ABC's of... Symbiotic Relationships

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Introduction

Project Prompt

Topic Selection

Solution Statement





I — PROJECT PROMPT

Interactive ABC's

Educate children on a complex topic using an "ABC's of..." format, and allow them to interact with the experience across multiple forms of media.

DELIVERABLES

Print based component

Interactive digital experience

AR experience





I — TOPIC SELECTION

Our group employed an extensive, dot voting based procss to choose our toic.



I — TOPIC SELECTION

In order to make sure our choice was clearly defined, our group employed an extensive dot voting process that considered all of our potential topics, allowing us to avoid one person dominating the thought process.

Although time consuming, this allowed us to fully define and rally behind our chosen topic: **mutualistic relationships in nature.**



I — TOPIC SELECTION

mutualism: a relationship defined by two organisms working together to benefit.



A matching card game centered around habitats and teamwork, enhanced by layers of digital and AR experiences.

06 | INTRODUCTION



I. Research

Letter Matching

Competitive Analysis

Teacher Interviews

07 | RESEARCH

II — LETTER MATCHING

In order to emulate the core "matching"	D - Deci
component of our proposed solution, we	
extensively researched existing relationships	E - Emus
in nature and found a pairing that matched	F - Figs (
our own letters.	G - Gian

This was a very time consuming process, as each letter had to have its own individual species and its own individual pairing.

- **A American Beaver** (w/ Kestral)
- **B**-**Bacteria** (w/ Humans)
- **C Carrier Crabs** (w/ Urchins)
 - iduous Baobob (w/ Lemur)
 - **s** (w/ Nitre Bush)
 - (w/Wasps)
 - iant Tarantulas (w/ Microhylids)
- H Humans (w/ Bacteria)
- I Imperial Shrimp (w/ Sea Cucumber)
- **J Jellyfish** (w/ Zooxanthellae)
- **K Kingfisher** (w/ American Beaver)
- L Lemur (w/ Deciduous Baobab)
- M Microhylid (w/ Giant Tarantula)

- **N Nitre Bush** (w/ Emu)
- **O Oxpecker Birds** (w/ Rhino)
- **P Perennials** (w/ Xantus' Bird)
- **Q Quoll** (w/ Vulture)
- **R Rhino** (w/ Oxpecker Birds)
- **S Sea Cucumber** (w/ Imperial Shrimp)
- **T Tegeticula Moth** (w/ Yucca Plant)
- **U Urchin** (w/ Carrier Crab)
- V Vulture (w/ Quoll)
- W Wasp (w/ Figs)
- X Xantus' Bird (w/ Perennials)
- Y Yucca Plant (w/ Tegeticula Moth)
- **Z Zooxanthellae** (w/ Jellyfish)

G

Giant Tarantula

Giant Tarantulas have been observed living in very close proximity to Microhylids, a small species of frogs. The spider benefits from the frog because the Microhylid eats tiny pests that attack the spiders eggs, and the frog gains protection from predators.

The Tegeticula moth species is deeply intertwined with the Yucca Plant. The moth is the only species that pollenates the Yucca Plant by spreading the plants pollen. In turn, the moth gains a space to lay her eggs and, when they hatch, the larvae feed on the plants seeds.

Tegeticula Moth

Yucca Plant

The Yucca Plant relies on the Tegeticula moth species for survival, as the moth provides a means for cross-pollenation. The moth is then allowed to lay eggs inside the flowers ovary.

II — COMPETITIVE ANALYSIS

Khan Academy

Khan Academy is an application that focuses on producing short educational videos and lessons for their users to read through and learn from.

ANALYSIS

What really stood out to me with Khan Academy was the simple yet effective wait it delivers information to the user. It also combines interactive diagrams with videos and text to create an experience for the user.

Sign in

Introduction

What would it be like to live in a one-room cabin? Well, things would probably be pretty simple. You would eat, sleep, work, and relax in a single room—which might be a bit cramped, but would certainly make cleaning the house a snap!

Prokaryotic cells, the simple cells of organisms like bacteria, are sometimes compared to one-room cabins: they don't have internal membranes, so they're like a single room with no walls to carve it up¹. If we extend this analogy to eukaryotic cells, the more complex cells that make up plants, fungi, and animals, we'll find that they're a definite step upward in the real estate market.

II — COMPETITIVE ANALYSIS

Earth School

Earth School is an interactive application that teaches children about the Earth and space through interactive, educational components.

ANALYSIS

Earth School makes the idea of learning about space fun and itneractive for its audience, and incorporates beautiful and vivid illustrations as well as a personal guide through the game fro children to enjoy.

