What are the barriers and opportunities using Augmented Reality for Primary Science Education?

Backstage Academy Symposium 23 09 22

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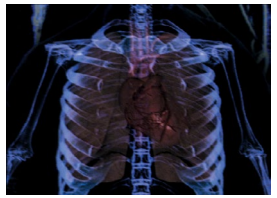
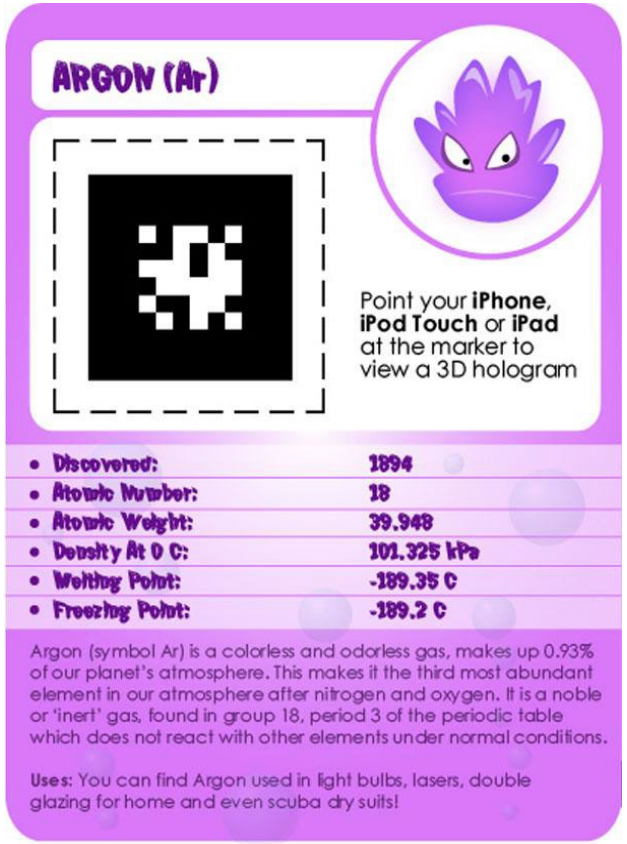
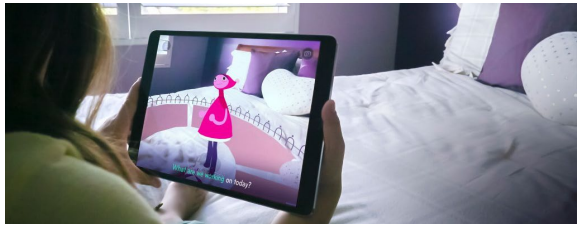



BAMZOOKA


Watch a 3D TREE
appear on your
iPhone / iPad / iPod


ARGON (Ar)
Point your iPhone, iPod Touch or iPad at the marker to view a 3D hologram
Discovered: 1894
Atomic Number: 18
Atomic Weight: 39.948
Density At 0 C: 101.325 kPa
Melting Point: -189.35 C
Freezing Point: -189.2 C
Argon (symbol Ar) is a colorless and odorless gas, makes up 0.93% of our planet's atmosphere. This makes it the third most abundant element in our atmosphere after nitrogen and oxygen. It is a noble or 'inert' gas, found in group 18, period 3 of the periodic table which does not react with other elements under normal conditions.
Uses: You can find Argon used in light bulbs, lasers, double glazing for home and even scuba dry suits!


Magical Park.




LEARN IN 3D W
OUR FREE AR
LIFT


BASS
PIANO

AR in Education

- (Akcayir, Akcayir, 2017; Wang, et al., 2017; Radu, 2014; Yuen, Yaoyuneyong, Johnson, 2011), suggest educators and designers need to collaborate in terms of creating sound pedagogy to develop AR applications that maximise on learning outcomes.

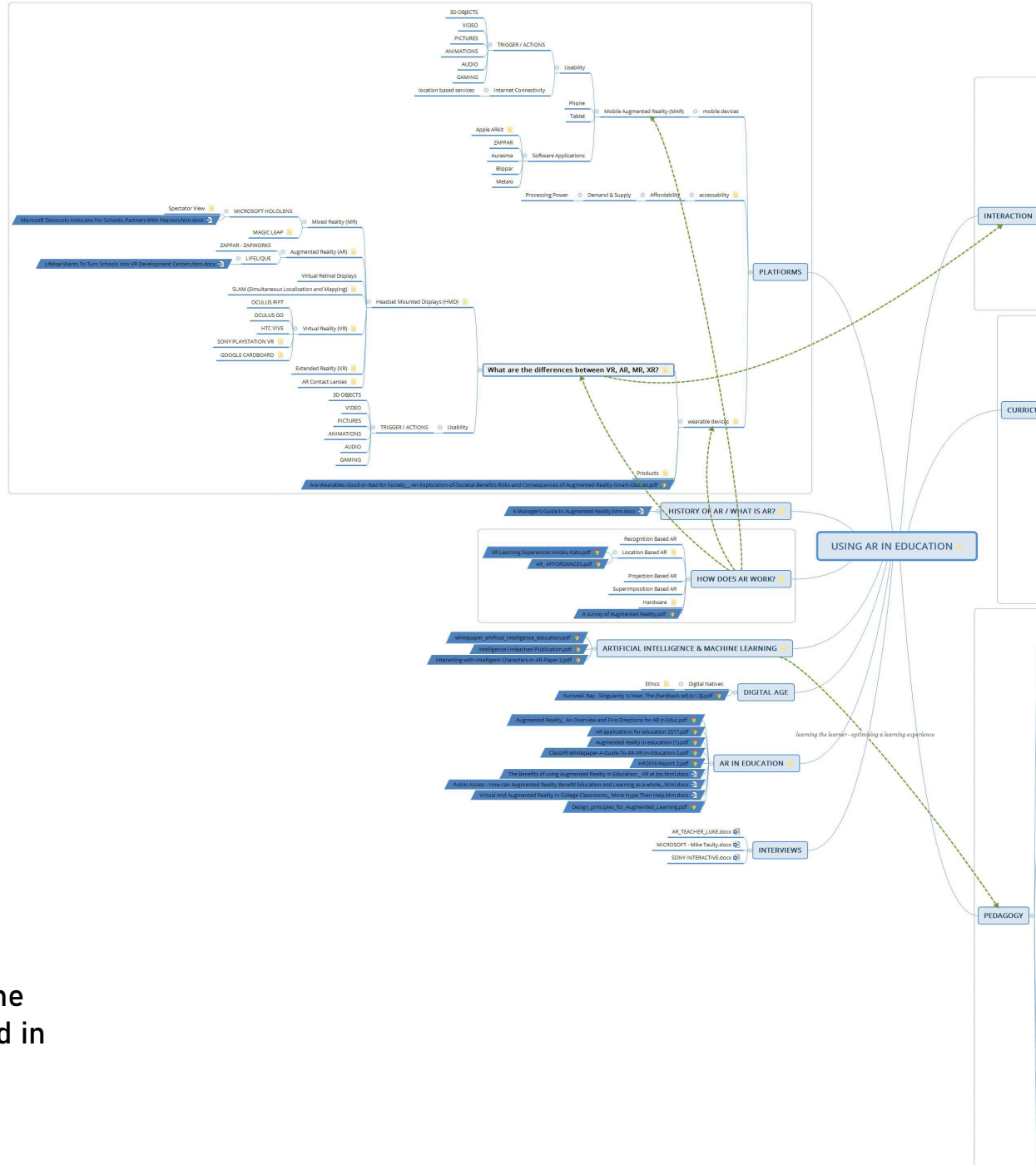
- A study by Silva et al. (2019) found that although educators did recognise the potential of AR, the adoption of such technologies within mainstream schools is rare.

- (Kerawalla, Woolward, Luckin, 2006; Bistaman, Idrus, Rashid, 2018) specifically demonstrate AR provides a positive impact on a teaching and learning experience for primary science education.

