INTRODUCTION TO GBL DESIGN

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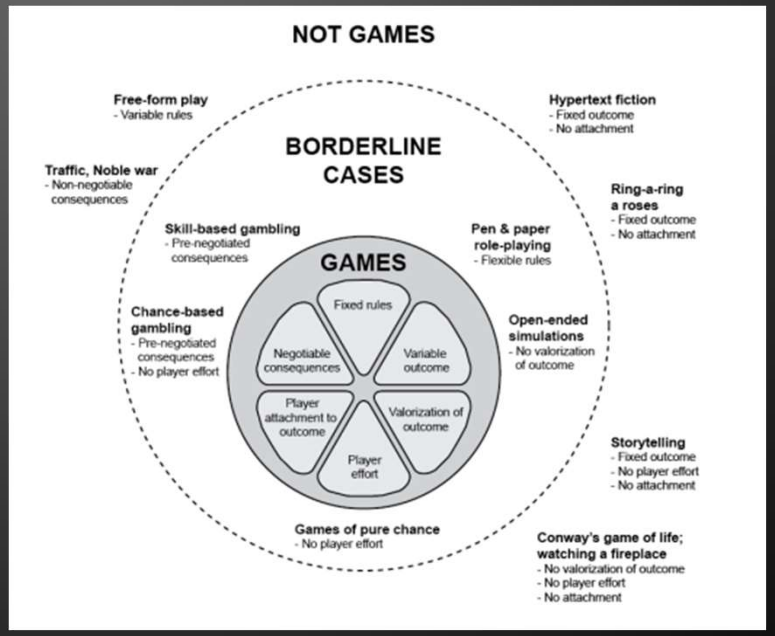
WHAT IS A GAME?

- WHAT HUMANS DO IS CREATE CULTURE.
- PART OF THIS CULTURE IS PLAY
- GAME IS MERELY THE TERM WE APPLY TO A PARTICULAR KIND OF PLAY: PLAY THAT HAS GONE BEYOND THE SIMPLE AND HAS BEEN COMPLEXIFIED AND REFINED BY HUMAN CULTURE.
- JUST AS NOVELS AND FILMS ARE ARTISTIC FORMS THAT DERIVE FROM OUR IMPULSE TO TELL STORIES AND MUSIC IS THE ARTISTIC FORM THAT DERIVES FROM OUR PLEASURES TO SOUND SO THE GAME IS THE ARTISTIC FORM THAT DERIVES FROM OUR IMPULSE TO PLAY.

PLAY AND GAME RELATED?

- PLAY AND GAMES ARE RELATED BUT NOT THE SAME THING.
- IT CAN BE VIEWED AS A GAME A SUBCLASS OF PLAY AND INHERITS FROM PLAY DIFFERENT CHARACTERISTICS.

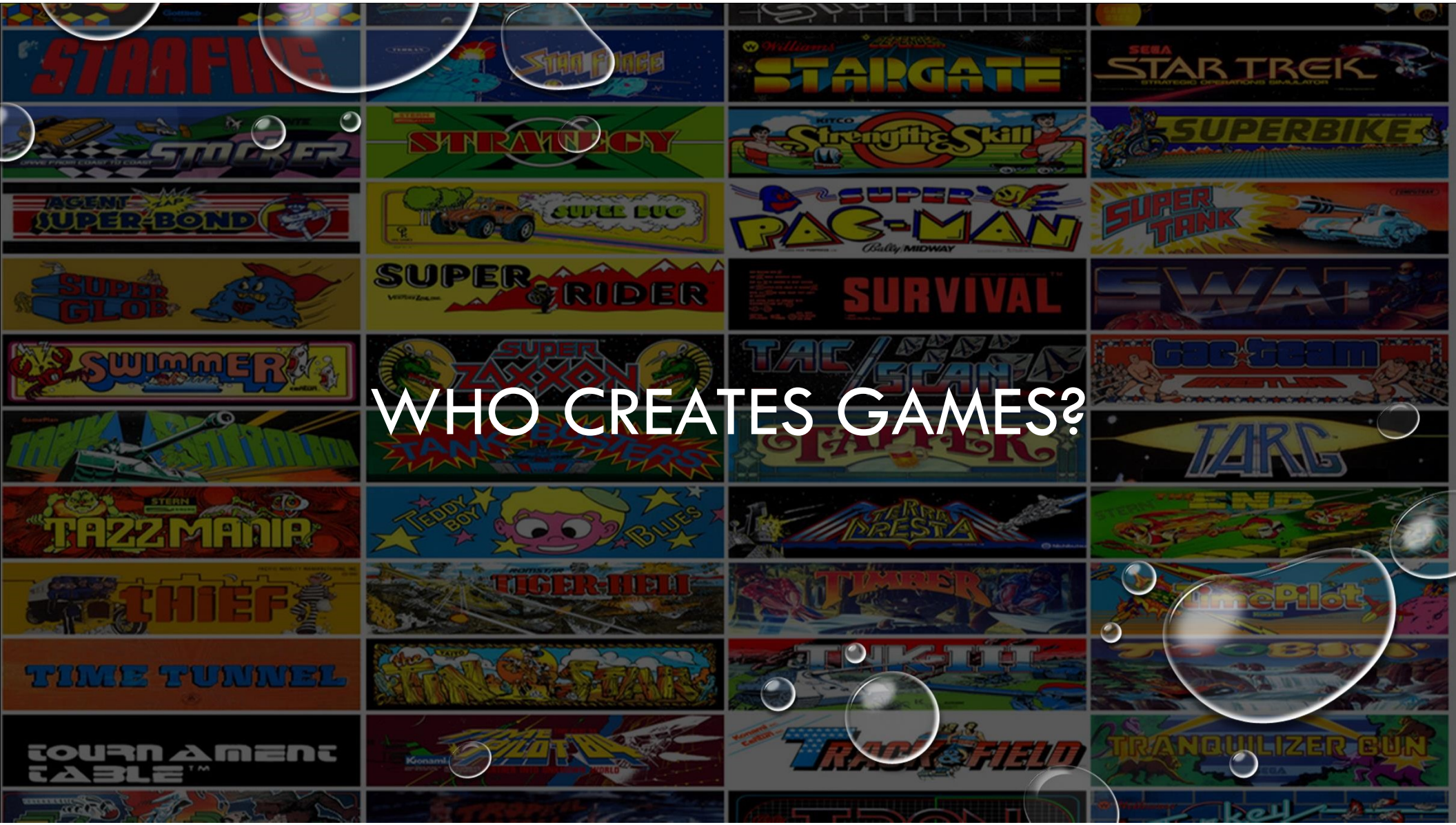
WHAT DO WE UNDERSTAND BY PLAYING A GAME ?



