Est. 1841 | YORK ST JOHN UNIVERSITY

Fearn, Warren ORCID logoORCID: https://orcid.org/0000-0002-2029-630X (2024) A Service Design Approach: What are the barriers and opportunities to using augmented reality in primary science education? In: Animex Research and Innovation Conference 2024, 13 November 2024, Teesside University. (Unpublished)

Downloaded from: https://ray.yorksj.ac.uk/id/eprint/11051/

Research at York St John (RaY) is an institutional repository. It supports the principles of open access by making the research outputs of the University available in digital form. Copyright of the items stored in RaY reside with the authors and/or other copyright owners. Users may access full text items free of charge, and may download a copy for private study or non-commercial research. For further reuse terms, see licence terms governing individual outputs. Institutional Repository Policy Statement

RaY

Research at the University of York St John

For more information please contact RaY at ray@yorksj.ac.uk

Using augmented reality to teach primary sciences

Northern Digital Storytelling Festival - 27 03 23

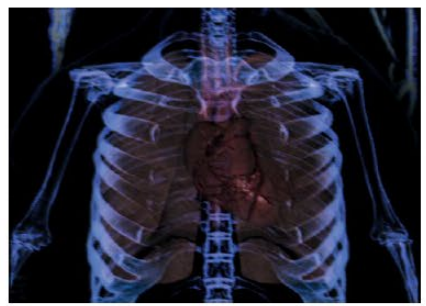
Warren Fearn
Senior Lecturer, York St John University
Ph.D. Student, University of York.

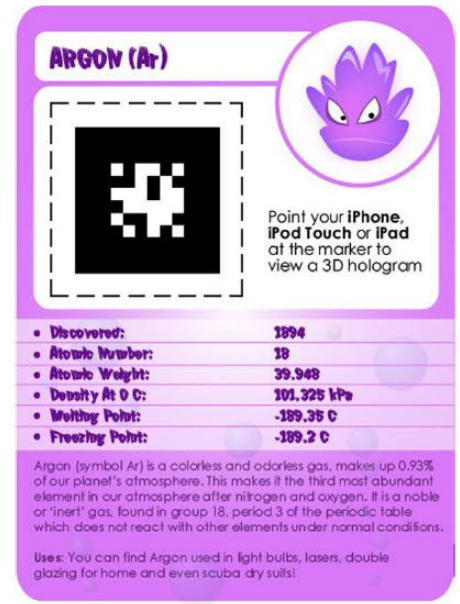
Est. 1841 | YORK ST JOHN UNIVERSITY

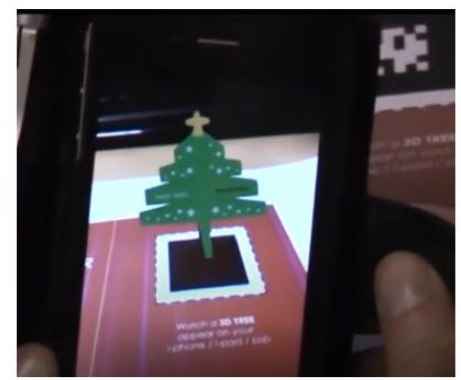
EPIC MegaGrants RECIPIENT

Epic SCIENCE


BAMZOOKI




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!



Stakeholders

Nicky Waller

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

Dr Katy Bloom

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

Jake Reeves Kemp

Computing Specialist Lead
Ebor Academy Trust
York
UK

Emma Davies

Science Academy Leader
Ebor Academy Trust
York
UK

Ebor Academy Trust

Pupils - Keystage 2

EBOR ACADEMY TRUST

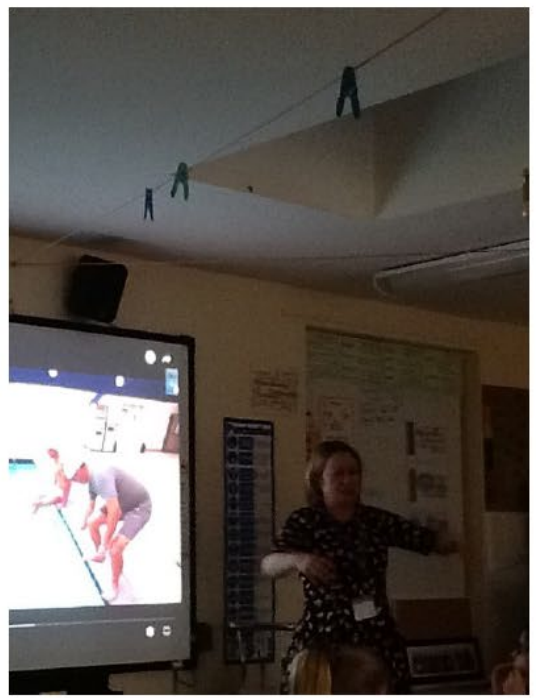
CENTRE *for* INDUSTRY EDUCATION COLLABORATION

Est. 1841 YORK ST JOHN UNIVERSITY

EPIC MegaGrants RECIPIENT

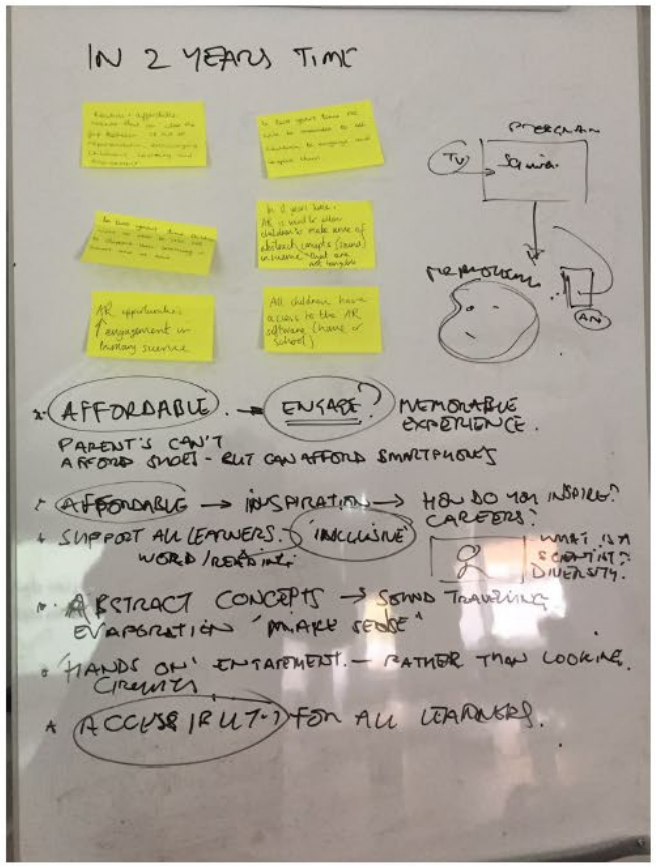
/ Collaborators
/ Understand subject area
/ Empathy