COMPETITIVE ANALYSIS II ——

Creaturizer

Creaturizer is a fun little application that allows children to make their own creature using simple taps, and then use the camera to photograph their creature in the wild.

ANALYSIS

Creaturizer excels in creating near limitless opportunities for a childs imagination to take hold. It also does a good job of offering protective boundaries by asking for a parents permission when using the camera.

II — TFACHER INTERVIEWS

Our group interviewed seven elementary school teachers to understand our audience.

13 | RESEARCH

01

Keep it simple

When teaching to a large group of students, a topic that one thinks will only take one to two days can often take much longer.

Opportunity: Simplify our game down to the core components so that it is easily understood by the students.

02

Assist with educating

Because the course curriculum for elementary teachers is rigorous, our solution needs to assist teachers in educating students on given topics.

Opportunity: Tailor our game around a topic that is required to be taught, allowing teachers to have an immediate jumping off point.

03

Interactive workbooks

All of the teachers I interviewed described utilizing an interactive workbook, allowing each student to individually learn and make progress.

Opportunity: Create an interactive experience that allows students to learn about both their animal, as well as the habitat they come from.

Education through imagination

Strike the balance between a childs imagination and the education they are partaking in.

Layer and enhance experiences

Make sure that the experiences can stand on their own, but are enhanced by layering on one another.

Provide the building blocks

While keeping the game as simple as possible, provide enough context for teachers to immediately jump into the topic.

Reinforce existing topics

Because the course structure is strict for teachers, the game and experiences should fit into existing required topics.

II. Exploration

Iteration Exercise

Card Design

16 | EXPLORATION

III —— ITERATION EXERCISE

To establish consistency, our group employed a rapid iteration Crazy-4's exercise.

17 | EXPLORATION

III — ITERATION EXERCISE

Because all nine of our group members had different ideas of what the playing cards should look like, I led a rapid ideation exercise in which each designer got four index cards, and was given a single minute to quickly sketch out their idea before moving onto the next card.

This exercise allowed us to quickly produce a myriad of potential solutions before narrowing down and discussing which sketches stood out to us.

III — ITERATION EXERCISE

Pulling from our iterations

Once completing our iteration exercise, we were able to discuss and narrow down what we wanted for our card. We then moved onto wireframing and continuing iterations.

ns for CLUBS:

III — CARD DESIGN

Initial Card Design

Our initial card design explored a mainly illustrative approach, maintaining space for the animals name, description, and a QR code for the AR to recognize as a starting point.

III — CARD ITERATIONS

Iterate, iterate, iterate

Once our first wireframe was completed, we recognized that we needed to tweak some things before moving forward.

We focused on balancing the overall card between illustration and description, as well as experimenting with different layouts and placement for hierarchy.

Yucca Plant

Hello, I'm a Yucca! I can be found in hot, dry climates. In order to pollenate, I need help from a flying species that can help carry pollen I produce to other plants!

I am Emu. A bird 6 feet tall. 2nd tallest of them all. I have tiny useless wings. I cannot fly, but I can swim. I am hungry, I want a snack. Help me find me the red-berried plant?

HABITAT ANIMAL NAME 铅 I am Emu. A bird 6 feet tall. 2nd tallest of them all. I have tiny useless wings. I cannot fly, but I can swim. I am hungry, I want a snack. Help me find me the red-berried plant? MOUNTAINOUS

Yucca Plant

I'm a Yucca! I can be found in hot, dry climates To pollenate, I need help from a flying animal that can help carry pollen I produce to other plants!

I am Emu. A bird 6 feet tall. 2nd tallest of them all. I have tiny useless wings. I cannot fly, but I can swim. I am hungry, I want a snack. Help me find me the red-berried plant?

Hello, I'm a Yucca! I can be found in hot, dry climates. In order to pollenate, I need help from a flying species that can help carry pollen I produce to other plants!

Giant Tarantula

III — CARD WIREFRAME

Final Card Wireframe

Our final card wireframe includes a balance of the necessary components, with ample space for illustration as well as description.

We also moved away from a QR code and instead chose to tag each card with a custom identifier icon, that would be completed once the paired cards are put together.

IV — SKETCHING

Through my sketches, I wanted to iterate on possible layouts for my illustrations and interactions.

Sketching out my layout for the Giant Tarantula playing card.

Sketching out my layout for the Tegeticula Moth playing card.

Sketching out interactions for my Yucca Plant interaction/

v. Design

Illustrations Goals

Interactive Experiences

38 | DESIGN

V —— ILLUSTRATION GOALS

I designed my illustrations around the idea of exploring the habitats of my animals.

V — ILLUSTRATIONS

Card Illustrations

When illustrating, I knew that I wanted my illustrations to be as immersive as possible, with the idea of peering into the habitat the animal exists in.

