future
- Let players experience **the joy of doing good deeds**

Alba: A Wildlife Adventure (ustwo games, 2020)

BEHAVIORAL TRANSFERENCE

HOW TO USE IT?

- Build **emotional resilience**
- Push players **out of their comfort zone**
- Normalize **eco-conscious** behaviours
- Teach **useful life skills** for the future
- Let players experience **the joy of doing good deeds**
- Allow **peaceful resolutions** of conflict

Dishonored 2 (Arkane Studio, 2016)

BEHAVIORAL TRANSFERENCE

HOW TO USE IT?

- Build **emotional resilience**
- Push players **out of their comfort zone**
- Normalize **eco-conscious** behaviours
- Teach **useful life skills** for the future
- Let players experience **the joy of doing good deeds**
- Allow **peaceful resolutions** of conflict
- Discourage **negative behaviours** such as **hoarding**

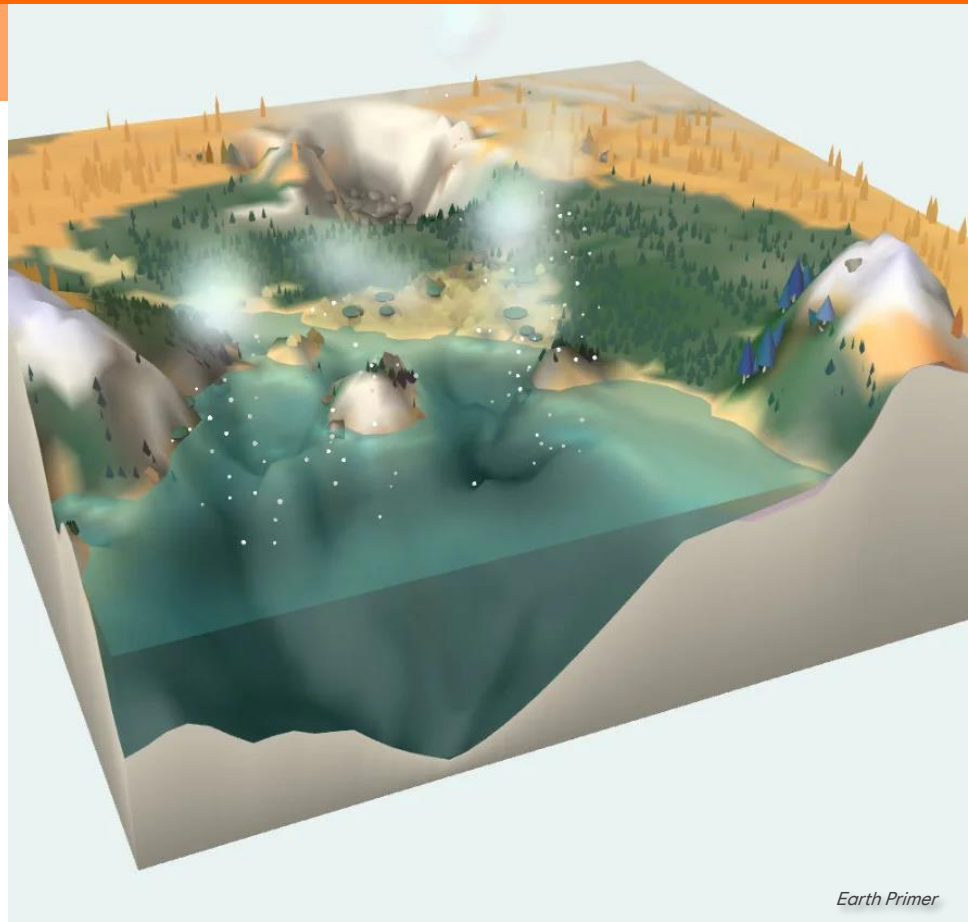
80 days (Inkle, Cape Guy Ltd, Cape Guy Limited, 2014)

EMOTIONAL IMPACT
SIMULATION
BEHAVIORAL TRANSFERENCE
CALL TO ACTION
MESSAGE
VISUALIZATION
Aesthetic
visuals, sounds...
Story
Narrative, setting...
Tech
Code, engine...
Gameplay
Mechanics, UX...

SIMULATION

WHY IT MATTERS

- Our brains value **short-term outcomes** over long-term ones
- Games make us experience the **long-term consequences** of our actions on a much **shorter time-frame**!
- Experimentation makes us **understand complex systems**



SIMULATION

HOW TO USE IT?

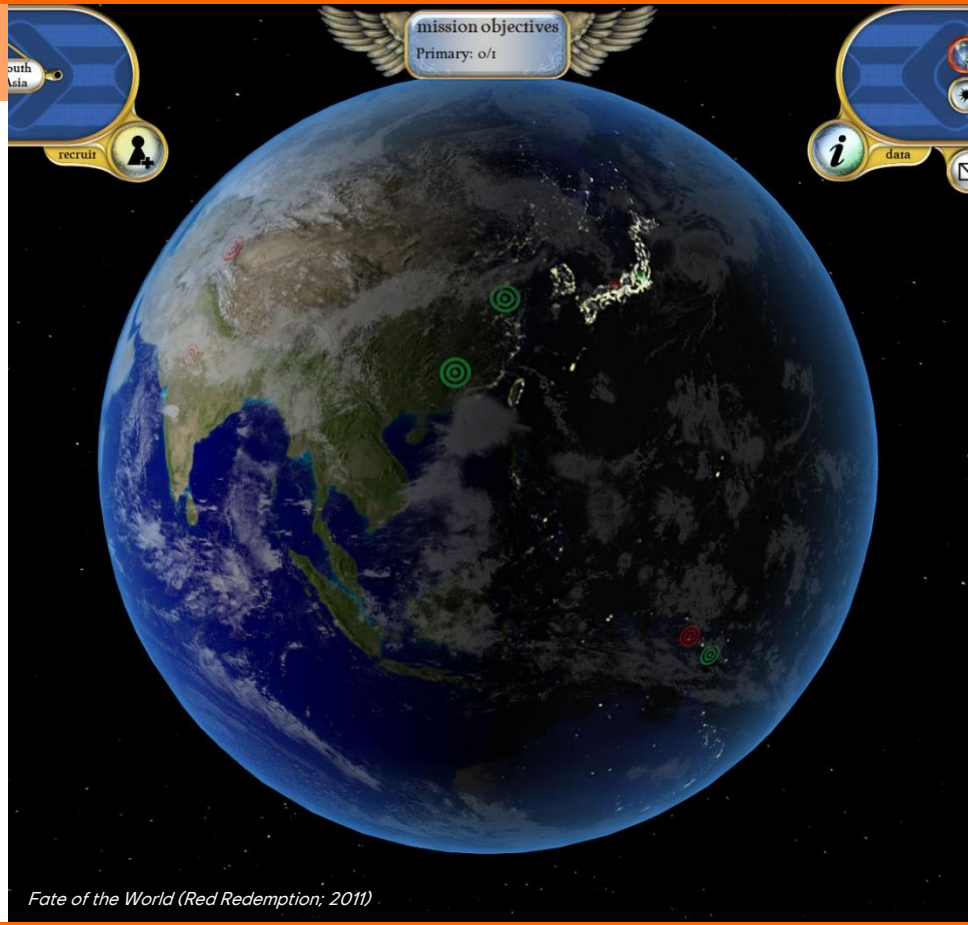
- Ground your game in **real Earth science & data**

Plague Inc : the Cure (Ndemic Creation, 2020)

SIMULATION

HOW TO USE IT?

- Ground your game on **real Earth science & data**
- Give opportunities for **trial & error** in safe environment



Fate of the World (Red Redemption; 2011)

SIMULATION

HOW TO USE IT?

- Ground your game on **real Earth science & data**
- Give opportunities for **trial & error** in safe environment
- Demonstrate **interconnections** between **Humans & Nature**

Anno 1800 : Eden Burning mode (Ubisoft, 2021)

SIMULATION

HOW TO USE IT?

- Ground your game on **real Earth science & data**
- Give opportunities for **trial & error** in safe environment
- Demonstrate **interconnections** between **Humans & Nature**
- Build **systemically** to encourage curiosity and experimentation

ECO (Strange Look Games, 2018)

EMOTIONAL IMPACT
VISUALIZATION
MESSAGE
OPTIMIZATION
CALL TO ACTION
SIMULATION
BEHAVIORAL TRANSFERENCE
Aesthetic
visuals, sounds...
Story
Narrative, setting...
Tech
Code, engine...
Gameplay
Mechanics, UX...

OPTIMIZATION

WHY IT MATTERS

- Before doing good, we should at least **do no harm**
- Ever-increasing horsepower have led us to build bigger, better, but more **power-consuming games**
- High power usage = **high carbon emissions**

Genshin Impact (MiHoYo, 2020)

OPTIMIZATION

HOW TO USE IT

- **Optimize code** to reduce power consumption

Subway Surfers (Sybo Games, 2012)

OPTIMIZATION

HOW TO USE IT

- **Optimize code** to reduce power consumption
- Propose an **opt-in power saving mode**

OPTIMIZATION

HOW TO USE IT

- **Optimize code** to reduce power consumption
- Propose an **opt-in power saving mode**
- Release on **multiple platforms** to increase the reach of your positive impact

Genshin Impact (MiHoYo, 2020)

OPTIMIZATION

HOW TO USE IT

- **Optimize code** to reduce power consumption
- Propose an **opt-in power saving mode**
- Release on **multiple platforms** to increase the reach of your positive impact
- Bring the extreme optimizations of **ports** back into your **main SKU**

Ori and the Will of the Wisps (Moon Studios, Xbox Game Studio, Ian8bit, 2020)

OPTIMIZATION

HOW TO USE IT

- **Optimize code** to reduce power consumption
- Propose an **opt-in power saving mode**
- Release on **multiple platforms** to increase the reach of your positive impact
- Bring the extreme optimizations of **ports** back into your **main SKU**
- Release on **previous generation devices** to fight **obsolescence**

Persona 4 PS2 (Altus, 2009)

EMOTIONAL IMPACT
GRAPHIC SOBRIETY
OPTIMIZATION
SIMULATION
BEHAVIORAL TRANSFERENCE
CALL TO ACTION
MESSAGE
VISUALIZATION
Aesthetic
visuals, sounds...
Story
Narrative, setting...
Tech
Code, engine...
Gameplay
Mechanics, UX...

GRAPHIC SOBRIETY

WHY IT MATTERS

- Culture assumes that **good graphics makes good games**
- We’ve been conditioned to **“always max out”** our graphics
- Graphics are responsible of most of the **power consumption and game size**

The Legend of Zelda: Breath of the Wild (Nintendo, 2017)

GRAPHIC SOBRIETY

HOW TO USE IT

- **Tailor Art Direction** to your target experience

The Legend of Zelda: Breath of the Wild (Nintendo, 2017)

GRAPHIC SOBRIETY

HOW TO USE IT

- **Tailor Art Direction** to your target experience
- Rely on **smart asset and texture** usage to limit GPU usage and memory footprint

Team Fortress 2 (Valve Corporation, 2007)

GRAPHIC SOBRIETY

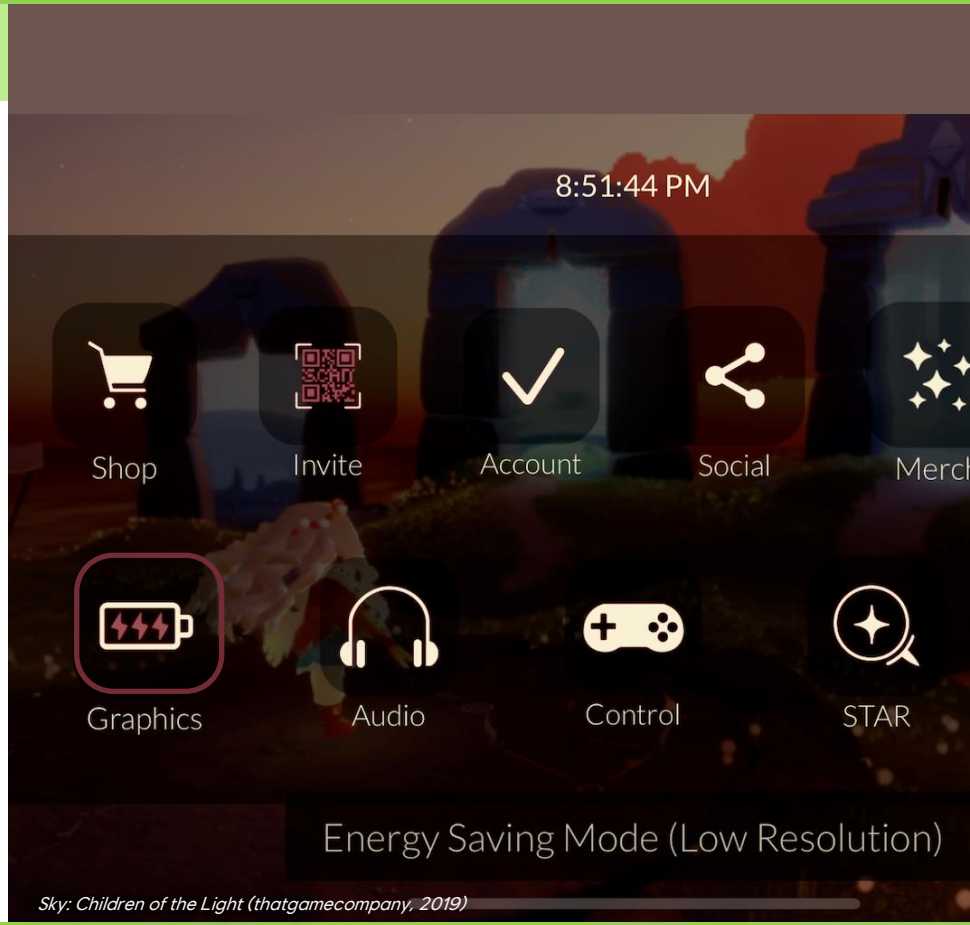
HOW TO USE IT

- **Tailor Art Direction** to your target experience
- Rely on **smart asset and texture** usage to limit GPU usage and memory footprint
- Educate about **power/carbon impact** of each graphic setting

GRAPHIC SOBRIETY

HOW TO USE IT

- **Tailor Art Direction** to your target experience
- Rely on **smart asset and texture** usage to limit GPU usage and memory footprint
- Educate about **power/carbon impact** of each graphic setting
- **Give players agency** to balance their power consumption

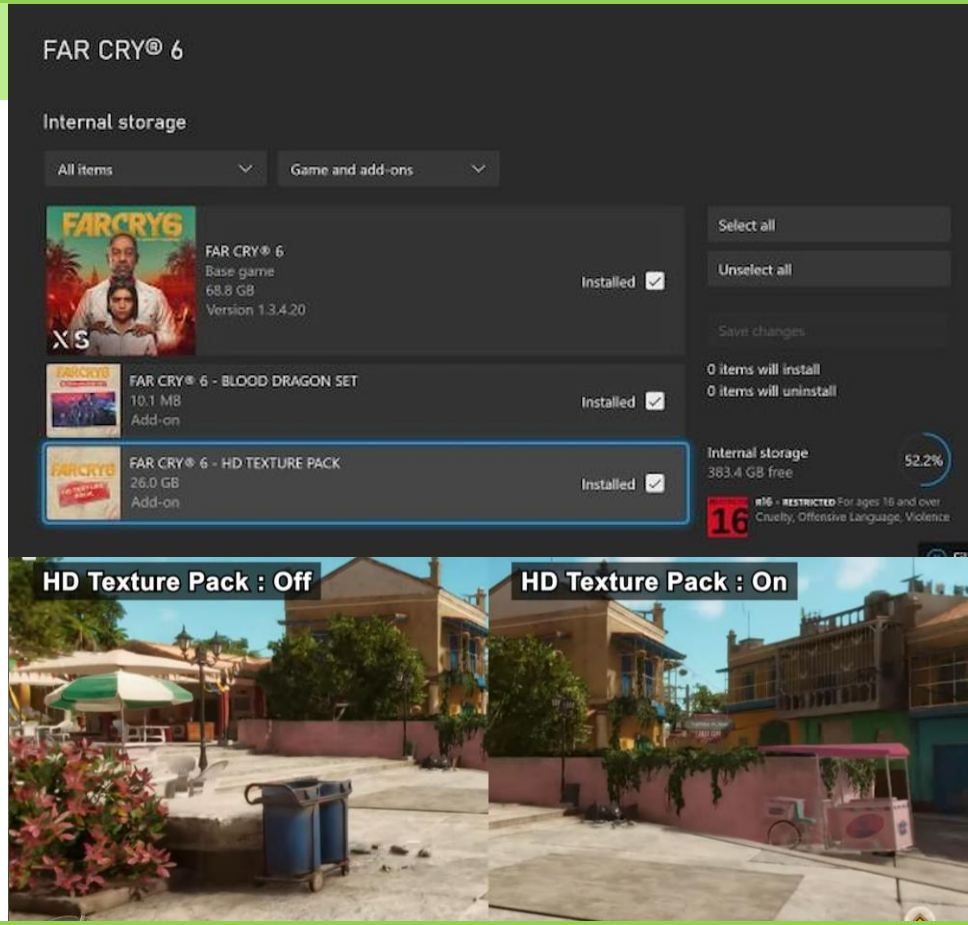


Sky: Children of the Light (thatgamecompany, 2019)

GRAPHIC SOBRIETY

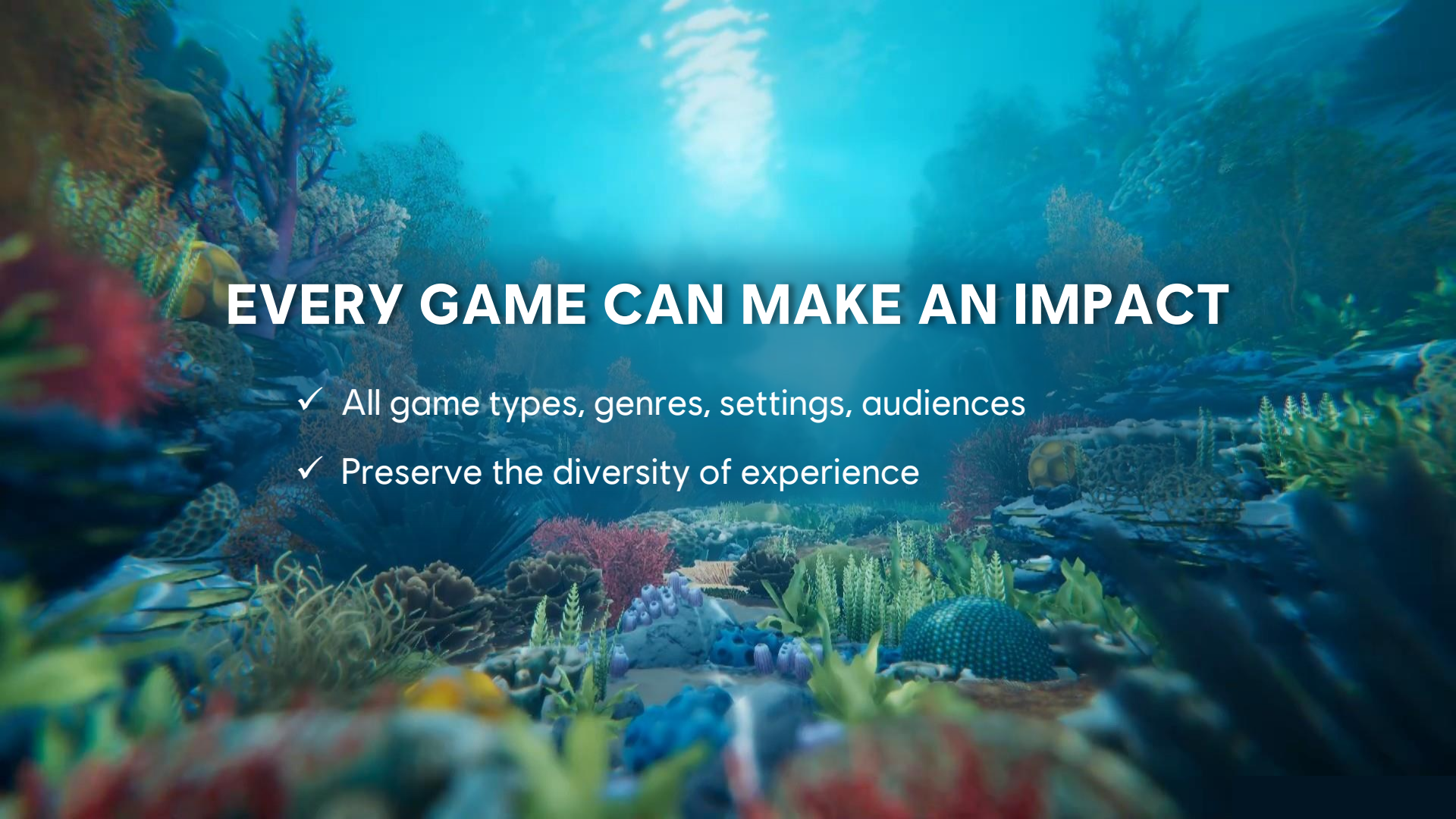
HOW TO USE IT

- **Tailor Art Direction** to your target experience
- Rely on **smart asset and texture** usage to limit GPU usage and memory footprint
- Educate about **power/carbon impact** of each graphic setting
- **Give players agency** to balance their power consumption
- **Reduce game size** to save bandwidth



EMOTIONAL IMPACT
GRAPHIC SOBRIETY
OPTIMIZATION
SIMULATION
BEHAVIORAL TRANSFERENCE
CALL TO ACTION
MESSAGE
VISUALIZATION
Aesthetic
visuals, sounds...
Story
Narrative, setting...
Tech
Code, engine...
Gameplay
Mechanics, UX...

CONCLUSION


EVERY GAME CAN MAKE AN IMPACT
✓ All game types, genres, settings, audiences
✓ Preserve the diversity of experience

EVERY DISCIPLINE IS IMPORTANT
✓ We need everyone
✓ We can act individually or collectively

EVERYONE CAN CONTRIBUTE
✓ Don’t wait to be asked
✓ What can YOU do?

EVERY GAME MUST BE FUN
✓ Make **green** games **fun**
✓ Make **fun** games **green**

THANK YOU!

NEXT PART

3 EXAMPLES OF
CLIMATE DESIGN

Chance Glasco

WE'RE HERE TO HELP!

Join like-minded people at
https://www.igdaclimatesig.org/

igda® Climate SIG

Download and read the Environmental Game Design Playbook
https://www.igdaclimatesig.org/workstream-pages/published-resources

RELATED SESSIONS @ GDC 2023

Teaching Sustainability and Game Design: From the Low-Hanging Fruits to the Root of the Problem
Presented by Patrix Prax, Clayton Whittle, Trevin York, Sonia Fizek
https://schedule.gdconf.com/session/educators-summit-teaching-sustainability-and-game-design-from-the-low-hanging-fruits-to-the-root-of-the-problem/891032

Climate Games: The Developer's Field Guide
Presented by Arnaud Fayolle
https://schedule.gdconf.com/session/climate-games-the-developers-field-guide/890846

Playing for the Planet Climate Check: 10 Steps to Climate Leadership
Presented by Sam Barratt
https://schedule.gdconf.com/session/playing-for-the-planet-climate-check-10-steps-to-climate-leadership/894994

How Xbox, 343i, Epic and Ubisoft are Reducing Energy & Emissions While Maintaining Gameplay Fidelity
Presented by Trista Patterson, Tad Swift, Paula Angela Escuadra, Alex Le Boulicaut, Ben Woodhouse, Iris Gardet
https://schedule.gdconf.com/session/how-xbox-343i-epic-and-ubisoft-are-reducing-energy-emissions-while-maintaining-gameplay-fidelity-presented-by-microsoft/894609

GDC | March 20-24, 2023 San Francisco, CA

Adrienne Arsht-Rockefeller Foundation Resilience Center

Atlantic Council

igda Climate SIG

Use Your **Game Developer Superpowers** to Fight the **Climate Crisis**

4

DESIGNING GAMES THAT

TRANSFORM PLAYERS

Trevin YORK

#GDC23

What I’ve learned while designing games that transform players:

What I've learned while designing games that transform players:

- It's hard!

CONSIDERATIONS

CONSIDERATIONS

CONSIDERATIONS

FRAMING

THIS IS A FUNDRAISER

THIS IS A FUNDRAISER

DONATE NOW

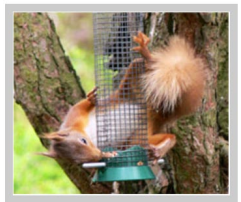
SAVE THE SQUIRRELS!!

Squirrel
Fire
Brigade
Geert Weggen

Red Squirrels Trust Wales
Ymddiriedolaeth Gwiwerod Coch Cymru

HOME ABOUT NEWS GALLERY EDUCATION MAP SHOP CONTACT US PRIVACY POLICY

Red squirrel conservation



This attractive mammal has a chestnut upper body, with buff to cream underside, noticeable ear tufts and the famous fluffy tail. It is a smaller animal than the introduced grey squirrel.

Red squirrels are naturally found across most of Europe into northern Asia and Siberia. In this part of its range the creature is not threatened. In the UK it is restricted to a few sites, mainly those free from competition by grey squirrels.

The red squirrel was historically widespread on Anglesey and particularly within the broadleaved woodlands bordering the Menai

---

The Wildlife Trust for Lancashire Manchester & North Merseyside

Our work Visit Wildlife What's on About us

Our work / Red squirrels

Share

The Wildlife Trusts

About us What we do Get involved

Saving species / Red squirrels

Share

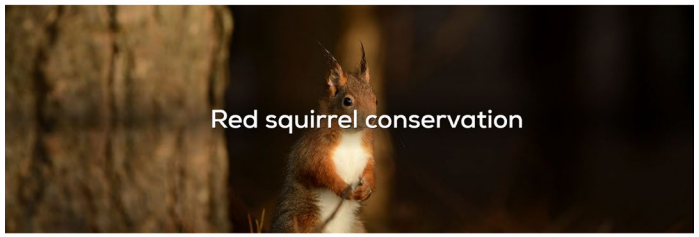
---

rspb giving nature a home

Shop | Community Log in | Sign up Search

About the RSPB Our work Birds & wildlife Get involved Reserves & events Fun & Learning Join & Donate

Home Our work ... Species Red squirrel conservation



Red squirrels were once found across most of the UK. However, non-native grey squirrels have pushed them out of many areas.