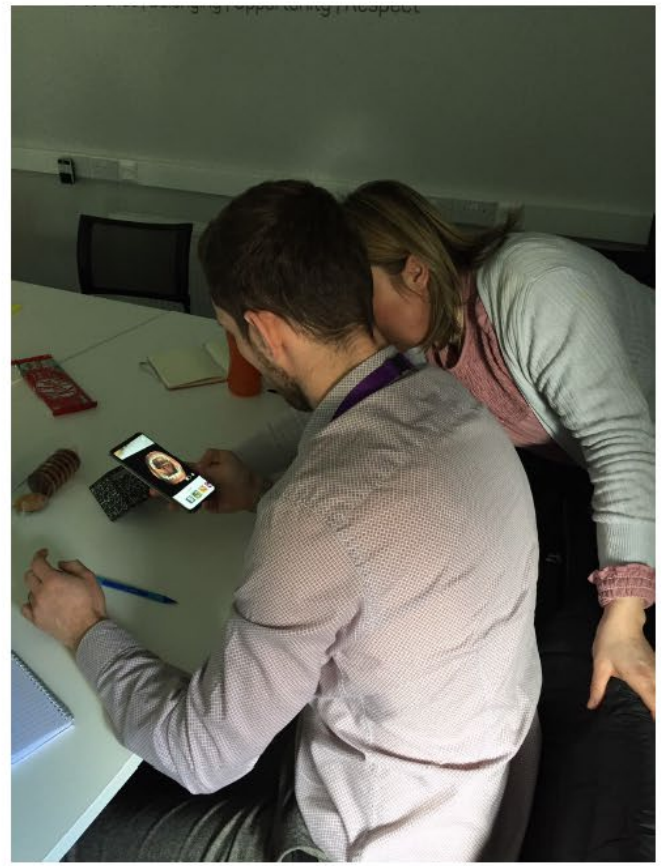
Exploration:
Classroom Observations



/ Comical Videos
/ Characterisation
/ Stories happened?

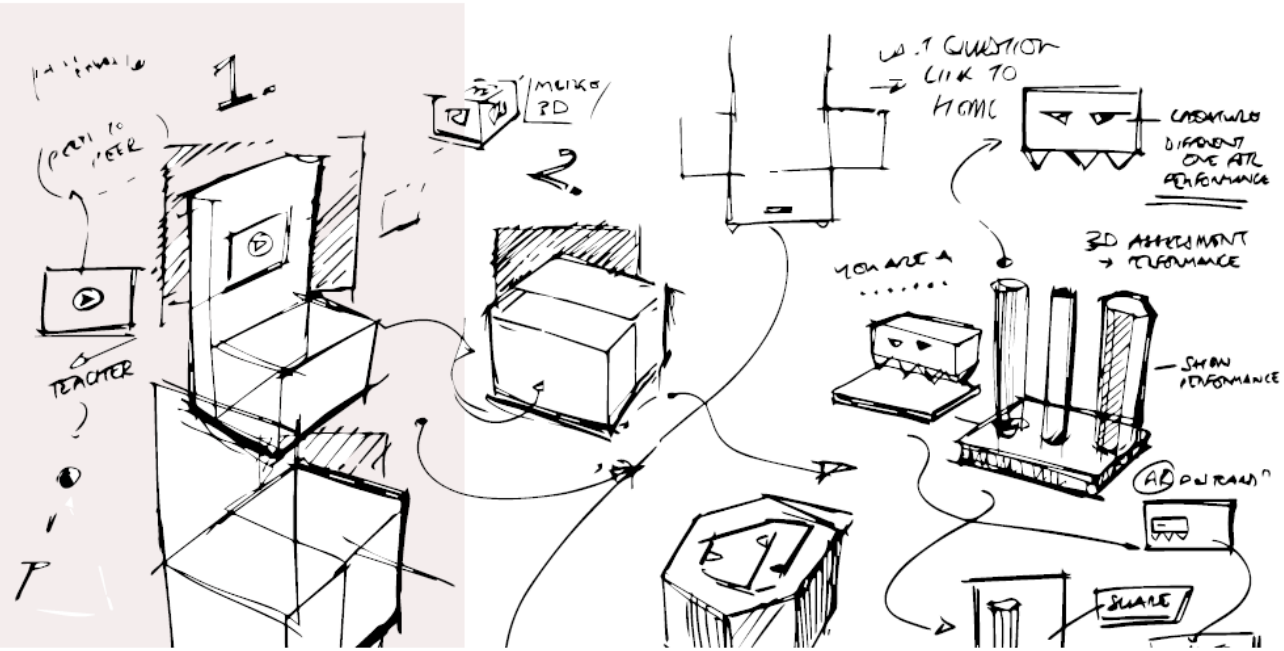
Exploration:
Focus Groups / Design Sprints





/ Benefit of using medium?
/ Storytelling?

