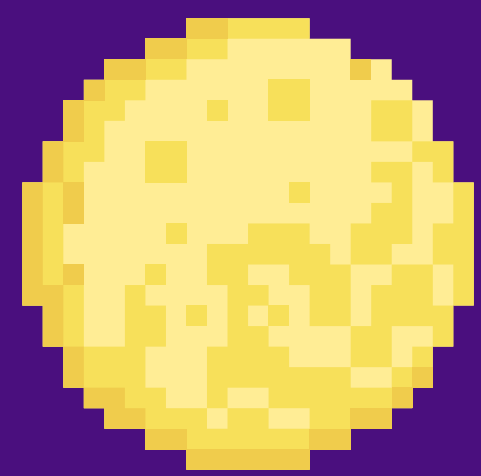


FROM SCAN TO STORY

TEACHING GAMES PROGRAMMING THROUGH 3D
CAPTURE AND IMMERSIVE TECHNOLOGIES.

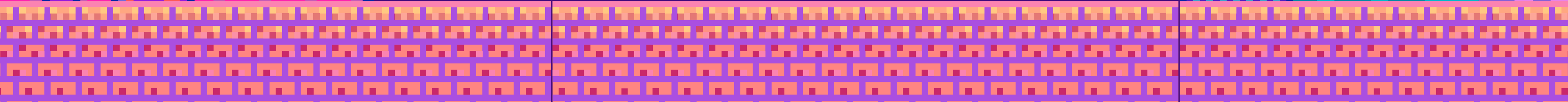




HELLO

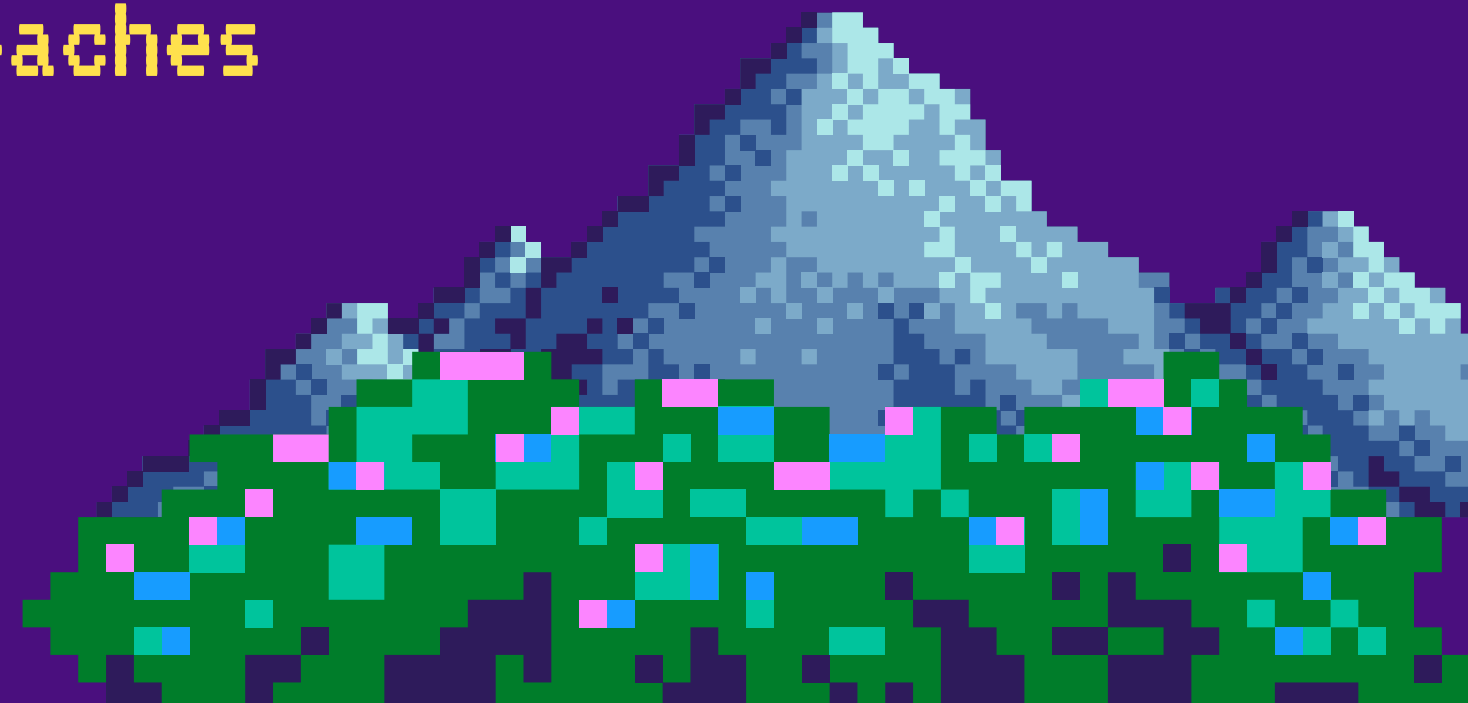
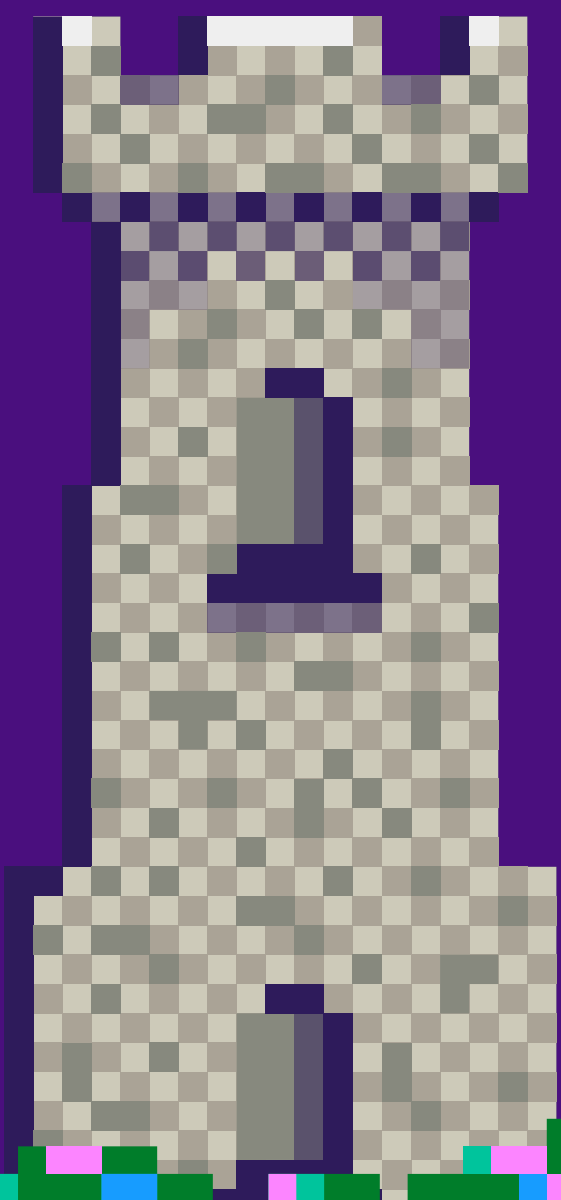
Hi!
I am Verda, Lecturer at
SoCET, RGU

Hi!
I am Xander, Foundation
Lecturer at Abertay



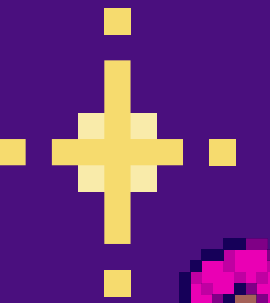
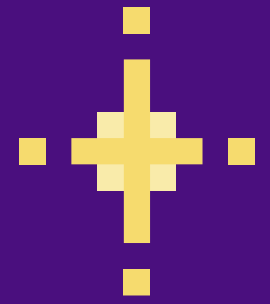
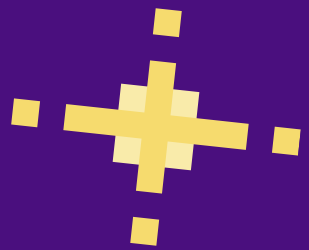
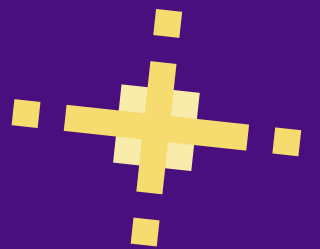
OVERVIEW

- SICSA L&T scholarship
- Cognitive load
- Pedagogy - Why it matters?
- Breaking down the process
- Scanning to interactive story pipeline
- Student projects
- Industry and Research approaches

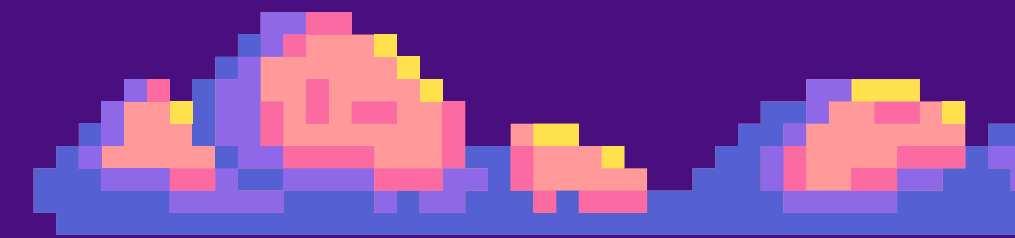


SICSA L&T SCHOLARSHIP

Concept: How do we make learning games approachable?



WHAT IS COGNITIVE LOAD?