Forestry Commission
231 Corstorphine Road
Edinburgh
EH12 7AT
http://www.forestry.gov.uk

Red Squirrel Conservation

PRACTICE NOTE

ISSUED BY FORESTRY PRACTICE SEPTEMBER 1998

BY HARRY PEPPER & GORDON PATTERSON

INTRODUCTION

Our native red squirrel has disappeared from large parts of its natural range in the UK over the past 50 years. This is mainly as a result of the spread of the introduced grey squirrel which is better able to live in most broadleaved

THE CHALLENGE

Because grey squirrels (greys) are now an established part of our forest wildlife, with a population of 2.5 million, it is not practical to aim to re-establish red squirrels (reds) to their former range. The current distribution of reds is

---

News Shop

RED SQUIRREL SURVIVAL TRUST

MAKE A DONATION

Home Protecting Red Squirrels Woodland Damage What We Do Our People Support Us Contact Us

RED SQUIRRELS ARE HEADING FOR EXTINCTION

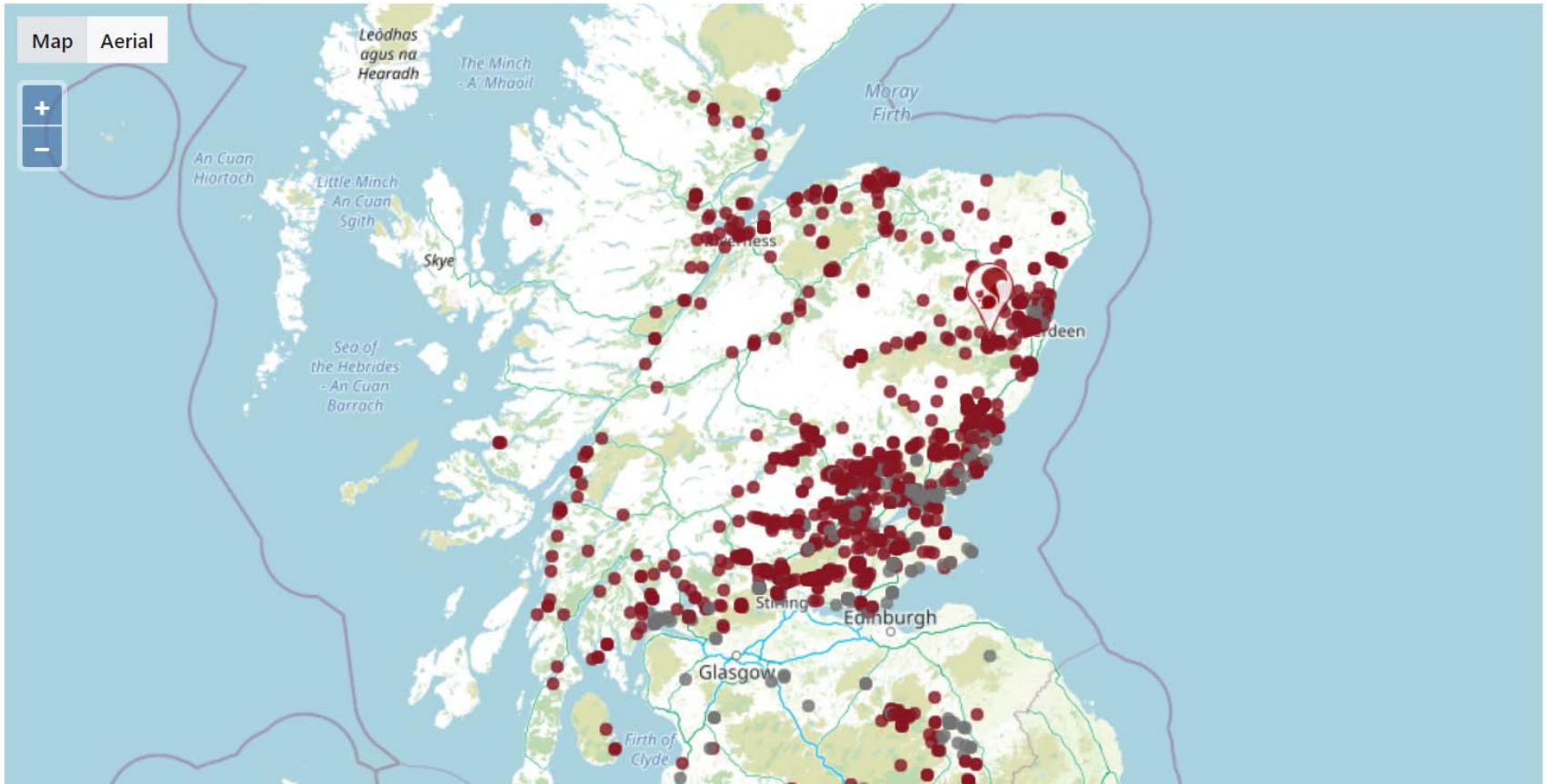
Sightings of Red and Grey Squirrels across Scotland

REPORT A SQUIRREL SIGHTING NOW

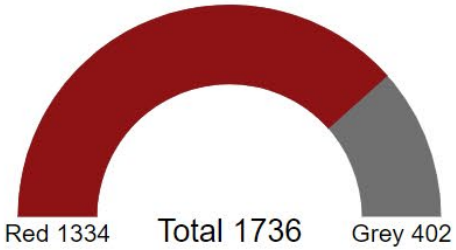
RED SQUIRRELS | GREY SQUIRRELS | ALL SQUIRRELS

Year to display on map:

2022



This Year's Sightings



REPORT A SQUIRREL SIGHTING ▶

The long read

‘Kill them, kill them, kill them’: the volunteer army plotting to wipe out Britain’s grey squirrels

Exmoor Squirrel Project wants grey squirrels culled and on menus

28 February

Ms Hosegood said the grey squirrel has caused an estimated £40m worth of damage to UK trees

‘It invades gardens, and will take peas from their pods as cleanly as a man. In spring it turns carnivorous and eats eggs and young birds. It damages trees by biting bark and preventing the flow of sap.’

George Jennison, 1927

CONSIDER

1. What are you trying to say? Does the framing created by your gameplay support that message?
2. Your framing defines your truth.

May
0

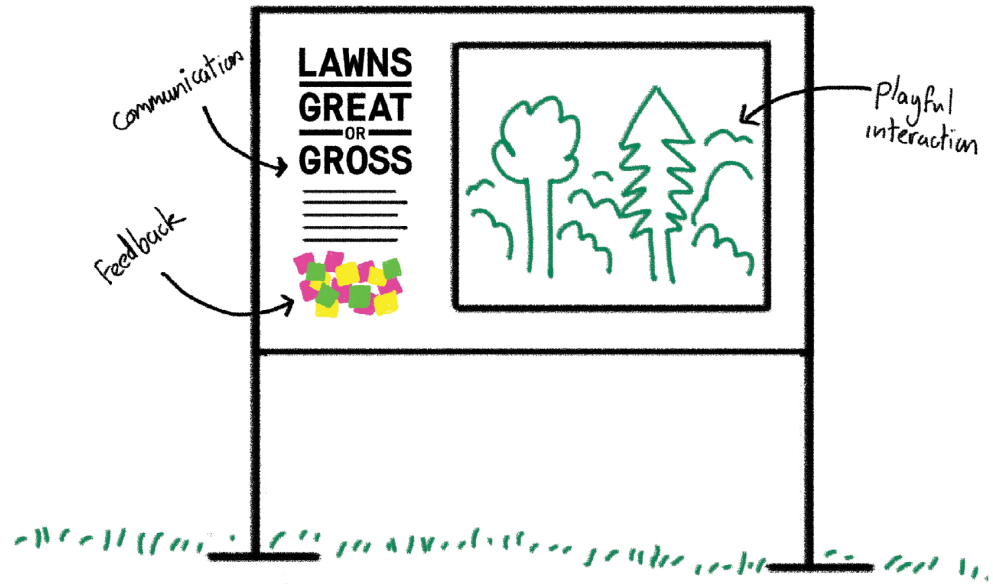
Emma saved
$172,386
which will last until she's
53 years old!
INCOME
45
EARNED
$562,500
EXPENSE
80
SPENT
-$124,990
SAVINGS
31
DEPOSITED
$96,875
BONUS AVG
X1
$75,511
READY TO RETIRE?

LAWN TO BE WILD

Design for Social Change

Ahkila Ganesh Shamanur. Eliza Garduza.
Trevin York. Sebastian Chaloner.

LAWNS
GREAT
OR


LAWNS
GREAT
OR
GROSS
Communication
Feedback
Playful interaction

OR
GROSS
Lawns aren't "green." They might look it, but they don't capture carbon, support biodiversity, clean air or water, or moderate temperature. They're relics of a time when we valued conquering nature. We think they should go.
By replacing lawns with literally any native plants, we can support flood mitigation, reduce pressure on sewer systems, reduce heat-island effects, capture carbon, and grow ecological resiliency quickly and at scale. (leaked IPCC WGIII Summary Report)
Use our markers & show us how you'd make this green space greater.

leaves

INTERVENTION IDEAS

Participants generated specific interventions and in some cases were eager to act on them.

CONSIDERATIONS

CONSIDERATIONS

CONTEXT

Context is key!

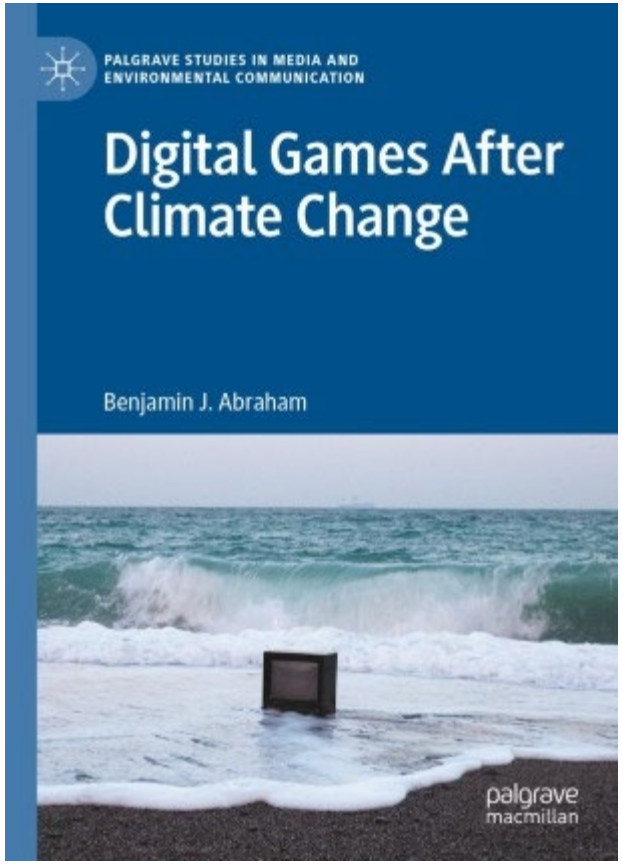
Context is key!

Context is key!

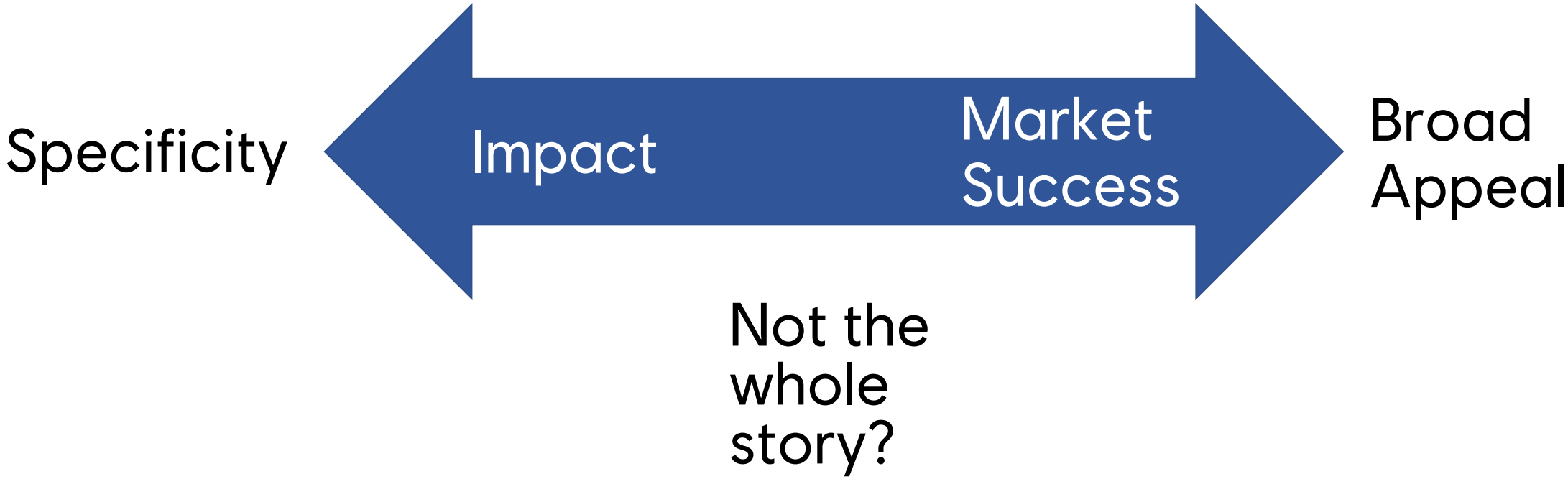
Context is key!

Specificity

Specificity
Impact
Market
Success
Broad
Appeal


PALGRAVE STUDIES IN MEDIA AND ENVIRONMENTAL COMMUNICATION
Digital Games After Climate Change
Benjamin J. Abraham
palgrave
macmillan

Specificity
Impact
Market
Success
Broad
Appeal


Specificity
Impact
Market Success
Broad Appeal
Not the whole story?

mstoriabeall@gmail.com

https://www.linkedin.com/in/victoriabeall/

1
2
10
3
4
5
6
7
8
9

STINGIN

RASPBERRIES

Rubus idaeus | Harvest July - August

HARVEST RESPONSIBLY

You can harvest both berries and leaves (which are great as a tea!). However, be sure to leave some berries for birds and insects to enjoy as well and be careful not to take too much from any single plant.

WHERE DOES IT GROW?

Wild raspberries are quite widespread this time of year, particularly near open woodland, scrub, heathland and hedgerows. In the uplands, it grows on the drier ledges of basic crags and ravines, and below base-rich cliffs.

WHO USES IT?

We all know the much larger cultivated rapsberries, but these wee wild ones have a distinct flavor. If it's tasty to us, that usually means other species find it so too. Wild raspberries are popular among beetles and other flying insects, as well as deer and squirrels. In the Highlands, raspberry leaves were once used to treat sore throats and to aid pregnant women in preparing to deliver.

WHERE TO LEARN MORE

- Mark Williams, Galloway Wild Foods | *gallowaywildfoods.com*
- Monica Wilde | *monicawilde.com*
- Szymon Szyszczakiewicz, Foragerium | *foragerium.co.uk*
- Robin Harford, Eat Weeds | *eatweeds.co.uk*
- Leanne Townsend | *wildfoodstories.co.uk*
- Woodland Trust | *woodlandtrust.org*

Digital version

DRYAD'S SADDLE

Cerioporus squamosus | Harvest March - August

RESPONSIBLE HARVESTING

Dryad's saddles are really only edible when the mushrooms are young and small, smaller than the size of your hand. Any bigger and they become too tough. If you find larger specimens, leave them for the insects!

WHERE DOES IT GROW?

Dryad's grow on dead and dying broad-leafed trees, especially willow, sycamore, and polar.

WHO USES IT?

Mushrooms are just the reproductive organs of a fungus, and the majority of the fungus is actually growing through a vast network of root-like strands called mycelium. The dryad's saddle fungus is a decomposer, working to recycle dead trees into nutrients and soil for other organisms. The mushrooms themselves are also a good source of food for flies and gnats.

WHERE TO LEARN MORE

- Mark Williams, Galloway Wild Foods | *gallowaywildfoods.com*
- Monica Wilde | *monicawilde.com*
- Szymon Szyszczakiewicz, Foragerium | *foragerium.co.uk*
- Robin Harford, Eat Weeds | *eatweeds.co.uk*
- Leanne Townsend | *wildfoodstories.co.uk*
- Woodland Trust | *woodlandtrust.org*

Digital version

CLEAVERS

Galium aparine | Harvest March - September

OTHER NAMES

Cleavers have made such an impression on humans, that we have many different names for them. They're also known as goosegrass, sticky

WHERE DOES IT GROW?

Cleavers are widespread across Scotland. They can be found in hedgerows, scrub land, and on cultivated land, including gardens. They're incredibly prolific, and so ther is not much risk of overharvesting.

WHO USES IT?

Many insects, like aphids and spittlebugs, eat cleavers. Dogs are also strangely attracted to cleavers and will nibble on them (which is totally safe). For humans, cleavers are an extremely versatile plant. The boiled leaves and stems can be used in pretty much any way you'd use garden greens. The seeds can be roasted to make a (caffeinated!) coffee substitute. If crushed into a poultice, cleavers can also relieve bites and stings.

WHERE TO LEARN MORE

- Mark Williams, Galloway Wild Foods | *gallowaywildfoods.com*
- Monica Wilde | *monicawilde.com*
- Szymon Szyszczakiewicz, Foragerium | *foragerium.co.uk*
- Robin Harford, Eat Weeds | *eatweeds.co.uk*
- Leanne Townsend | *wildfoodstories.co.uk*
- Woodland Trust | *woodlandtrust.org*

Digital version

DANDELIONS

Taraxacum offici | Harvest Year-Round

RESPONSIBLE HARVESTING

Dandelions love to grow along roadsides and are widespread in urban areas. However, you should exercise caution and avoid harvesting from areas such as parks where pesticides/herbicides may have been sprayed, as well as highly trafficked areas that may be polluted by trash, dog feces, or car emissions.

WHERE DOES IT GROW?

Dandelions are very common. You can easily spot them in gardens, parks, lawns, roadsides, waysides, meadows, fields, orchards, and woodlands

WHO USES IT?

Dandelions are a key plant for pollinating insects like bees. They are nutrient dense, and every part of the plant is edible. The leaves have a spicy kick and can be used as you would with any leafy green. The flowers, stems, and young buds can be pickled or used in baking, and the roots have traditionally been used as a coffee substitute.

WHERE TO LEARN MORE

- Mark Williams, Galloway Wild Foods | *gallowaywildfoods.com*
- Monica Wilde | *monicawilde.com*
- Szymon Szyszczakiewicz, Foragerium | *foragerium.co.uk*
- Robin Harford, Eat Weeds | *eatweeds.co.uk*
- Leanne Townsend | *wildfoodstories.co.uk*
- Woodland Trust | *woodlandtrust.org*

Digital version

A WILD FOOD TOUR
of
CAMMO ESTATE
START HERE

RICHARD MYLES JOHNSON
FOUNDATION

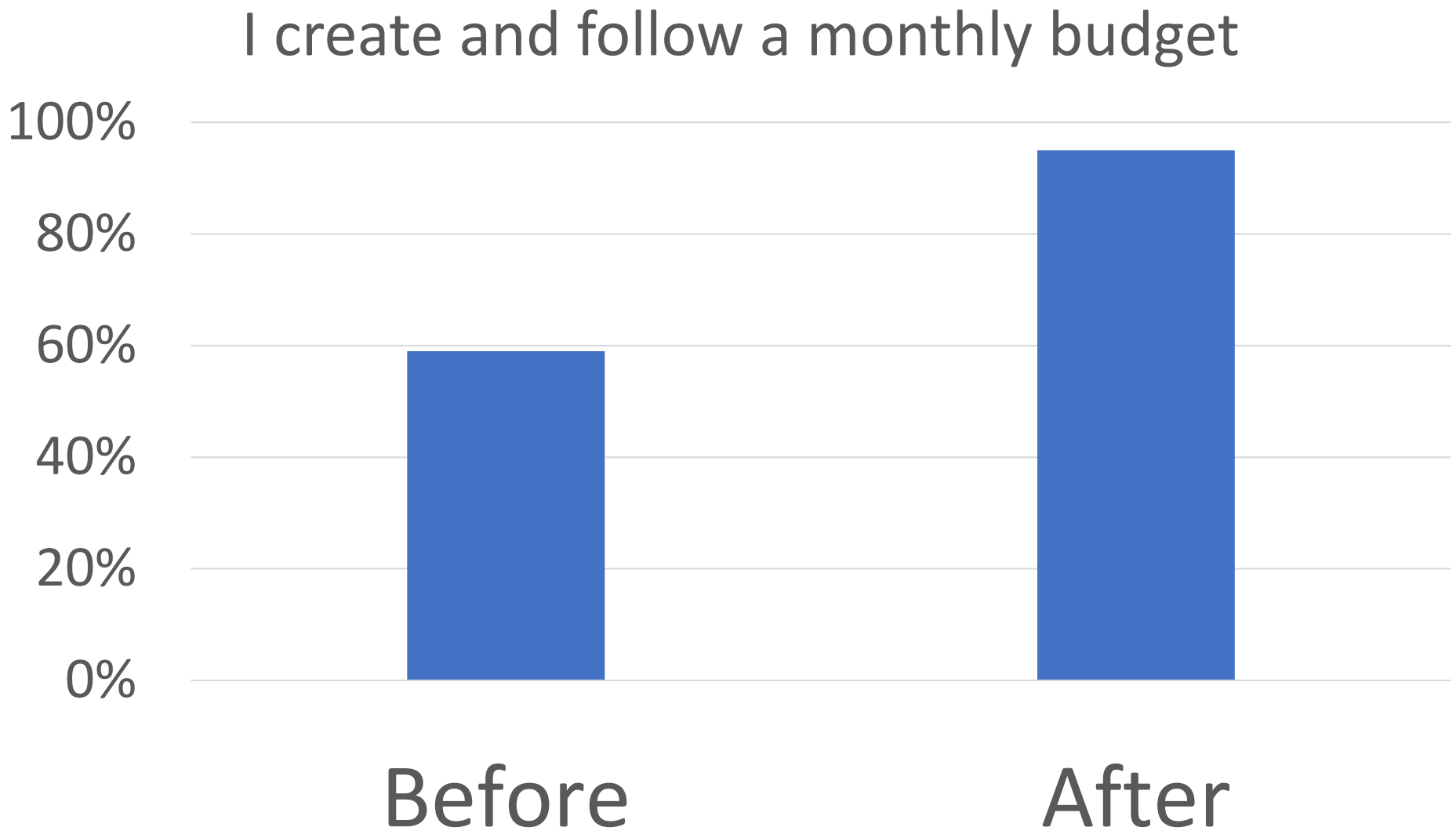
Credit Unions dare you to take a ...
BITE OF REALITY

Welcome to the Bite of Reality App!

Tap the button below when your facilitator says to begin.

Who am I?

Restart


I create and follow a monthly budget
100%
80%
60%
40%
20%
0%
Before
After

RICHARD MYLES JOHNSON
FOUNDATION

Credit Unions dare you to take a ...
BITE OF REALITY

Welcome to the Bite of Reality App!

Tap the button below when your facilitator says to begin.

Who am I?

Restart

Design, When Everybody Designs

An Introduction to Design for Social Innovation

Ezio Manzini

Copyright © 2015 MIT Press. All rights reserved.

Consider:

1. Who are you trying to impact? What is their specific context? What's the best way to reach them?
2. Ideally, build a business model that lets you work in the appropriate context.

CONSIDERATIONS

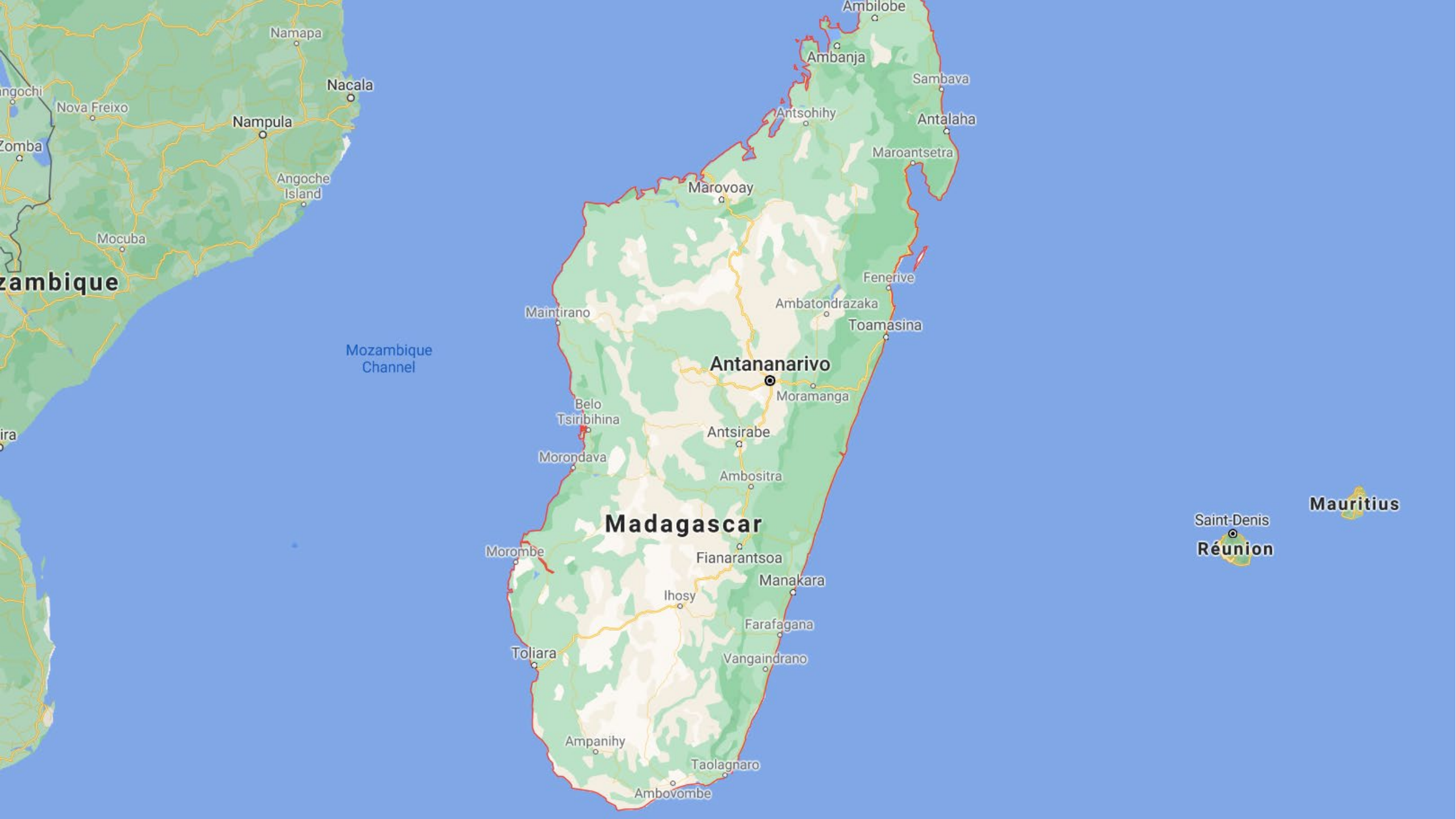
CONSIDERATIONS

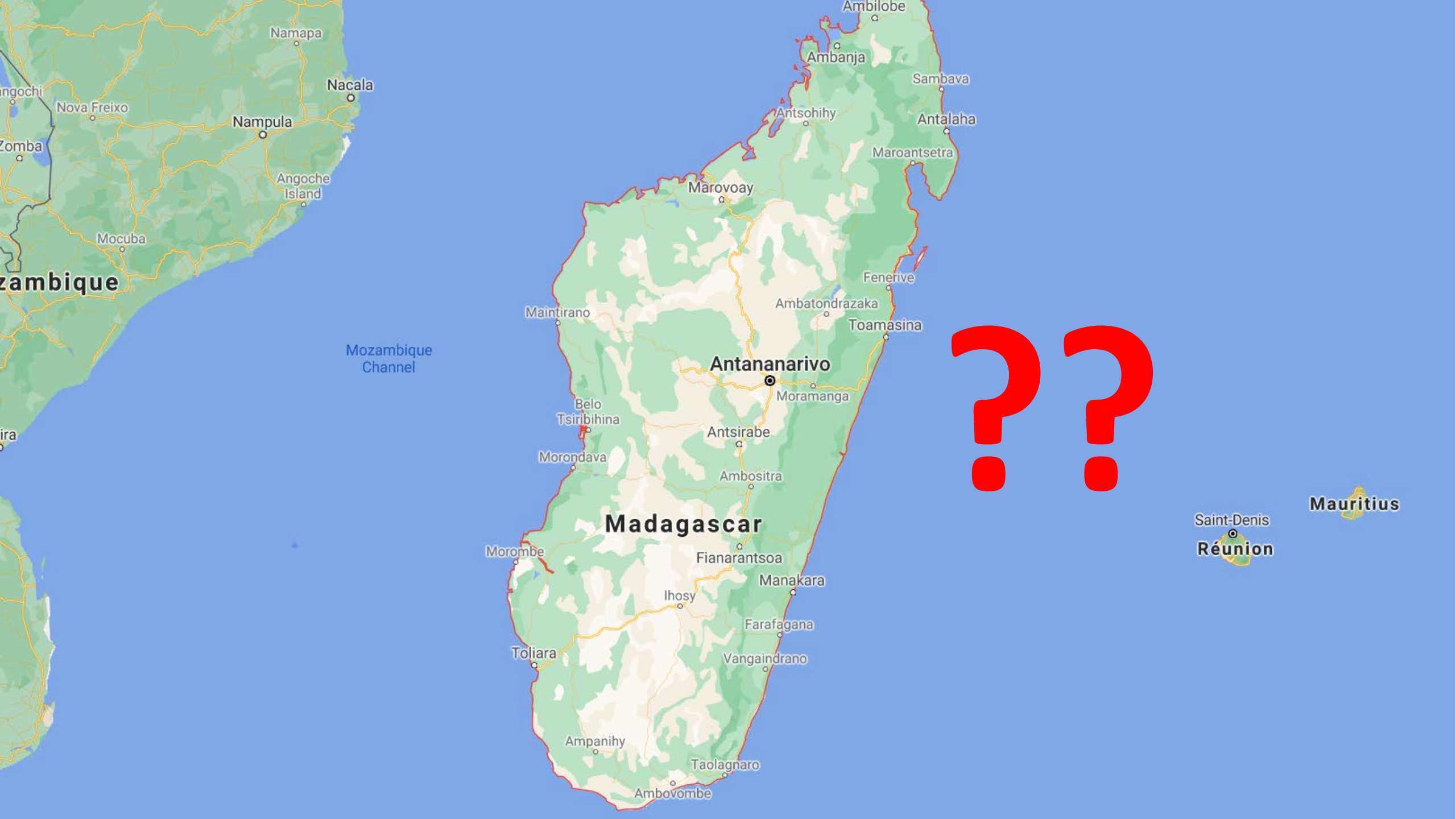
1. TRUTH IS DEPENDANT ON TRUST

Science is a system designed to translate direct observation of the natural world

into a story that earns the collective social trust.