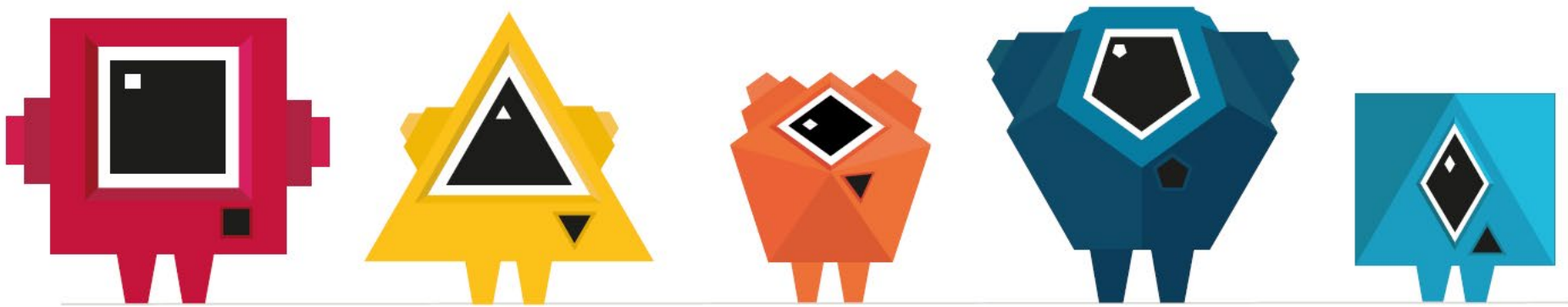
Creation:
Concept Work



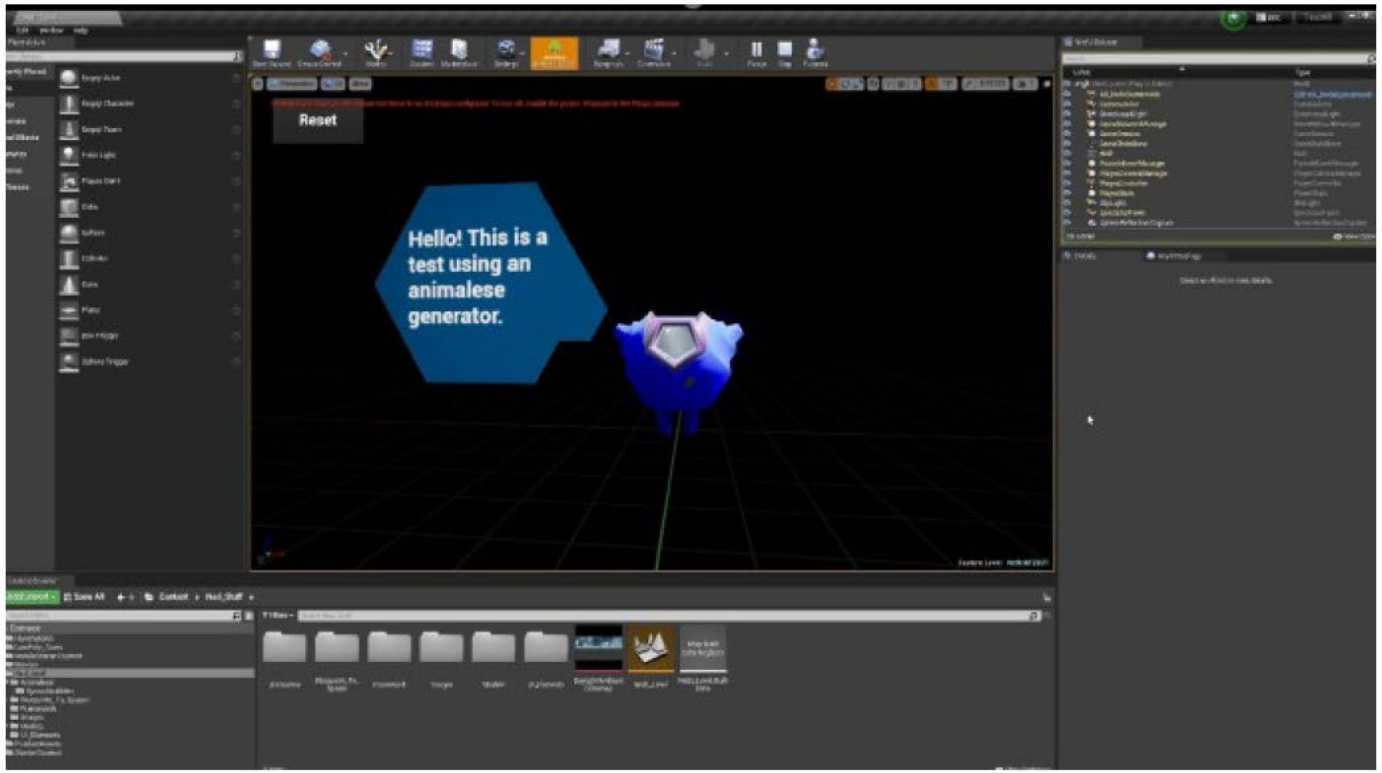
/ Curriculum Alignment
/ Cross Curriculum (STEM)
/ Connecting Science to Real Life
/ Appropriate Language (KS2)
/ Science Capital (sharing stories)

/ Science Event
/ Change Content (Cloud based)
/ Image Recognition
/ Group Related

Creation:
Character Design



Creation:
Character Design



Creation:
AR Interaction

1. Renewables
Touching on the wind turbine (learning about parts of the turbine)

2. Habitats
Choosing options to help an animal survive. Shelter, food, water (problem solving)

3. Materials
Choosing which materials to remove from the ocean to stop pollution (gaming)

4. Healthy Living
What is a burger made from? (what's in a burger)

5. Earth Science
Character in a car, too hot. Using dial to get hotter and colder (slider to make temp hotter and colder)

Creation:
Storyboarding

Renewables:

1.

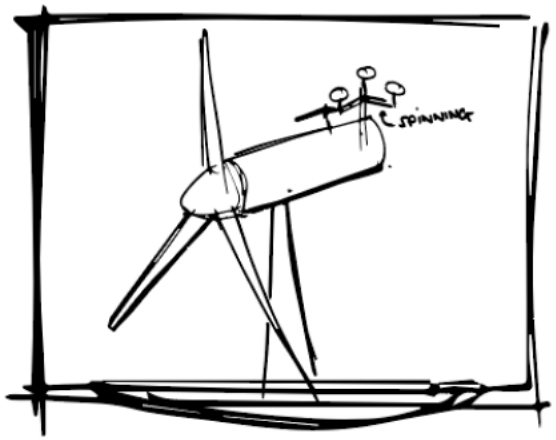
(6 Seconds)

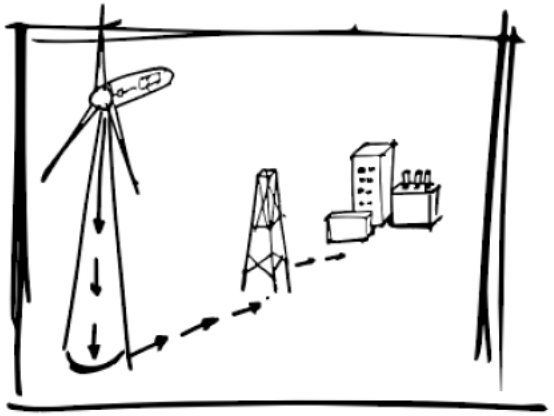
FRAMES
1 - 150

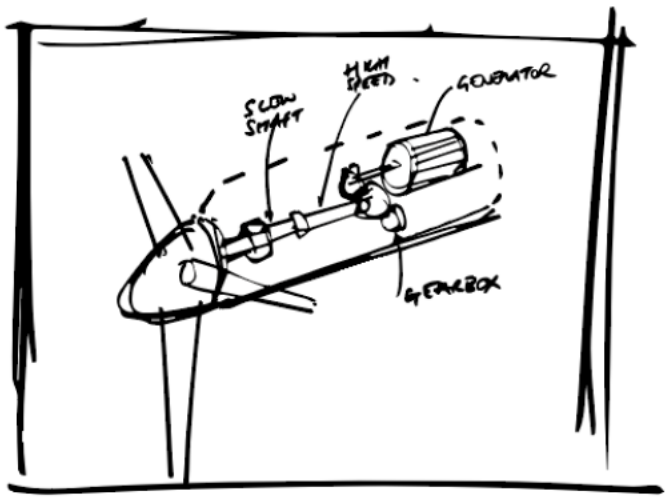
Narration:
The wind pushes the air and spins the blades of the windturbines