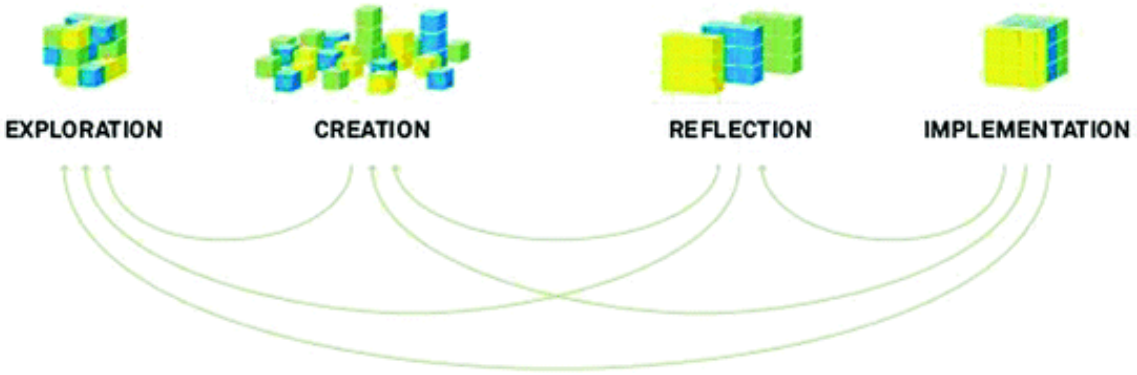
Primary Education: Science

- (Wellcome Trust, 2017) that primary teachers within the UK education system are now only managing to devote on average 1 hour and 24 minutes per week in teaching science.

- Ofsted warned that science “has clearly been downgraded in some primary schools” since the key stage 2 science test was scrapped in 2009.



Service Design Thinking Process



Stickdorn, Hormess, Lawrence and Schneider (2018)
This is Service Design Thinking

5 Principles of Service Design

1. User Centred
Experiences are customer focused.

2. Co Creative
All stakeholders are part of the process.

3. Sequencing
The service should be visualized as a sequence of Interrelated actions.

4. Evidencing
The service should be visualized in terms of physical artefacts.

5. Holistic
The entire environment of a service should be considered.

Stakeholders

Nicky Waller

Primary Science Advisory Teacher at CIEC (Centre for Industry Education Collaboration)
University of York

Dean Finnegan

Animation Lead, Character Rigging
Ubisoft
Sydney

Dr Yang Lu

Lecturer in Computer Science
York St John University

Tim Moat

Director of Communications and Development
Ebor Academy Trust
York

Associate Professor Dr Katy Bloom

Associate Professor of Initial Teacher Education,
School of Education,
Languages and Psychology
York St John University

Jake Reeves Kemp

Computing Specialist Lead
Ebor Academy Trust
York

Emma Davies

Science Academy Leader
Ebor Academy Trust
York

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Pupils - Keystage 2

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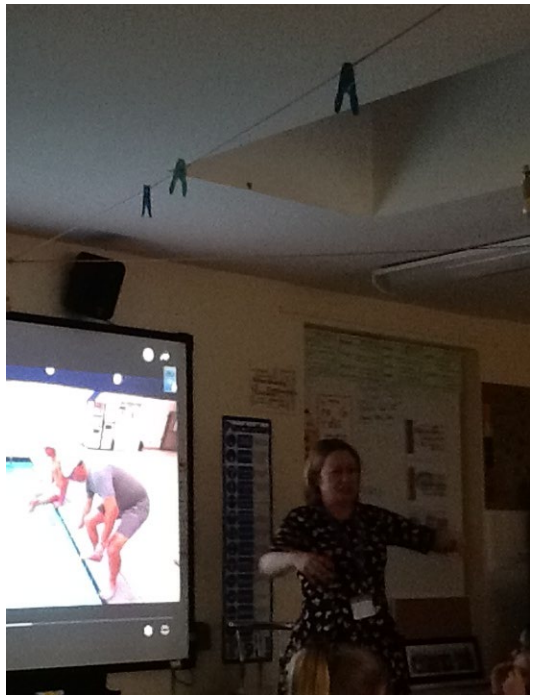
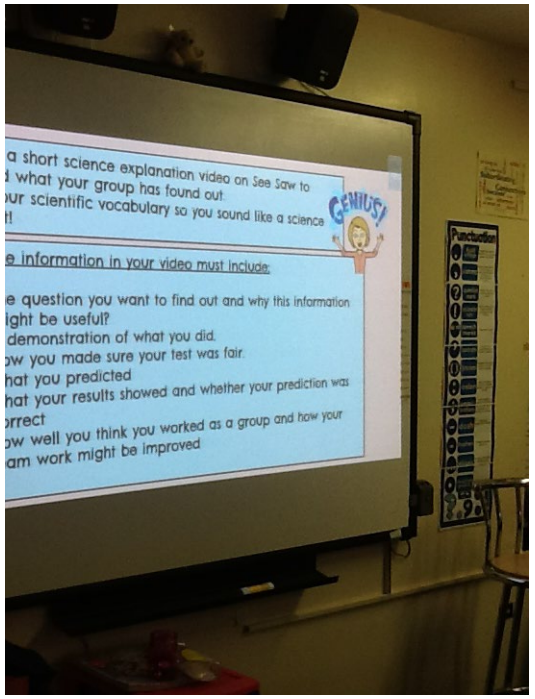
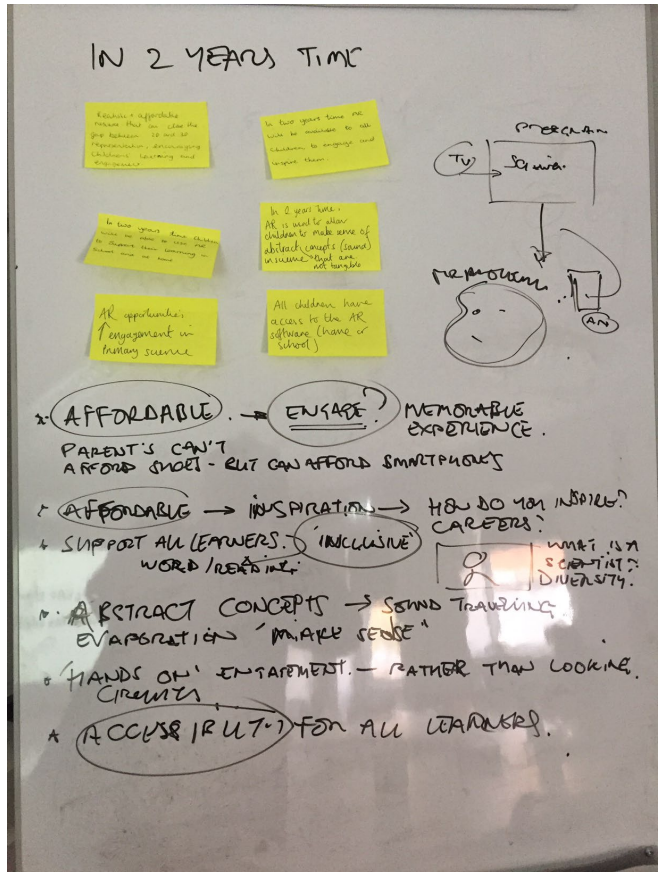
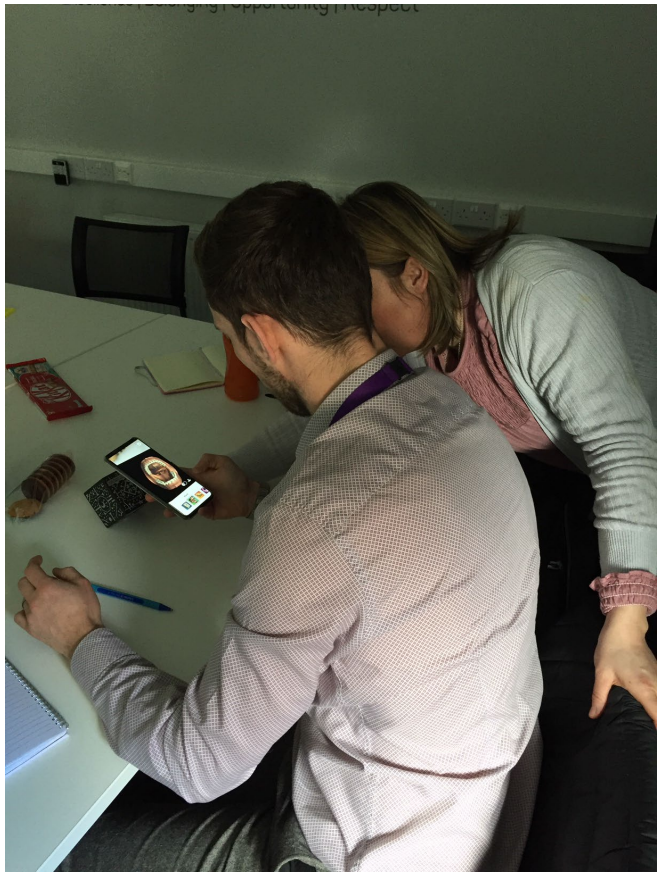
Exploration:
Classroom Observations