Dr. Arno Verhoeven

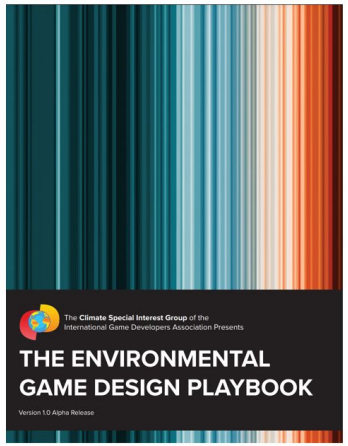

Ambilobe
Ambanja
Sambava
Antsohihy
Antalaha
Maroantsetra
Marovoay
Fenerive
Ambatondrazaka
Toamasina
Maintirano
Antananarivo
Moramanga
Belo
Tsiribihina
Antsirabe
Morondava
Ambositra
Madagascar
Morombe
Fianarantsoa
Manakara
Ihosy
Farafagana
Toliara
Vangaindrano
Ampanihy
Taolagnaro
Ambovombe
Mozambique
Channel
Namapa
Nacala
Nova Freixo
Nampula
Zomba
Angoche
Island
Mocuba
zambique
Saint-Denis
Réunion
Mauritius


Namapa
Nacala
Nova Freixo
Nampula
Zomba
Angoche Island
Mocuba
zambique
Mozambique Channel
Ambilobe
Ambanja
Sambava
Antsohihy
Antalaha
Maroantsetra
Marovoay
Fenerive
Ambatondrazaka
Maintirano
Toamasina
Antananarivo
Moramanga
Belo Tsiribihina
Antsirabe
Morondava
Ambositra
Madagascar
Morombe
Fianarantsoa
Manakara
Ihosy
Farafagana
Toliara
Vangaindrano
Ampanihy
Taolagnaro
Ambovombe
??
Saint-Denis
Réunion
Mauritius

FACT: SANTA IS REAL

DESIGN FOR CHANGE

THE UNIVERSITY of EDINBURGH
Edinburgh College of Art



igda® Climate SIG

MindBlown Labs

TRAKID Explorer Quest

Millipore Sigma

Trevin York

Atlantic Council

Adrienne Arsht-Rockefeller Foundation Resilience Center

Challenging the image of the altruistic and flexible household in the smart grid using design fiction

Sofie Nyström
Cecilia Katzeff
sofienys@kth.se
ckatzeff@kth.se
Department of Sustainable Development, Environmental Science and Engineering KTH Royal Institute of Technology
Stockholm, Sweden

Miriam Börjesson Rivera
Arjun Rajendran Menon
miriamrg@kth.se
armenon@kth.se
Division of Media Technology and Interaction Design KTH
Stockholm, Sweden

Björn Hedin
bjornh@kth.se
Department of Learning in Engineering Sciences KTH
Stockholm, Sweden

The Limits of Our Imagination: Design Fiction as a Strategy for Engaging with Dystopian Futures

Theresa Jean Tanenbaum, Marcel Pufal and Karen Tanenbaum
UC Irvine
Department of Informatics
ttanen@uci.edu; mpufal@uci.edu; karen.tanenbaum@uci.edu

Original research article

What smart grids tell about innovation narratives in the European Union: Hopes, imaginaries and policy☆

Lucia Vesnic-Alujevic*, Melina Breitegger, Ângela Guimarães Pereira
European Commission, Joint Research Centre, Via E. Fermi 2749, 21027 Ispra, Italy

Original research article

Imagining energy futures: Sociotechnical imaginaries of the future Smart Grid in Norway

Ingrid Foss Ballo*
University of Bergen, Centre for the study of the Sciences and the Humanities, Postbox 7805 & Department of Geography, Postbox 7802, 5020 Bergen, Norway

Transition Design: An Educational Framework for Advancing the Study and Design of Sustainable Transitions

Terry Irwin [1], Cameron Tonkinwise [2] and Gideon Kossoff [3]

Original research article

Towards pragmatic narratives of societal engagement in the UK energy system

Iain Soutar*, Catherine Mitchell
Energy Policy Group, University of Exeter, United Kingdom

Unleashing Sociotechnical Imaginaries to Advance Just and Sustainable Energy Transitions: The Case of Solar Energy in Puerto Rico

Sociotechnical Imaginaries and National Energy Policies

Original research article

Political power and renewable energy futures: A critical review

Matthew J. Burke[a,*], Jennie C. Stephens[b]
[a] *Department of Natural Resource Sciences, McGill University, Macdonald Campus, 21,111 Lakeshore Road, Ste. Anne de Bellevue, Québec H9X 3V9, Canada*
[b] *School of Public Policy & Urban Affairs, Global Resilience Institute, Northeastern University, Boston, MA, USA*

Original research article

The micro smart grid as a materialised imaginary within the German energy transition

(Re)assembling Natures, Cultures, and (Nano)technologies in Public Engagement

Bioenergy Futures: Framing Sociotechnical Imaginaries in Local Places

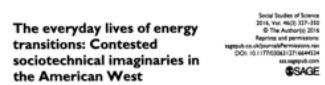
Original research article

Envisioning and implementing wood-based bioenergy systems in the southern United States: Imaginaries in everyday talk

John Schelhas[a,*], Sarah Hitchner[b], J. Peter Brosius[c]
[a] *Southern Research Station, USDA Forest Service, 320 Green Street, Athens, GA 30602, USA*
[b] *Center for Integrative Conservation Research, University of Georgia, 321 Holmes Hunter Academic Building, 101 Herty Drive, Athens, GA 30602, USA*
[c] *Department of Anthropology, 250 Baldwin Hall, University of Georgia, Athens, GA 30602, USA*

State imaginaries of the public good: shaping UK innovation priorities for bioenergy

Les Levidow *, *Theo Papaioannou*
Development Policy and Practice, Open University, Milton Keynes, UK



The everyday lives of energy transitions: Contested sociotechnical imaginaries in the American West

Jessica M Smith
Liberal Arts and International Studies, Colorado School of Mines, Golden, CO, USA

Abraham SD Tidwell
School for the Future of Innovation in Society, Arizona State University, Tempe, AZ, USA

Original research article

Cosmopolitan, dynamic, and contested energy futures: Navigating the pluralities and polarities in the energy systems of tomorrow

Laurence Delina*, Anthony Janetos
Frederick S. Pardee Center for the Study of the Longer-Range Future at Boston University, 67 Bay State Road, Boston, MA, 02215, USA

Original research article

Reimagining energy futures: Contributions from community sustainable energy transitions in Thailand and the Philippines

Jens Marquardt[a,*], Laurence L. Delina[b]
[a] *Program on Science, Technology & Society, Harvard University, 79 JFK Street, Cambridge, MA 02138, USA*
[b] *Frederick S. Pardee Center for the Study of the Longer-Range Future, Boston University, 67 Bay State Road, Boston, MA 02215, USA*

Original research article

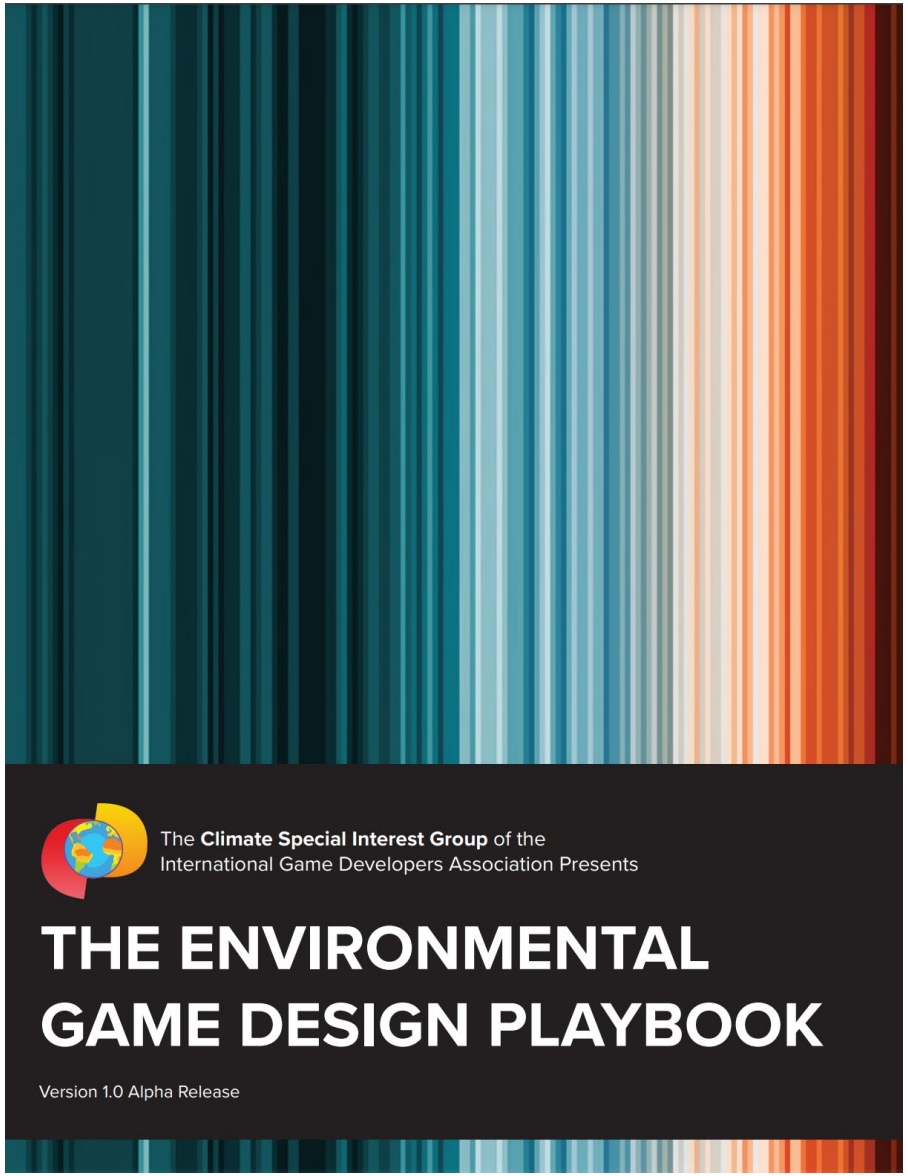
Whose and what futures? Navigating the contested coproduction of Thailand's energy sociotechnical imaginaries

Laurence L. Delina
Frederick S. Pardee Center for the Study of the Longer-Range Future, Boston University, 67 Bay State Road, Boston, MA 02215, USA

1. TRUTH IS DEPENDANT ON TRUST

1. TRUTH IS DEPENDANT ON TRUST

2. YOU CAN BENEFIT FROM EXISTING TRUST



The **Climate Special Interest Group** of the
International Game Developers Association Presents

THE ENVIRONMENTAL GAME DESIGN PLAYBOOK

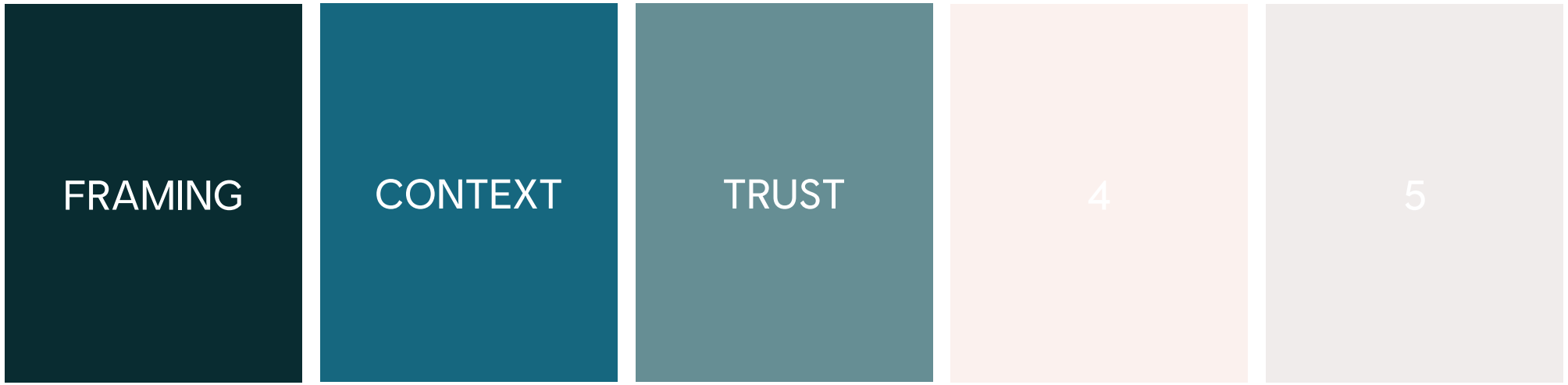
Version 1.0 Alpha Release

1. TRUTH IS DEPENDANT ON TRUST

2. YOU CAN BENEFIT FROM EXISTING TRUST

3. YOUR PLAYERS (WILL) TRUST YOU

CONSIDERATIONS



CONSIDER:

1. What are you trying to say?
2. Who are you trying to say this to?
3. Why should they trust you?

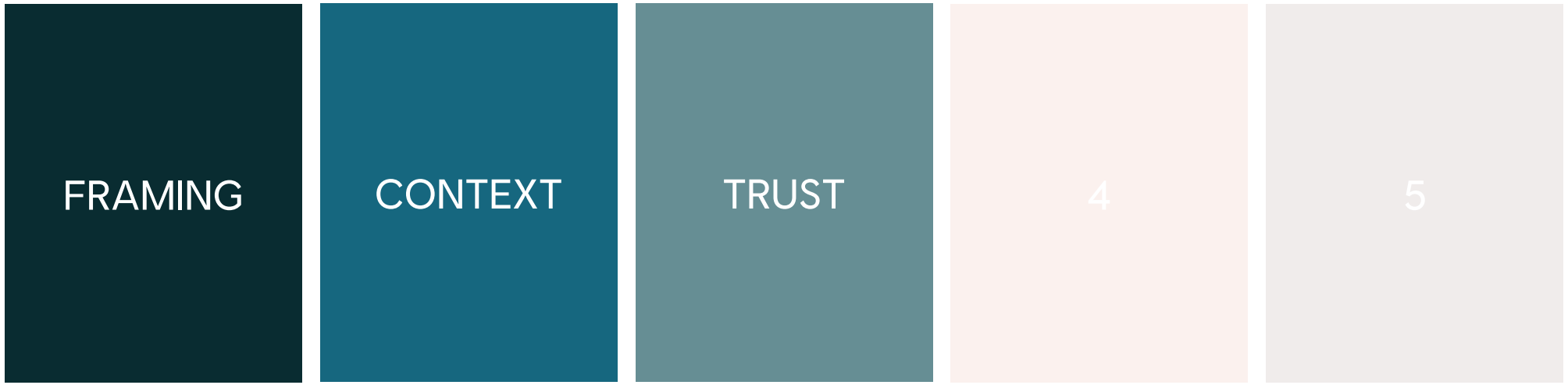
THANK YOU!

NEXT PART

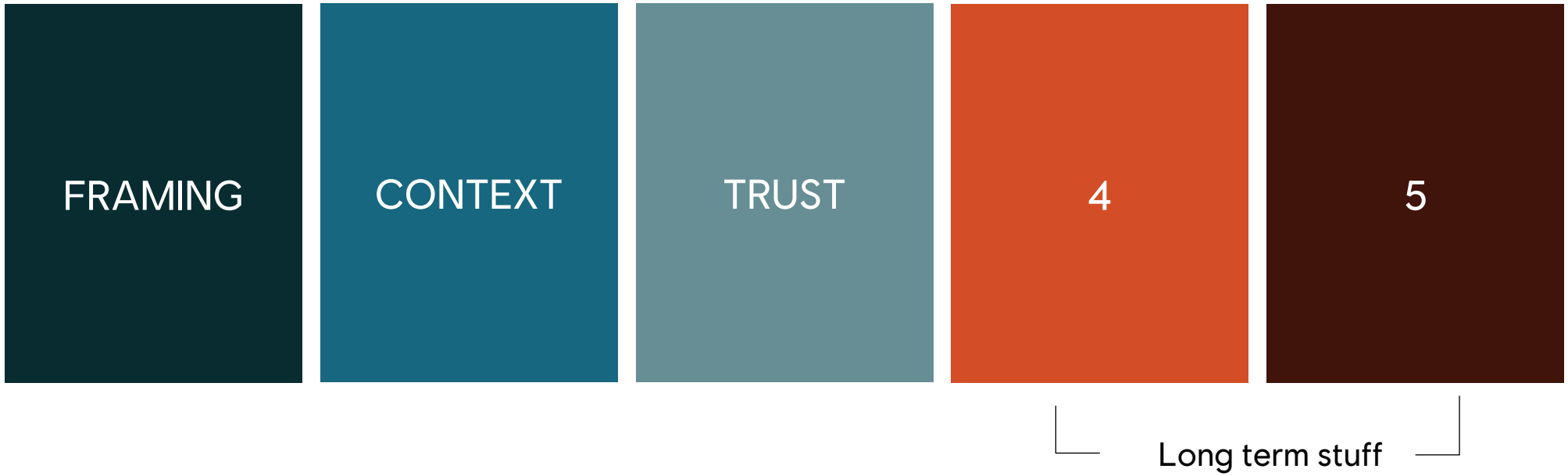
INTERLUDE

COFFEE! We'll return at 3pm

CONSIDERATIONS



CONSIDERATIONS



ONTOLOGY

WAYS OF BEING

ONTOLOGY

WAYS OF BEING

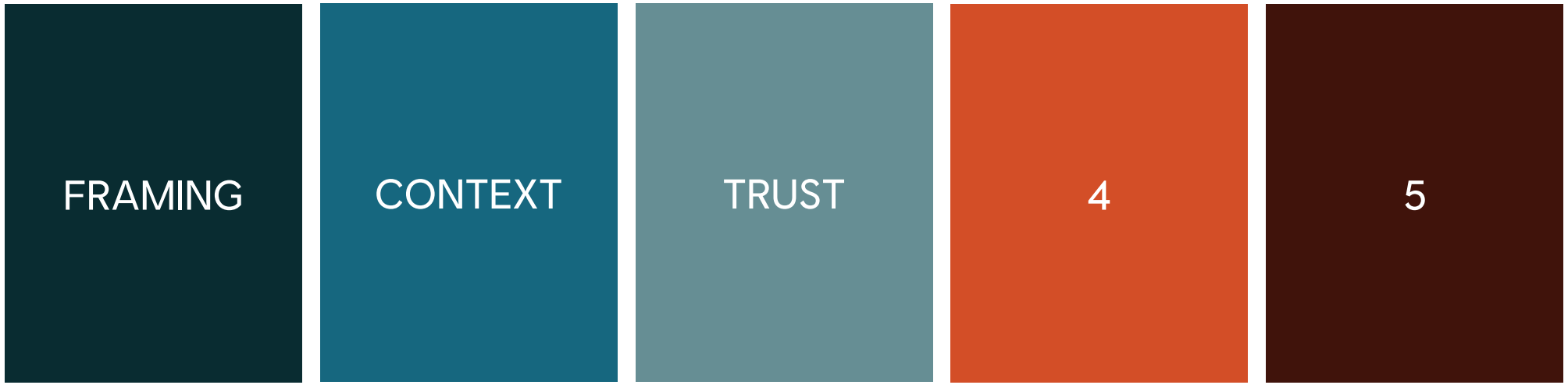
EPISTEMOLOGY

ONTOLOGY

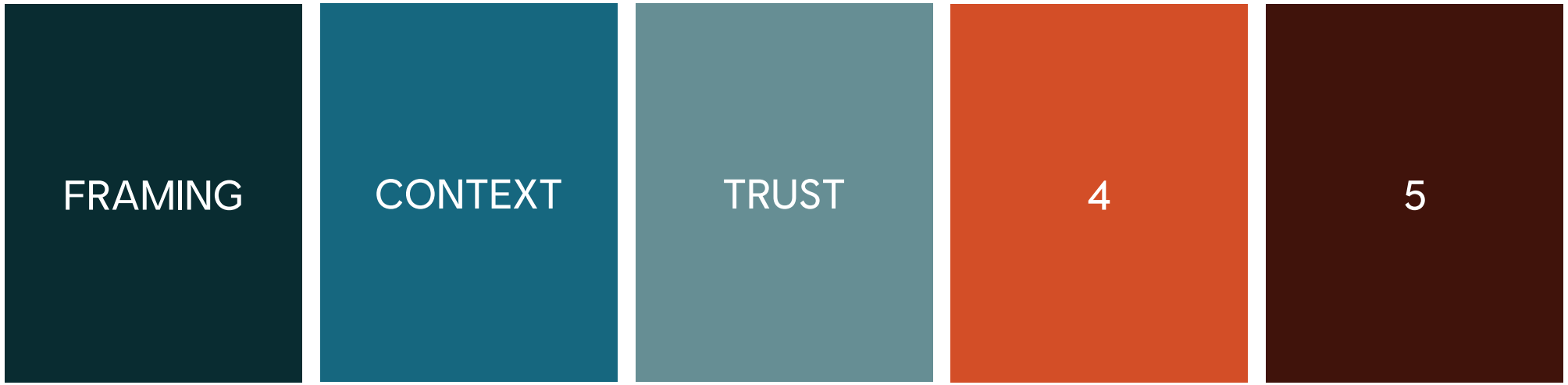
WAYS OF BEING

EPISTEMOLOGY

WAYS OF KNOWING



EPISTEMOLOGIES

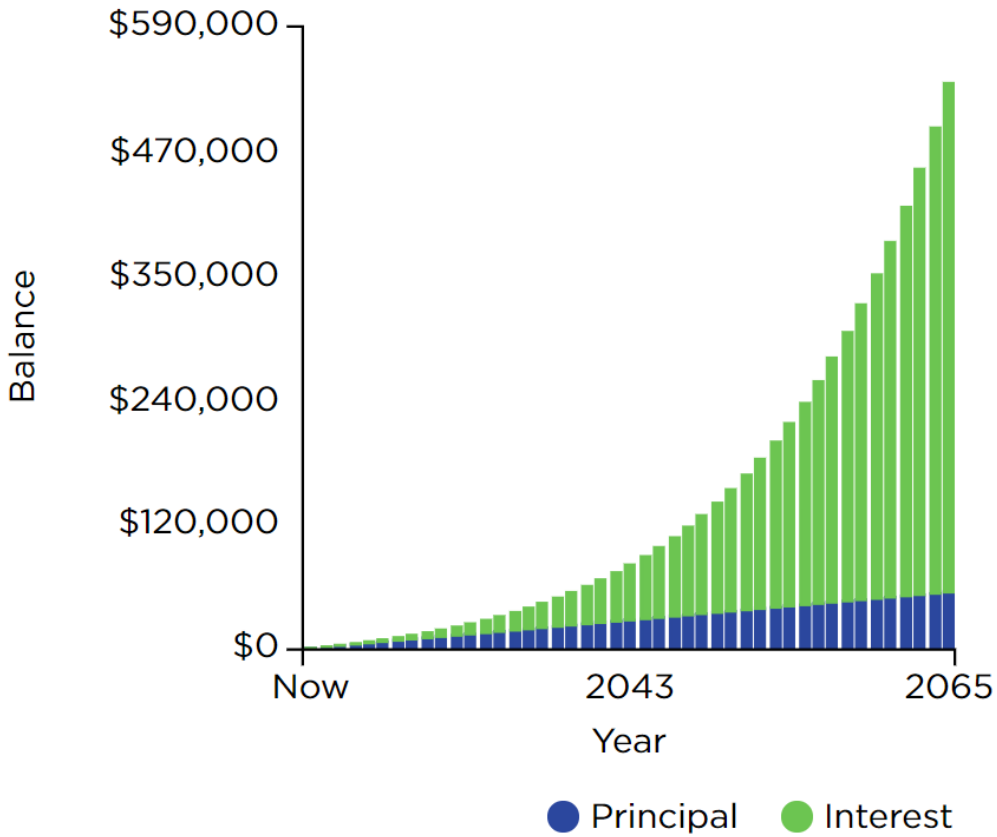


EPISTEMOLOGIES ONTOLOGIES

CONSIDERATIONS

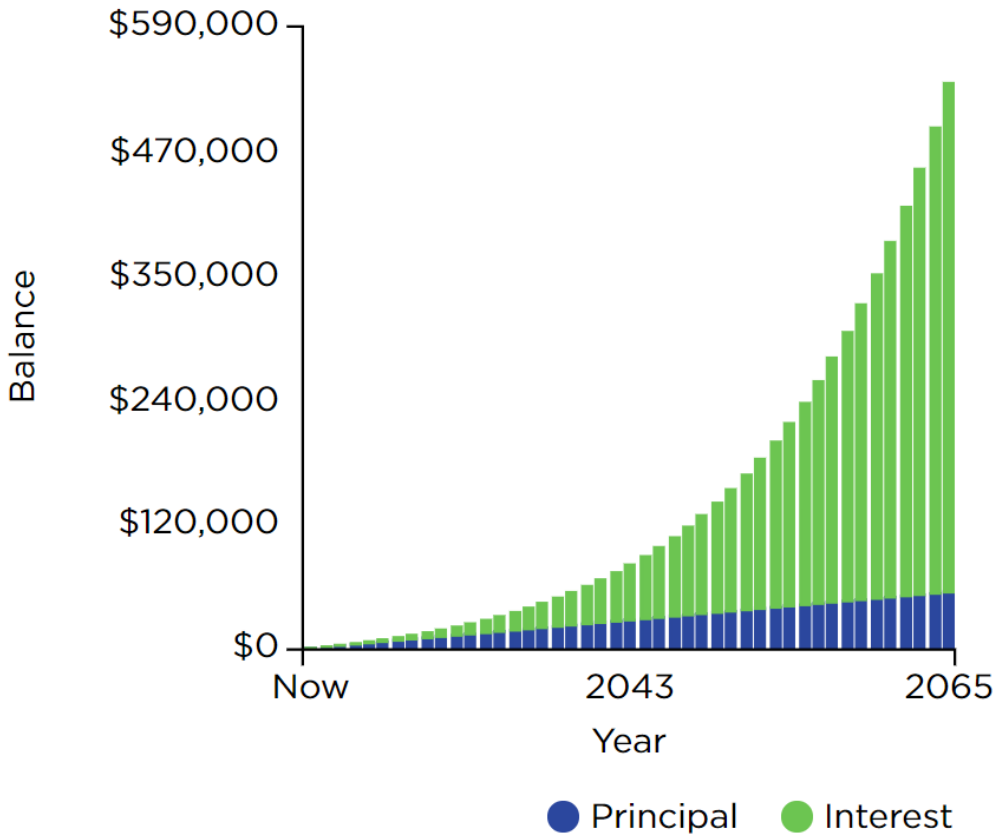
Future Balance

$534,745



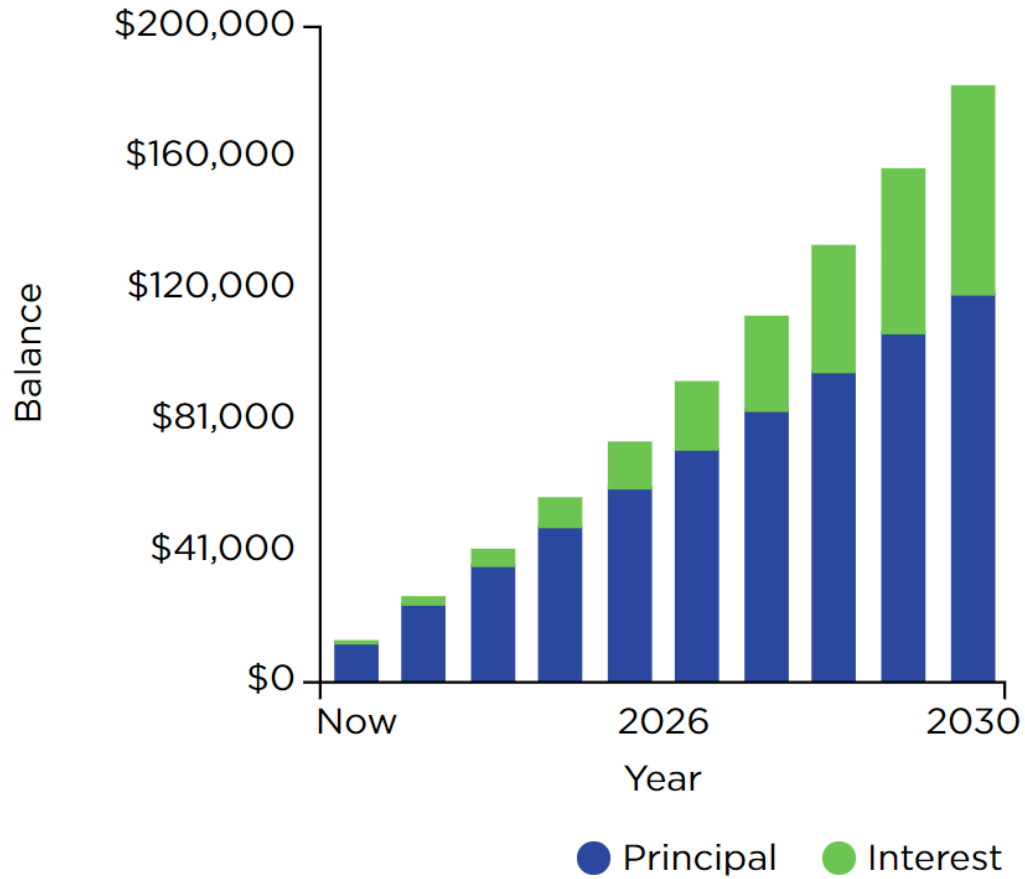
Future Balance

$534,745



Future Balance

$184,397



1500
45
10

When people become emotionally overwhelmed, they shut down.