To do this, I played a lot with layering different objects to provide a sense of depth to pull the viewer in.

I'm a Yucca! I can be found in dry climates, and I have long stalks with pretty flowers. To pollenate, *I need help from a flying animal that can help carry pollen I produce to other plants!*

Tegeticula Moth

GRASSLAND

I'm the Tegeticula species! I have pretty white wings and tentacles that I store pollen in when flying from flower to flower. I'm about to give birth, so I need to find a flower to lay my eggs in!

IV — SKETCHES

Wheel navigation 01

Wheel navigation 02

Interaction screen, with the "View Pairing" button at the bottom and the grid card icon at the top.

Grid view of all the cards, the user being able to swipe through them and navigate.

Sketching out different interaction approaches to the two cards coming together.

Concept for the "View Pairing" screen, with the two cards being shown and brief information about them revealed.

IV — SKETCHES

Second concept for the "View Pairing" screen, with the cards layered and can be "swapped" through by tapping. Detailing how the two cards would come together in more detail.

lotters come together

Card swap detail, with the animal information changing depending on which card is in front.

Yucca Plant interaction: the user would "build" the perfect flower by dragging and dropping the pieces of the plant onto the outlines displayed.

Once the flower is made, it is then seen in an interactive habitat that the user can tap through and explore and learn about the habitat the species is a part of.

When a touchpoint is tapped, a modal appears on screen with more information on the topic.

IV — SKETCHES

For the Giant Tarantula interaction, the user would draw the spider web/nest by following the dotted lines with their fingers.

The nest would then be placed into the interactive habitat, and the user can explore the touchpoints.

Second touchpoint concept, instead of a modal based touchpoint.

IV — SKETCHES

For the Tegeticula interaction, the user would be prompted to shake their tablet. Once shaken, pollen falls from the top and collects on the bottom.

The user is then prompted to make the pollen for the moth by dragging the pieces into the center.

The moth then flies in and collects the pollen, flying off. The user is then taken to their interactive habitat exploration.

Once the user lands on a letter, a brief screen overlays with the letter as well as the animal. This is meant to provide a better way to receive scannable info if the user is continuously scrolling using the dial.

The interactive screen has the dial constantly present, as well as a grid view option. By tapping on the "view pairing" button, the screen would scroll down and show the two card pairings.

Grid view concept 1, with the screen below partially shown.

Grid view concept 2, with the grid taking up the entire screen.

IV — WIREFRAMES

View pairing screen concept 1.

View pairing screen concept 2.

IV — WIREFRAMES

Giant Tarantula

The giant tarantula makes its home in tropical habitats, and is a fierce predator that is very protective of their babies.

The microhylid works well with the spider. The spider provides protection, and the frog eats pests that may eat the spiders babies!

View pairing screen concept 3, first animal.

BACK TO LETTER

TROPICAL

Microhylid Frog

The giant tarantula makes its home in tropical habitats, and is a fierce predator that is very protective of their babies.

The microhylid works well with the spider. The spider provides protection, and the frog eats pests that may eat the spiders babies!

VIEW MICROHYLID

View pairing screen concept 3, second animal.

BACK TO LETTER

TROPICAL

Giant Tarantula

The giant tarantula makes its home in tropical habitats, and is a fierce predator that is very protective of their babies.

The microhylid works well with the spider. The spider provides protection, and the frog eats pests that may eat the spiders babies!

View pairing screen concept 4, first animal.

BACK TO LETTER

TROPICAL

Microhylid Frog

The giant tarantula makes its home in tropical habitats, and is a fierce predator that is very protective of their babies.

The microhylid works well with the spider. The spider provides protection, and the frog eats pests that may eat the spiders babies!

VIEW MICROHYLID

View pairing screen concept 4, second animal.

v. Sketches + Wireframes

Sketches

Wireframes

IV — WIREFRAMES

I wireframed out a possible container for our interactions, working off of a circular navigation idea.

32 | SKETCHES + WIREFRAMES

V — INTERACTIVE GOALS

Creating a digital workbook through my interactive experiences.

42 | DESIGN

IV — INTERACTIVE

Interactive Workbook

My interactions are each composed of two central parts: a small interactive activity, and then an explorative animation that the student can use to learn more about the habitat their animal comes from.

Trace the dotted lines to draw the nest.

The Giant Tarantula interaction has the user tracing lines to help draw the spider's nest.

Bringing the Giant Tarantula's card to life through an interactive animation.

The Tegeticula Moth's interaction allows them to gather pollen, much like the moth does.

Bringing the Tegticula Moth's card to life through an interactive animation.

The Tegeticula Moth's interaction allows them to gather pollen, much like the moth does.