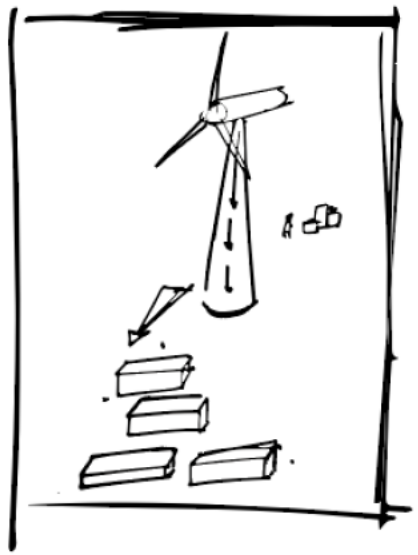
(Close up of the top of a windturbine)

(3D Arrows floating above, as the wind turbine blades begin to rotate)





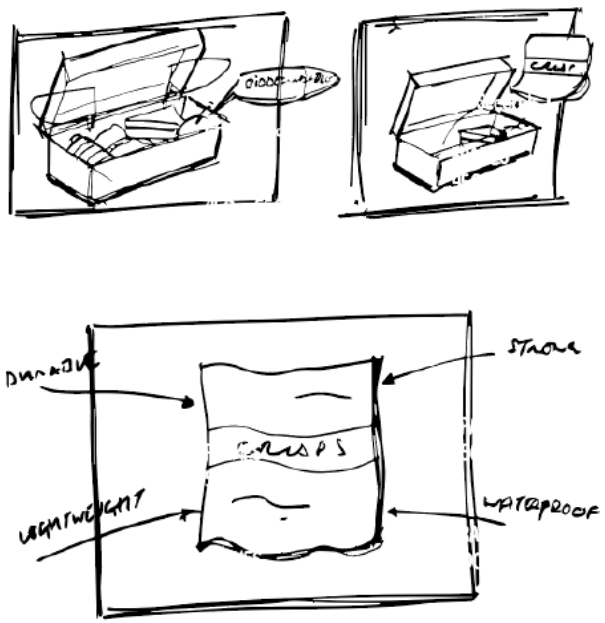


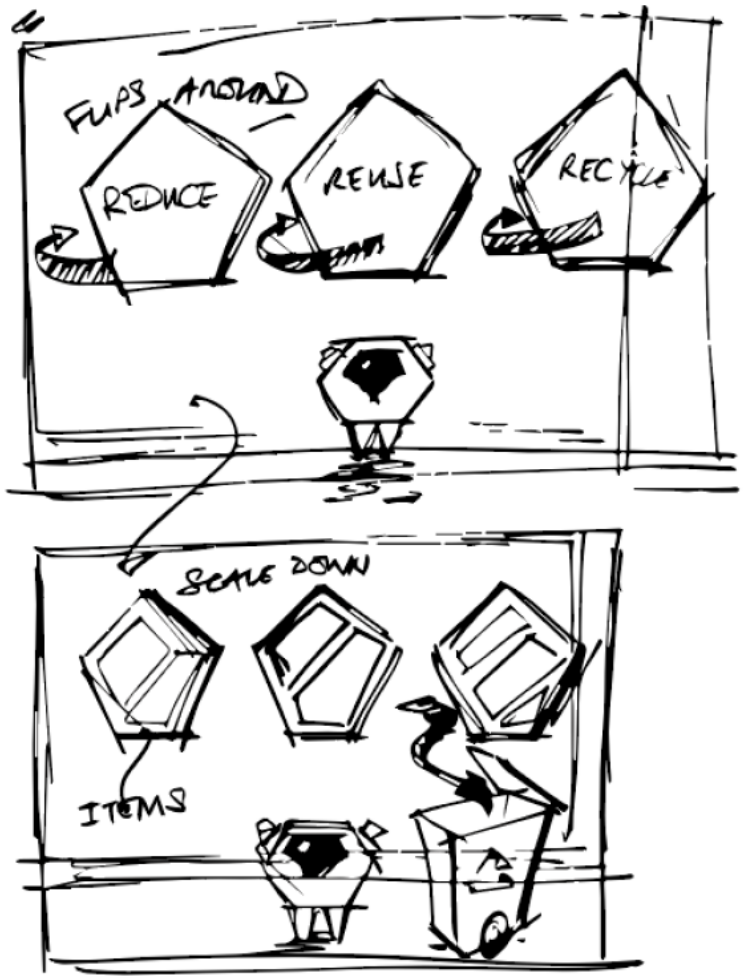


Creation:
Storyboarding

Materials:

2.	Narration:
(4 Seconds)	Which items do you think could be bad for the environment? Why do you think this?
FRAMES 450 - 550	(Character asks question / speech bubbles pop up to reveal the answers) Yoghurt Banana Peel Sandwich Crisps
(10 Seconds)	(Lunchbox fades / scales away)
FRAMES 550 - 800	(Close up of Crisp Packet - scale up) A plastic crisp food wrapper is strong, durable, lightweight and waterproof. This material makes it good for protecting food.
(15 Seconds)	





Creation:
Storyboarding

Habitats:

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)