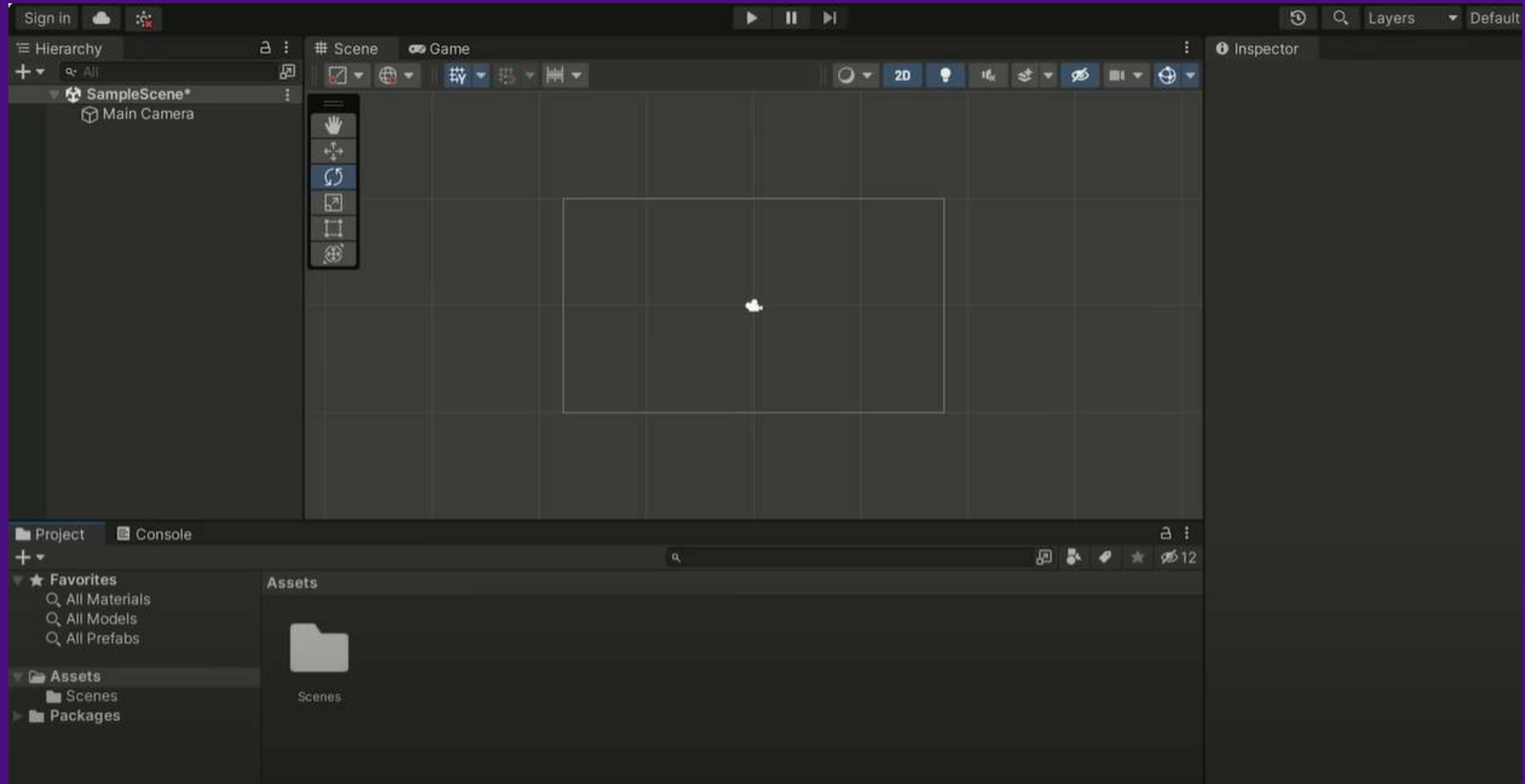
Cognitive Load Theory - coined in 1988 by John Sweller -

Our working memory holds a limited amount of information at a time

Thus, learning can be maximised if our instructions avoid
overloading working memory



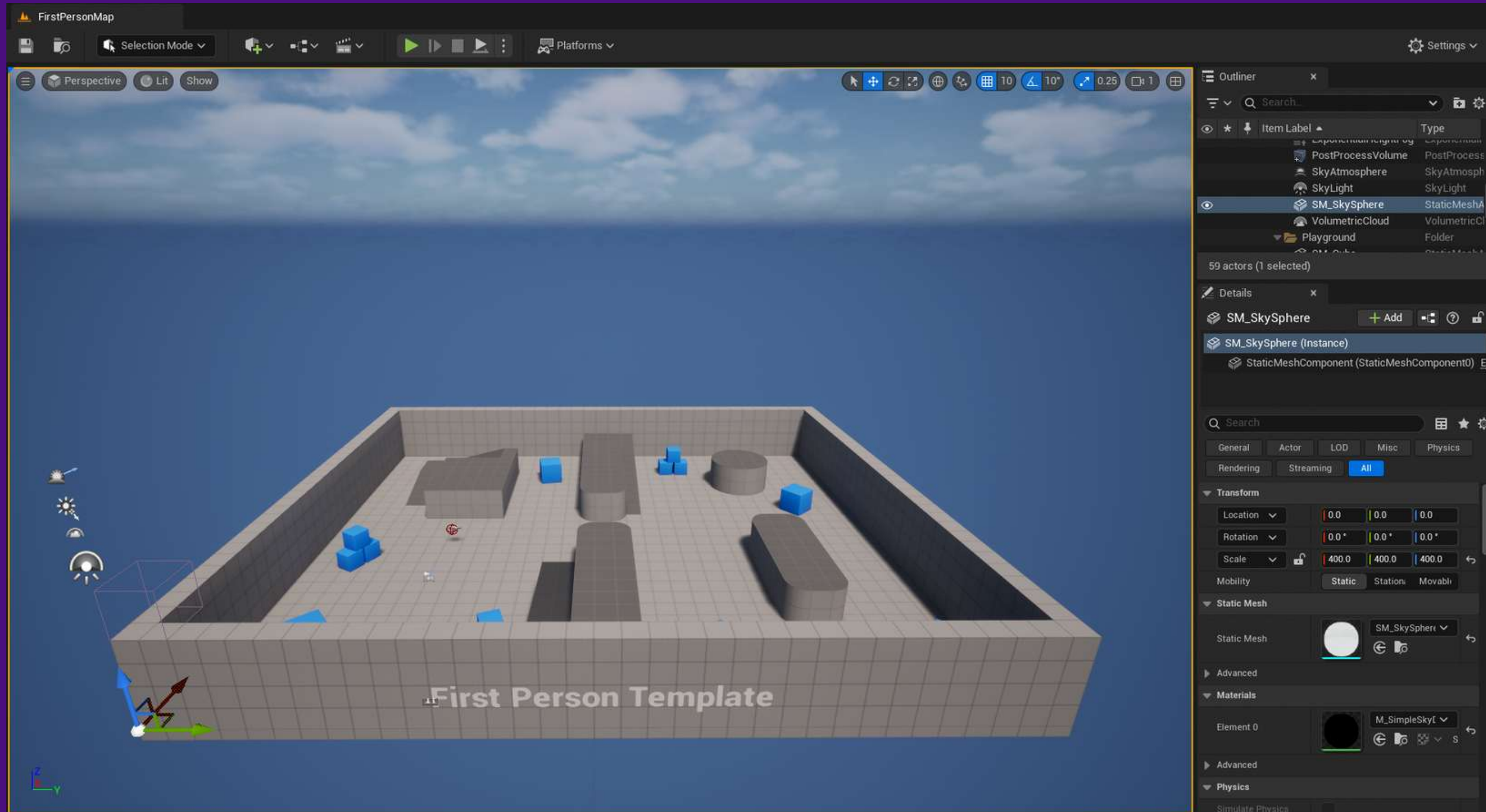
COGNITIVE LOAD



UNITY OPENING SCREEN



COGNITIVE LOAD



UNREAL TEMPLATED PROJECT



PEDAGOGY

Experimental Learning
Constructivist Approach
Cultural and Ethical
Scaffolding
Collaboration

~~Tool-First
Prior fluency
assumptions
Rigid Assessment
Over-loading~~

PEDAGOGY

Experimental Learning
Constructivist Approach
Cultural and Ethical
Scaffolding
Collaboration

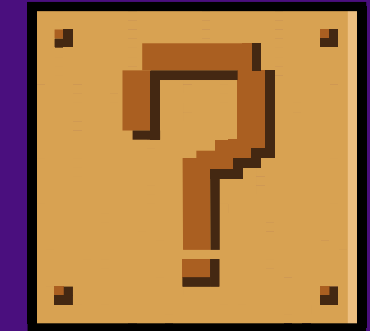
~~Tool-First
Prior fluency
assumptions
Rigid Assessment
Over-loading~~

PEDAGOGY

Experimental Learning
Constructivist Approach
Cultural and Ethical
Scaffolding
Collaboration

~~Tool-First
Prior fluency
assumptions
Rigid Assessment
Over-loading~~

WHY IT MATTERS



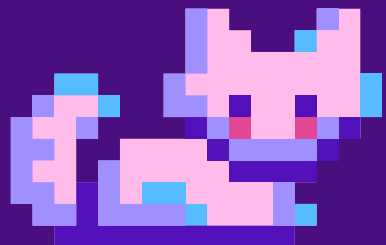
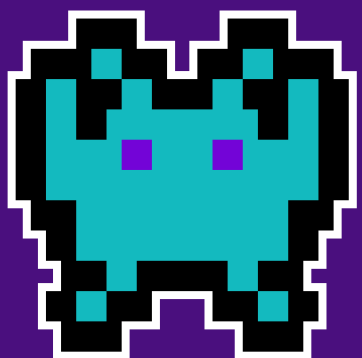
Intimidating