“THE IDEA OF RETIREMENT IS EXCITING, BUT IT'S MORE **SCARY** AND **CONFUSING** THAN ANYTHING”

“I'M **OVERWHELMED** BY ALL THE DIFFERENT POSSIBILITIES AND DON'T KNOW WHERE TO TURN FOR A RESOURCE.”

4 Elements to Pro-environmental Behavior

01

Attitude

02

Knowledge

03

Perceived Self-efficacy

04

Hope

4 Elements to Pro-environmental Behavior

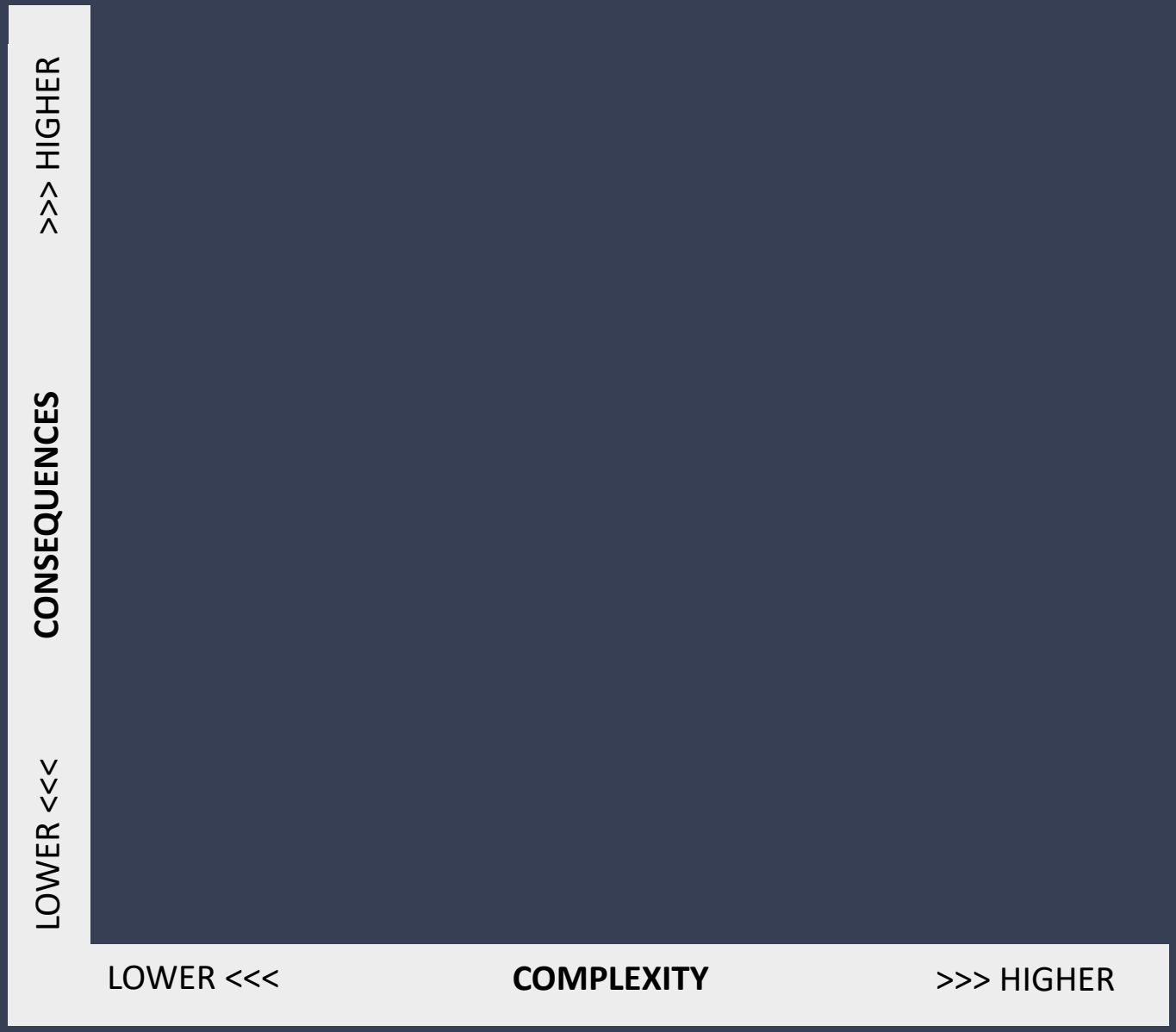
01
Attitude

02
Knowledge

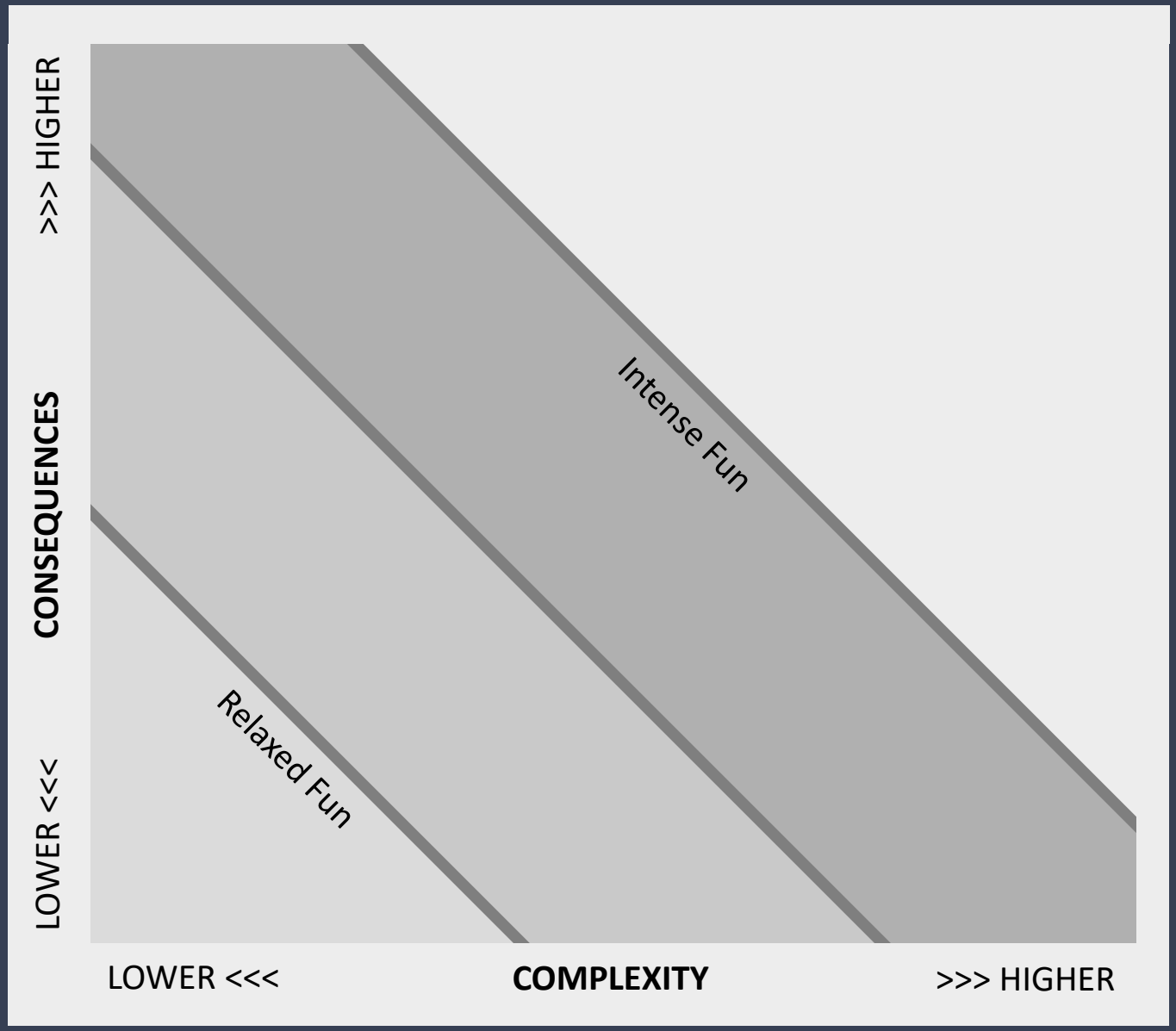
03
Perceived Self-efficacy

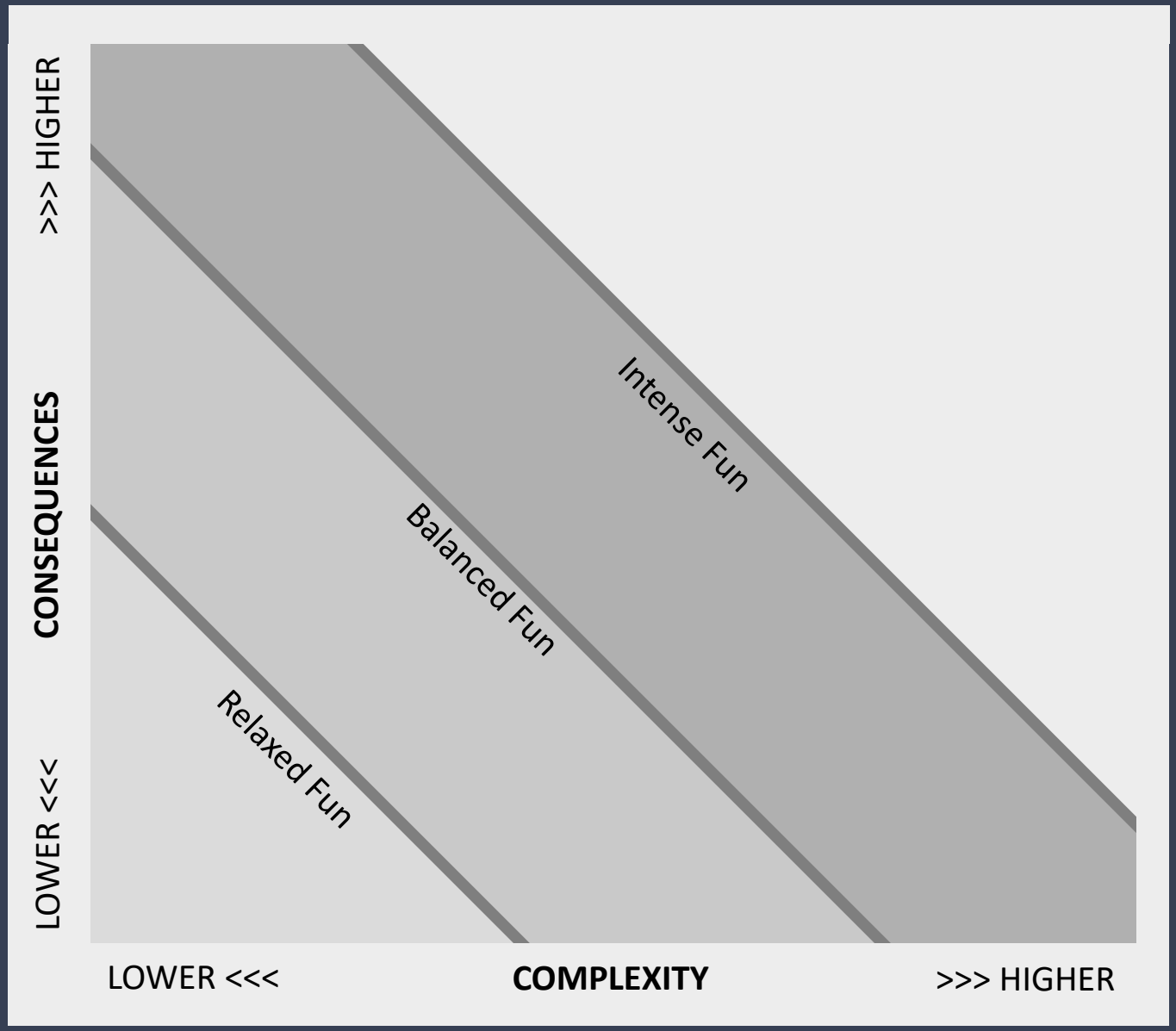
04
Hope

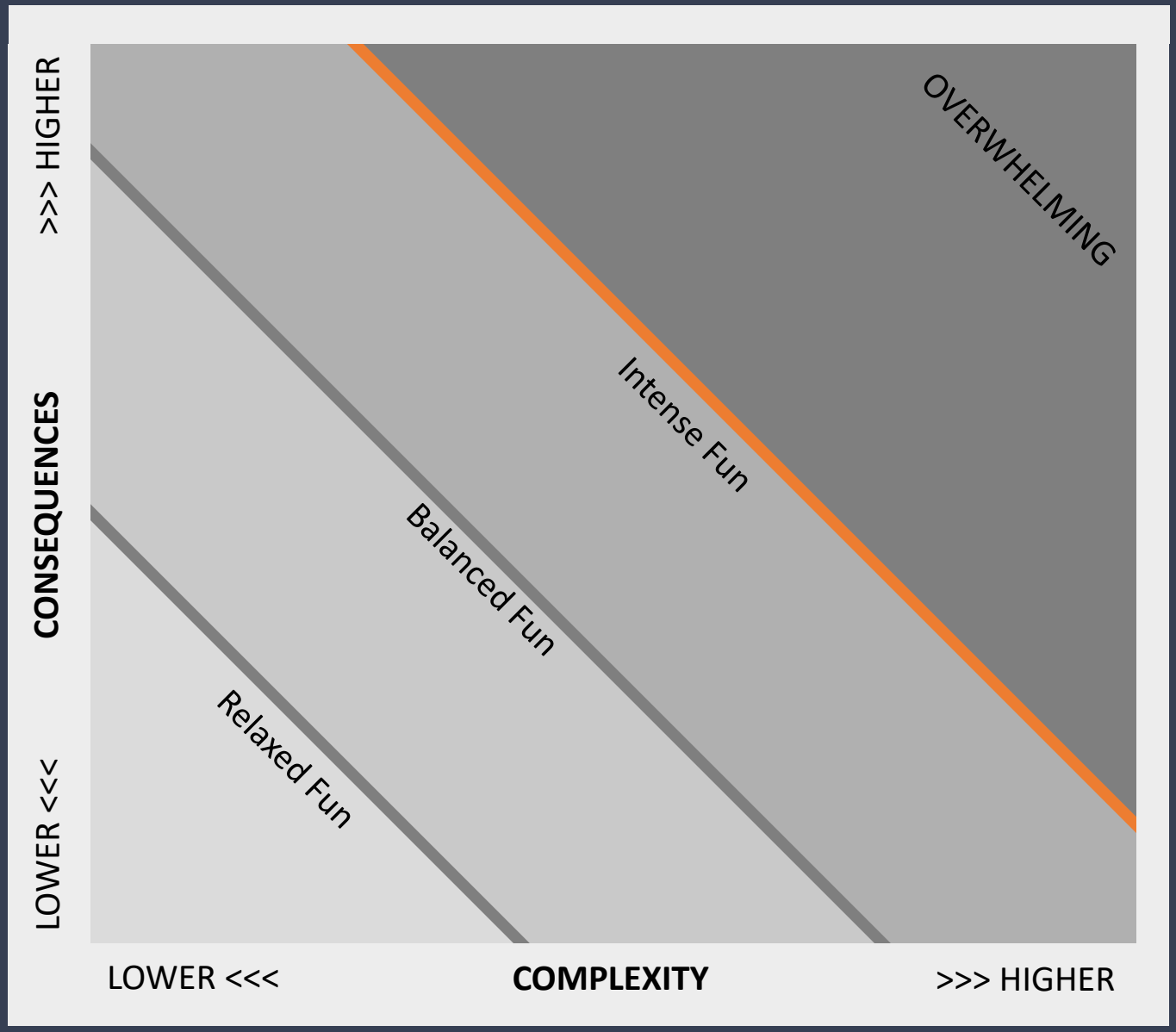
LOWER <<< **COMPLEXITY** >>> HIGHER

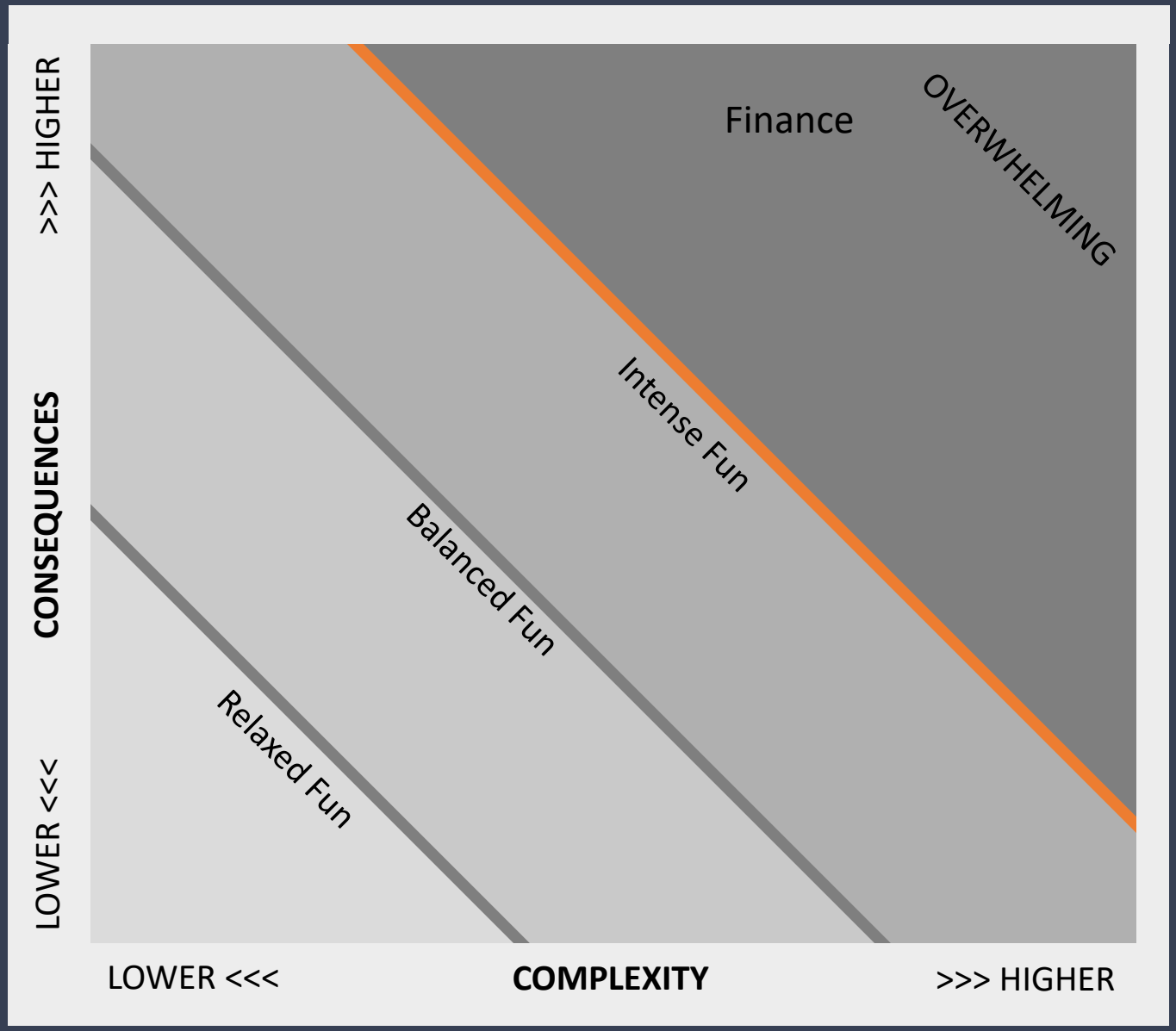

>>> HIGHER
CONSEQUENCES
LOWER <<<
LOWER <<<
COMPLEXITY
>>> HIGHER

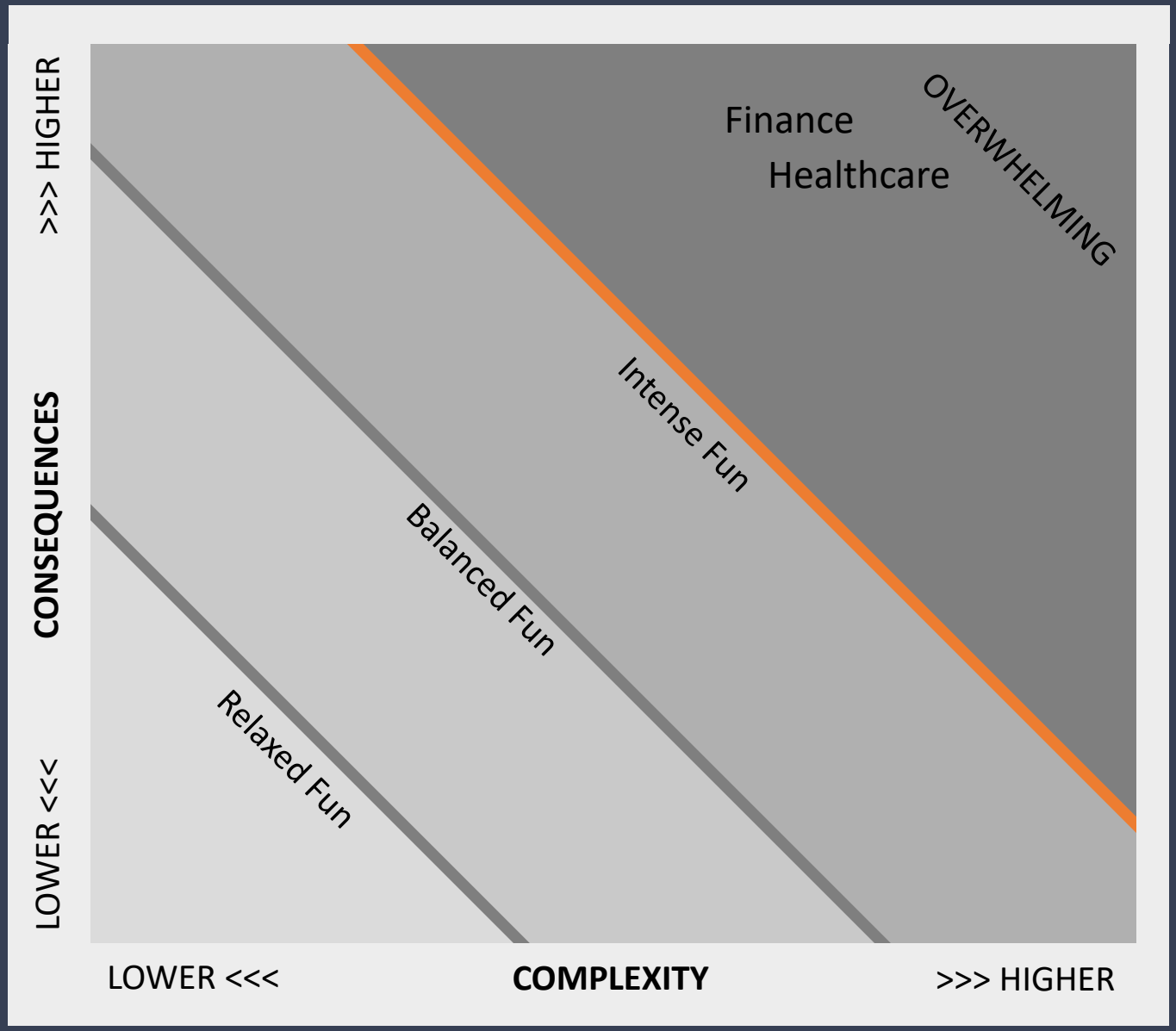
>>> HIGHER
CONSEQUENCES
LOWER <<<
Relaxed Fun
LOWER <<<
COMPLEXITY
>>> HIGHER

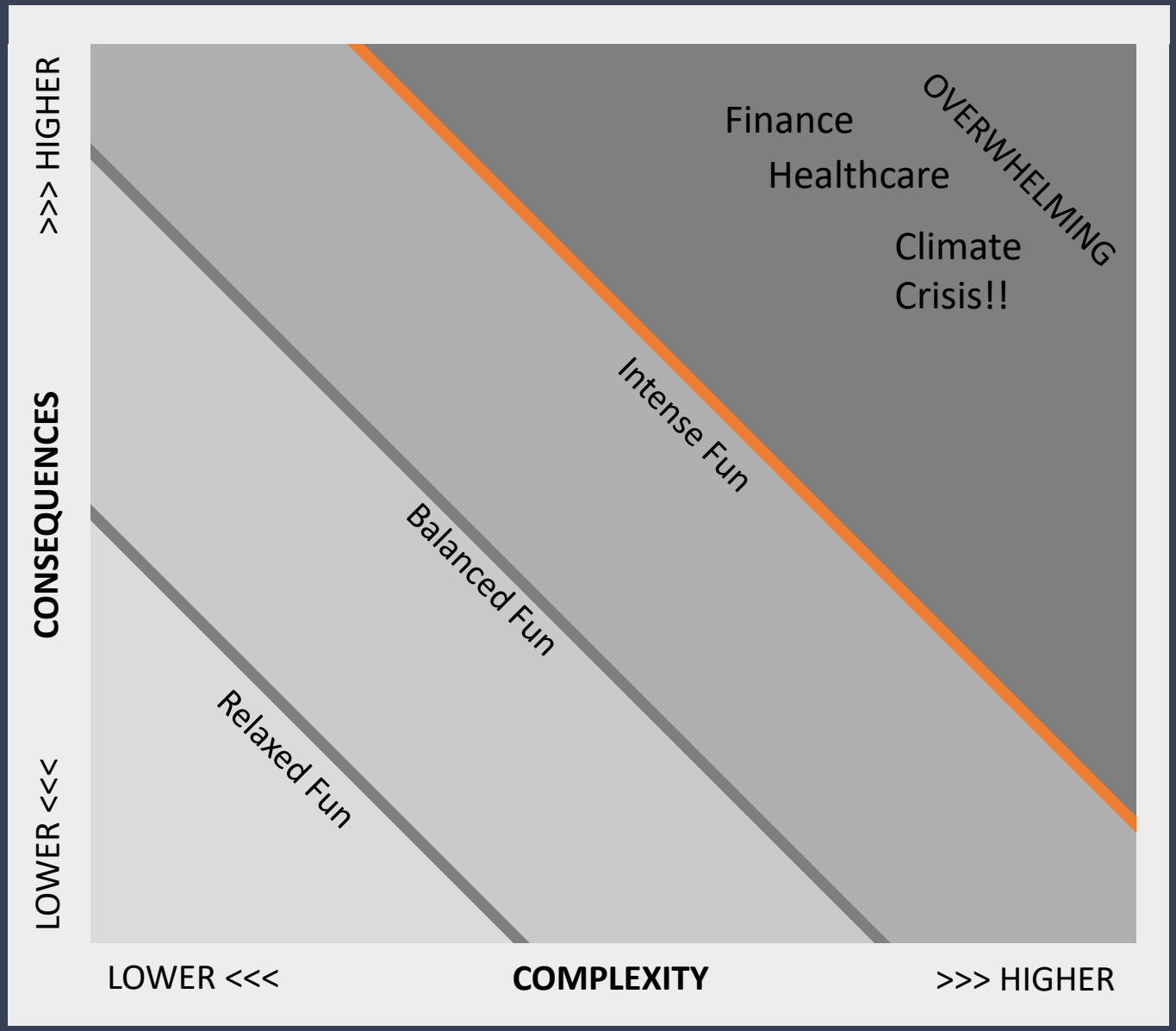

>>> HIGHER
CONSEQUENCES
LOWER <<<
Intense Fun
Relaxed Fun
LOWER <<<
COMPLEXITY
>>> HIGHER