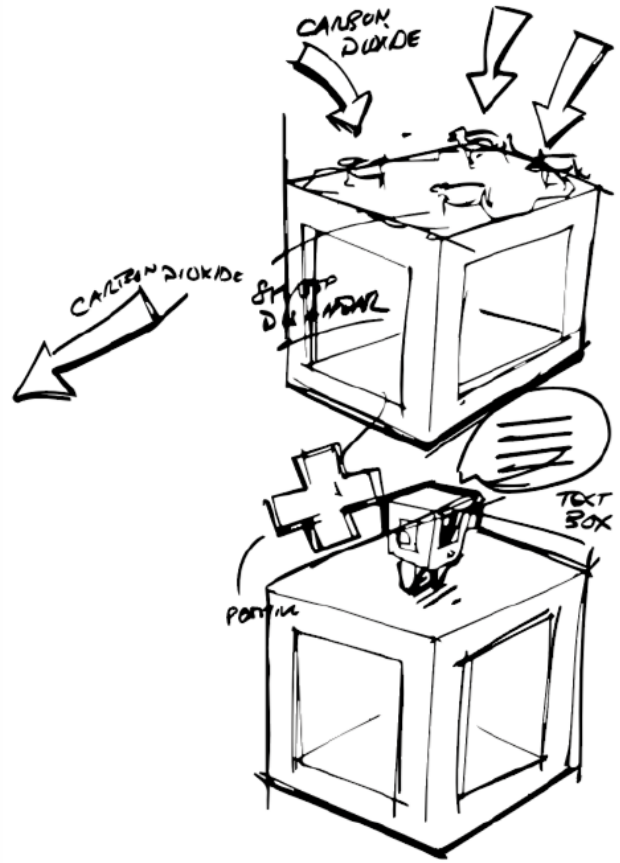
FRAMES
1825 - 2125

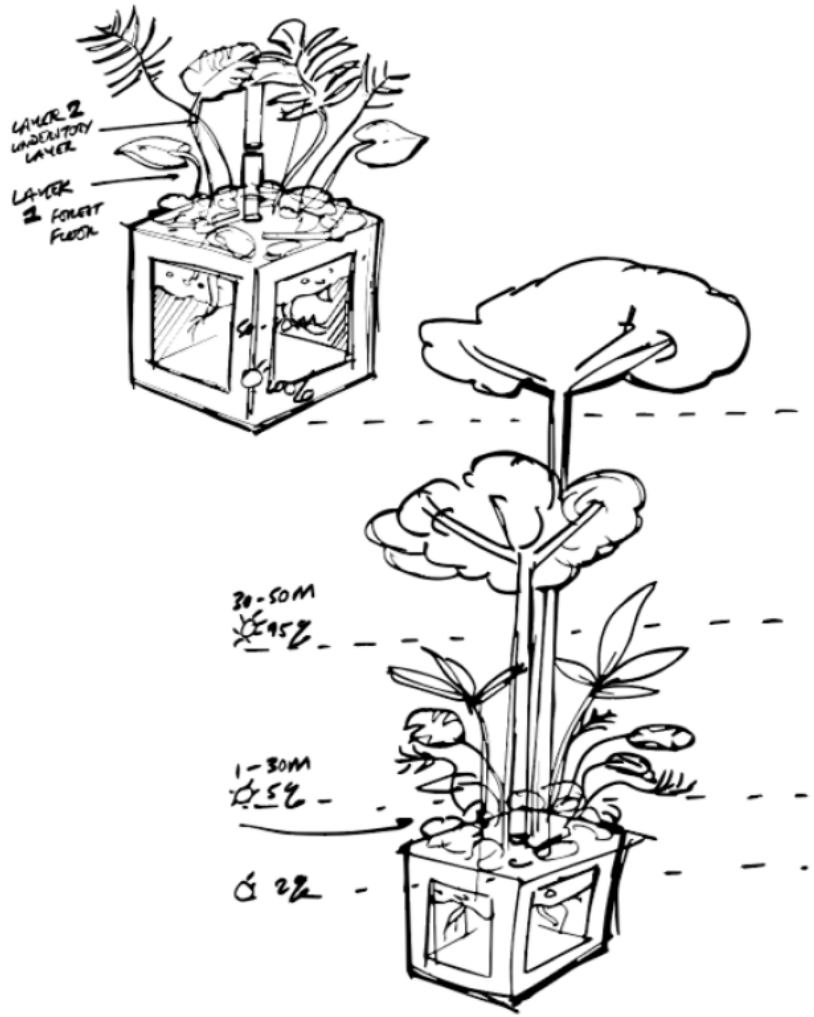
The canopy layer forms a dense network of leaves and branches as a roof over the two remaining layers. With so much food available, more animals live in the canopy than any other layer in the rainforest.

(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:
Storyboarding

Healthy Eating:

4.

Narration

(16 Seconds) One of the byproducts of cow digestion is a gas called METHANE.

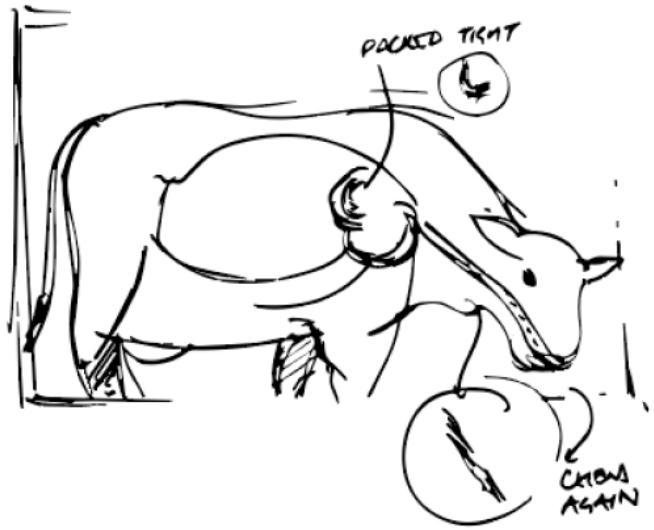
FRAMES
1875 - 2275 Methane is largely burped out by cow BURPS ! Did you know cows burp up to 60 times a day !

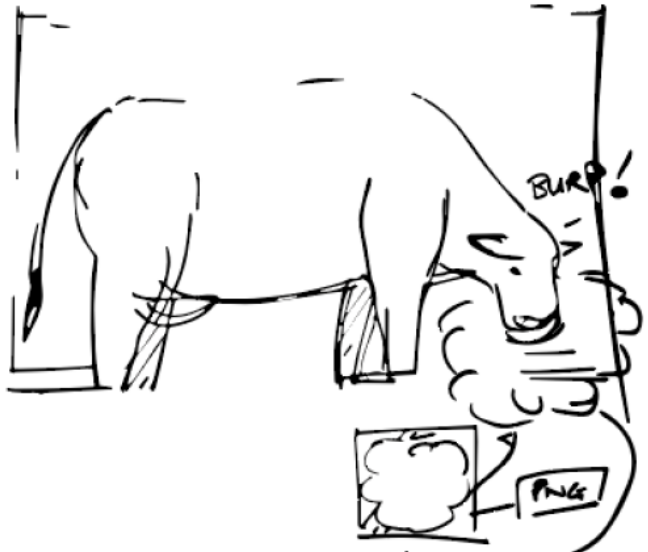
(Cow makes a large BURPING sound - blows the character backwards)

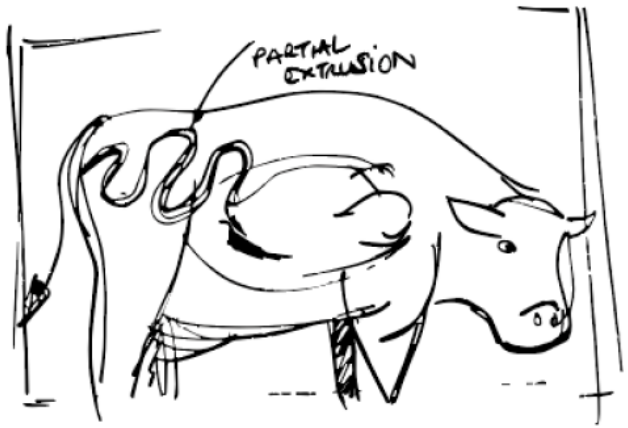
(10 Seconds) Also, the fermentation in a cow's stomach produces a small amount of methane gas
2275 - 2525 when a cow FARTS ! SMELLY !