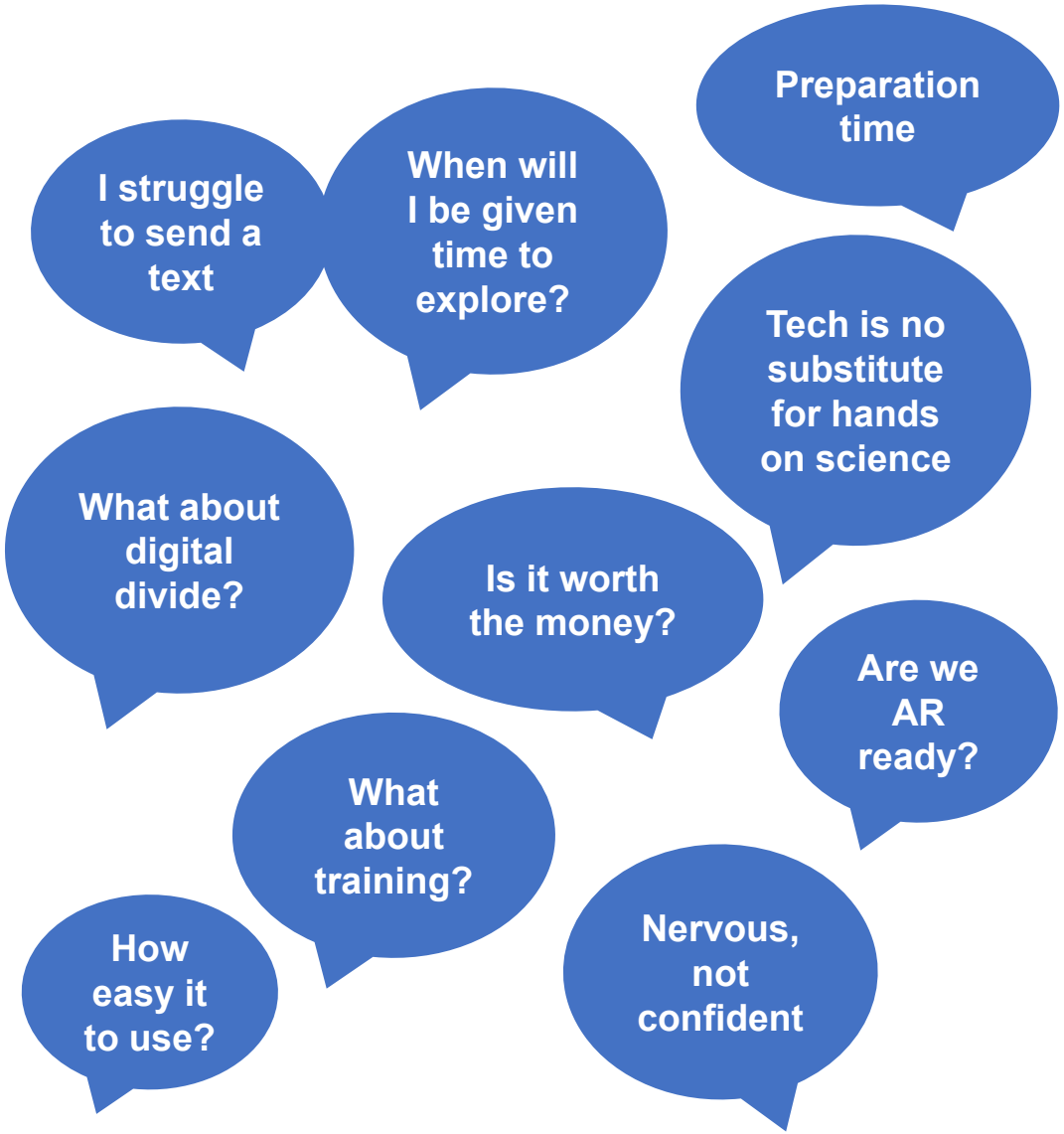
Exploration:
Focus Groups / Design Sprints