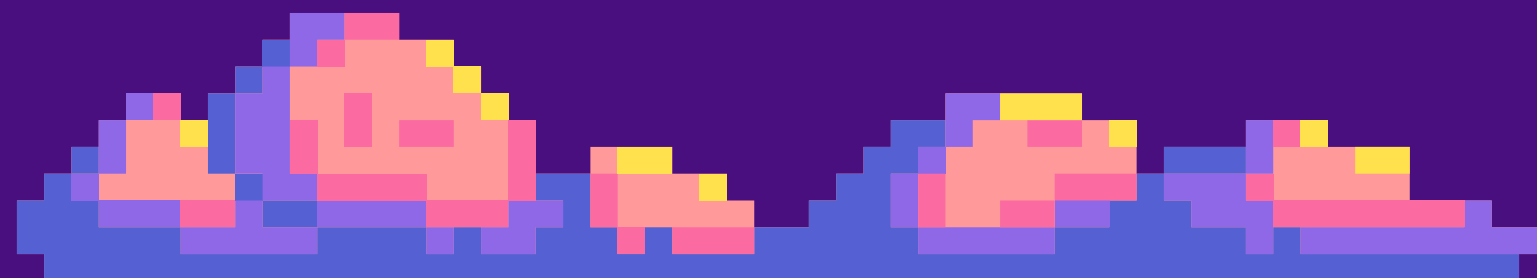
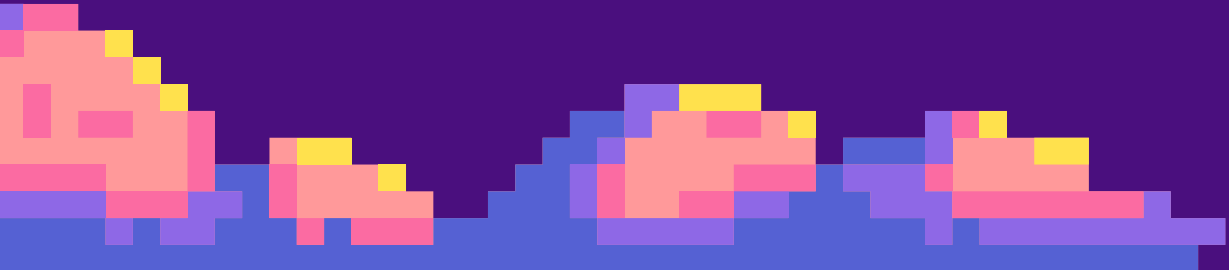
Narrative-first Learning

Visual Coding reduces cognitive load

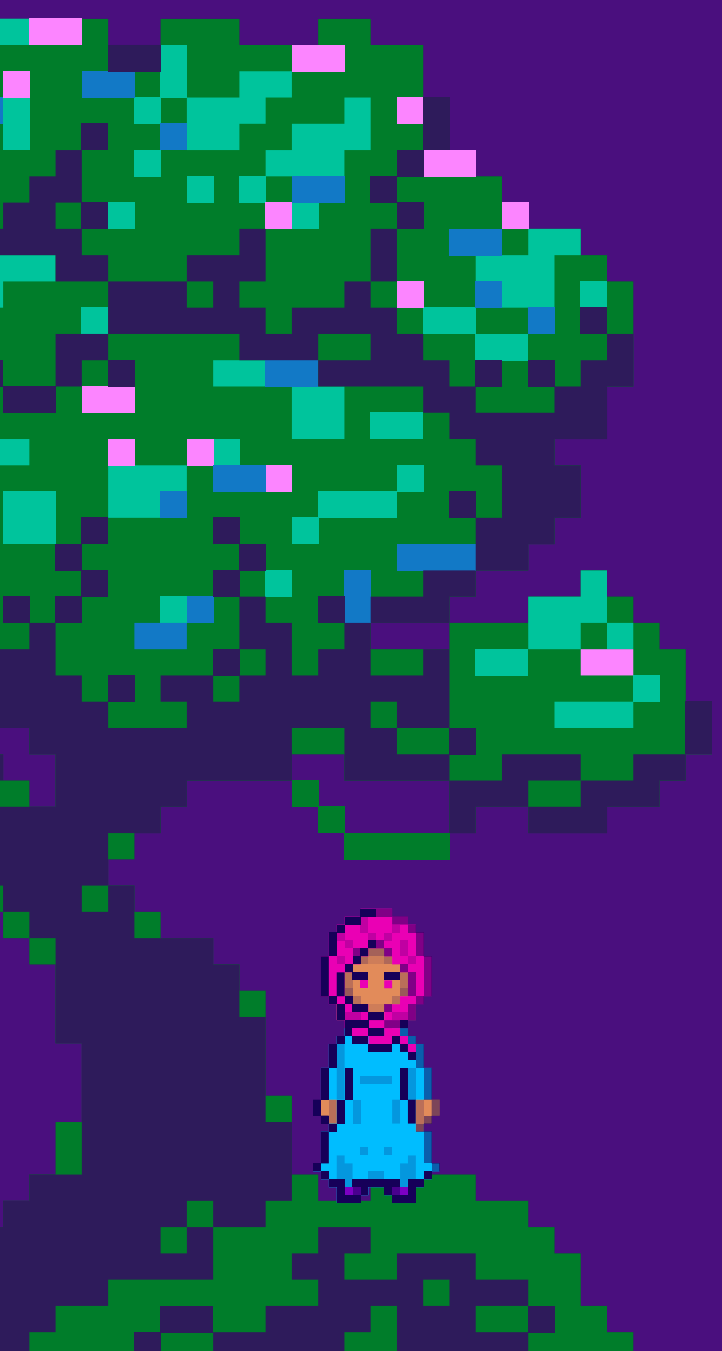
Collaborative Prototyping

Playful experimentation





BREAKDOWN THE LEARNING PROCESS!



HEALTHY LEARNING ENVIRONMENT



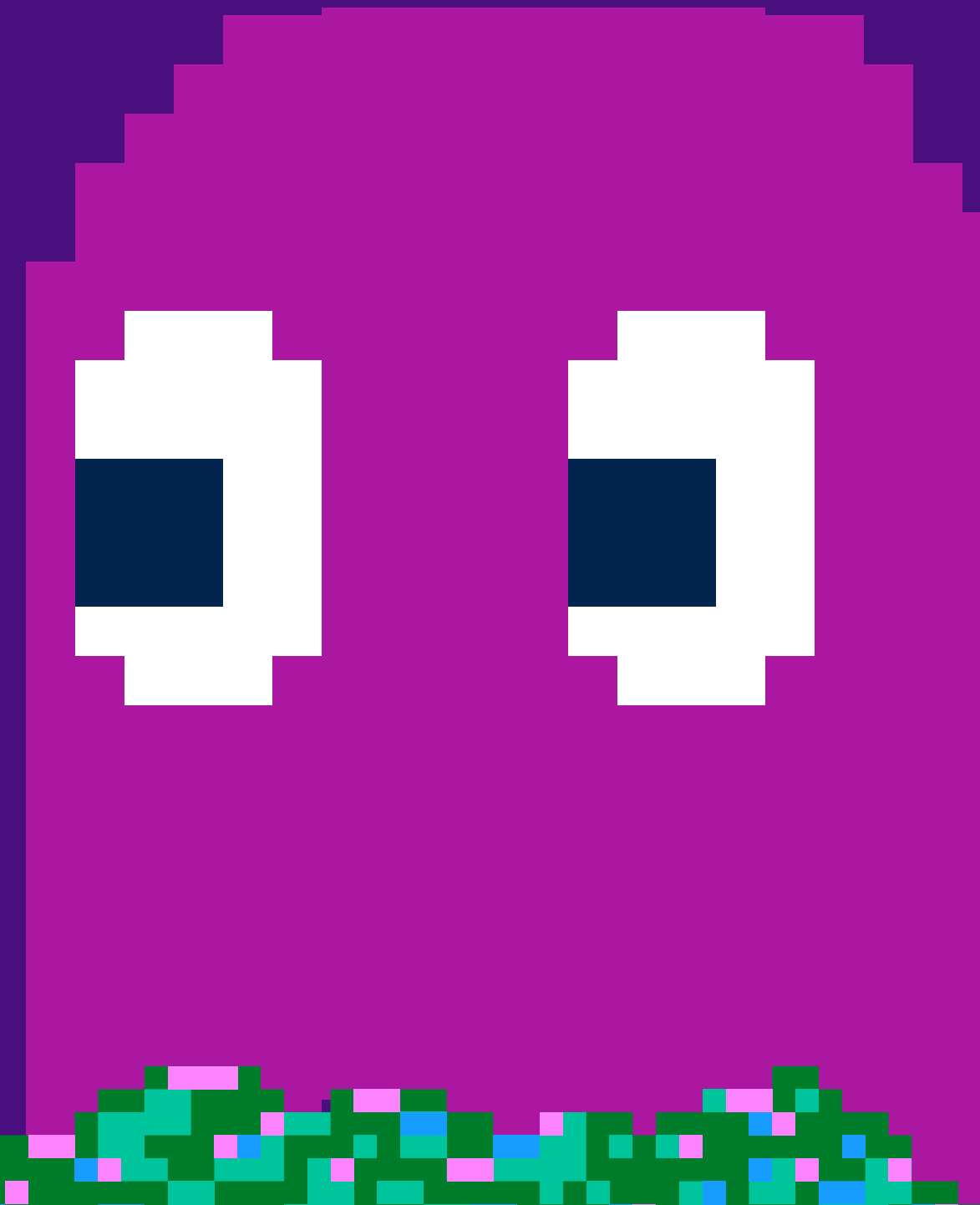
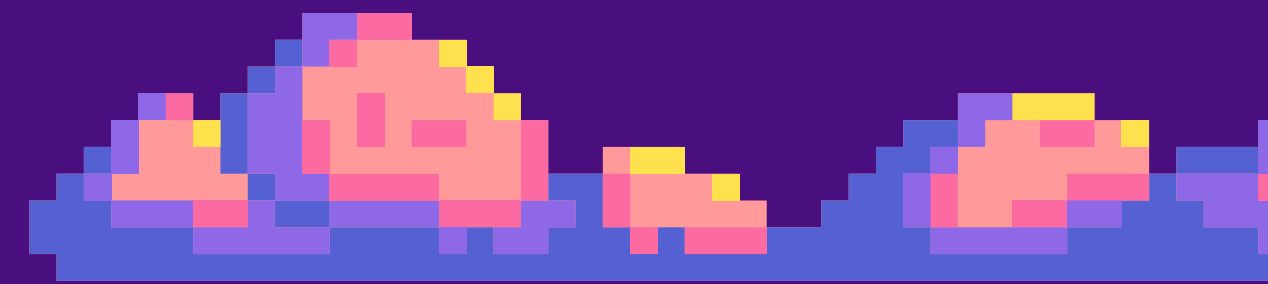
MUST HAVES