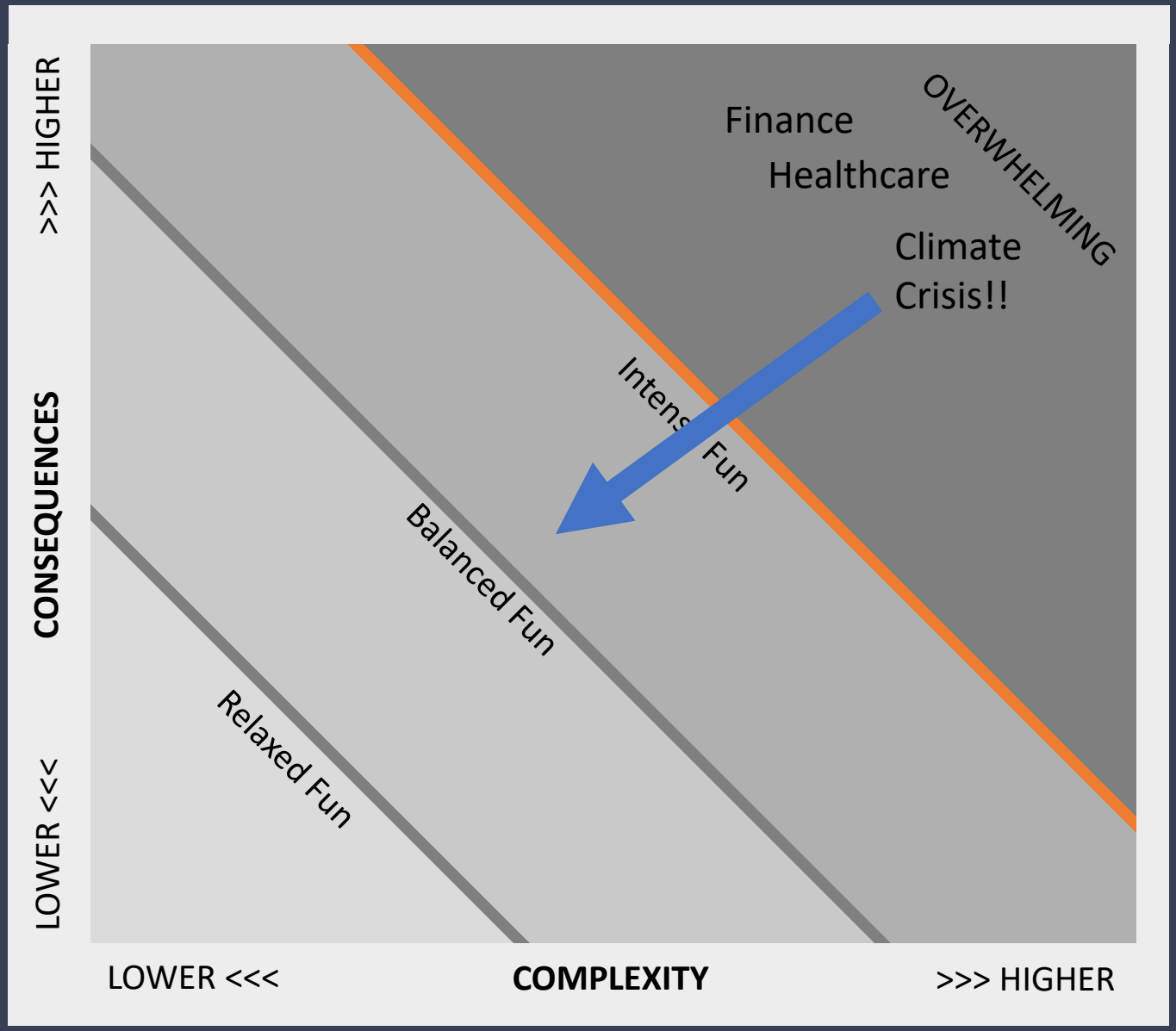

>>> HIGHER
CONSEQUENCES
LOWER <<<
Intense Fun
Balanced Fun
Relaxed Fun
LOWER <<<
COMPLEXITY
>>> HIGHER

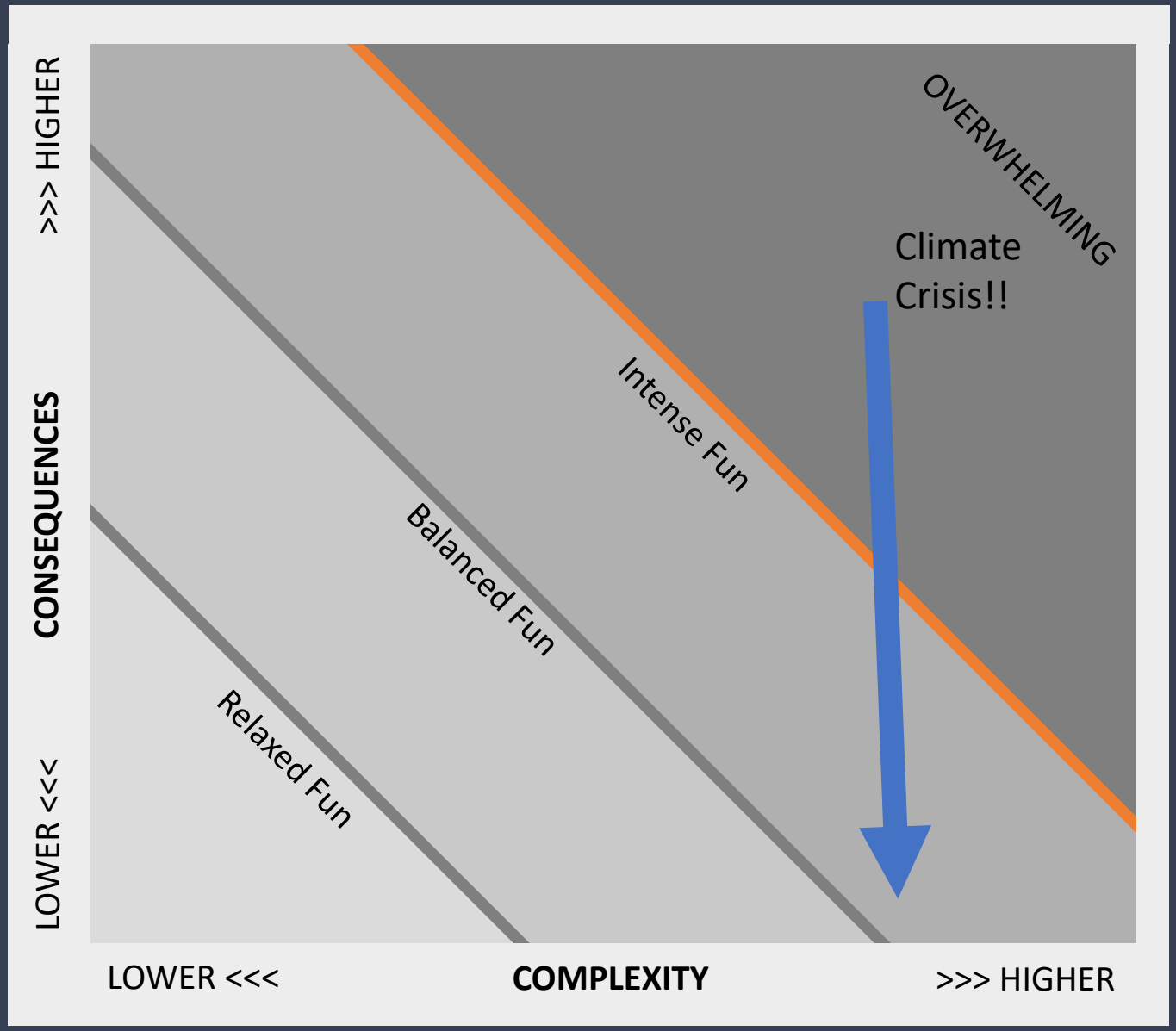

>>> HIGHER
CONSEQUENCES
LOWER <<<
OVERWHELMING
Intense Fun
Balanced Fun
Relaxed Fun
LOWER <<<
COMPLEXITY
>>> HIGHER

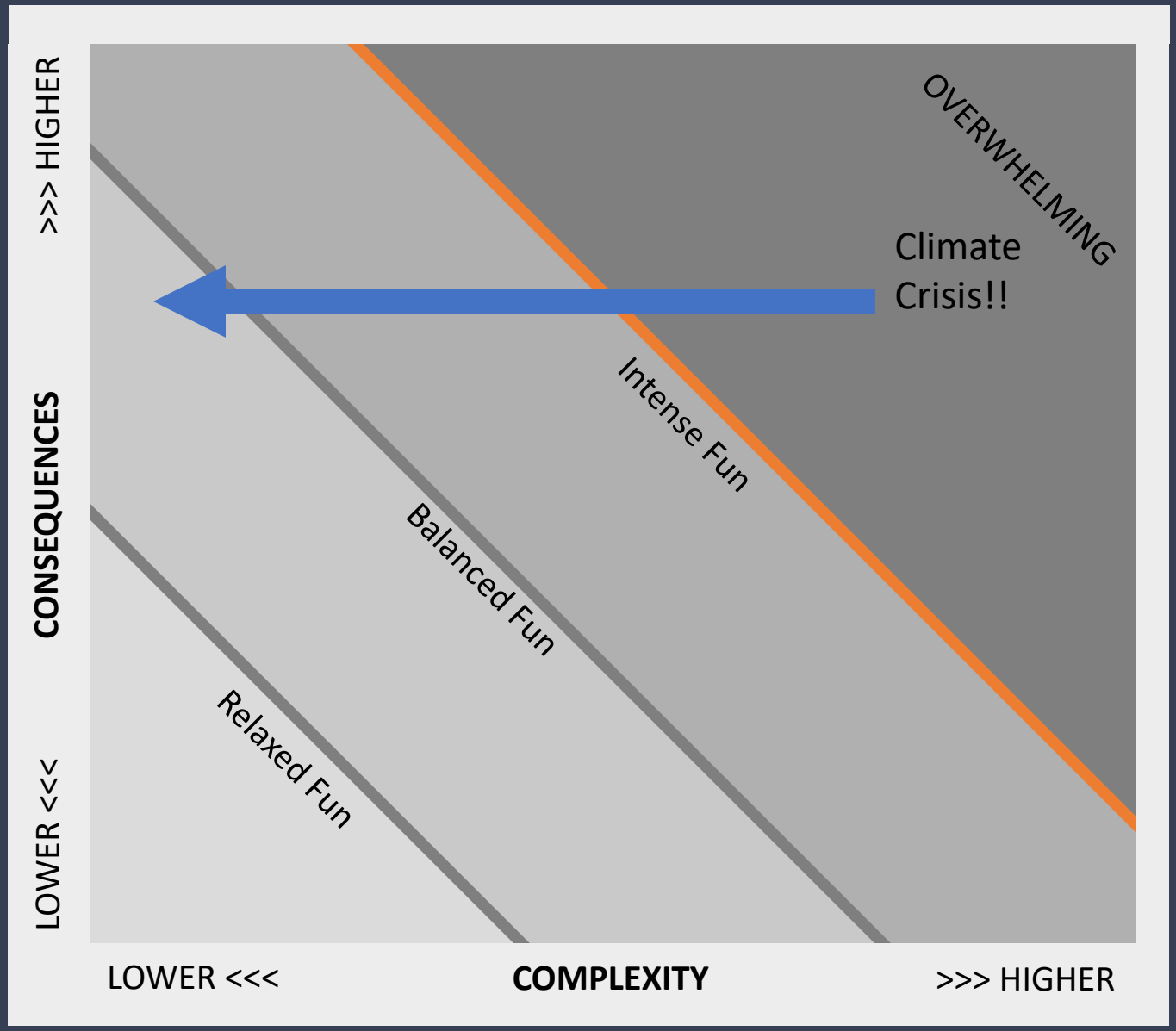

>>> HIGHER
CONSEQUENCES
LOWER <<<
Finance
OVERWHELMING
Intense Fun
Balanced Fun
Relaxed Fun
LOWER <<<
COMPLEXITY
>>> HIGHER

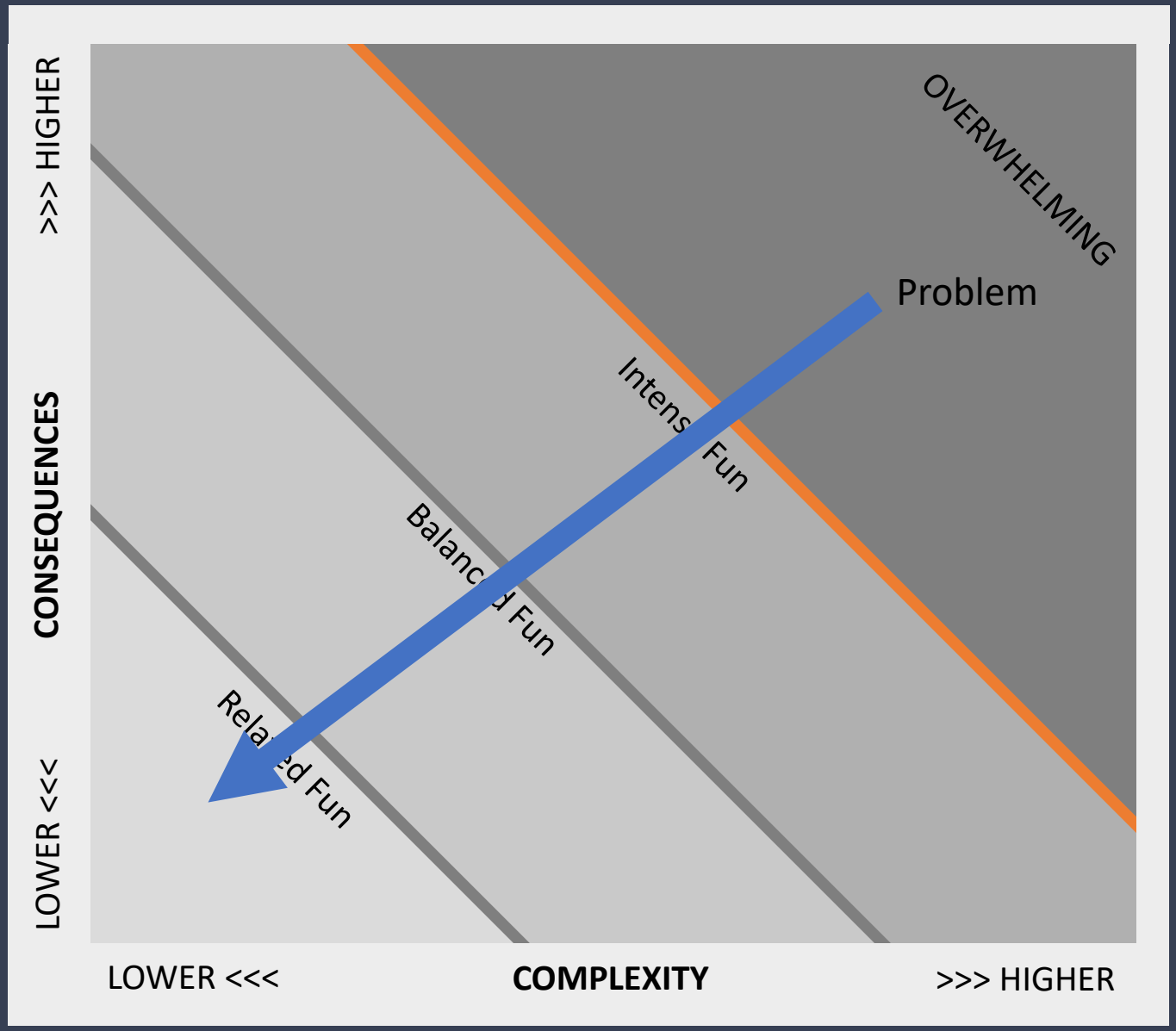

>>> HIGHER
CONSEQUENCES
LOWER <<<
Finance
Healthcare
OVERWHELMING
Intense Fun
Balanced Fun
Relaxed Fun
LOWER <<<
COMPLEXITY
>>> HIGHER


>>> HIGHER
CONSEQUENCES
LOWER <<<
Finance
Healthcare
Climate
Crisis!!
OVERWHELMING
Intense Fun
Balanced Fun
Relaxed Fun
LOWER <<<
COMPLEXITY
>>> HIGHER


>>> HIGHER
CONSEQUENCES
LOWER <<<
Finance
Healthcare
OVERWHELMING
Climate
Crisis!!
Intens
Fun
Balanced Fun
Relaxed Fun
LOWER <<<
COMPLEXITY
>>> HIGHER


>>> HIGHER
CONSEQUENCES
LOWER <<<
OVERWHELMING
Climate
Crisis!!
Intense Fun
Balanced Fun
Relaxed Fun
LOWER <<<
COMPLEXITY
>>> HIGHER


>>> HIGHER
CONSEQUENCES
LOWER <<<
OVERWHELMING
Climate
Crisis!!
Intense Fun
Balanced Fun
Relaxed Fun
LOWER <<<
COMPLEXITY
>>> HIGHER


>>> HIGHER
CONSEQUENCES
LOWER <<<
OVERWHELMING
Problem
Intens
Fun
Balanc
d Fun
Rela
d Fun
LOWER <<<
COMPLEXITY
>>> HIGHER

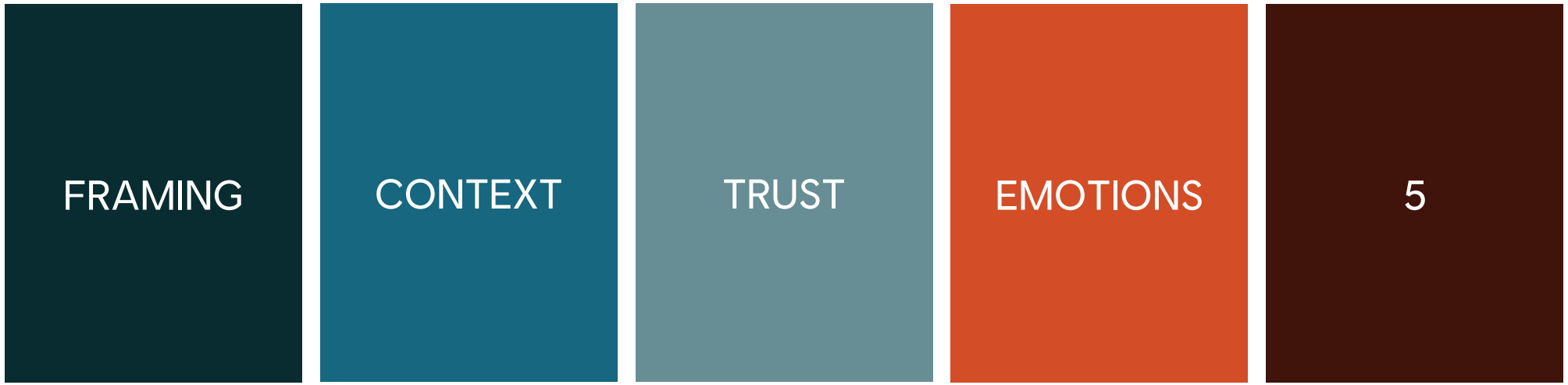
Connect Emotionally: Review

- Avoid overwhelming feelings
- Consider complexity and consequences in your designs
- Foster hope, optimism, confidence

Consider:

- How might you tune the complexity and consequences in your game to keep players feeling empowered rather than overwhelmed, even as you guide them to face large, potentially scary real-world issues?

CONSIDERATIONS



CONSIDERATIONS

MCU DIRECT
MARVEL STUDIOS
AVENGERS
ENDGAME

Disneyland
Park

Baby Names

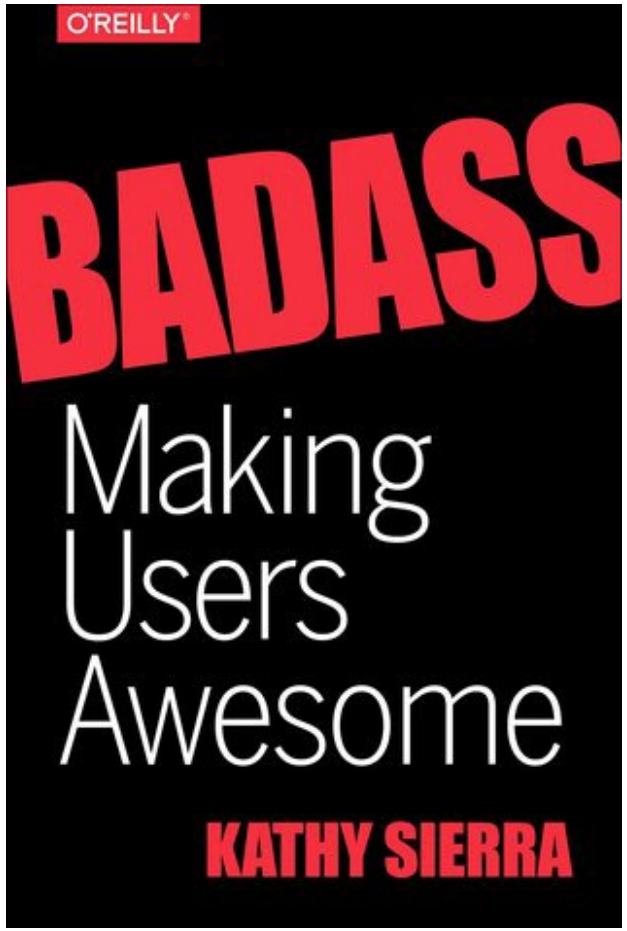
Get the lowdown on thousands of baby names right here – including meanings, origins, namesakes, celebrity babies, and **Disney characters** who share the same name. Not sure where to start? Browse our full collection of **baby girl names** and **baby boy names**, or check out some **Disney-themed baby name articles** to help get you inspired.

Browse By Origin

African	Arabic	Celtic
Chinese	Czech	Danish
Dutch	Egyptian	English
Finnish	French	German
Greek	Hebrew	Hungarian

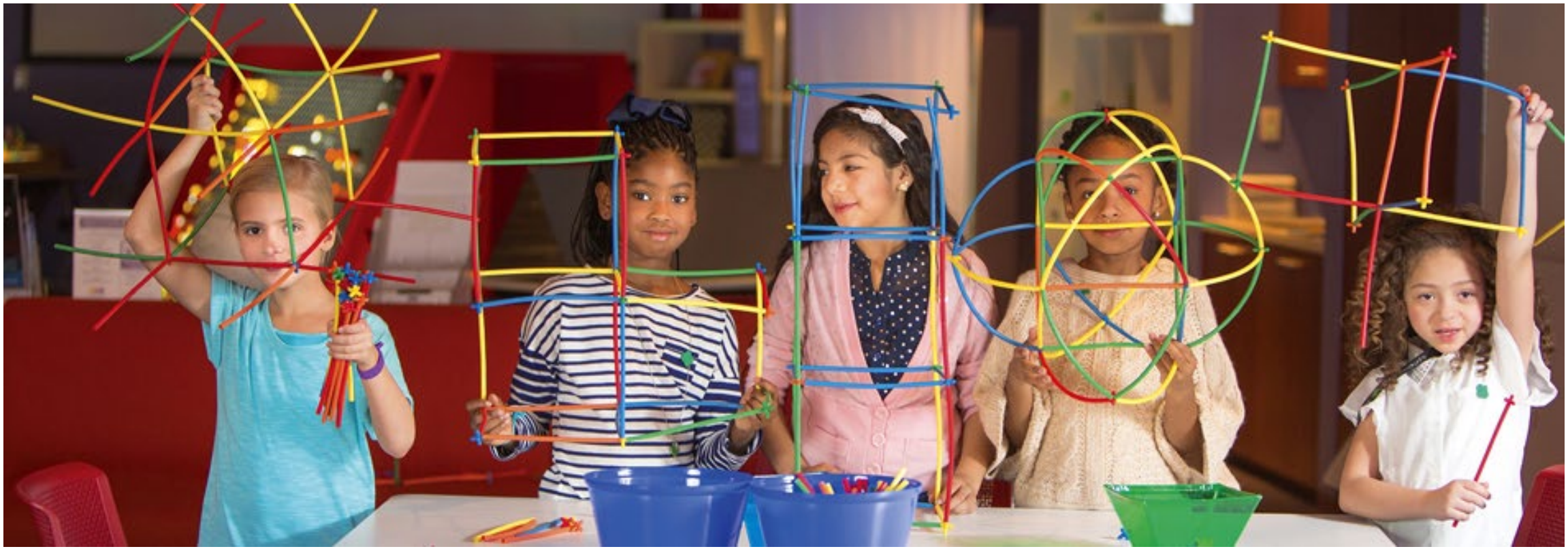
Browse By Theme

Animal	Bird
Color	Contemporary
Flower	Fruit
Green	Literary
Nature	Place


O'REILLY
BADASS
Making
Users
Awesome
KATHY SIERRA

Shape identity in games:

1. Connect in-game identity to a real-world identity
2. Actual gameplay experience ties to real-world identity behaviors
3. Provide the player’s in-game identity with a real-world identity



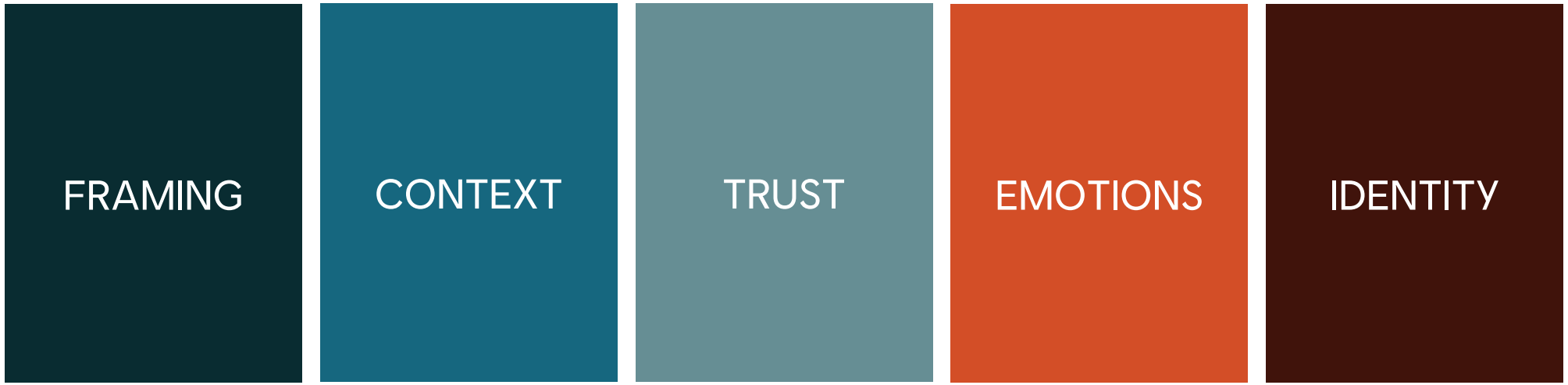
TraKid

BECOME AN EXPLORER

ADVENTURE IS CLOSER THAN YOU THINK

Earn the trust of your favorite animals and learn their secrets! With the TraKid Explorer Band, kids become heroic explorers on this family-friendly expedition through the zoo.

CONSIDERATIONS



CONSIDER:

1. What are you trying to say?
2. Who are you trying to say this to?
3. Why should they trust you?
4. How do you want them to feel?
5. Who might they become?

You are transformational game designers too.

THANK YOU!

NEXT PART

IN PRACTICE

PUTTING IT ALL TOGETHER

Agree on:

- Your specific topic
- Your theory of change
- Your impact statement (How will players be different)
- How your game will bring about that impact.

YOUR PITCH WORKSHEET

Topic
Genre
Audience
Title
Impact Statement
Related Systems /Features
Player Impact Stories
Summary

GDC | March 20-24, 2023 San Francisco, CA

Adrienne Arsht-Rockefeller Foundation Resilience Center

Atlantic Council

igda Climate SIG

Use Your **Game Developer Superpowers** to Fight the **Climate Crisis**

5

LET'S BUILD A

THEORY OF ACTION

Paula ESCUADRA

#GDC23

Paula Angela Escuadra (She/Her)

Sr UX Strategist, Xbox Game Studios Cloud Publishing
Co-Founder & Co-Chair, IGDA Climate Special Interest Group
Co-Author, Environmental Game Design Playbook: Presented by the IGDA Climate SIG

12+ years in the video game industry (AAA, indie, nonprofit education, workforce simulation, and other fun/weird projects)

MBA and MPA from Presidio Graduate School of Sustainable Management, with an emphasis on using community-based participatory design to drive environmental impact and community resiliency building

Very avid dog person (It probably shows)

“All models are wrong,

but some are useful.”

George E. P. Box

Appreciation
(Fun, Interest in Continued Play, Advocacy)

Appreciation
(Fun, Interest in Continued Play, Advocacy)

Player Needs Fulfillment
(Emotional Responses, Psychological Needs)

Core Gameplay Elements
(What, Why, How)

Prior Knowledge
(Existing Mental Models,
Genre/Mechanics-Based Heuristics)

Appreciation
(Fun, Interest in Continued Play, Advocacy)

Player Needs Fulfillment
(Emotional Responses, Psychological Needs)

Core Gameplay Elements
(What, Why, How)

Prior Knowledge
(Existing Mental Models,
Genre/Mechanics-Based Heuristics)

What are players' existing expectations about how a given system works?