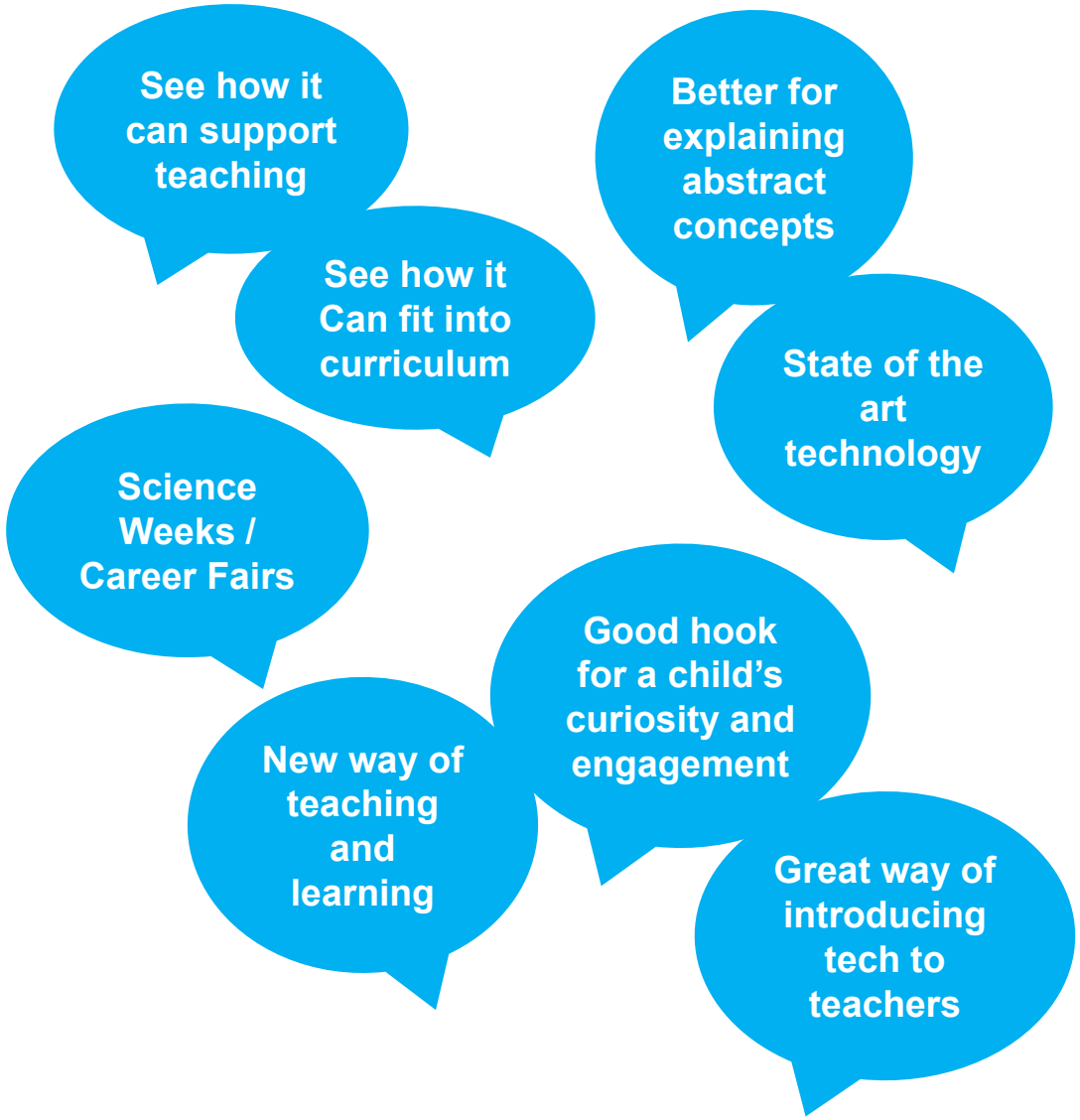


Exploration:
Empathy Canvas Maps

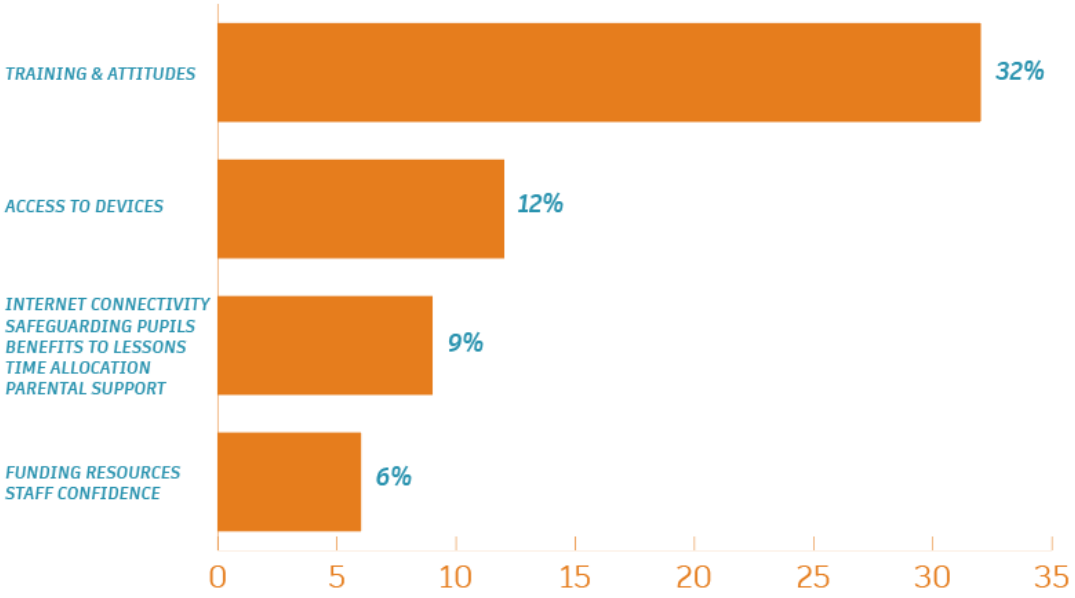
Exploration:
Empathy Canvas Map (Challenges)



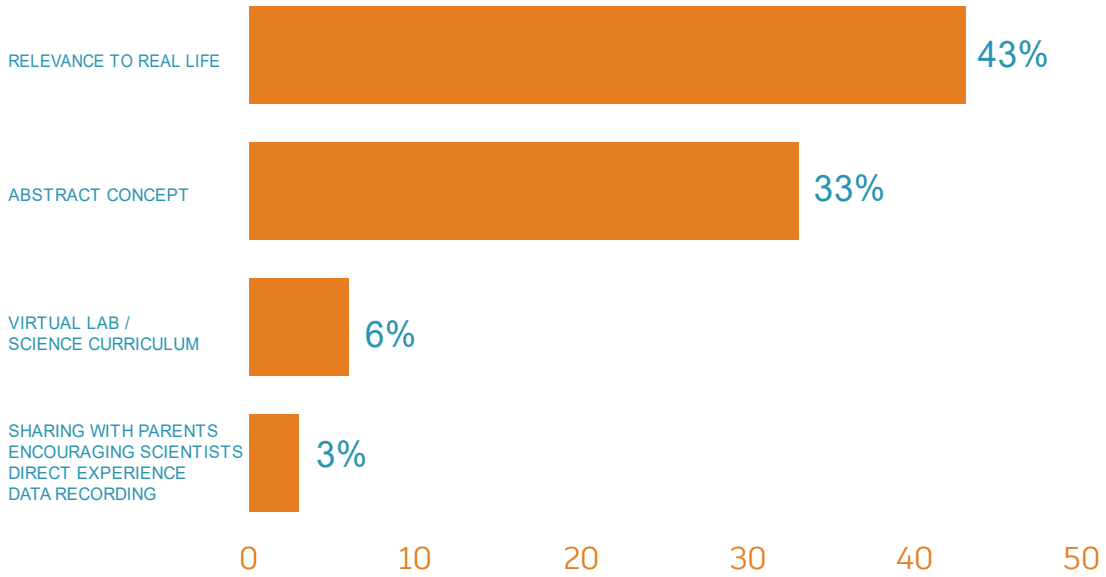
Empathy Canvas Map (Benefits)



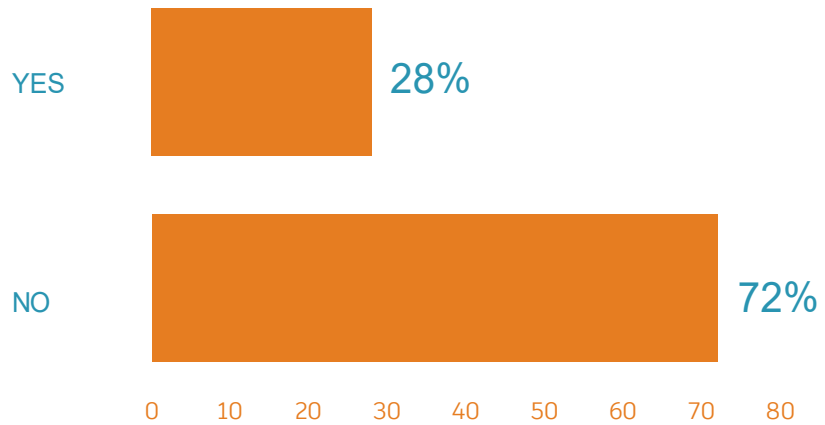
Exploration:
Empathy Canvas Maps (Challenges)



Empathy Canvas Maps (Benefits)