Encourage Student Contributions

Normalise Mistakes

Keep it Light

Inspire



COLLABORATIVE CODING



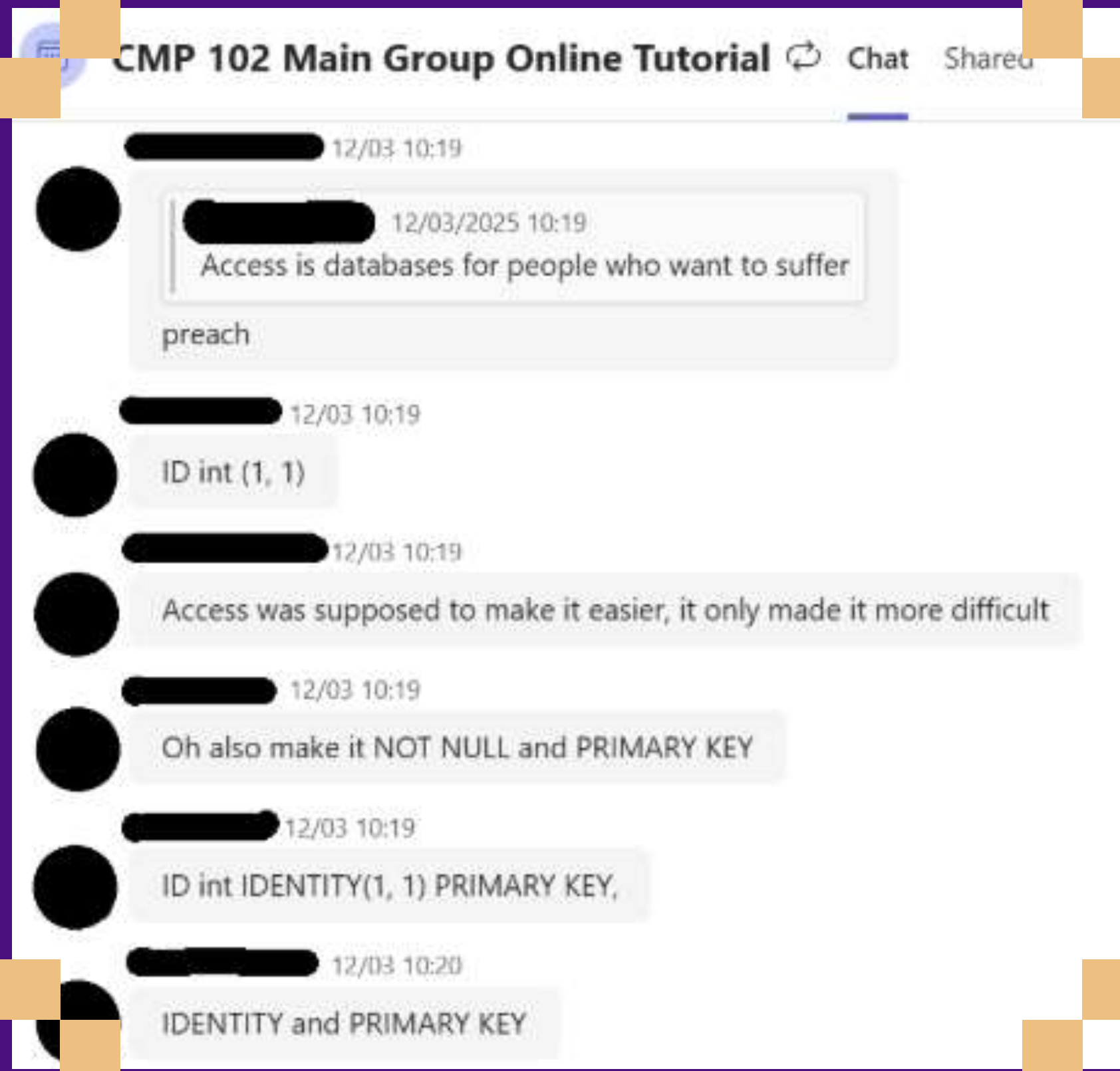
One Program 100 Students

Team Taught

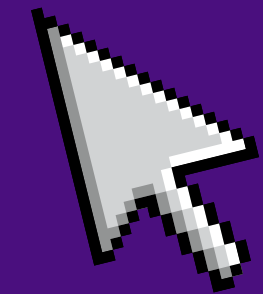
Great Engagement

Normalising Mistakes

Excellent Attendance

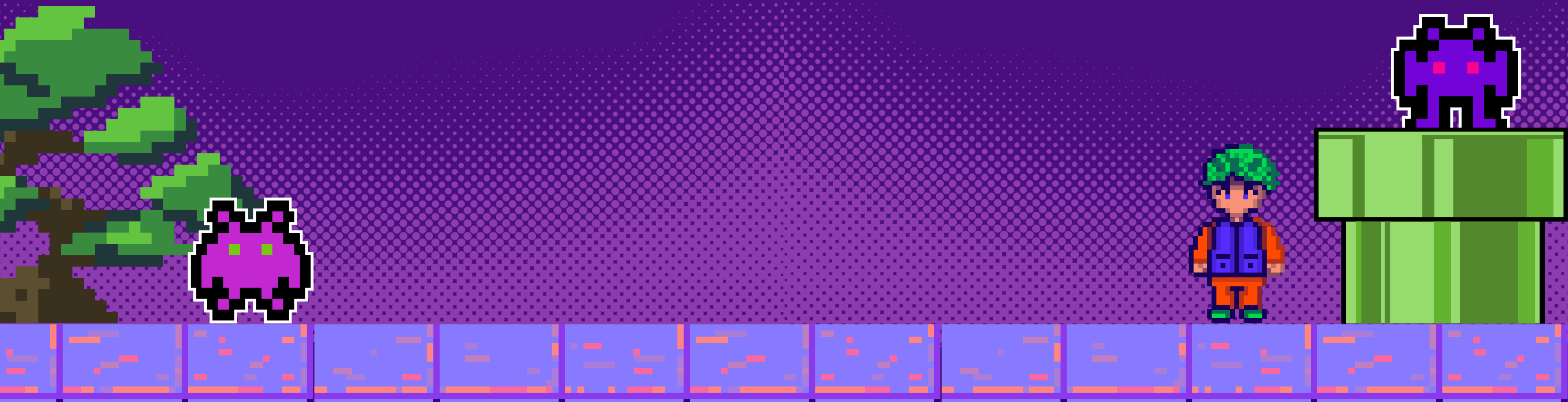


USING MEMORIES TO PLAY

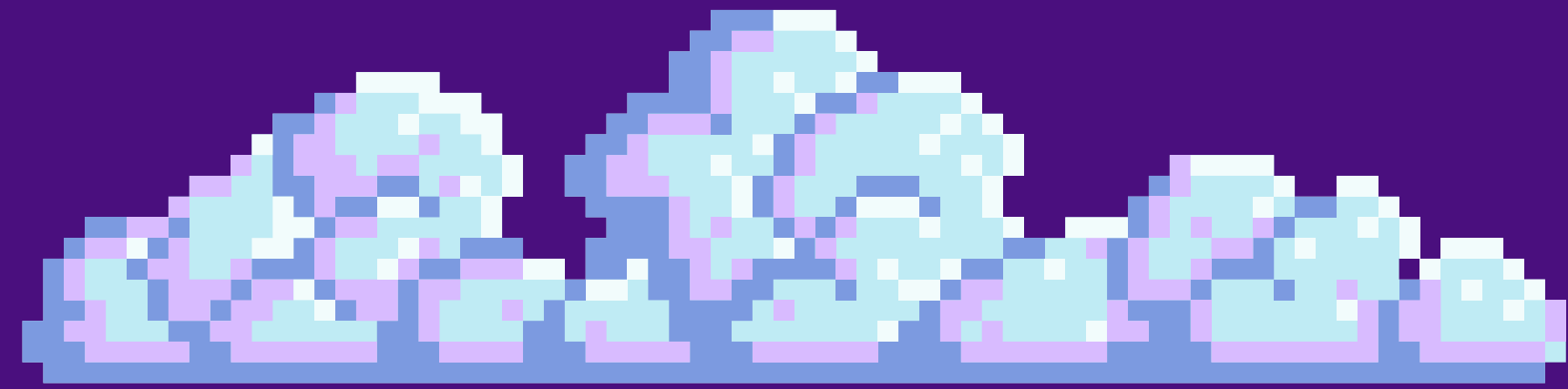


Narrative-First

capturing moments, structures, objects, humans



STORYTELLING TO TECHNICAL LEARNING



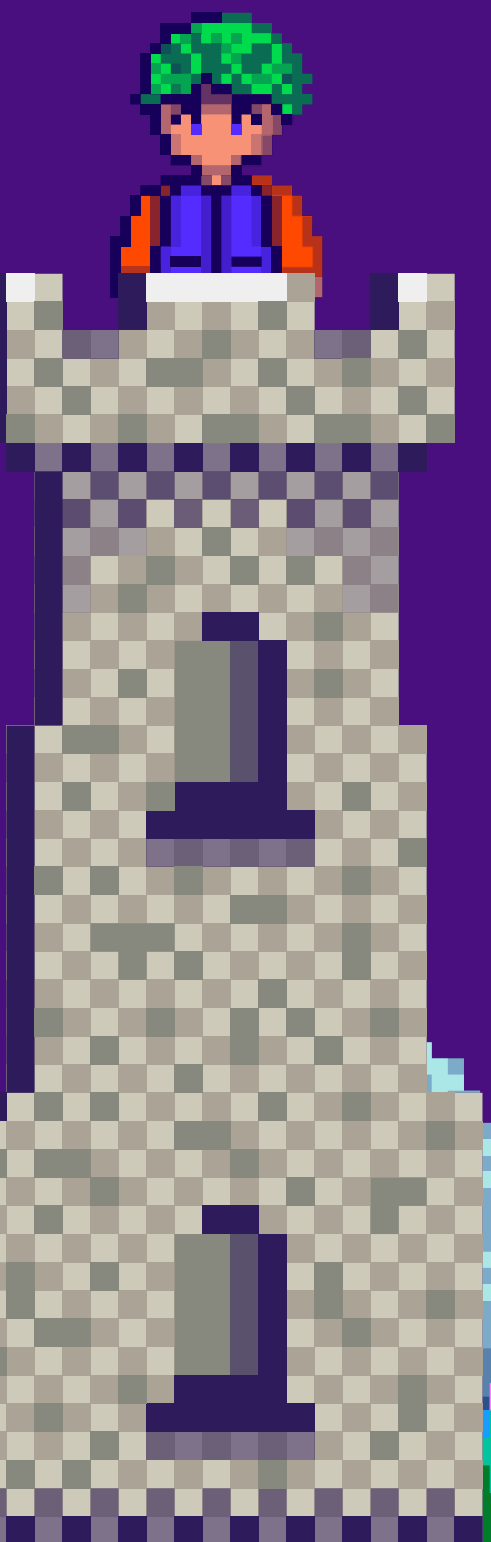
Interactive Design

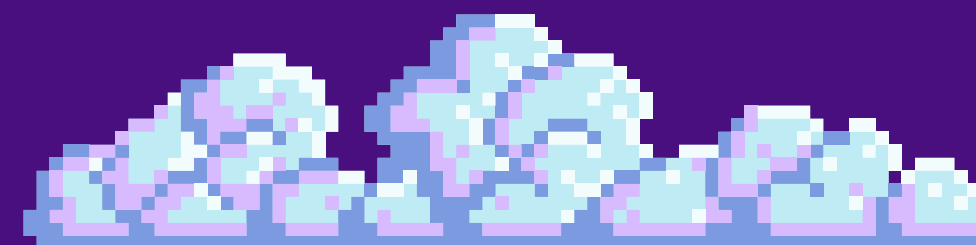
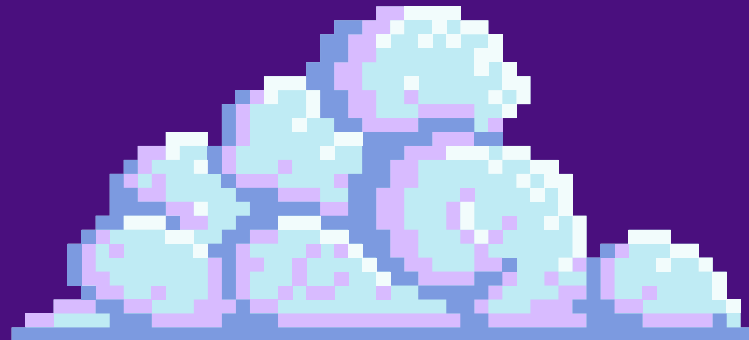
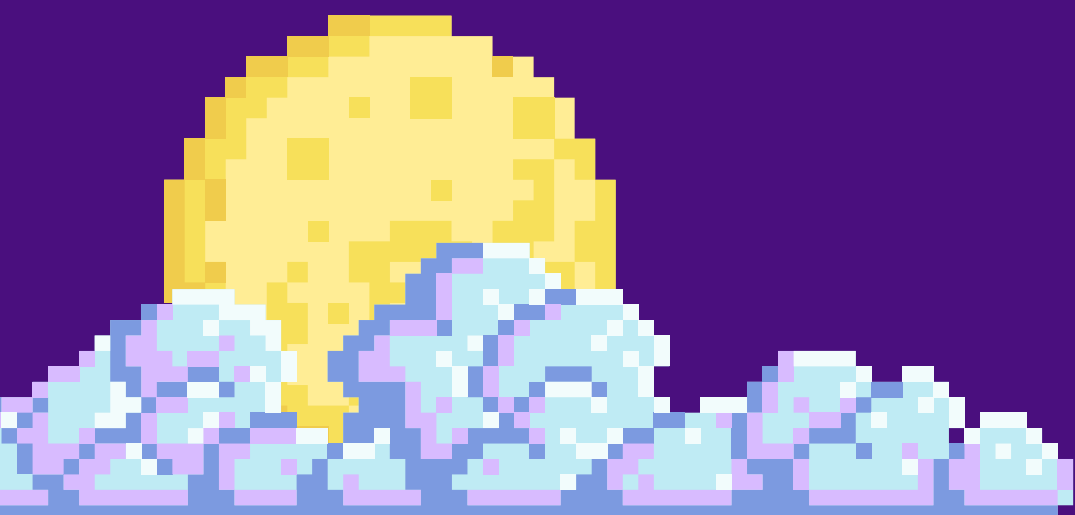