Appreciation
(Fun, Interest in Continued Play, Advocacy)

Player Needs Fulfillment
(Emotional Responses, Psychological Needs)

Core Gameplay Elements
(What, Why, How)

Prior Knowledge
(Existing Mental Models,
Genre/Mechanics-Based Heuristics)

*What are players' **existing expectations** about how a given system works?*

*Do players understand **what** to do, **why** they have to do it, and **how** they can do it - all in a way they **connect** with and can **access**?*

Appreciation
(Fun, Interest in Continued Play, Advocacy)

*What do they **experience**?*

Player Needs Fulfillment
(Emotional Responses, Psychological Needs)

Core Gameplay Elements
(What, Why, How)

*Do players understand **what** to do, **why** they have to do it, and **how** they can do it - all in a way they **connect** with and can **access**?*

Prior Knowledge
(Existing Mental Models,
Genre/Mechanics-Based Heuristics)

*What are players' existing **expectations** about how a given system works?*

*Do players feel it is **worthwhile**?*

Appreciation
(Fun, Interest in Continued Play, Advocacy)

*What do they **experience**?*

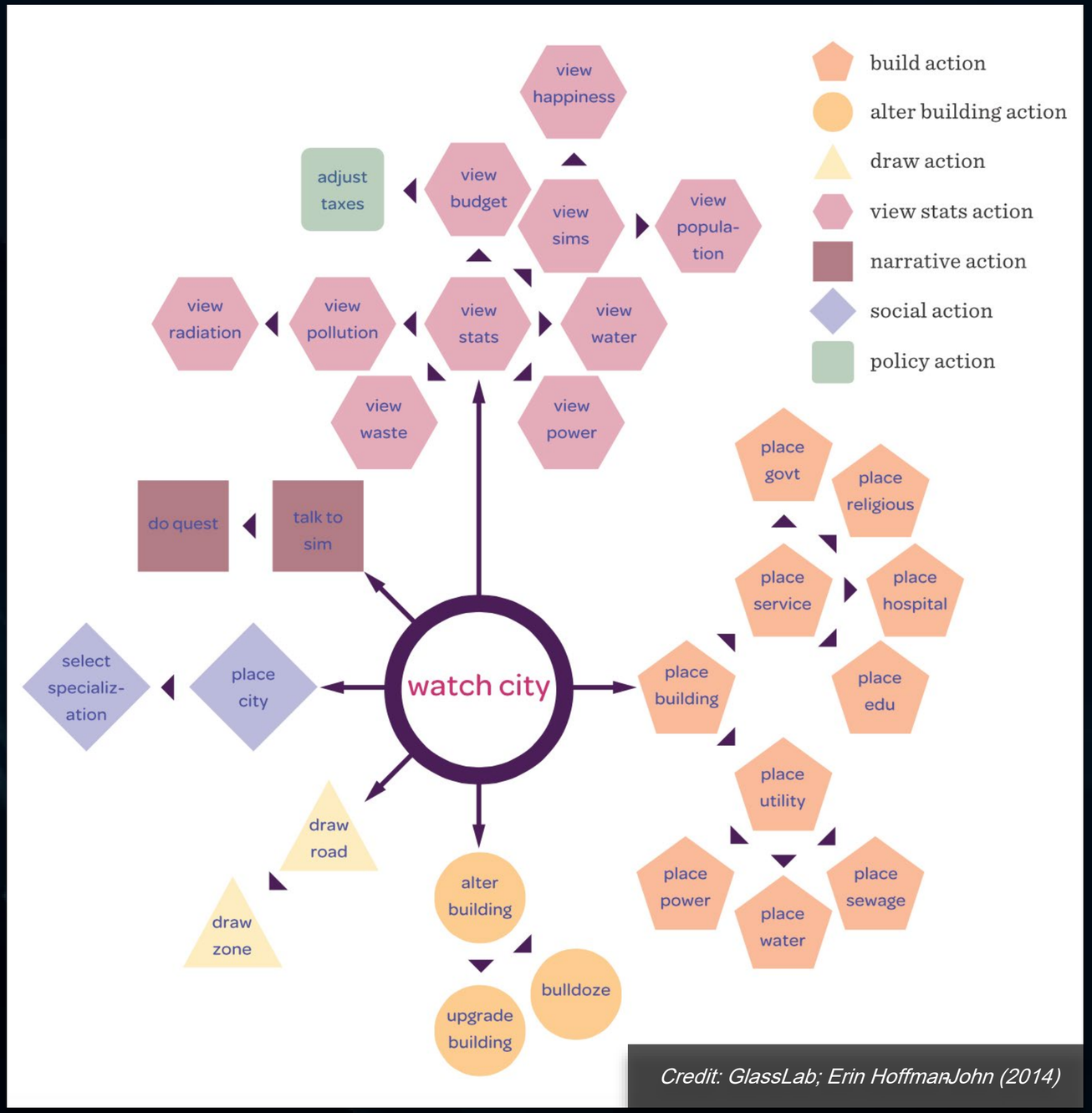
Player Needs Fulfillment
(Emotional Responses, Psychological Needs)

Core Gameplay Elements
(What, Why, How)

*Do players understand **what** to do, **why** they have to do it, and **how** they can do it - all in a way they **connect** with and can **access**?*

Prior Knowledge
(Existing Mental Models,
Genre/Mechanics-Based Heuristics)

*What are players' existing **expectations** about how a given system works?*



Credit: GlassLab; Erin HoffmanJohn (2014)

Pinned Tweet

Jack - blm

@failuagain

1. Exactly 5 years ago today, I visited my first fire lookout after playing Firewatch by @camposanto. 5 years later, I've visited 239 different towers and am preparing for a career in conservation. I'm going to talk about how this game changed my life.

8:57 PM · Feb 28, 2021 · Twitter for iPhone

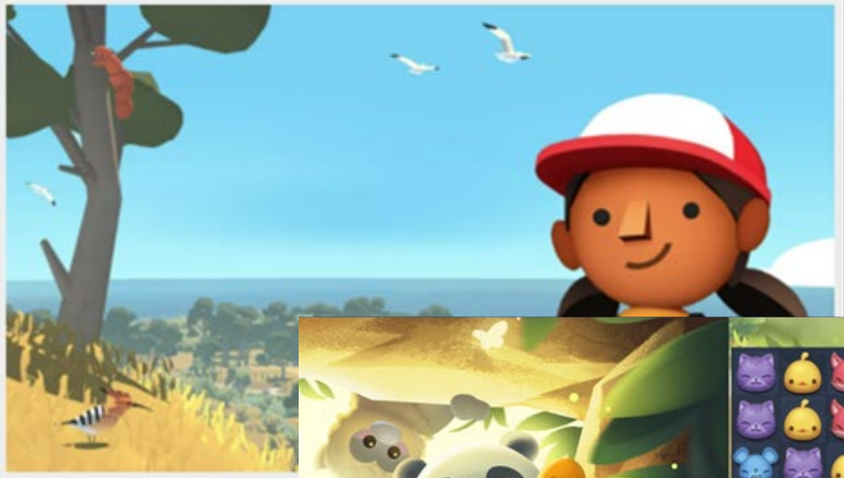
2,730 Retweets **436** Quote Tweets **20.9K** Likes

Alba: A Wildlife Adventure dev reveals one million trees have been planted thanks to game sales

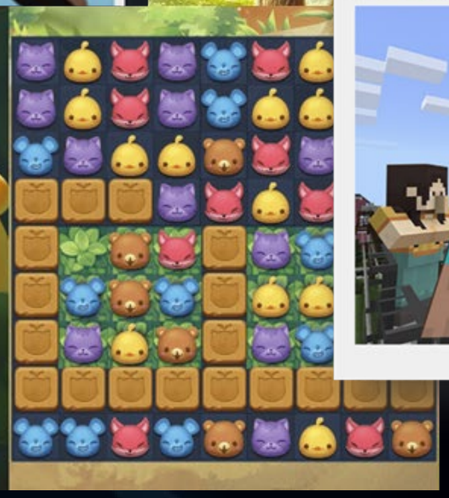
By Hirun Cryer published December 03, 2021

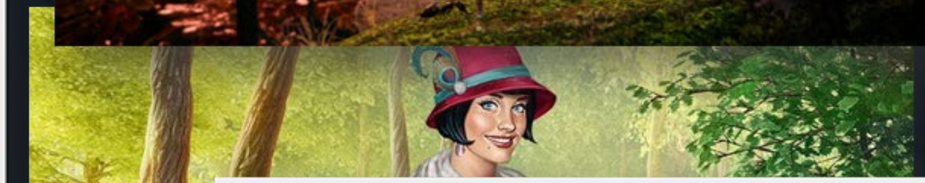
And they're not even done yet

COMMENTS



(Image credit: UsTwo Games)





BACK TO CATALOG

SUSTAINABILITY CITY

BY MINECRAFT → SEE MORE BY MINECRAFT

★★★★☆ 55745 Ratings

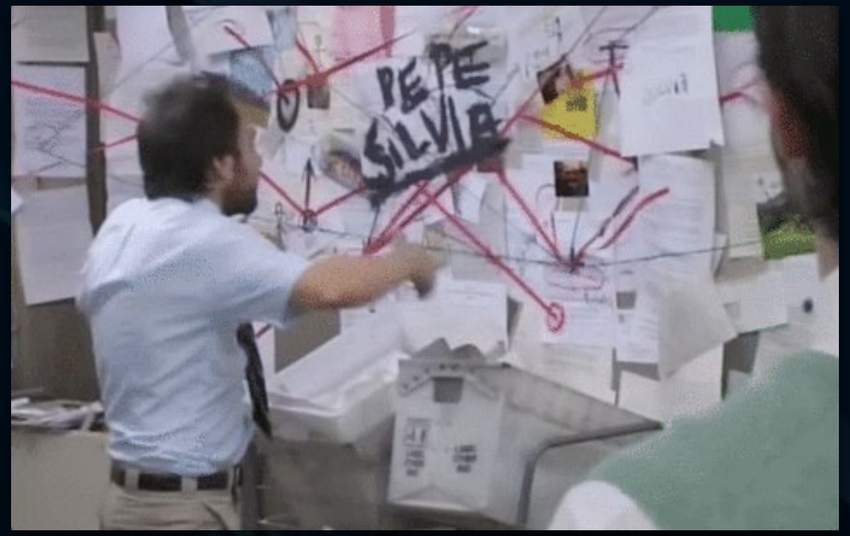
Unlock this item for FREE

Explore a sustainable neighborhood in Minecraft! Investigate sustainable water treatment, responsible forestry, clean power generation, energy efficiency, waste disposal, and recycling. Visit each area to learn more about the path to sustainability!

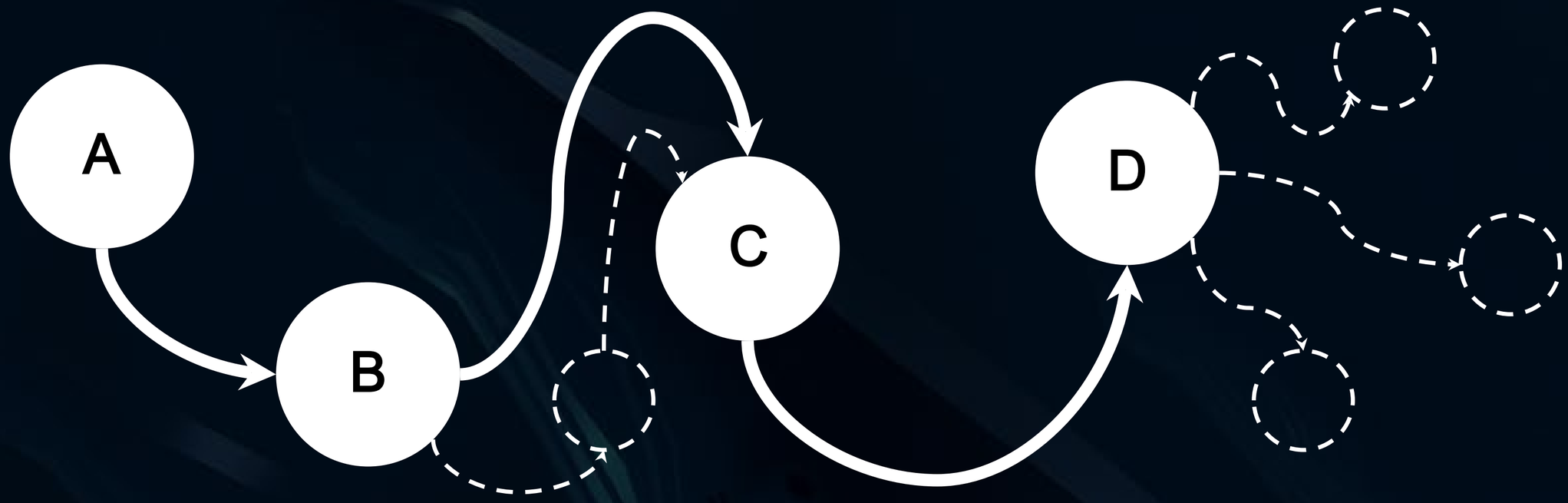
Open up the Marketplace on your Minecrafting device and download.

GET THIS ITEM

Don't own the game yet?
Get it for Windows 10 or your mobile device.



What is the path to *behavioral transference*?

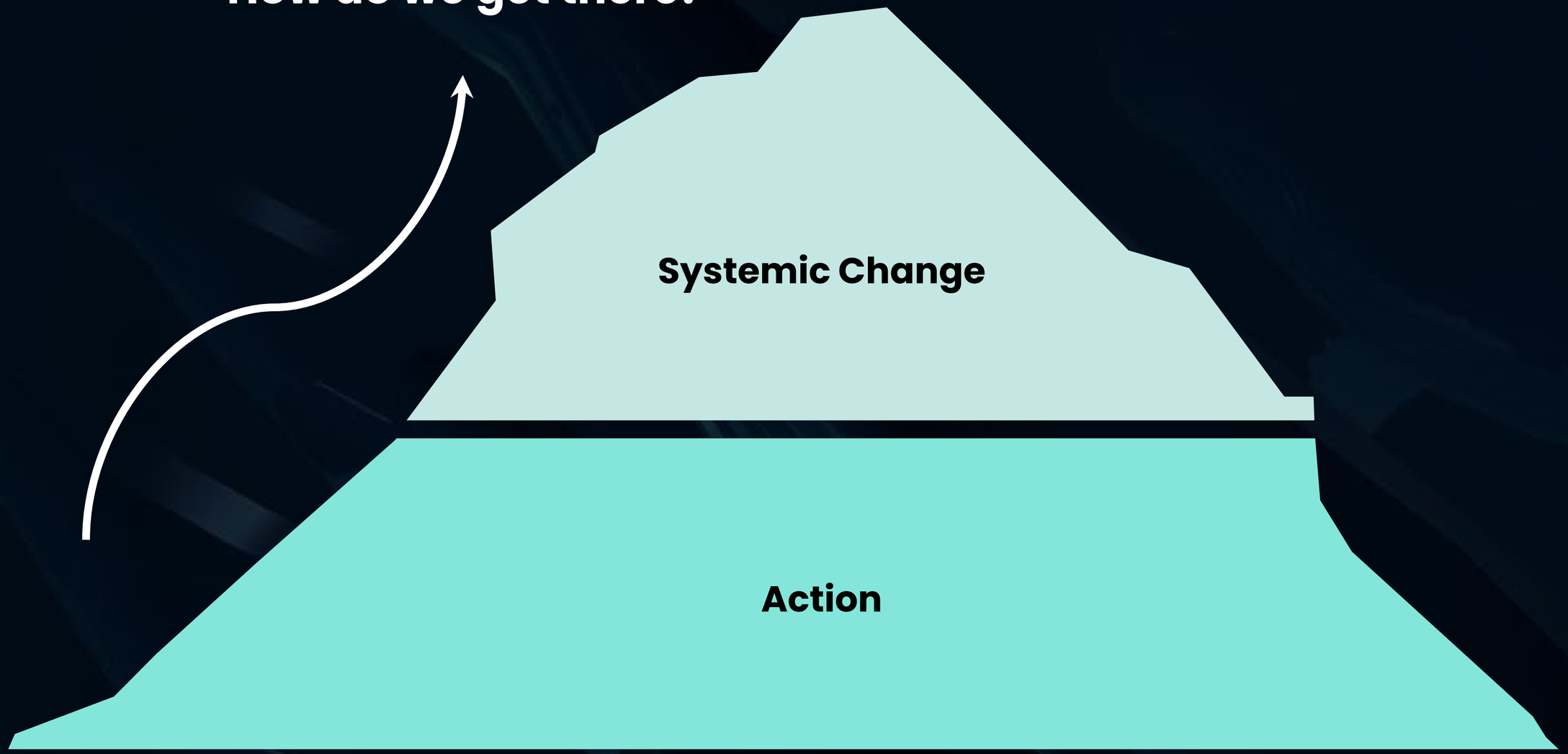


Let's build a *theory of action* .

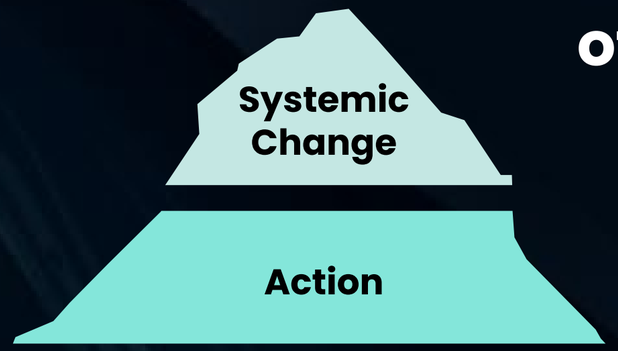
➔ A working, living, ever-evolving set of **hypotheses** about which **activities will generate what desired outcomes** , and **why they occur** .

➔ A **mental roadmap** that shows the relationships between our **interventions** (gameplay) and **intended results** (real-world outcomes).

Individual and collective action can create systemic change. How do we get there?

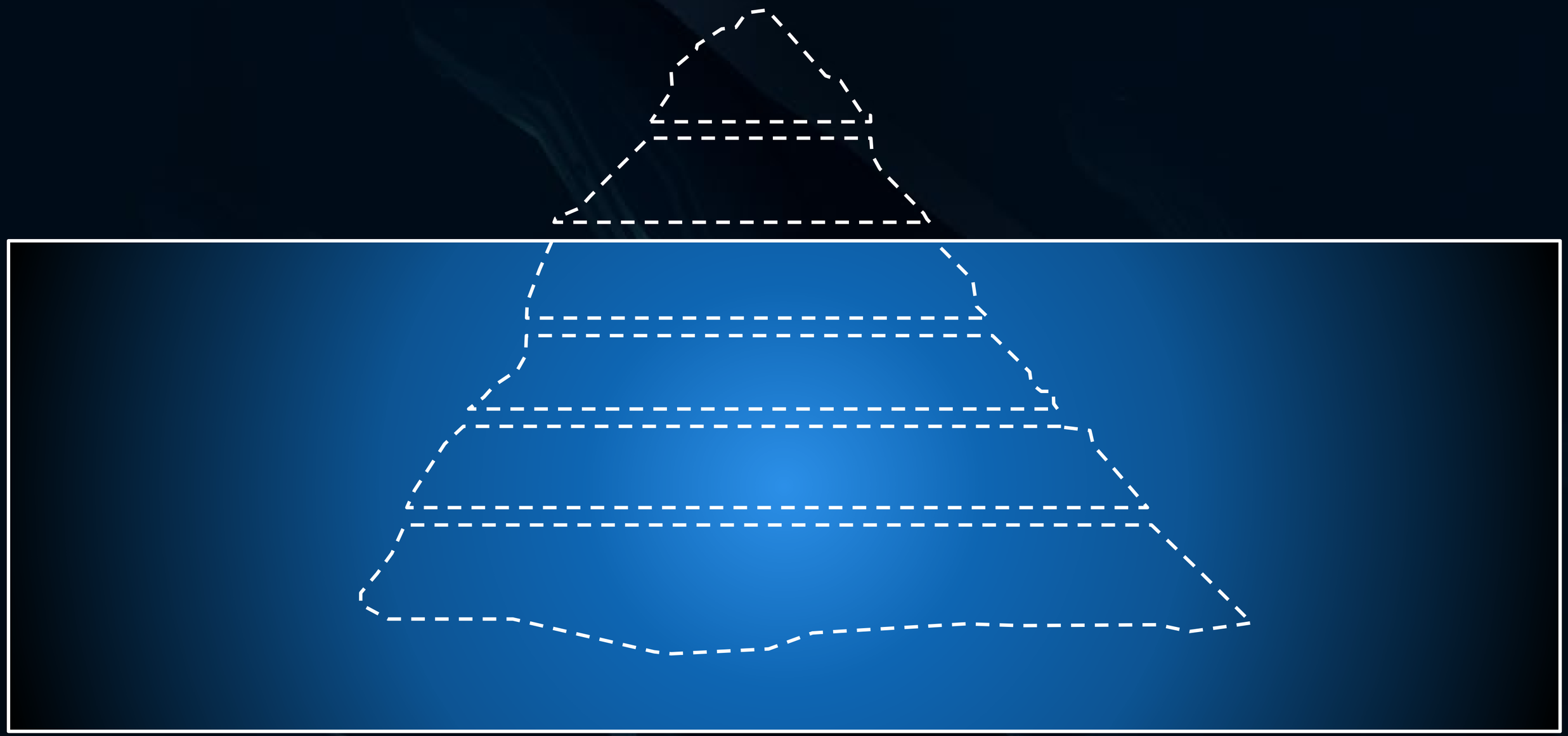


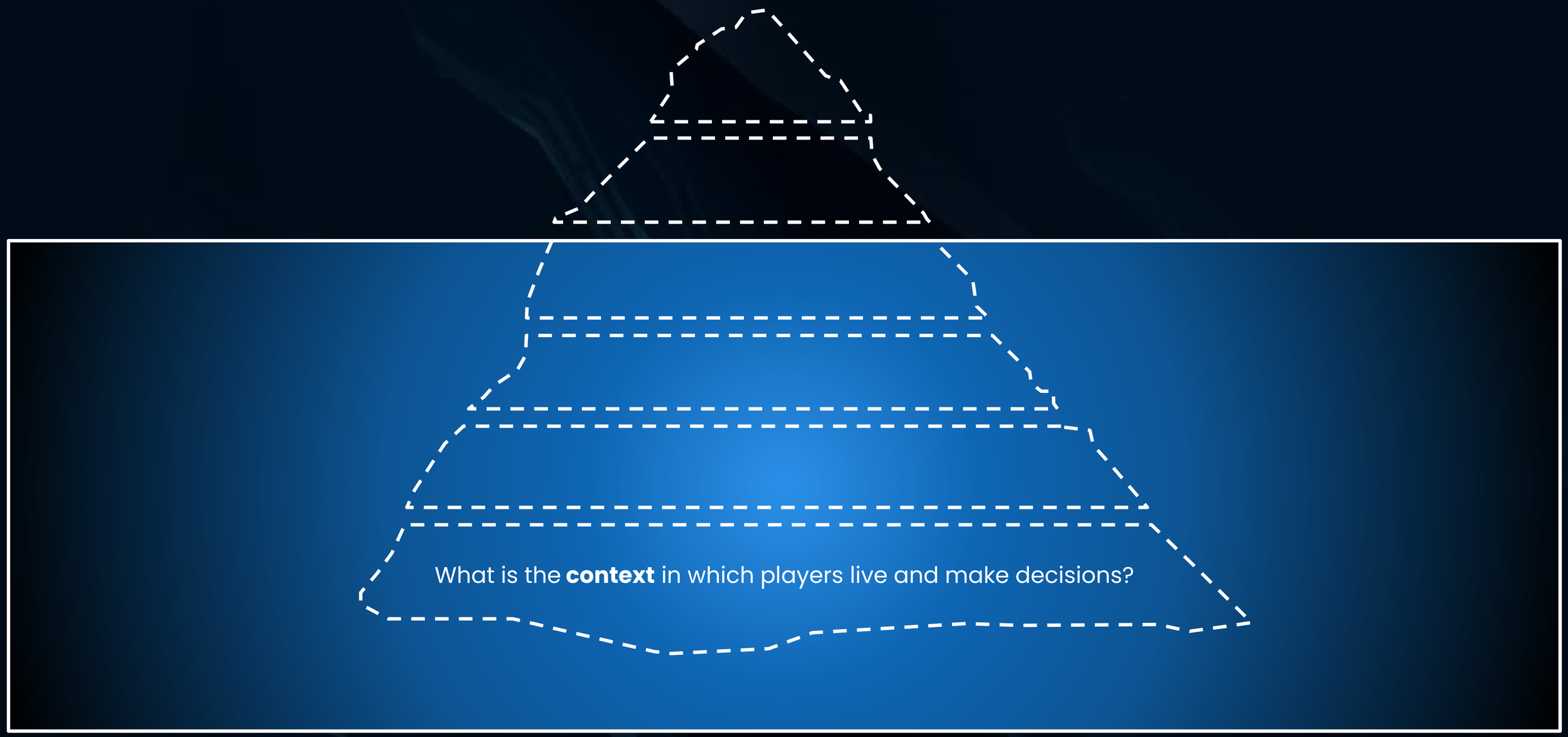
The process of transformative change often feels like a black box.

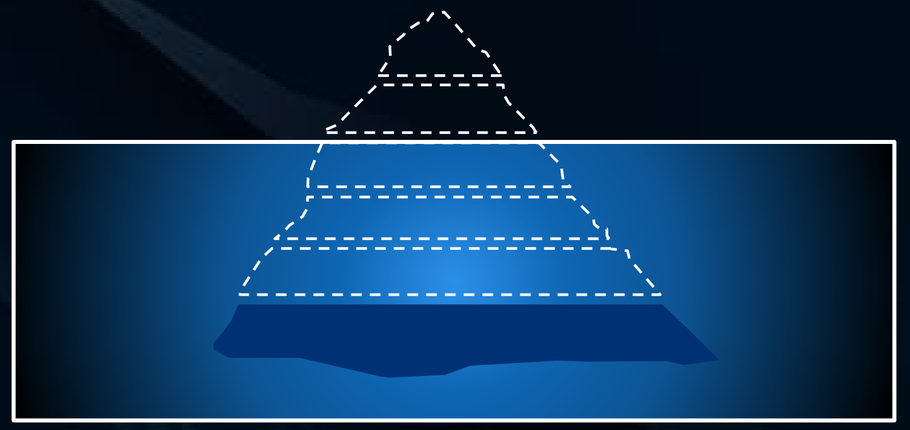


?

What can a theory of action look like?




What is the **context** in which players live and make decisions?

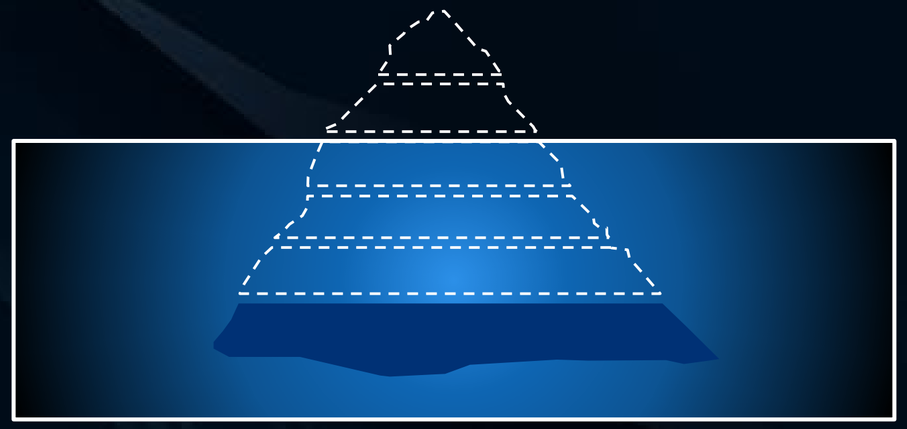


Define your baseline.

To build a strong foundation upon which climate action can eventually occur...

Understand the **context** in which your players will be experiencing your game.

What may they need for your game's climate action(s) to be physically, cognitively, and psychologically **accessible**?