Bringing the Tegticula Moth's card to life through an interactive animation.

V — INTERACTIVE CONTAINER

As a group, we worked to design a frame to contain all of our interactions.

V — INTERACTIVE FRAME

Interaction Frame

The framer for our interaction is composed of four parts: The primary letter interaction, the wheel-based navigation, a grid view of the cards, and a view of the cards pair.

52 | DESIGN

BACK TO LETTER

TROPICAL

Microhylid Frog and Giant Tarantula

The giant tarantula makes its home in tropical habitats, and is a fierce predator that is very protective of their babies.

The microhylid works well with the spider. The spider provides protection, and the frog eats pests that may eat the spiders babies!

VIEW MICROHYLID

Sea Urchin here! I drift around t with my spikes looking for food." survive I need help from a cr of the deep blue to tra

Hi! I am a human just like you. I like working out to keep myself in tip top shape. But I would like something teeny tiny to help keep my insides healthy!

V — DISCUSSION CARDS

We chose to build off our initial card game by creating topic cards to help guide the conversation.

53 | EXPLORATION

V — DISCUSSION CARDS

Discussion Cards

I designed a set of discussion cards that draw upon several core concepts that the game can be used to speak about. By doing this, our game is kept flexible enough to allow teachers to utilize it in any way they want, while still having the discussion cards to jump off of. DISCUSSION TOPIC

Animal habitats.

Every one of these pairings calls a specific habitat its home, and each habitat has its own special qualities that distinguish it from the others! It is important to recognize the specific traits of the habitat these relationships belong to, and how it helps the pair!

Together with ith their partner, have each student list out the specific traits of the habitat that their pairing lives in.

DISCUSSION TOPIC

Asking for help.

We all need a little help sometimes. Just like these animals, it's okay to need the help of a friend or loved one when you are struggling with something. Don't be afraid to reach out for help, and remember that teamwork is what makes the dream work!

Discuss the importance of asking for help when one needs it, and why it should never be something to be ashamed of.

DISCUSSION TOPIC

Environmental impact.

With all of these pairings, the loss of one of the species would have a negative impact on the other. These species also impact our environment, and the loss of some of these pairings could have a lasting impact on our environment as a whole!

Discuss the importance of respecting the world that we live in, and why we should work to mainting our environment.

DISCUSSION TOPIC

The importance of teamwork.

Every relationship in this deck is different, and each animal or species is unique in their own special way. However, there is on thing these relationships all have in common: they use teamwork to accomplish a common goal!

Discuss the importance of teamwork; not only amongst the animals, but amongst one another!

DISCUSSION TOPIC

Accepting your uniqueness.

Just like these species, we all have special qualities that no one else has. These traits are what make you unique, and should be celebrated. It's okay to feel different from others, but remember that being yourself is much more fun!

What types of things make us unique? Discuss the importance of uniqueness, and why it should be celebrated!

v. Print Images

Print Photos

57 | PRINT IMAGES

Yucca Plant

GRASSLAND

I'm a Yucca! I can be found in dry climates, and I have long stalks with pretty flowers. To pollenate, I need help from a flying animal that can help carry pollen I produce to other plants!

I'm the Tegeticula species! I have pretty white wings and tentacles that I store pollen in when flying from flower to flower. I'm about to give birth, so I need to find a flower to lay my eggs in!

Tegeticula Moth

Giant Tarantula

TROPICAL

I'm a Giant Tarantula! I have six long legs and eight eyes, and I can spin sticky webs to catch my food! I've recently made a nest for my babies, but I need some help from a tiny critter to protect my eggs!

INTERACTIVE IV

constitic habitat its home, and Environmental Impact DISCUSSION TOPIC Each student should get one card. Using the half-circle patterns, Each student should get one card. Using the half-orcie parterns, card descriptions, and color palettes, allow students to find the cara descriptions, and color Palettes, allow students to find their match. Correct card match. Once the students have found their match. How it works If desired, use the included Discussion Topics to expand on the r desired, use the included Discussion Topics to expand on the adapted importance of symbiotic relationships. This game can be adapted to teach in anyway you feel fire heet. with of nover use the answer cards to confirm. Created by Elena Berg, Jackie Jando, Kaltin Plane, Mackenzie Karwas, Indrem Huney, Seung Hee Yun, Sophie Signamo, Rohan Pawar, and Jam Madigan, PNT - New Media Interactive IV - Methodol Carbona - Corpyngh 2019 ouren nove to teach in anyway you feel fits best Discus and wh

Taking on a task like designing a card game was not an easy feat, but I am incredibly proud of our team for pulling through and designing it! Overall, I learned that complexity is not always better, especially when trying to explain concepts to children.