Shared stories, rituals, places

Immersive Worlds; emotional engagement



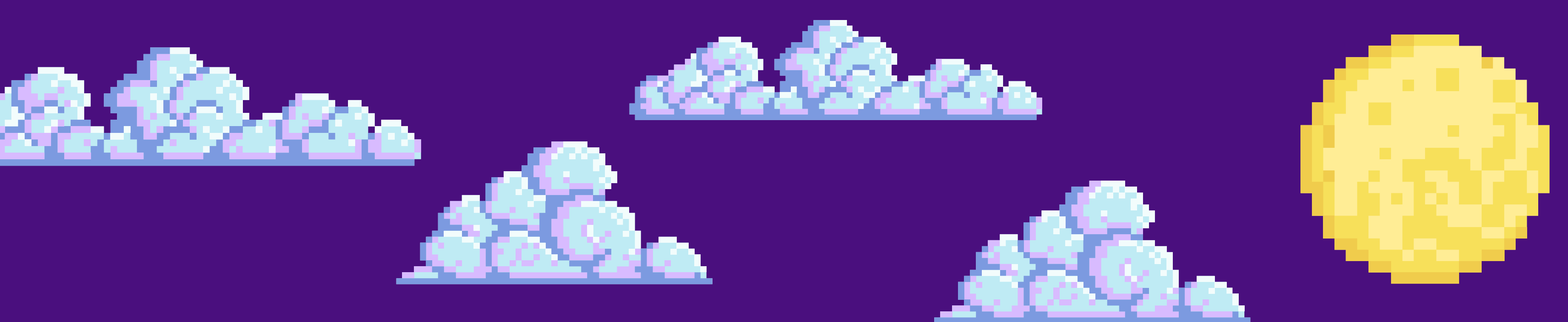
USING ART AND EMOTIONAL INVESTMENT





Art Allows For Emotional
Connection to Projects





Sounds
to find:

River Flowing

Flag Flapping



CHALLENGES / LIMITATIONS

Using Premade Assets

Takes time to source

Assets need to match up to look good

Lack of control over art direction

Some are not free or have special
copyright



CHALLENGES / LIMITATIONS



Creating Your Own Assets

Takes even more time to create

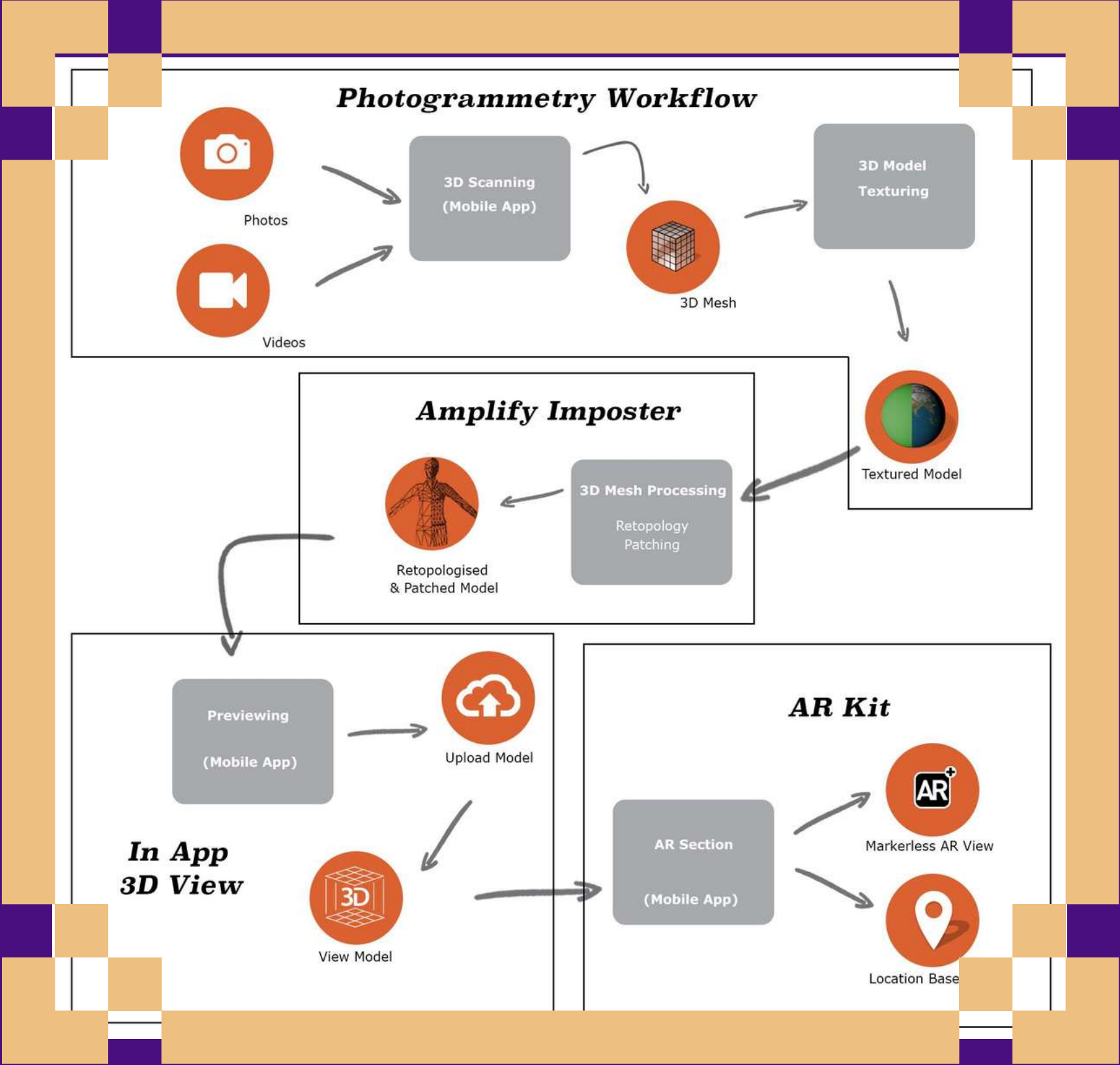
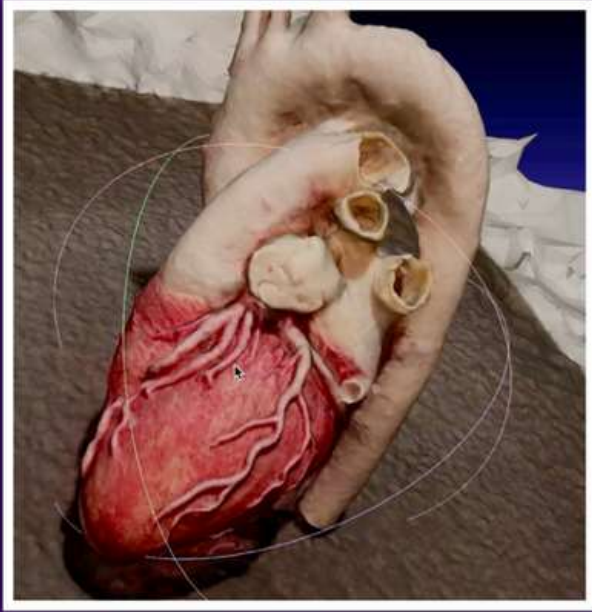
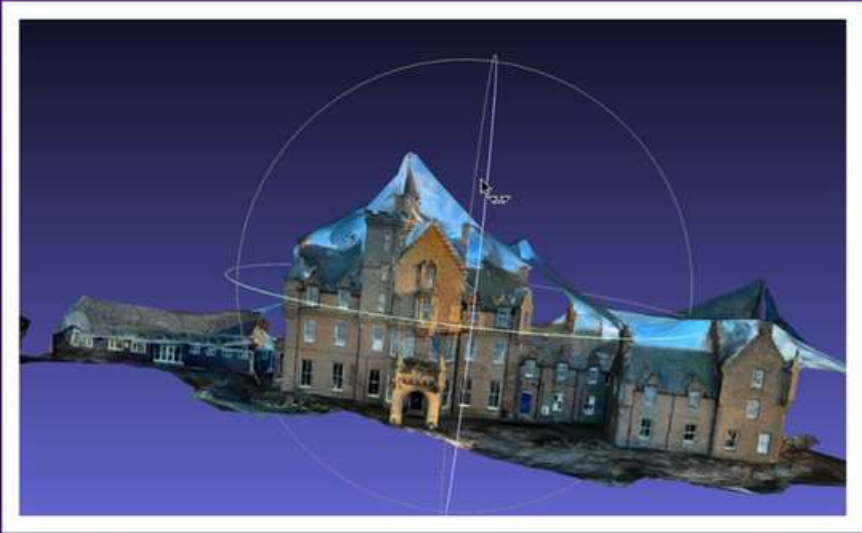
Requires artistic skills and
subject knowledge