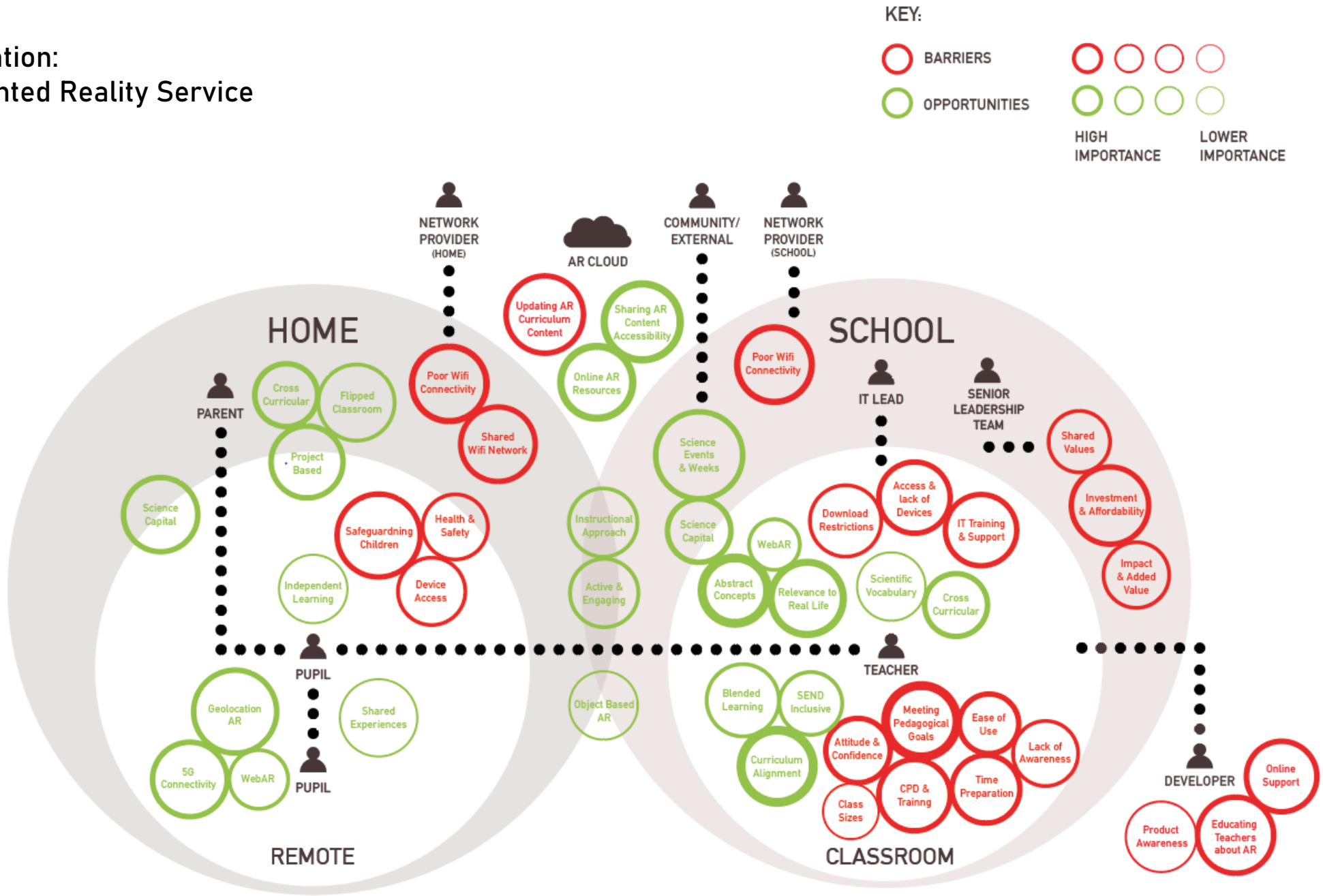
Exploration: Summary



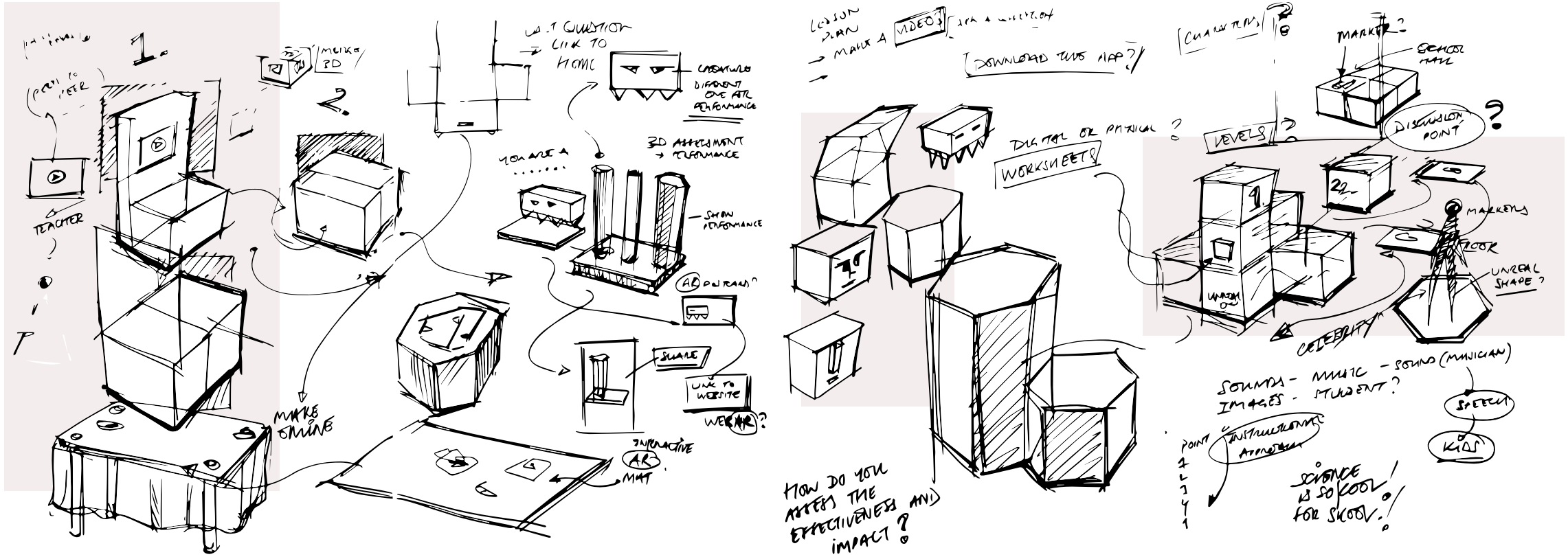
Affordability & Investment
Attitude & Confidence
IT Infrastructure
Time Preparation
CPD & Training
Inclusive

Curriculum Alignment
Cross Curriculum (STEM)
Connecting Science to Real Life
Science Capital

Exploration:
Augmented Reality Service



Creation:
Concept Work

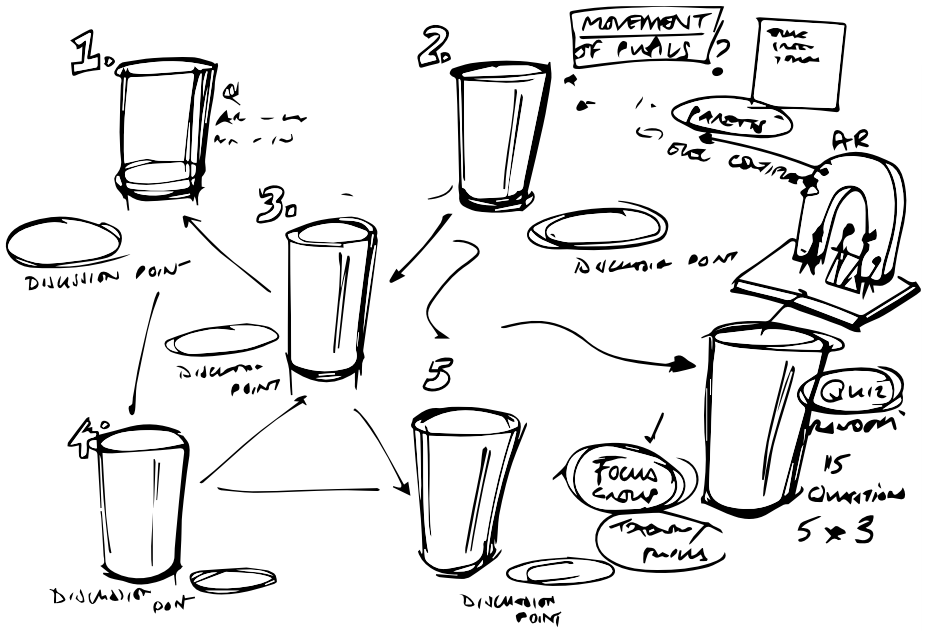


Science Event / Science Capital / Introduction in AR / Change Content (Cloud based)
/ Image Recognition / Time Preparation / Deep Dive / Active Learning / Group Work / Accessibility