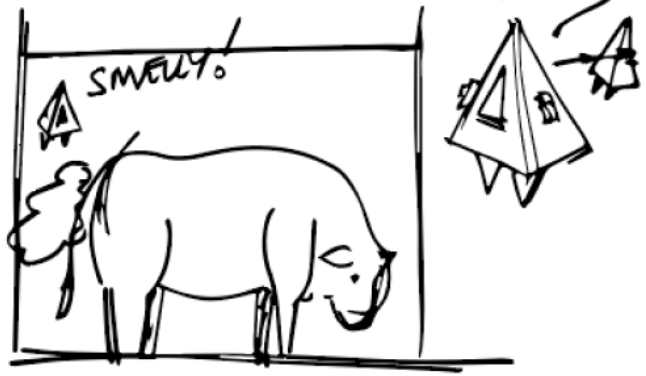
(Cow lets out a FART - sound added - character moves quickly out of the way !)

(12 Seconds) Methane is an important gas that's playing a role in global warming, and we need farming industries







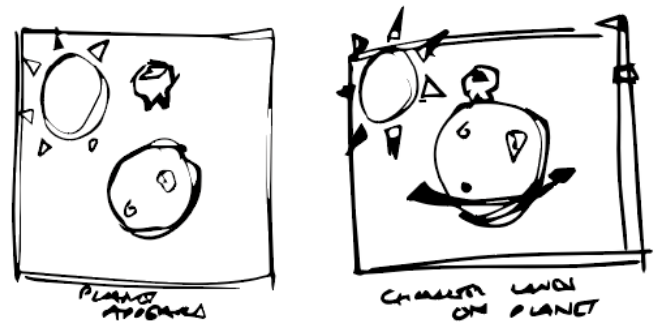


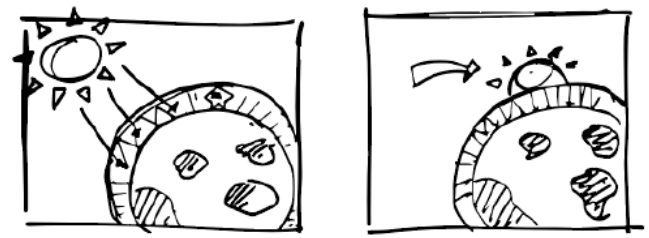
Creation:
Storyboarding

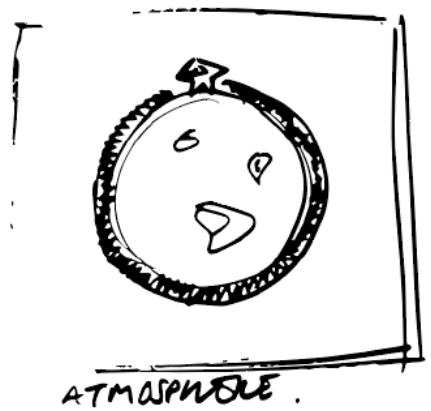
Earth Sciences:

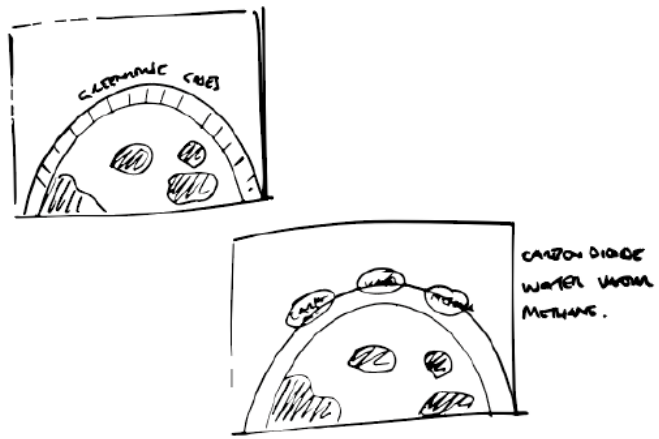
5.

(17 Seconds) FRAMES 2100 - 2525	Over the years, human activities have caused more carbon dioxide (also known as CO2) to be released into the atmosphere. For example, burning fossil fuels - such as coal and oil - are changing Earth's natural greenhouse effect. (Show factories, and cars popping up)
(15 Seconds) FRAMES 2525 - 2900	The extra greenhouse gases trap more heat, leading to Earth's capacity to retain solar radiation, resulting in the rising of the Earth's temperature - the same effect as in the greenhouse we saw earlier.
(13 Seconds) FRAMES 2900 - 3225	Satellite information is constantly measuring the gases in our atmosphere from space. This infomation can help scientists better understand how greenhouse gases are changing our climate. (Show satellite circling the planet)