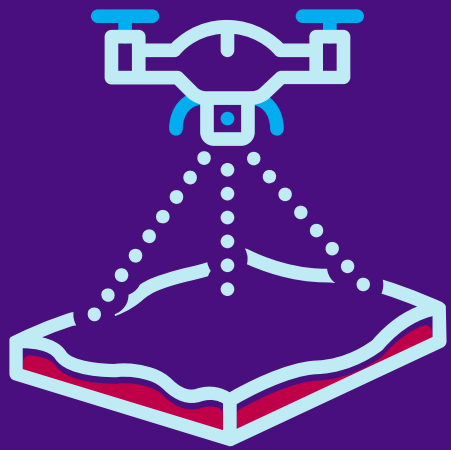
SCANNING TO INTERACTIVE STORY PIPELINE



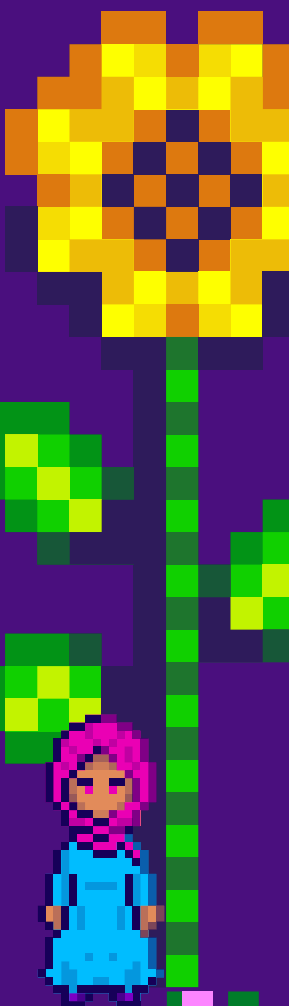
FRAMEWORK

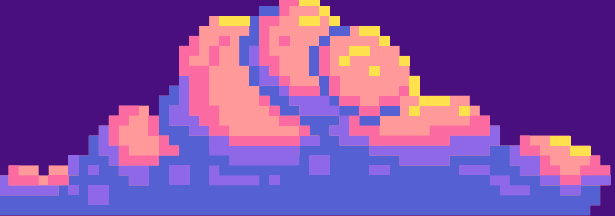


WHAT IS PHOTOGRAMMETRY?



Creating 3D models from overlapping photos

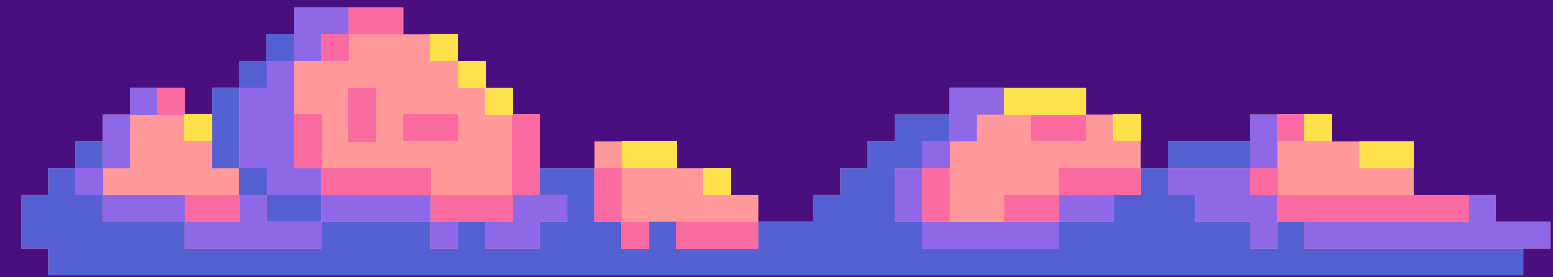




CAPTURE



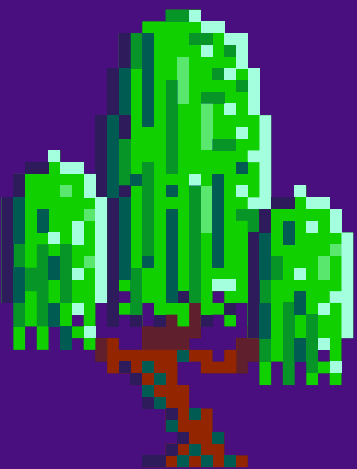
STEP 1: RECONSTRUCTION



3D MESH



PROCESSING



HOW DOES THIS REDUCE COGNITIVE LOAD?

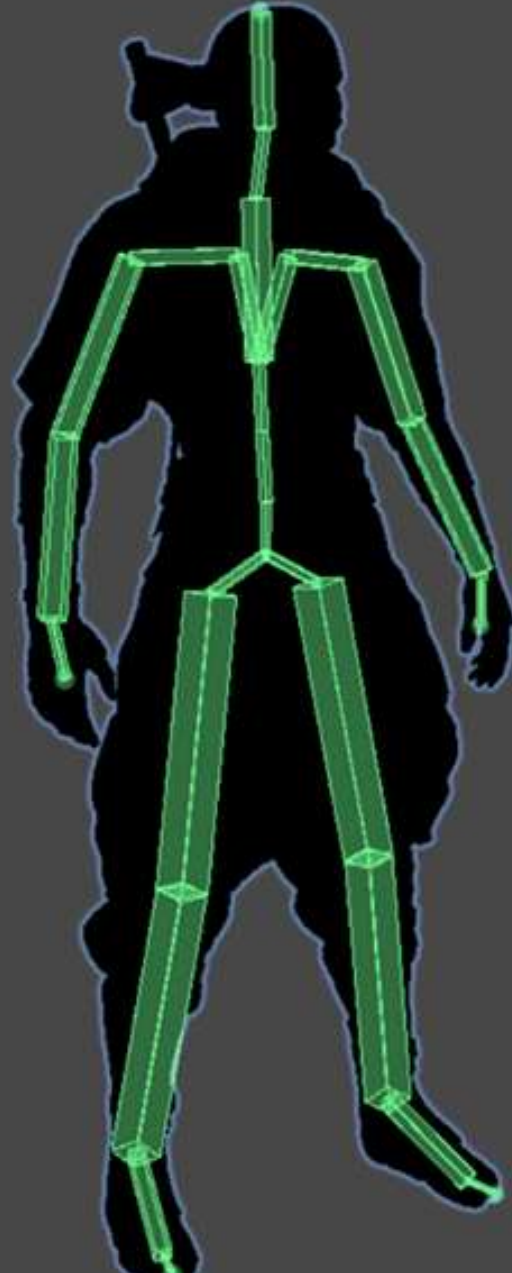
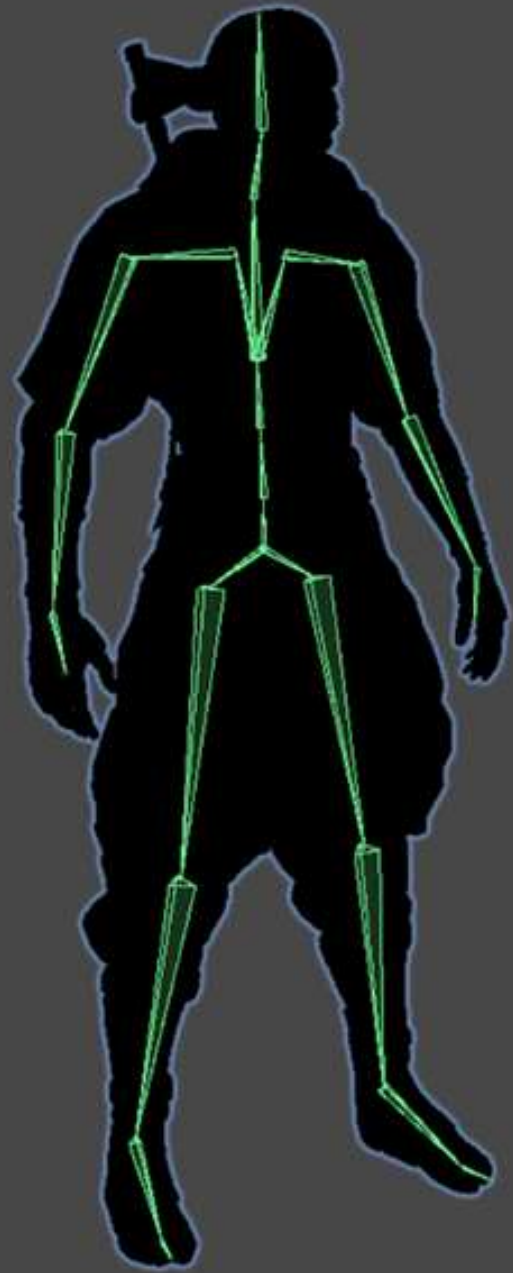
Scanning/Photographing vs asset sourcing/creation