Creation:
Concept Work

Creation:
Customer Journey Mapping

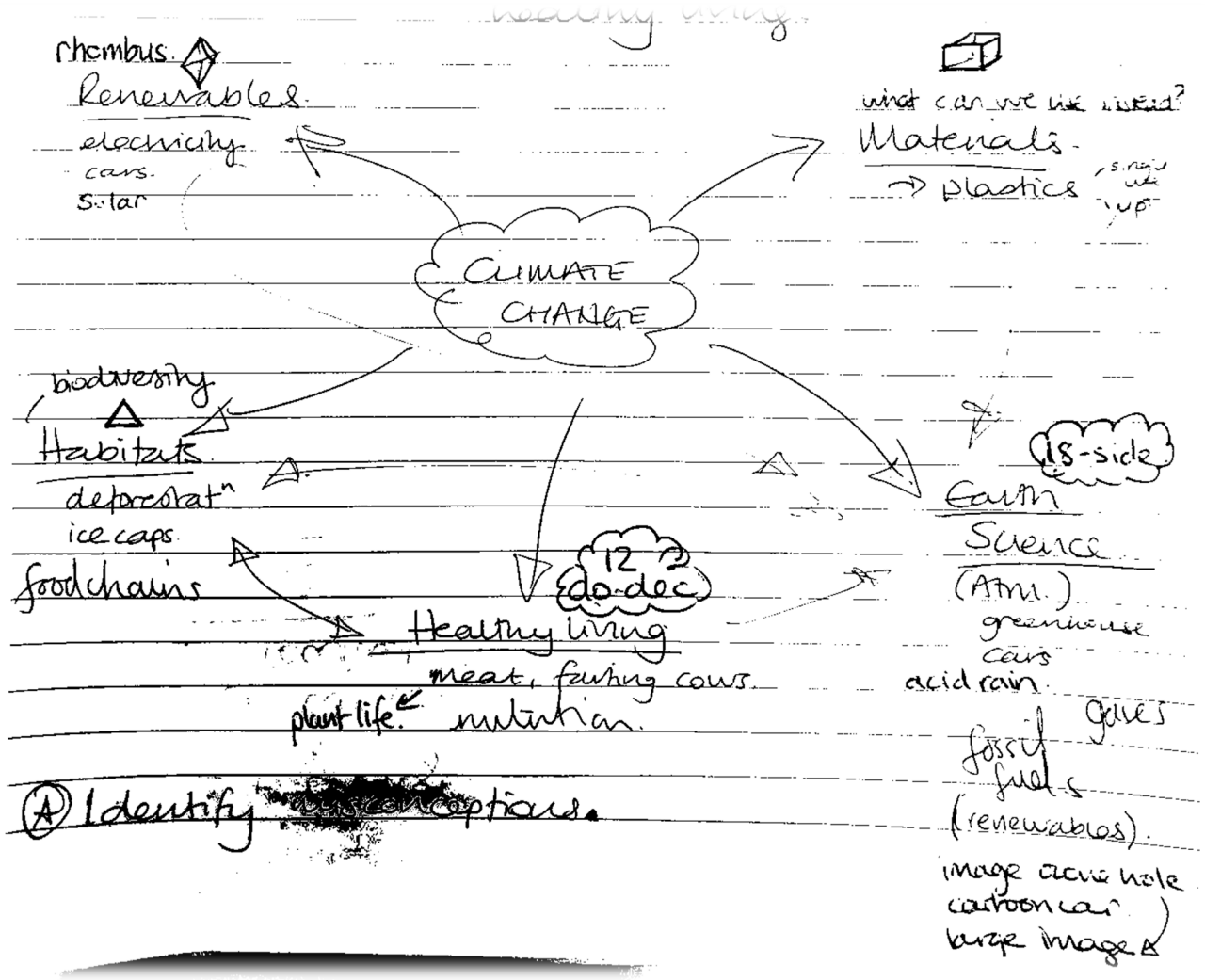
Creation:
Customer Journey Mapping



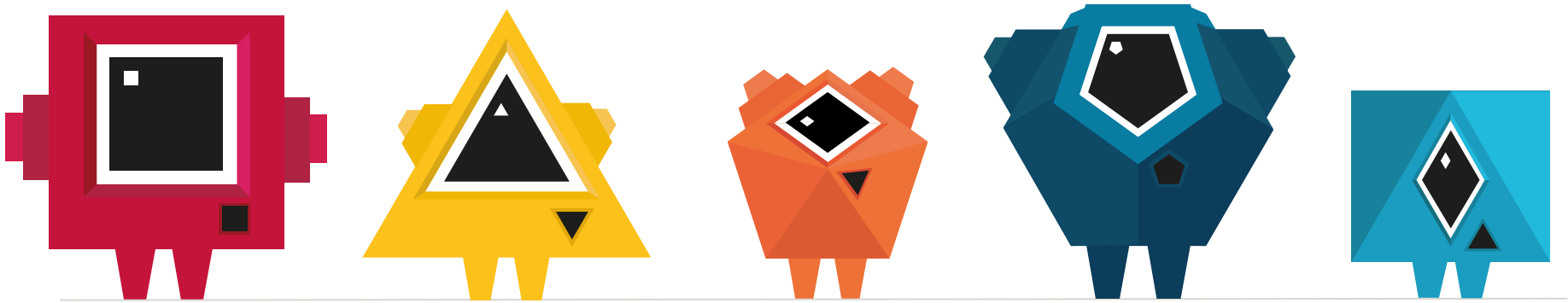
5 Stations:

1. Questions
2. Discussion Point
3. Video
4. AR Experience
5. AR Interactive
6. Reflection

7. Quiz



Creation:
Character Design



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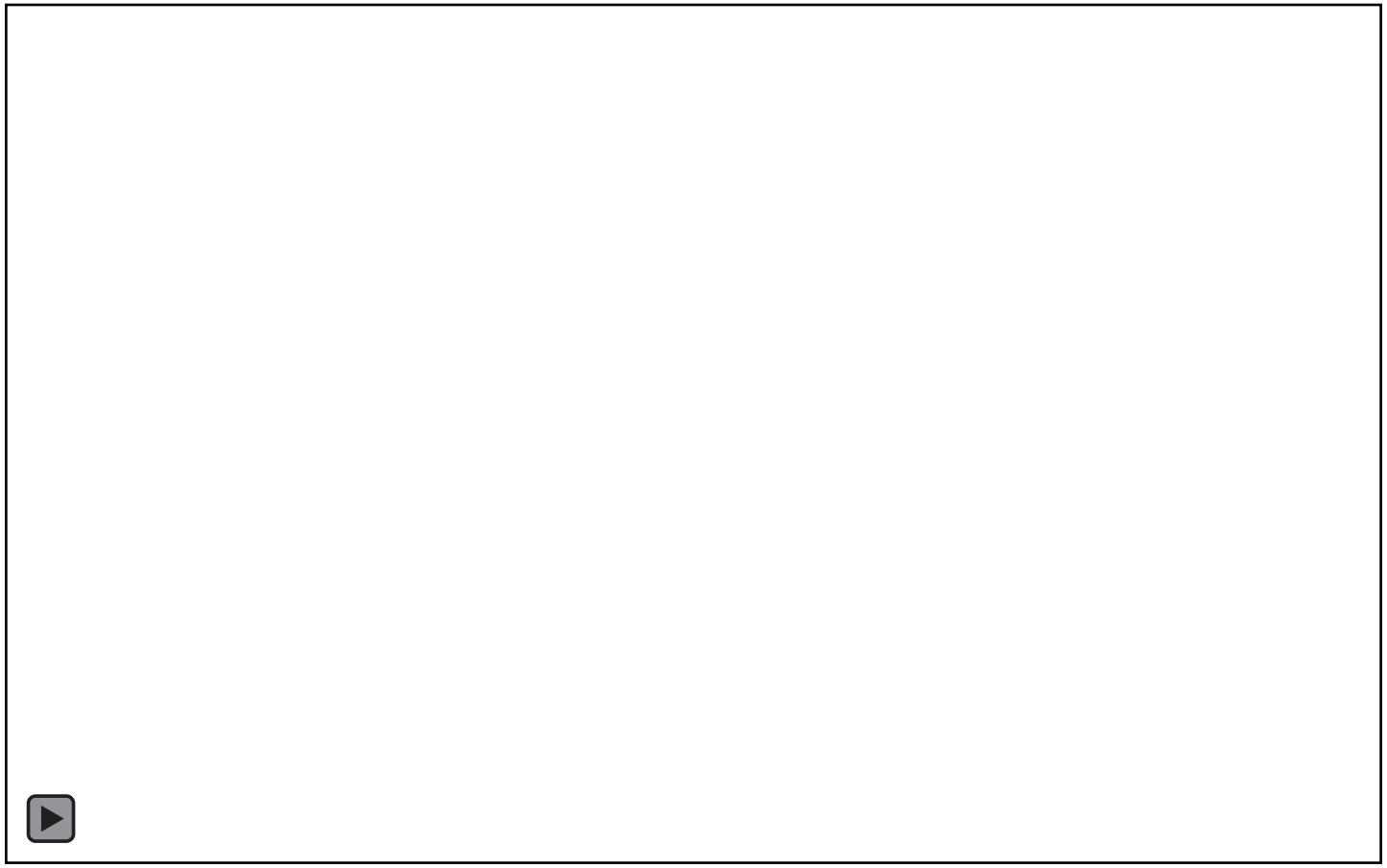