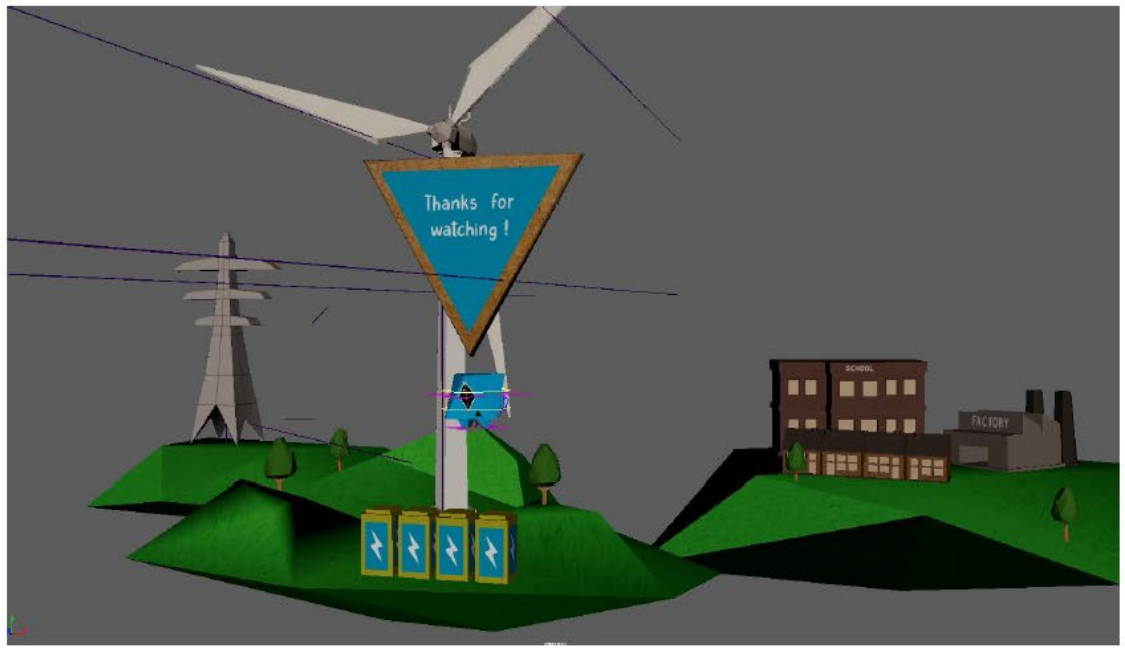


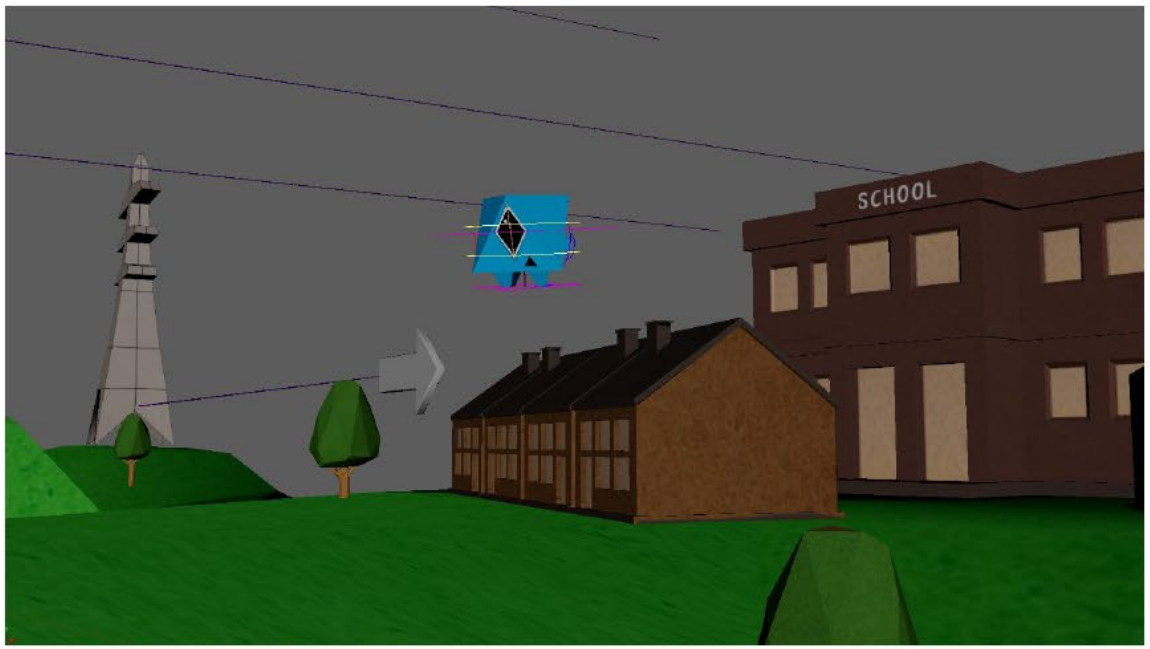




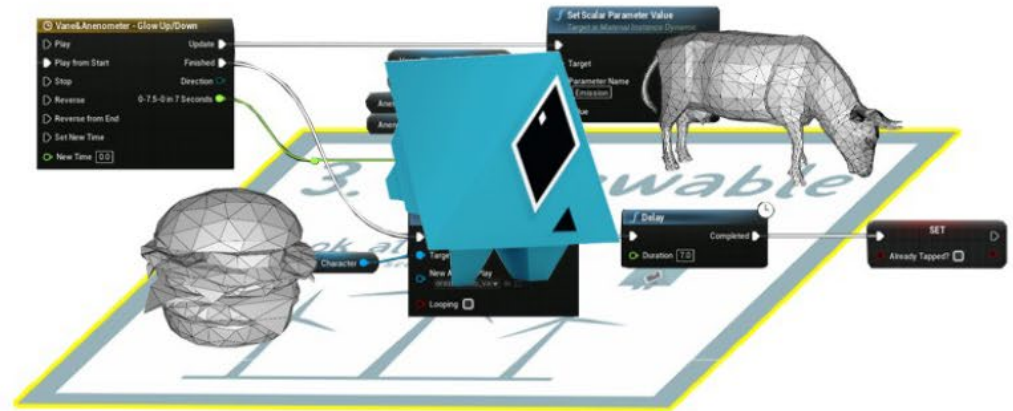


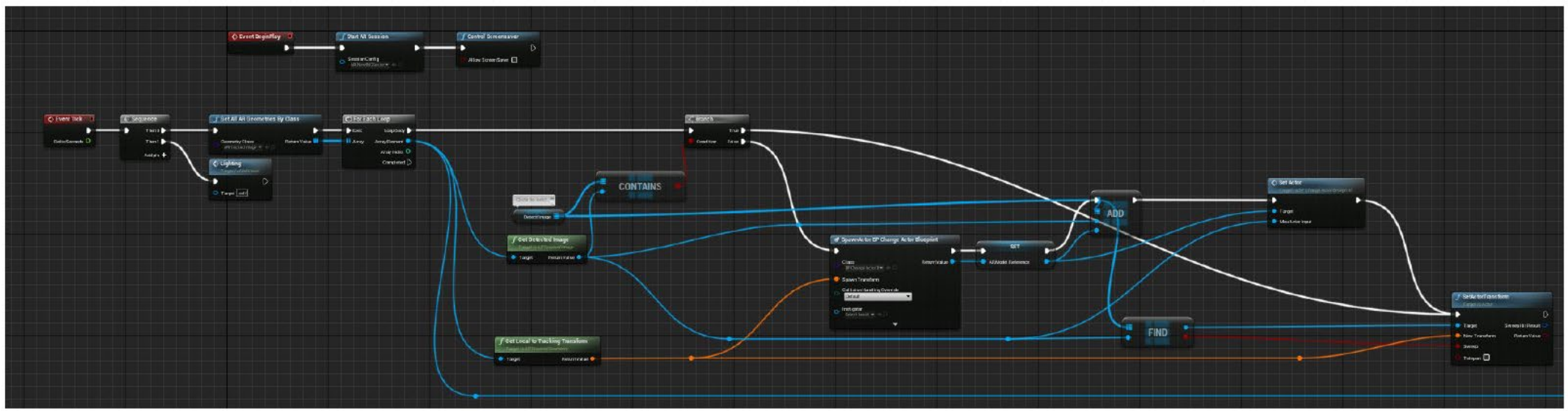
Creation:
3D Animation



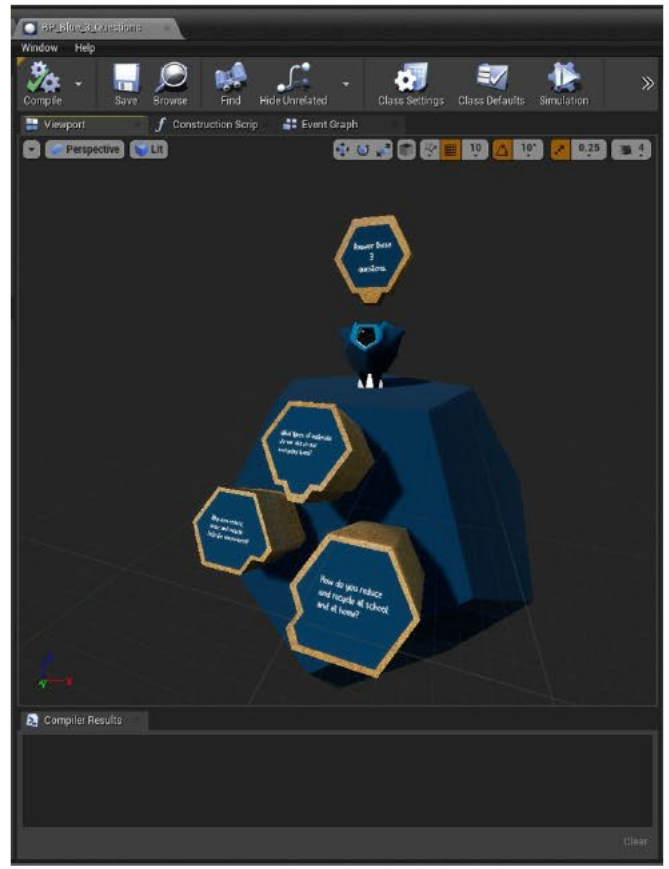


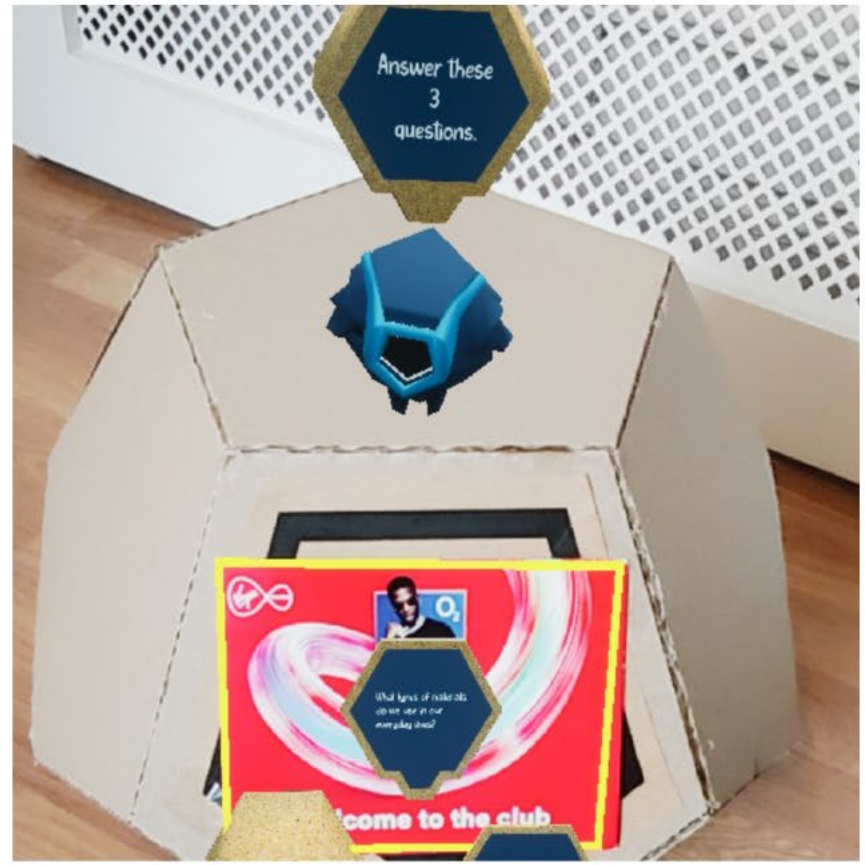
Creation:
Mechanics (Blueprint)