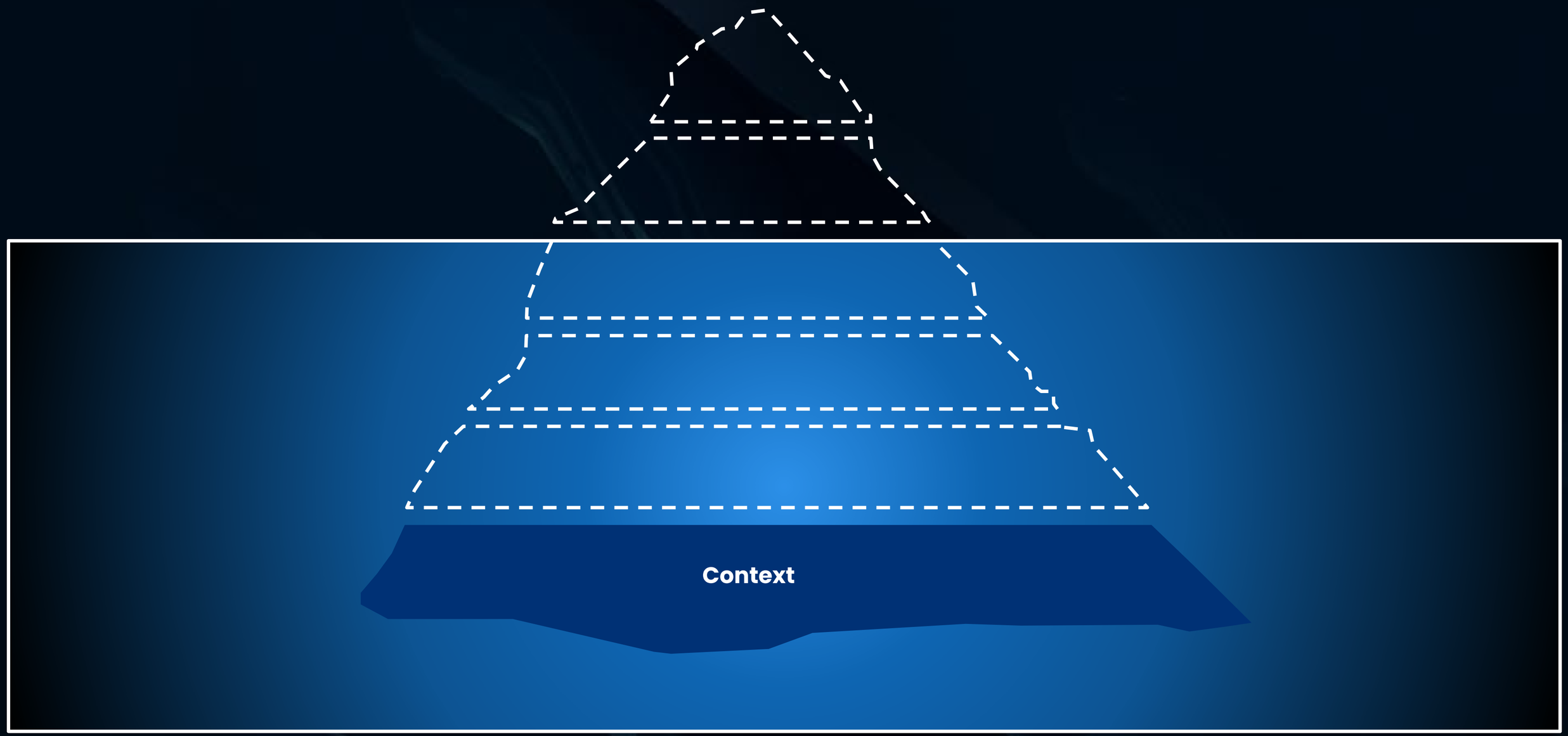
BREAKOUT (15 MINUTES)

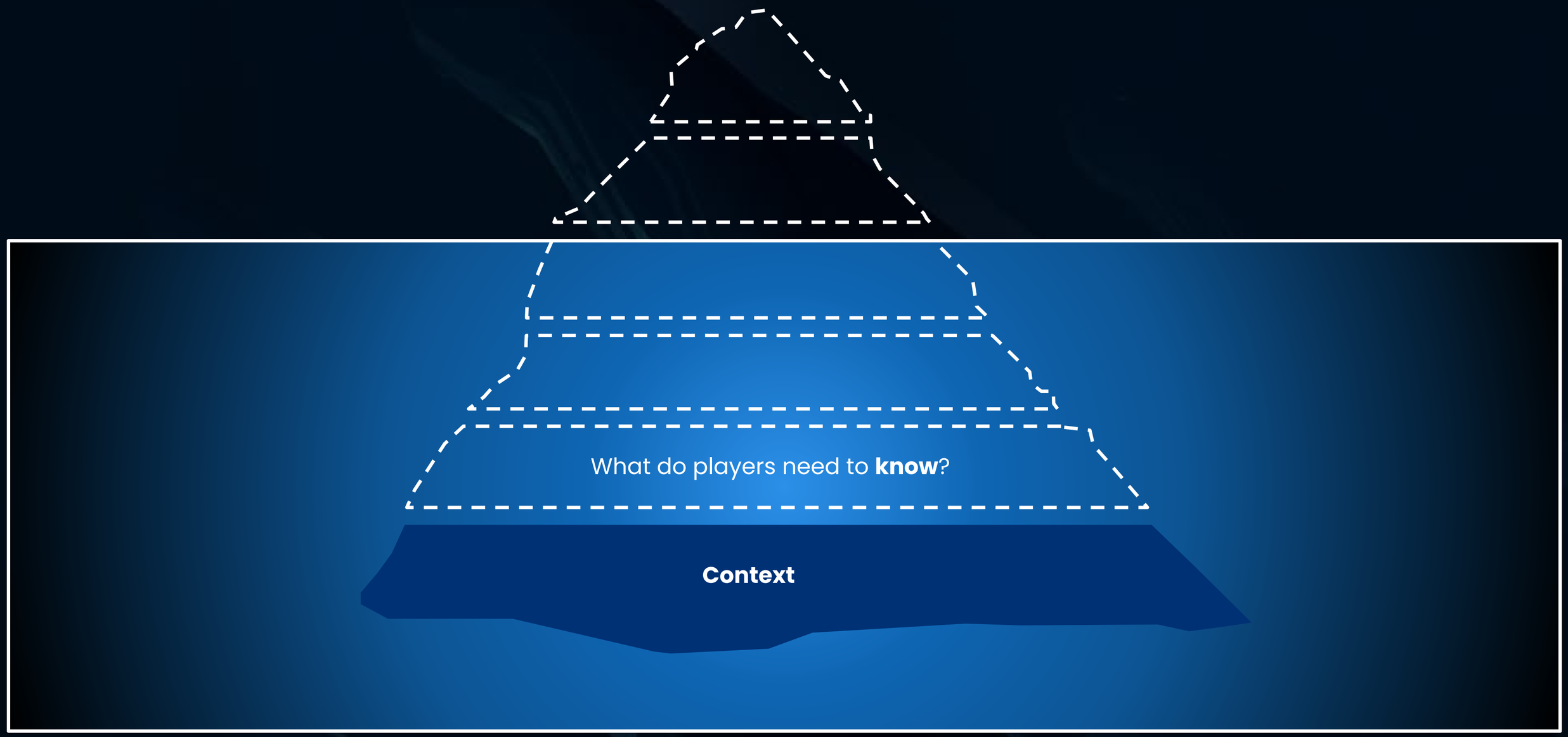
WHAT MOTIVATES YOUR PLAYERS TO GO INTO (AND STAY IN) YOUR GAME?

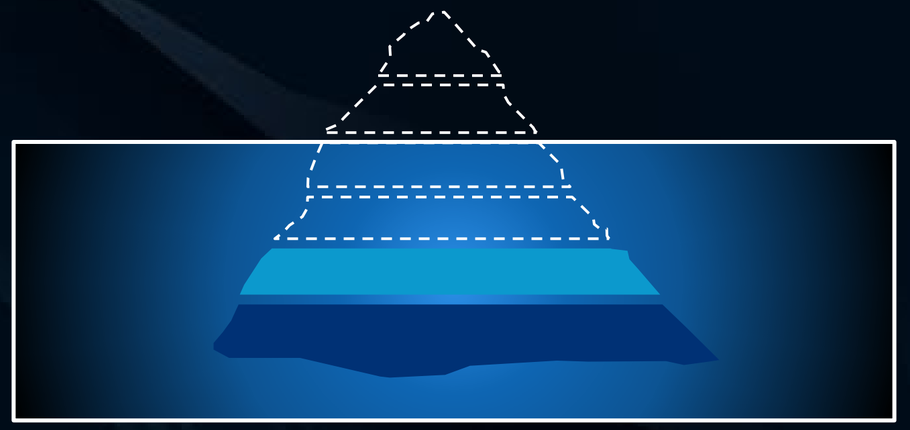
(Tip: Start with the core loop first!)

WHERE MAY THEY LIVE?
WHAT MAY THEY HAVE ACCESS TO?

WHAT MAY CREATE BARRIERS TO REAL-WORLD ACTION DURING OR AFTER GAMEPLAY?


Context

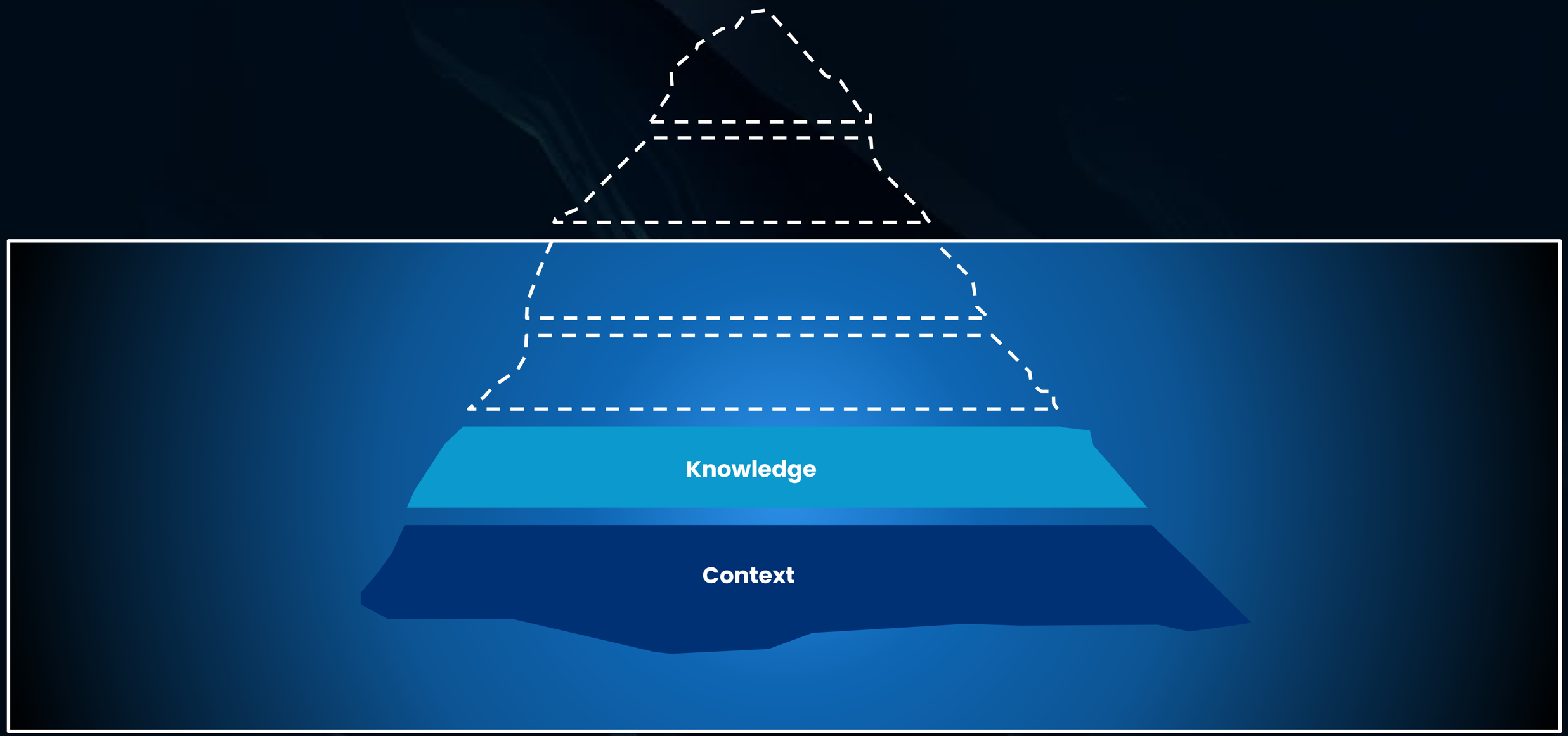

What do players need to **know**?
Context

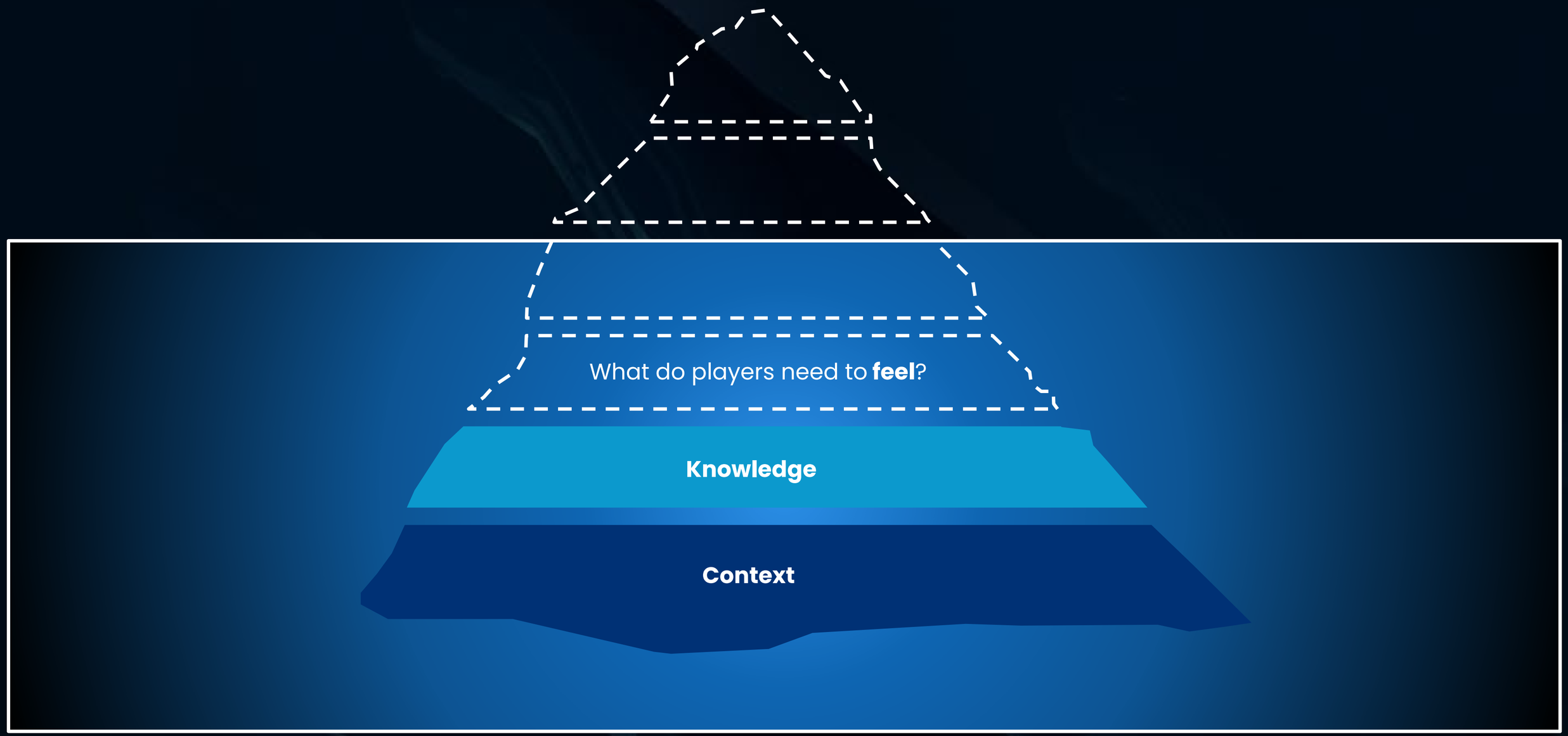


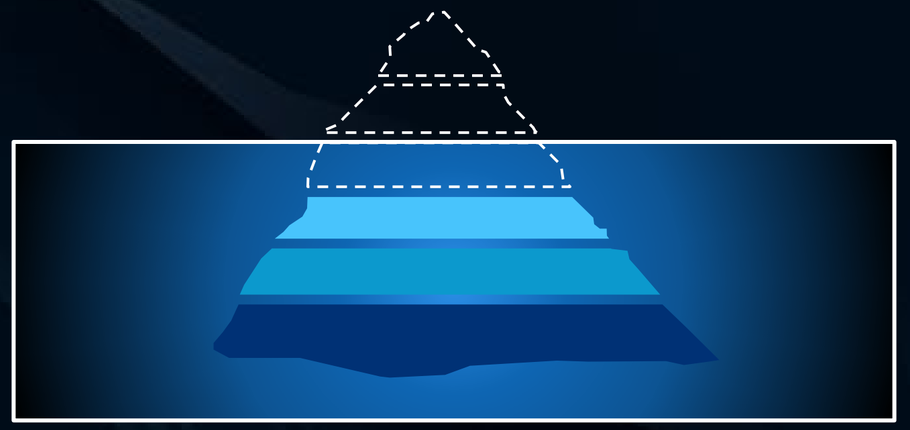
Build knowledge.

*“I am **aware** the climate crisis is real.*
*I **understand** why it is happening.*
*I **know** how to help.”*

Once aware a problem exists, we can gain **knowledge** to understand how it was created, what factors contributed to its current condition, and what solutions are.


Knowledge
Context

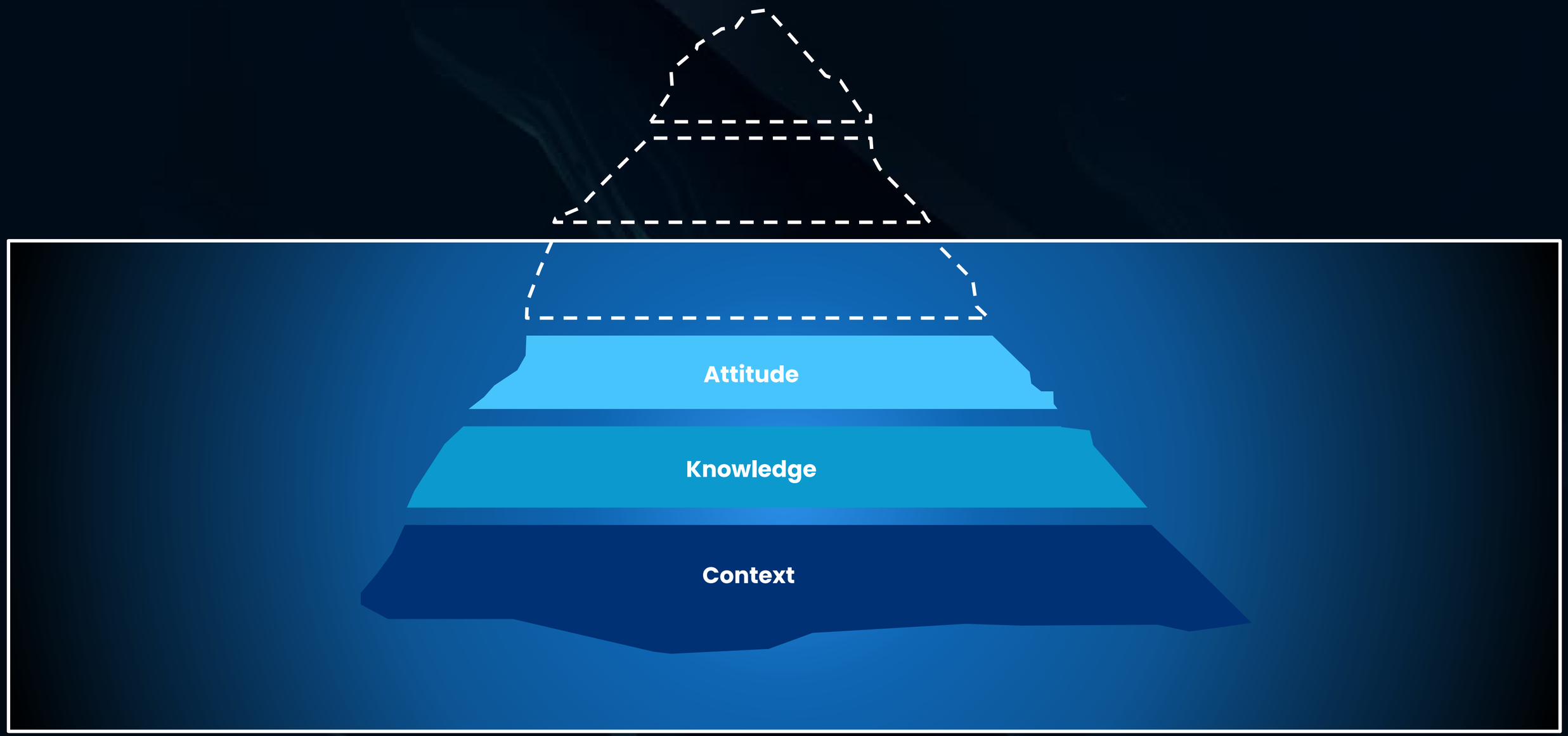

What do players need to **feel**?
Knowledge
Context

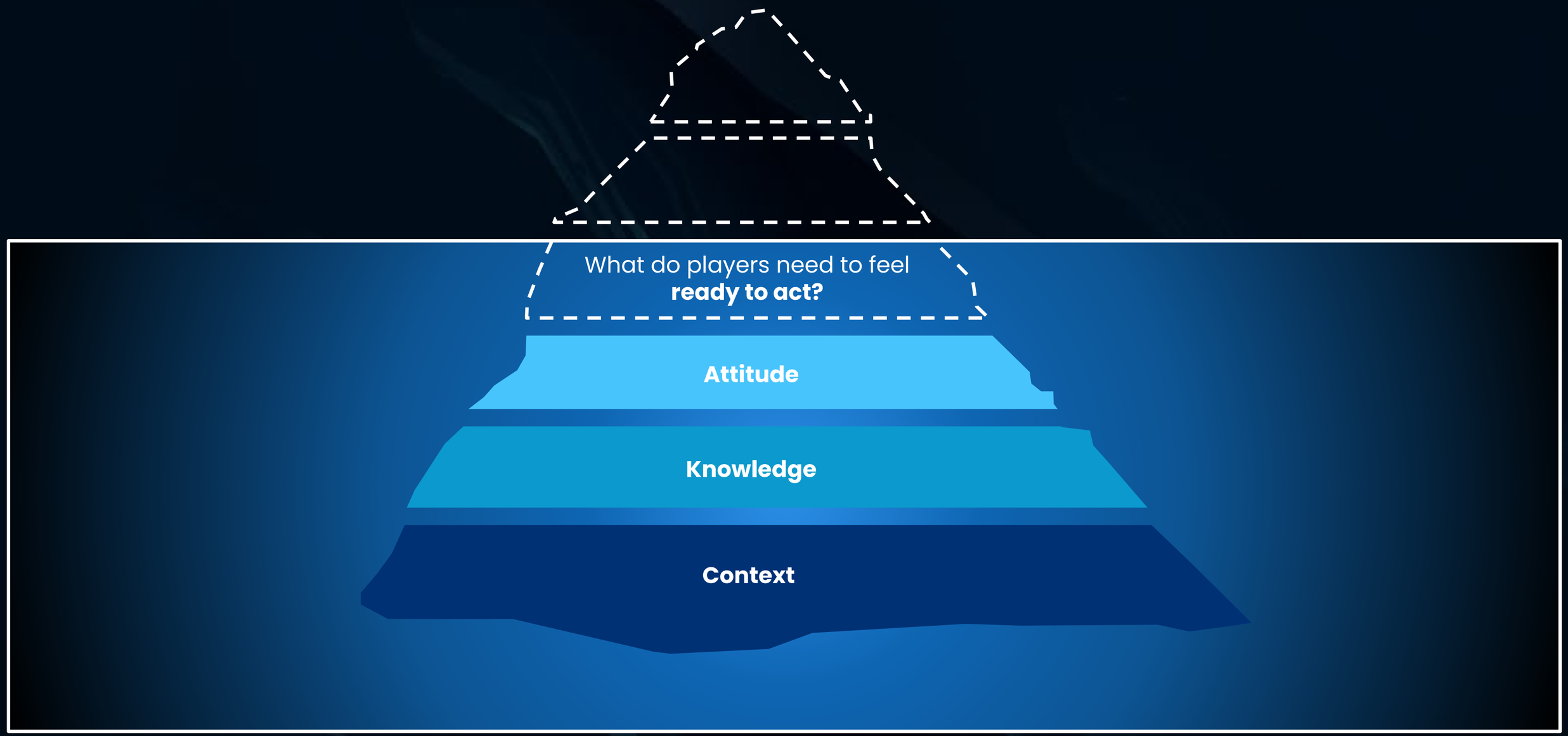


Inspire a pro-environmental attitude.

*“I **care** about this problem and feel it is **important to me personally**.”*

How we **define our relationship** with our environment and communities plays a direct role in our willingness to act.

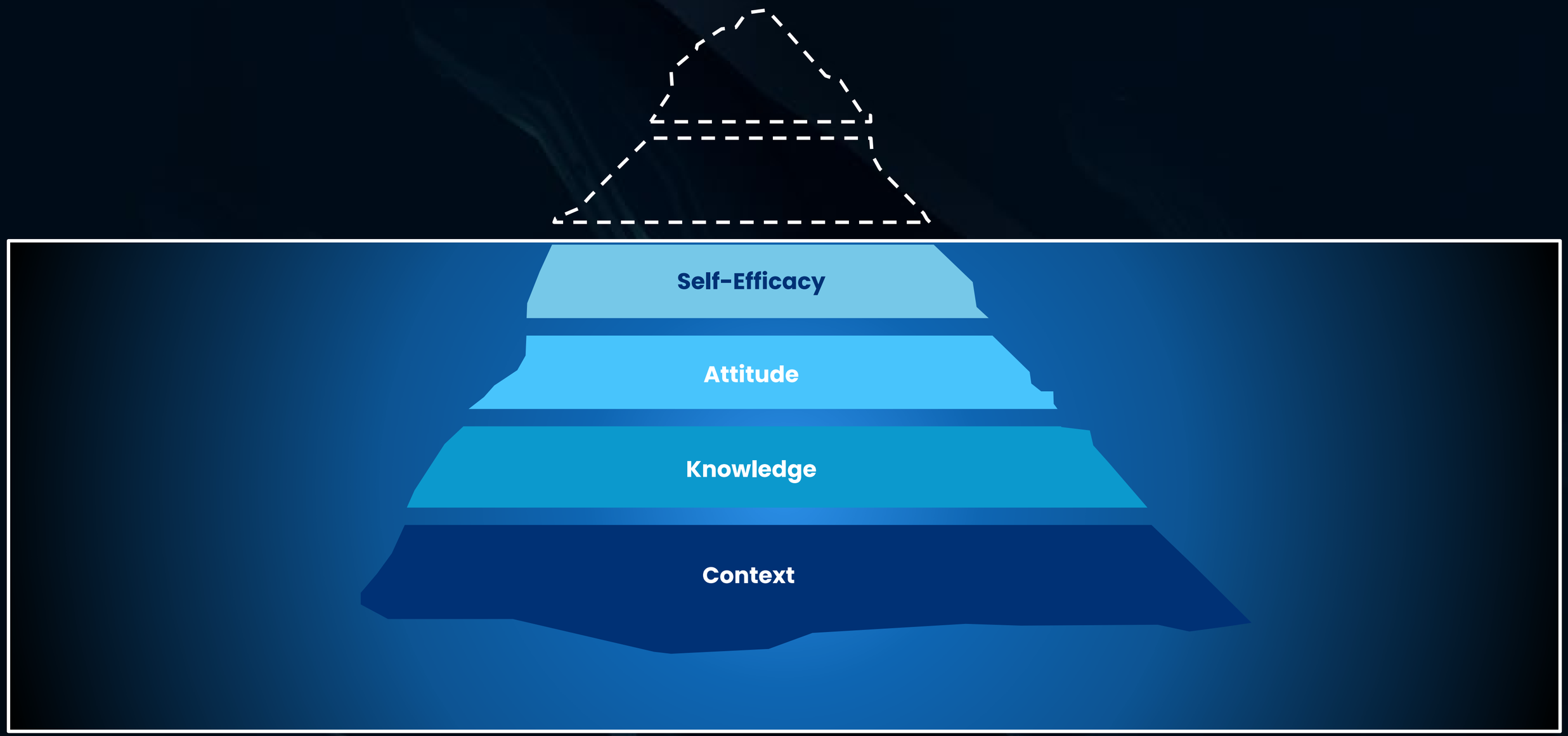

Attitude
Knowledge
Context


What do players need to feel
ready to act?
Attitude
Knowledge
Context

Support self-efficacy.

*"I have **confidence** in **knowing what I/we can do** to solve a specific problem."*

With knowledge, we can develop an understanding of how to **effectively act upon** an opportunity that can help solve the problem(s) we see.