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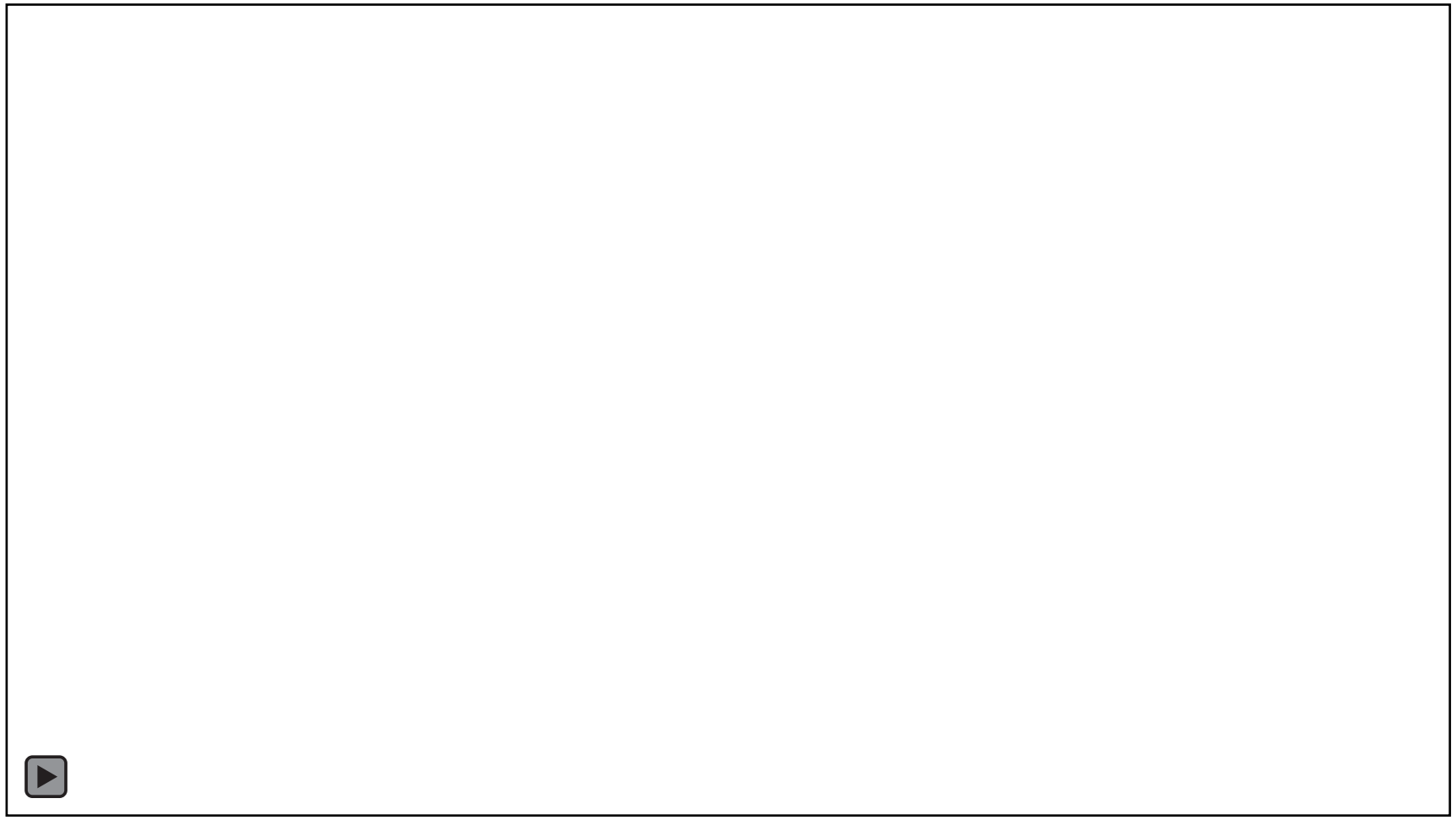
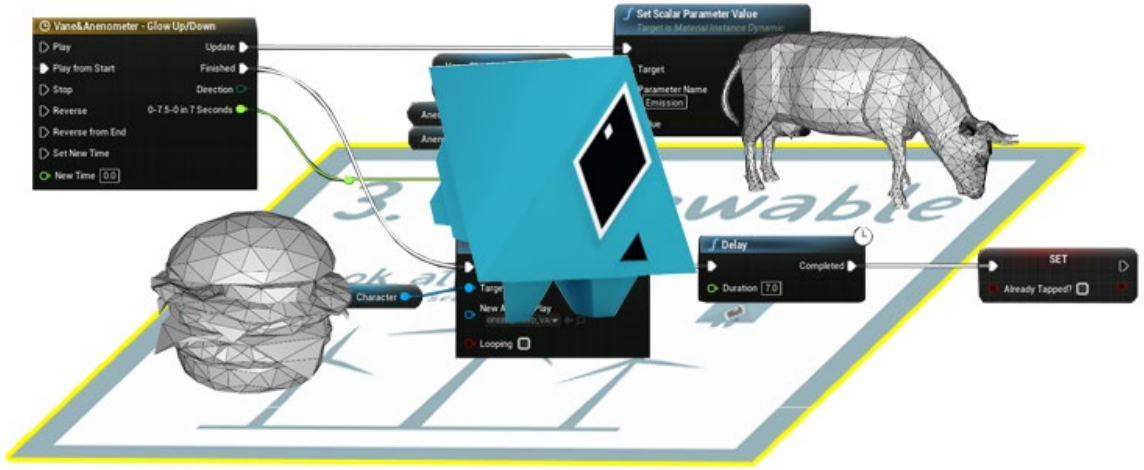
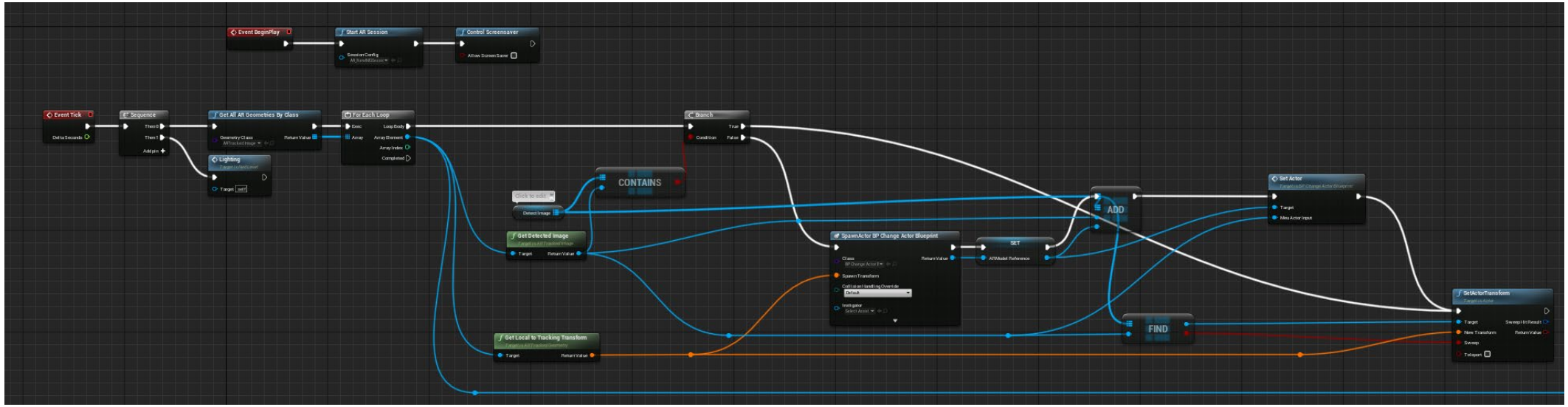


Creation:
Mechanics (Blueprint)





Creation:
Storyboarding

3.

Narration:

(12 Seconds)

FRAMES
1525 - 1825

Located above the forest floor is the understory layer. Small shrubs and trees can grow here. Understory plants often produce flowers that are large and easy to see.