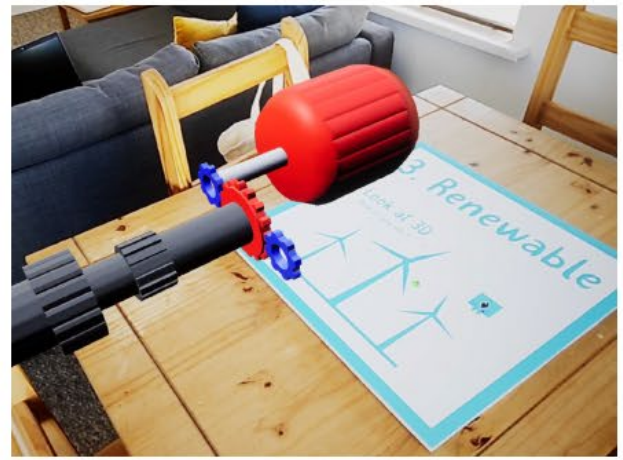


Creation:
Mechanics (Augmentation)





Creation:
Mechanics (Augmentation)



John Ricketts

Audio Engineer
Music Production and
Creative Business Student,
York St John University
UK

Thank you.

Contact Details

Warren Fearn
E: w.fearn@yorksj.ac.uk

Est. 1841 | YORK ST JOHN UNIVERSITY