Self-Efficacy
Attitude
Knowledge
Context

“If you want to tackle sustainability, you need more than science and tech because we’ve had those for years.

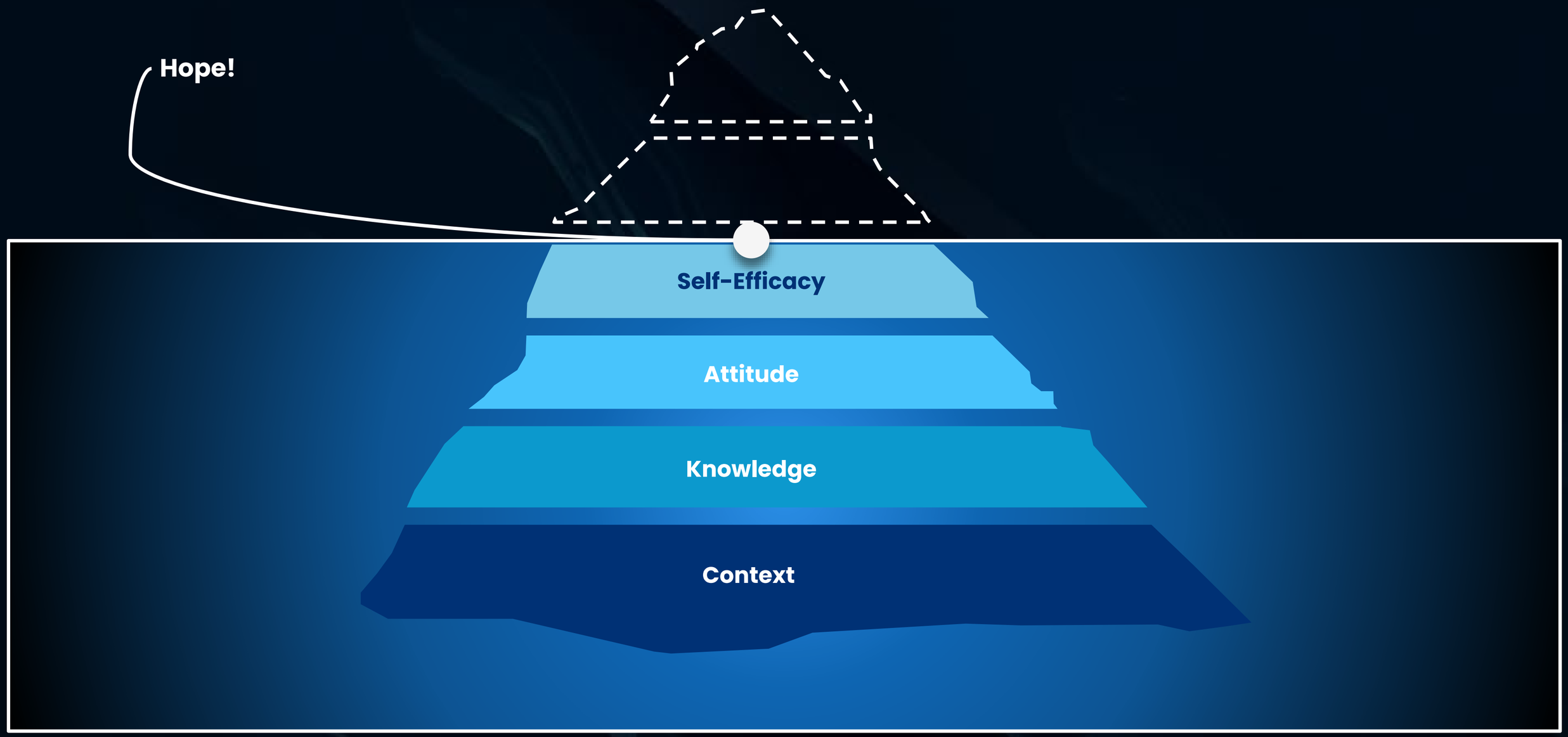
What we really need to do is *change hearts and minds*.”

Maria Sayans
ustwo games’ CEO

Build (and sustain) hope.

*"I am **willing to persevere** because it is **important enough** to do so."*

With knowledge, we can develop an understanding of how to **effectively act upon** an opportunity that can help solve the problem(s) we see.


Hope!
Self-Efficacy
Attitude
Knowledge
Context

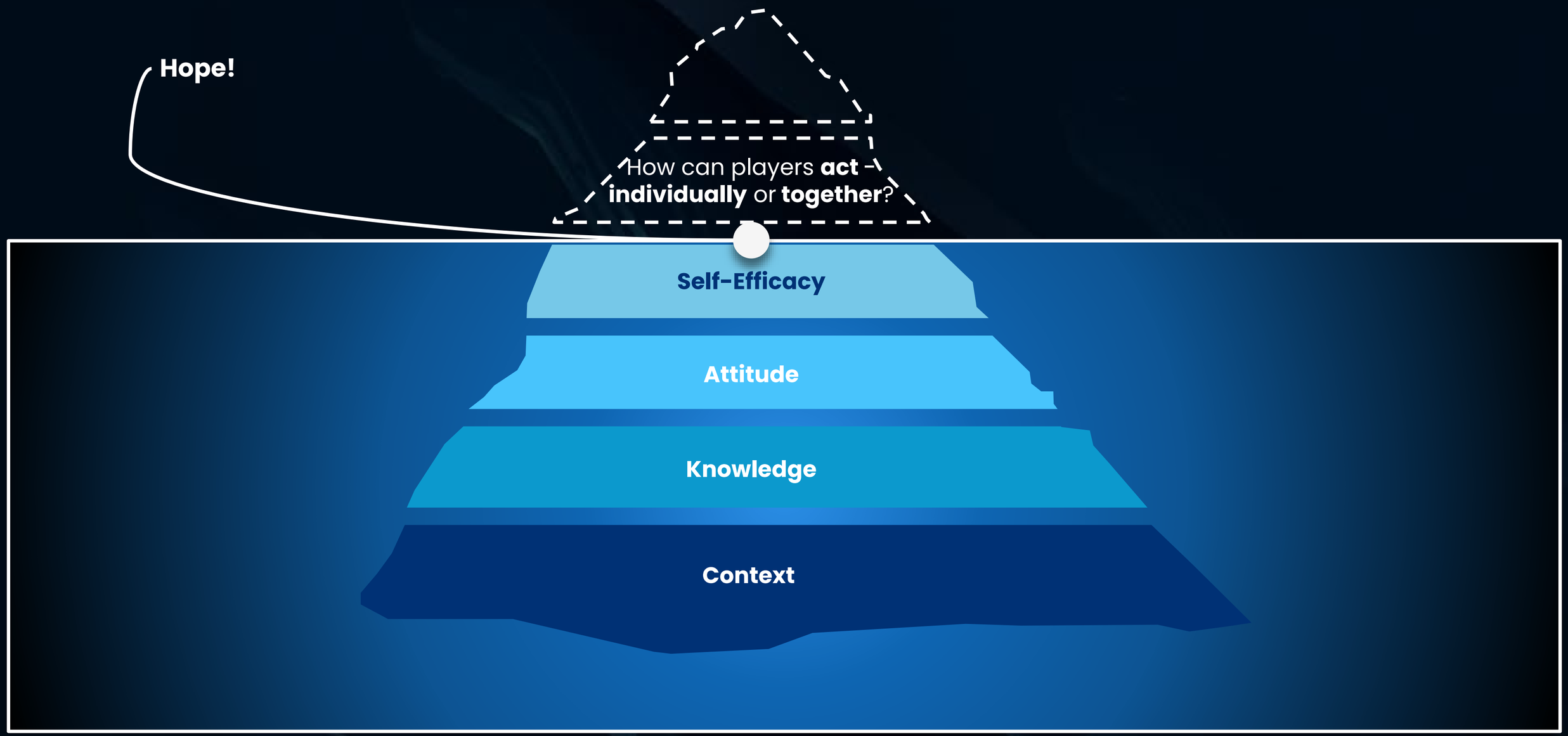
BREAKOUT (20 MINUTES)

If we wanted players to come away with 1-2 key pieces of knowledge about the problem or opportunity, what may that be?

What emotions or feelings may the game create?

What skill(s) may players come away with as a result of the knowledge and experience they gain?

How may these game elements prepare players for real-world action?

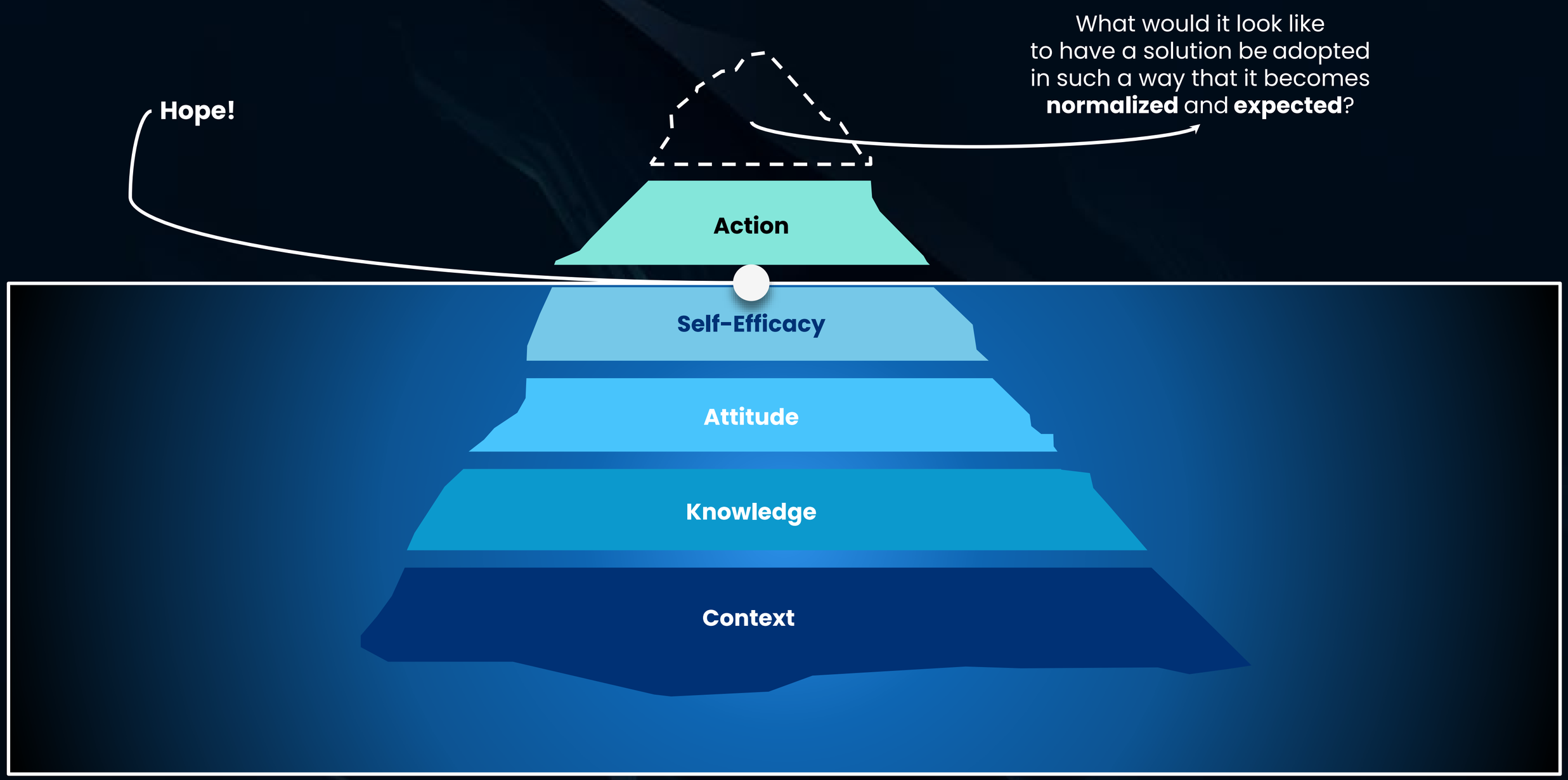

Hope!
How can players **act** – **individually** or **together**?
Self-Efficacy
Attitude
Knowledge
Context

Unlock action.

*"I am now acting as an **individual** or as **part of a community** to **act in service** of people and the environment."*

Players **act upon their intention** and/or the **call(s) to action** that a game or initiative provides. Players may engage their peer groups and/or communities to join and/or start their own climate journeys.

Hope!
Action
Self-Efficacy
Attitude
Knowledge
Context


Hope!
What would it look like to have a solution be adopted in such a way that it becomes **normalized** and **expected**?
Action
Self-Efficacy
Attitude
Knowledge
Context

Drive systemic change.

*"The solution is **proven valid, normalized, and implemented-at-scale** in our community, organization, and/or industry."*

Broader communities and industries can drive **systemic adoption** of sustainable practices and pro-environmental behaviors. Over the long-term, these behaviors become **normative** parts of our sociocultural systems.

*Do players feel it is **worthwhile**?*

Appreciation
(Fun, Interest in Continued Play, Advocacy)

*What do they **experience**?*

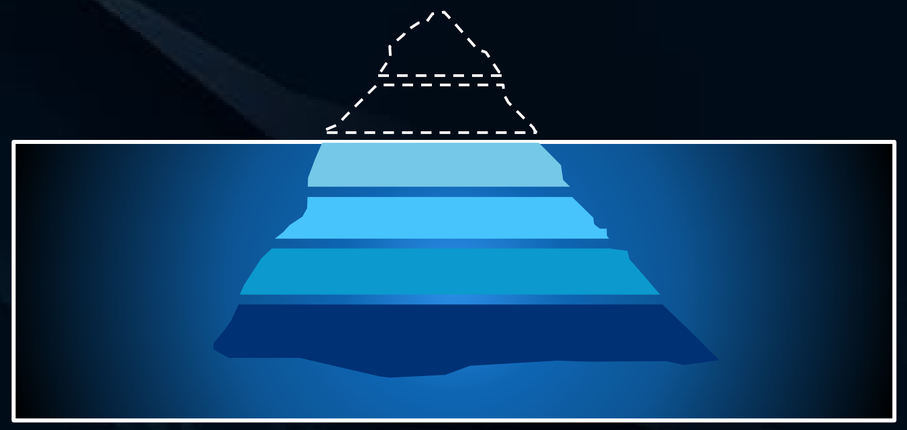
Player Needs Fulfillment
(Emotional Responses, Psychological Needs)

Core Gameplay Elements
(What, Why, How)

*Do players understand **what** to do, **why** they have to do it, and **how** they can do it - all in a way they **connect** with and can **access**?*

Prior Knowledge
(Existing Mental Models,
Genre/Mechanics-Based Heuristics)

*What are players' existing **expectations** about how a given system works?*

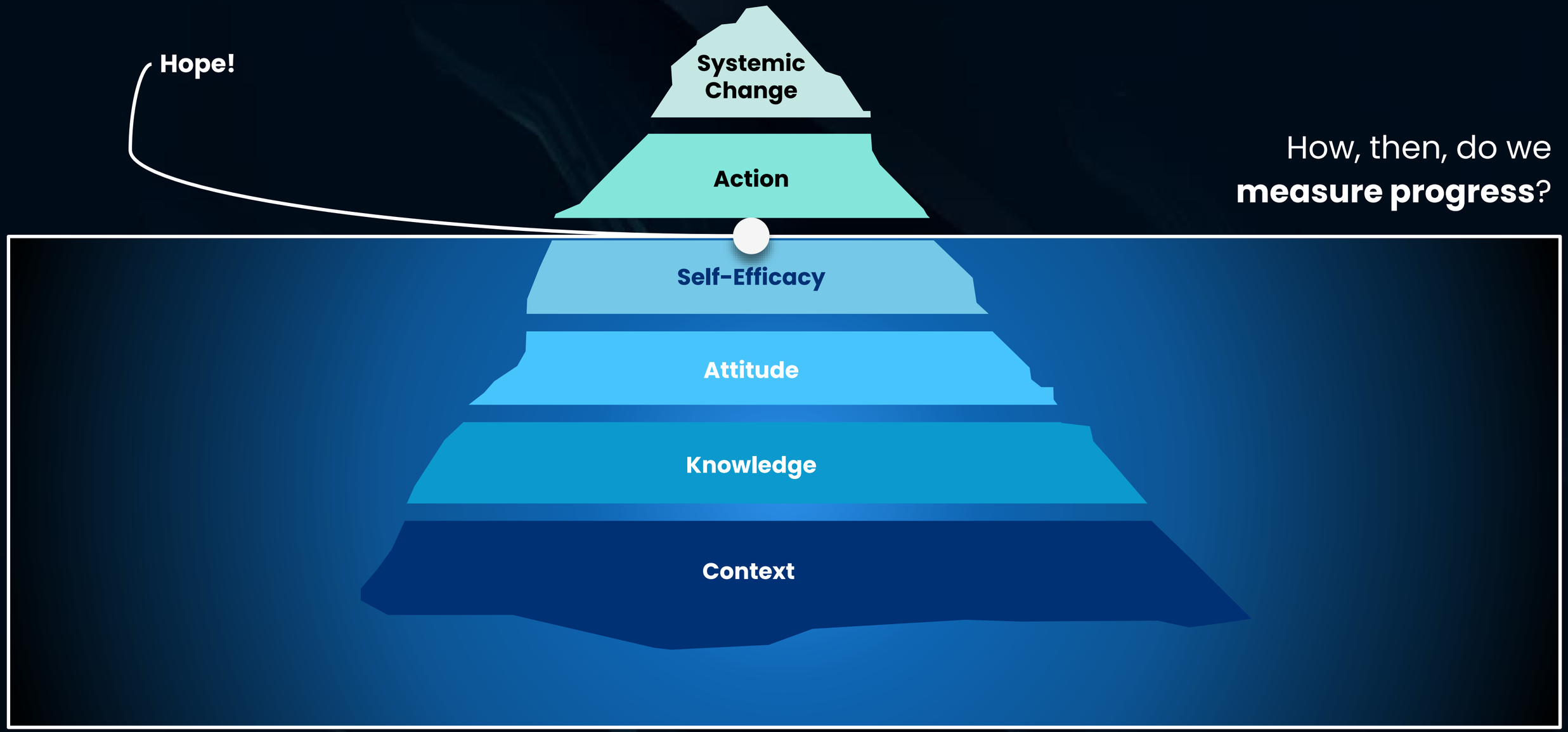


CONSTRUCT YOUR HYPOTHESIS (15 MINUTES)

“[Game] is a [genre] focused on [goal].
By [core loop], players unlock [outcome].”

We have a
theory of action!

Hope!



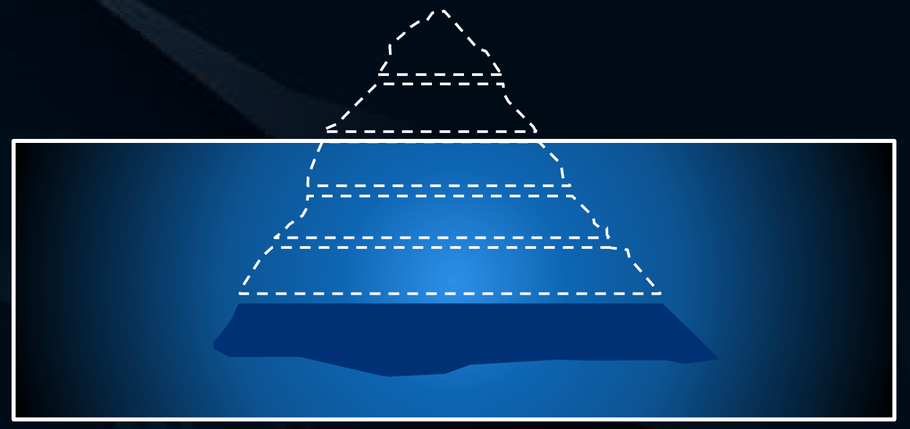
How, then, do we
measure progress?

PLEASE NOTE:

Due to time constraints, this will **not** be a deep dive into research methodologies and mixed method best practices.

Please leverage this as a **starting point** for discussion on what questions are on your mind, and what you may eventually want to measure.

If you're interested in a deeper conversation,
please feel free to chat with us in the breakout or after this session! :)



Define your baseline

If you were to explain climate change to a friend, what would you tell them?

Build awareness

(Pre/Post) If you were to explain whether fossil fuels do or do not contribute to climate change to a friend, how would you do so?

Build knowledge

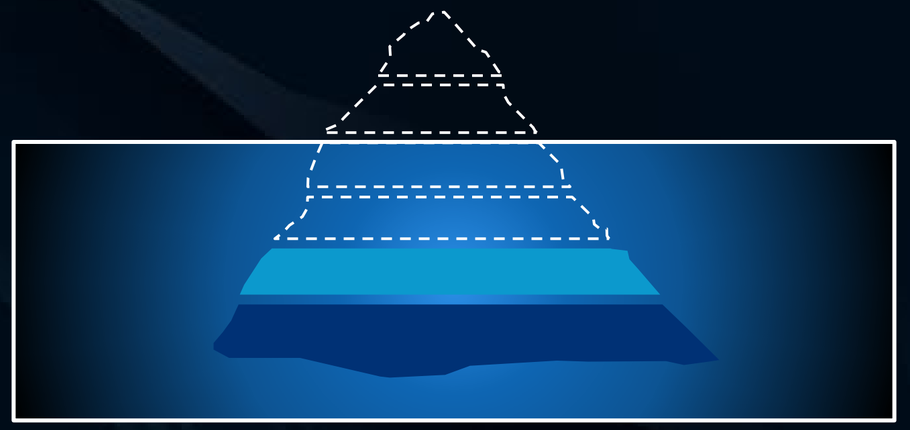
(Post-Test) Please describe how pollution does or does not affect how and where you live, in your own words.

Support self-efficacy

Please rate your response to the following statement: *"I have a clear idea of an action I can take to help solve [problem]."*

Spark action

In-Game Actions
Volunteer Sign-Ups
Pledges to Call Policymakers



Define your baseline

If you were to explain climate change to a friend, what would you tell them?

Build awareness

(Pre/Post) If you were to explain whether fossil fuels do or do not contribute to climate change to a friend, how would you do so?

Build knowledge

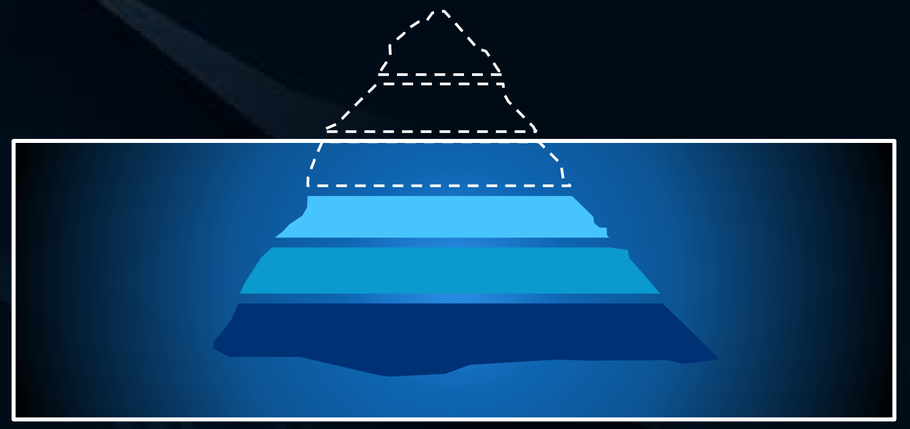
(Post-Test) Please describe how pollution does or does not affect how and where you live, in your own words.

Support self-efficacy

Please rate your response to the following statement: *"I have a clear idea of an action I can take to help solve [problem]."*

Spark action

In-Game Actions
Volunteer Sign-Ups
Pledges to Call Policymakers



Define your baseline

If you were to explain climate change to a friend, what would you tell them?

Build awareness

(Pre/Post) If you were to explain whether fossil fuels do or do not contribute to climate change to a friend, how would you do so?

Build knowledge

(Post-Test) Please describe how pollution does or does not affect how and where you live, in your own words.

Support self-efficacy

Please rate your response to the following statement: *"I have a clear idea of an action I can take to help solve [problem]."*

Spark action

In-Game Actions
Volunteer Sign-Ups
Pledges to Call Policymakers

Define your baseline

If you were to explain climate change to a friend, what would you tell them?

Build awareness

(Pre/Post) If you were to explain whether fossil fuels do or do not contribute to climate change to a friend, how would you do so?

Build knowledge

(Post-Test) Please describe how pollution does or does not affect how and where you live, in your own words.

Support self-efficacy

Please rate your response to the following statement: *“I have a clear idea of an action I can take to help solve [problem].”*

Spark action

In-Game Actions
Volunteer Sign-Ups
Pledges to Call Policymakers

Define your baseline

If you were to explain climate change to a friend, what would you tell them?

Build awareness

(Pre/Post) If you were to explain whether fossil fuels do or do not contribute to climate change to a friend, how would you do so?

Build knowledge

(Post-Test) Please describe how pollution does or does not affect how and where you live, in your own words.

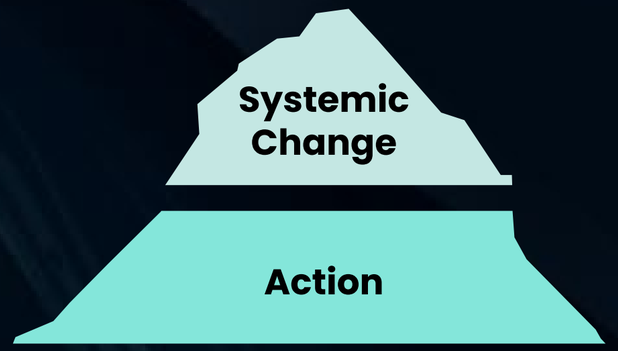
Support self-efficacy

Please rate your response to the following statement: *“I have a clear idea of an action I can take to help solve [problem].”*

Spark action

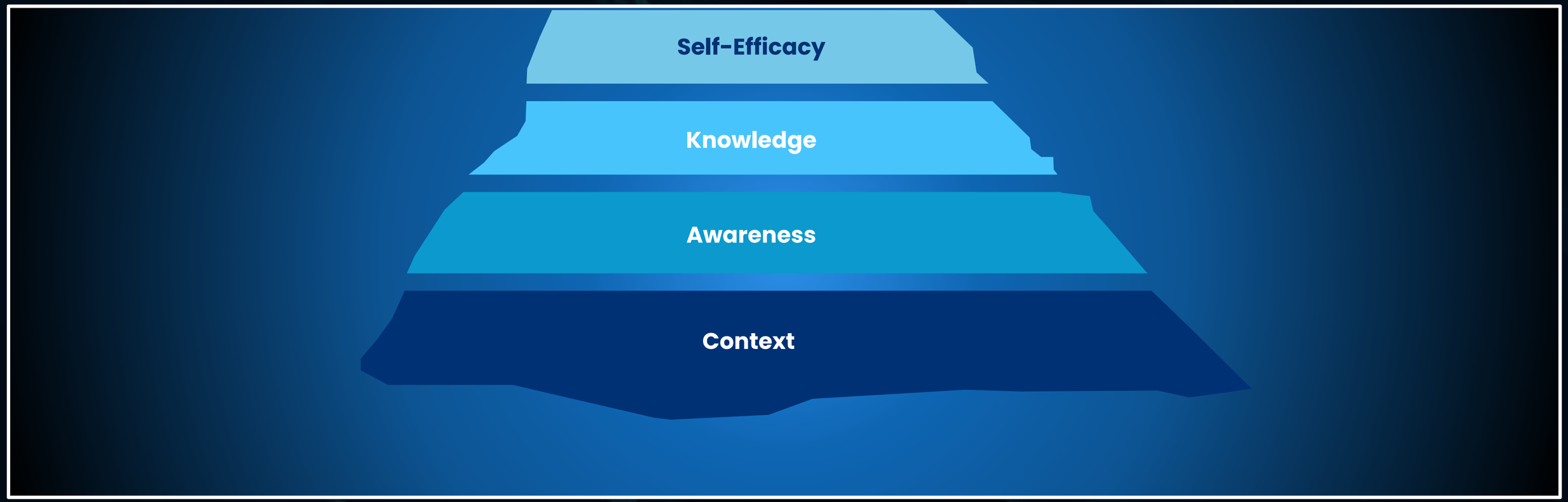
In-Game Actions
Volunteer Sign-Ups
Pledges to Call
- Local policy makers

In short, there are many ways to define and modify a theory of action to meet your needs and priorities.



https://tinyurl.com/EGDPworkshopguide

Let's do our hands-on activity to brainstorm the questions you can use to create your own!



THANK YOU!

NEXT PART

IT’S MONDAY, BUT THERE’S ALWAYS TIME FOR A

DANCE BREAK

ARCHIVE