Personalised Tailored assets

Accessible workflows



STEP 2: RIGGING AND ANIMATION



Bone Renderer (Script)

Bone Size: ☒ 1.07

Shape: Pyramid

Color:

Tripod Size: ☐ 1

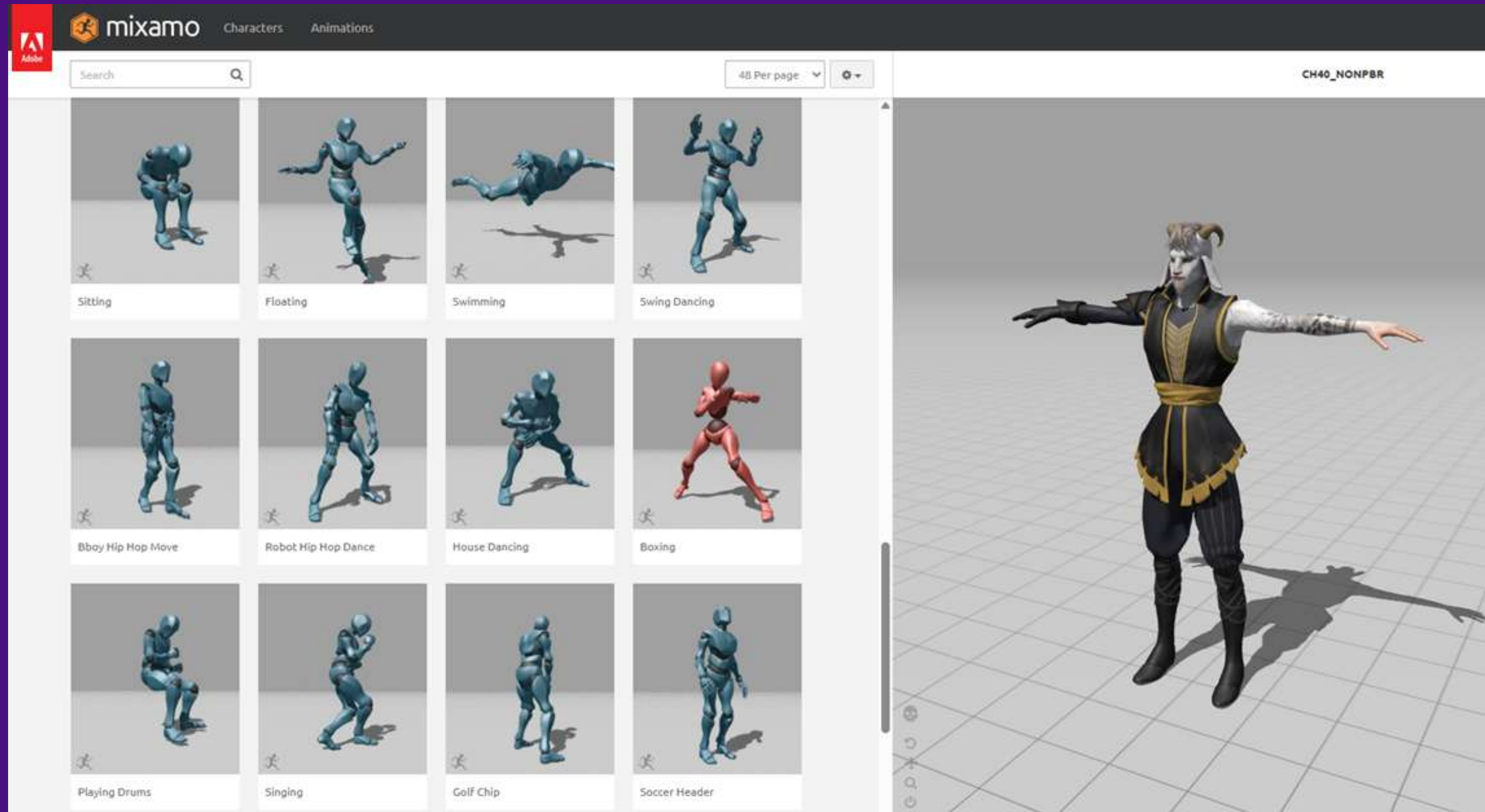
Transforms

Size: 27

- Element 0: Hips (Transform) ☐
- Element 1: Spine (Transform) ☐
- Element 2: Chest (Transform) ☐
- Element 3: UpperChest (Transform) ☐
- Element 4: Neck (Transform) ☐
- Element 5: Head (Transform) ☐
- Element 6: Head_null (Transform) ☐
- Element 7: RightShoulder (Transform) ☐
- Element 8: RightUpperArm (Transform) ☐
- Element 9: RightLowerArm (Transform) ☐
- Element 10: RightHand (Transform) ☐
- Element 11: RightHandGrip (Transform) ☐
- Element 12: LeftShoulder (Transform) ☐
- Element 13: LeftUpperArm (Transform) ☐
- Element 14: LeftLowerArm (Transform) ☐
- Element 15: LeftHand (Transform) ☐



RIGGING AND ANIMATION



HOW DOES THIS REDUCE COGNITIVE LOAD?

Targeted approach to Learning Complex systems
Early Visual Impact





STEP 3: IMPLEMENTATION

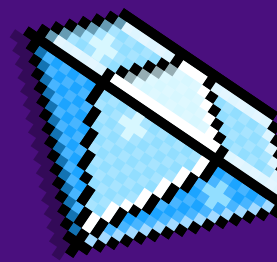


Particles and VFX

Using Unity, creating
gameplay mechanics



Setting Ross on Fire Test



HOW DOES THIS REDUCE COGNITIVE LOAD?

Tasks Done: Scanned Assets/ Rigged and Animated/ Implement basic Interactions

Result:

The students' experience using Unity in a fun and approachable way

They now know they do not need to understand everything all at once and have gained some confidence using the tool

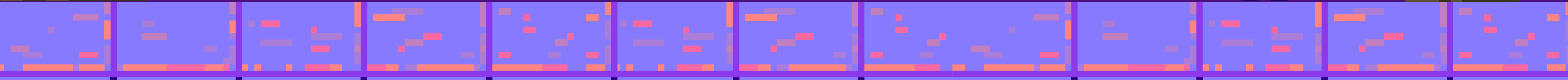
Next steps:

Begin to investigate how to add mechanics that will allow them to tell their story

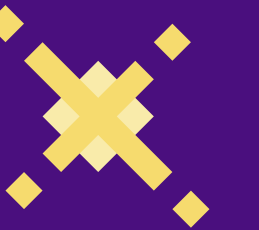
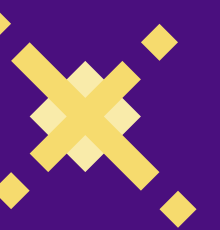




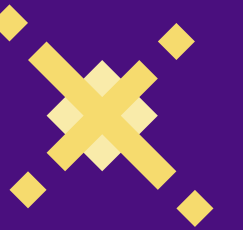
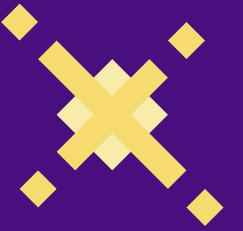
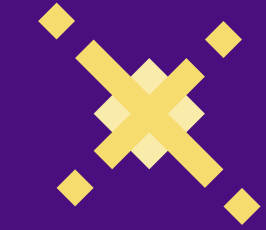
STUDENT PROJECTS



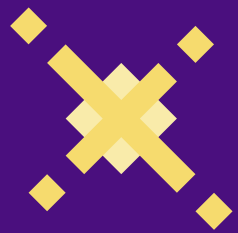
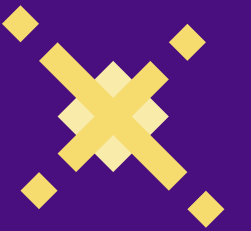
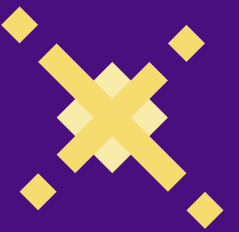
WHERE ARE THE PUPS?