(Animate the visibility of each layer)

(12 Seconds)

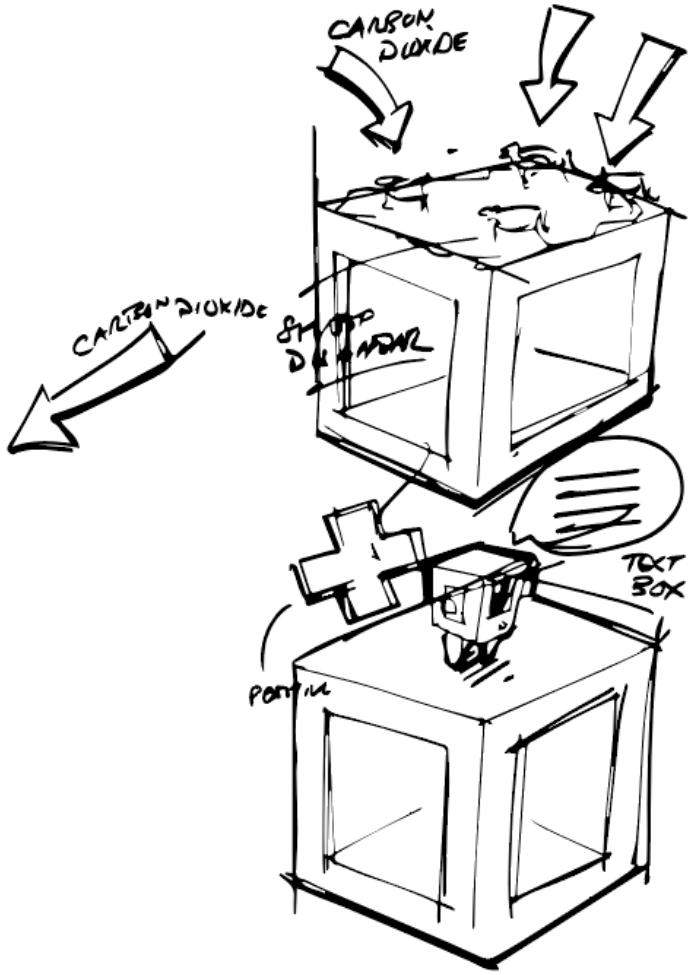
FRAMES
1825 - 2125

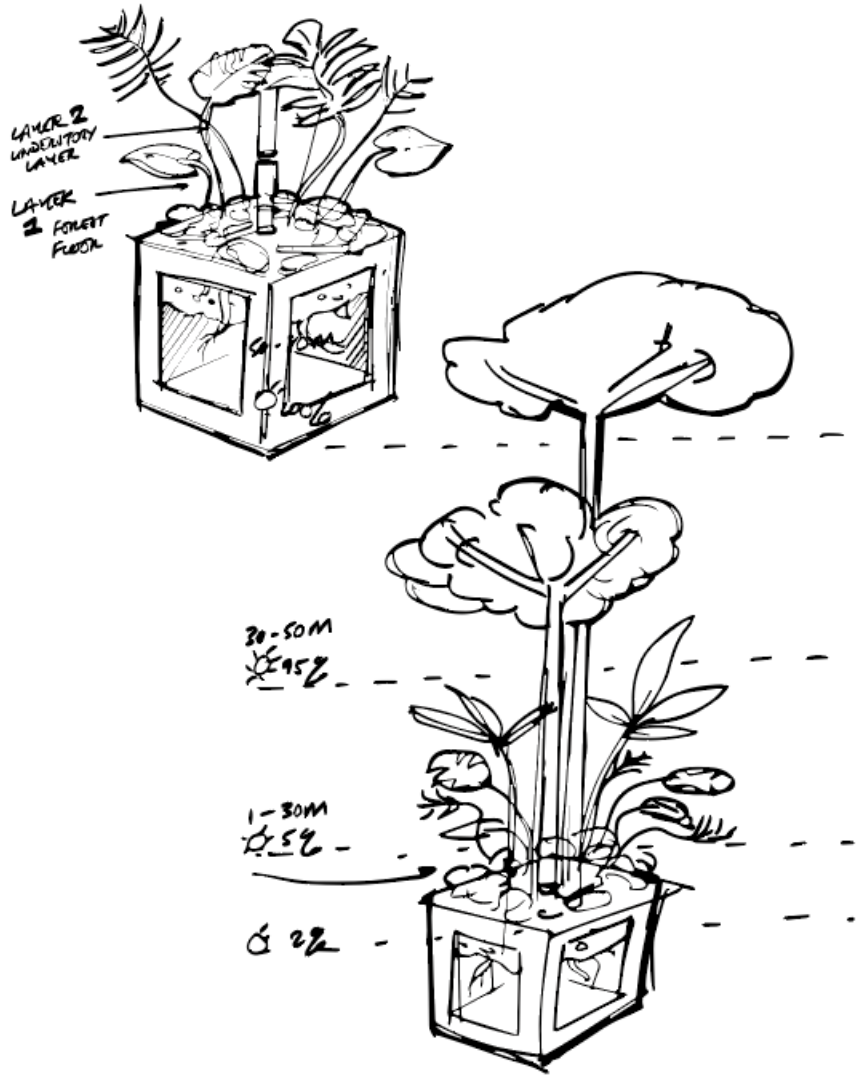
The canopy layer forms a dense network of leaves and branches as a roof over the two remaining layers. With so much food available, more animals live in the canopy than any other layer in the rainforest.

(11 Seconds)

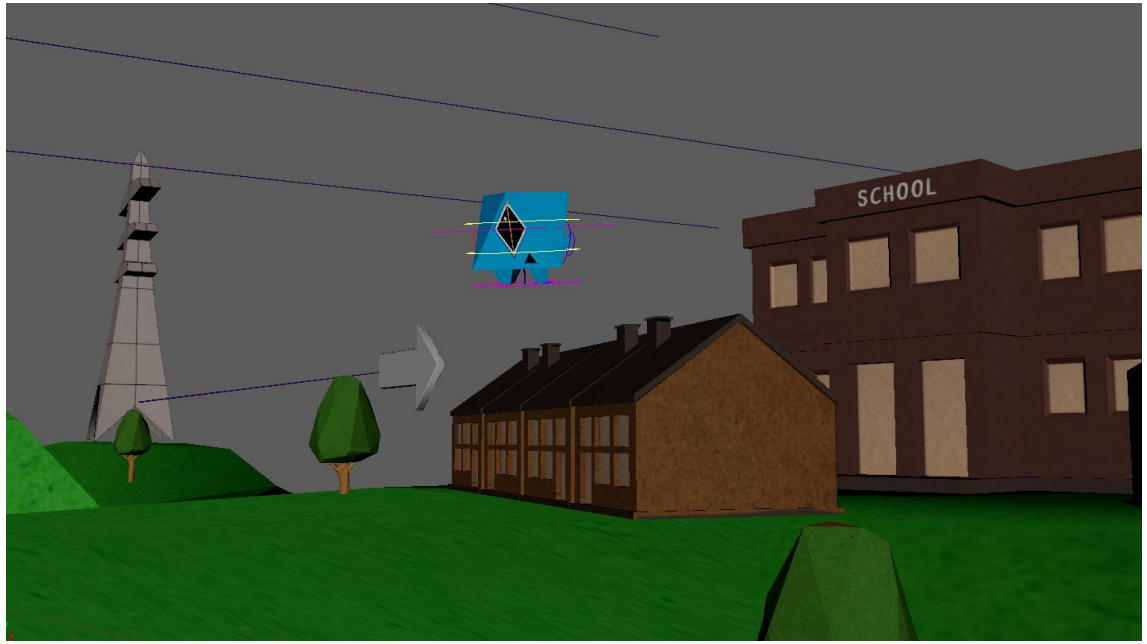
FRAMES
2125 - 2400

The top layer of the rainforest is the emergent layer, where trees can grow up to 60 metres tall due to larger amounts of sunlight. Here, you will find living bats, butterflies and awaiting predators such as hawks and eagles.





Creation:
Mechanics



Creation:
Mechanics

Thank you.

Contact Details

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