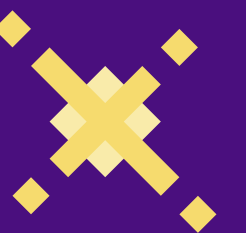
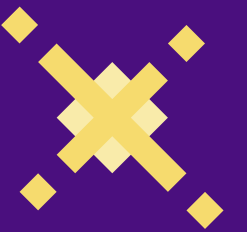
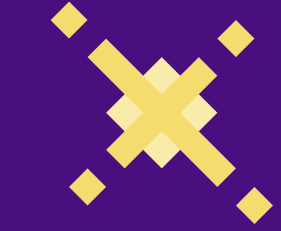
SNOOPY'S DINER



ESCAPE THE KITCHIN



SPIDERMAN



STUDENT RESULTS THAT MATTER

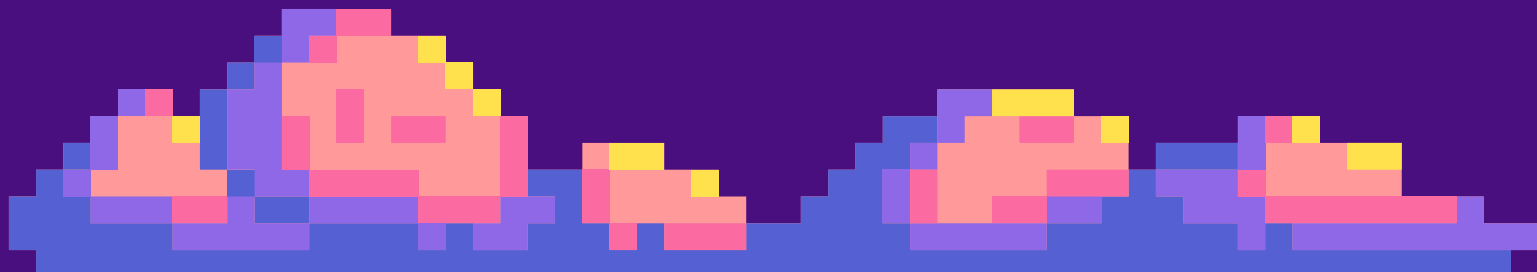




FUN
AGENCY
EMPOWERING

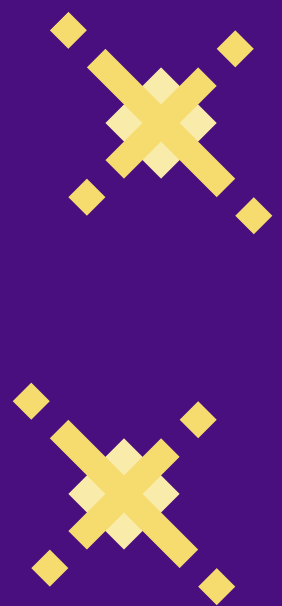
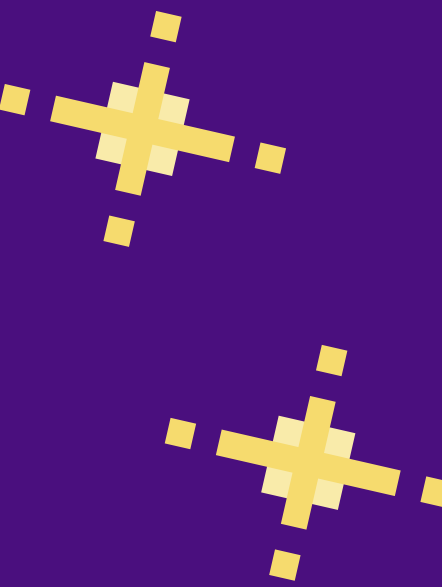
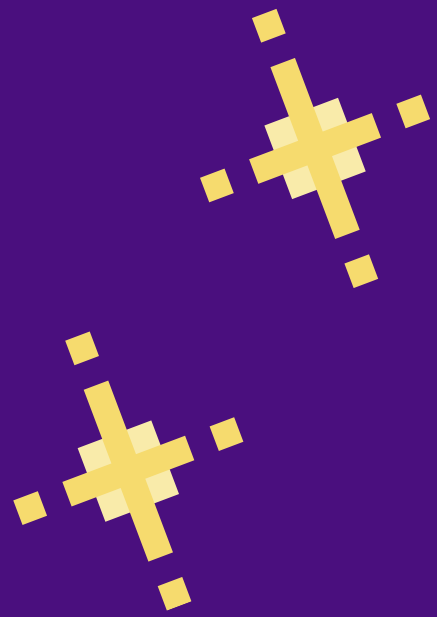
INDUSTRY APPROCHES

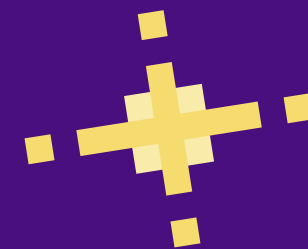
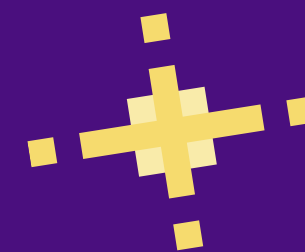
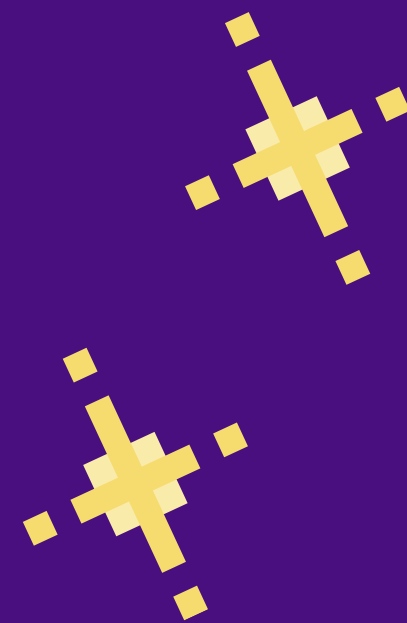
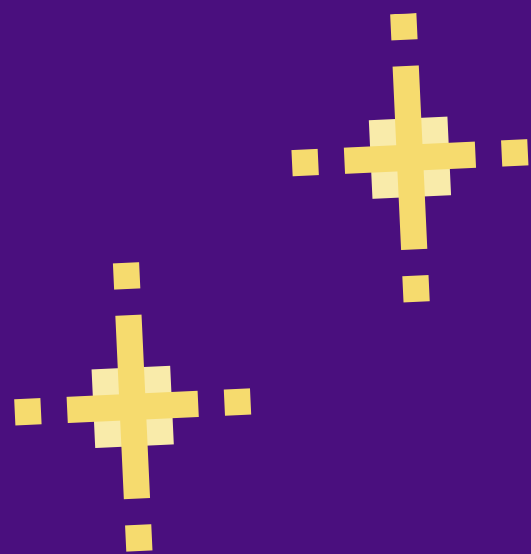
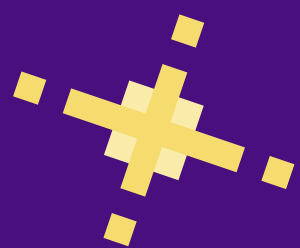
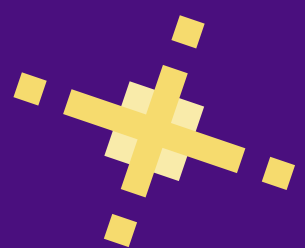




MoonHood's goal is to immerse players in strange worlds handcrafted in actual clay, cardboard and what have you...

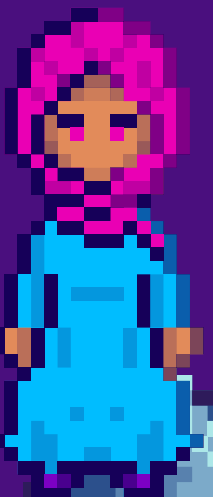






RESEARCH APPLICATIONS

Cultural Heritage
Eco-Simulation
Healthcare and Therapy
Safety Training



Key Takeaways

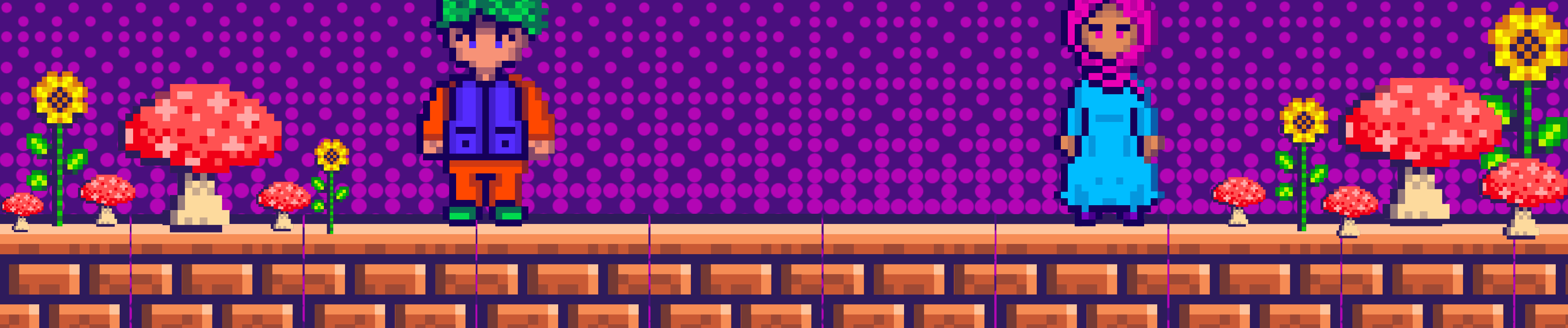
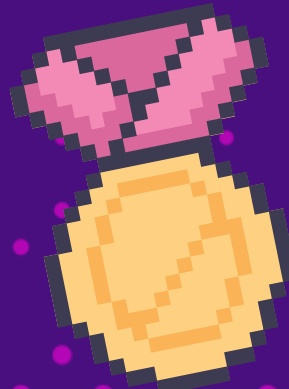
Student
Centric

Research-Led, Industry Informed

3D Scanning, Preservation, Serious Games



THANK
YOU



GAME
OVER

Questions?