CAN WE DEFINE A GAME AS FORMAL SYSTEM?

Game is a ***rule-based formal system*** *with a* ***variable and quantifiable and (qualitative)*** *outcome, where* ***different outcomes*** *are* ***assigned different values, the player exerts effort in order to influence the outcome,***
the player feels attached to the outcome*, and the consequences of the activity are* ***optional and negotiable.***

Juul (2013)



WHO CREATES GAMES?

WHO CREATES GAMES? WHO CONSUMES THEM?

- PEOPLE FROM DIVERSE CREATIVE, DEVELOPMENT AND SCHOLARLY BACKGROUNDS
- FOCUS ON GAME DESIGN AND DEVELOPMENT BUT SOMETIMES THE FOCUS CHANGES TO MULTIPLE AREAS OF FOCUS BASED ON EXPERTISE.
- GAME DESIGNERS - WITHOUT NECESSARILY KNOWING HOW TO CODE OR BE ARTISTIC
- GAME DEVELOPERS - PROGRAMMERS, AI EXPERTS, 3D/2D ARTISTS, AUDIO DEVELOPERS, STORY-MAKERS
- CONSUMED BY PLAYERS. THEY ARE PURCHASED, USED AND THEN CAST AWAY LIKE OTHER MULTIMEDIA / MULTIMODAL CONTENT.

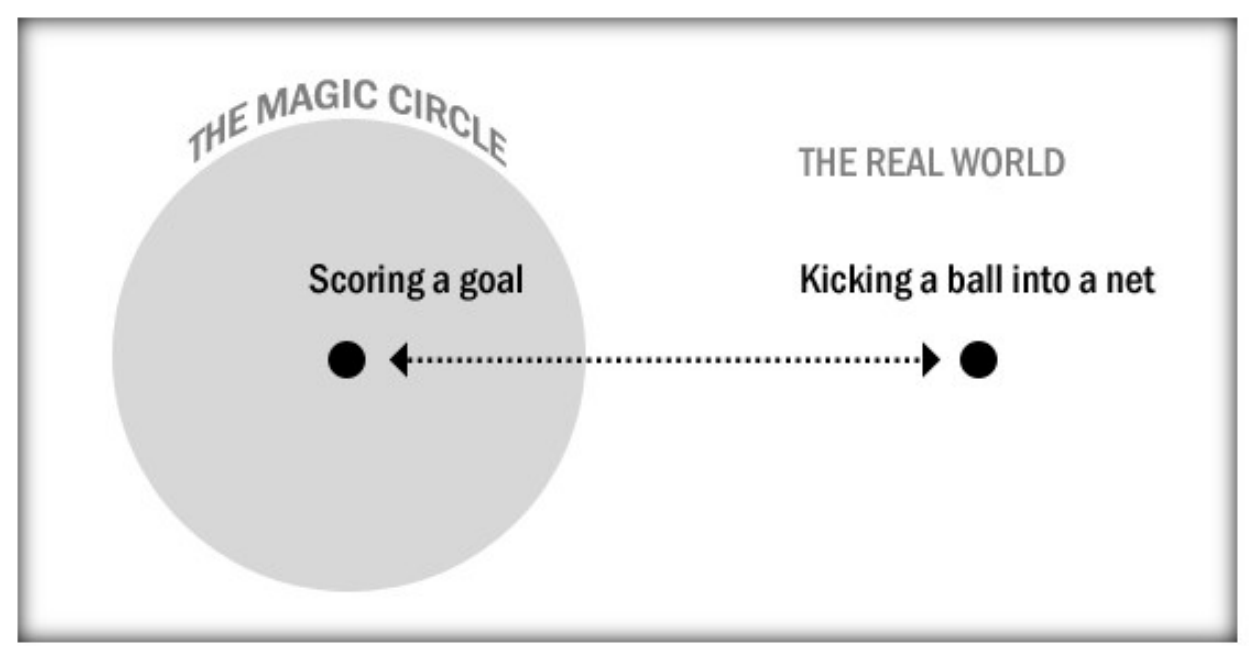
WHAT IS A GAME?

Elements of a game definition	Parlett	Abt	Huizinga	Caillois	Suits	Crawford	Costikyan	Avedon |Sutton-Smith
Proceeds according to rules that limit players	√	√	√	√	√	√		√
Conflict or contest	√					√		√
Goal-oriented/outcome-oriented	√	√			√		√	√
Activity, process, or event		√			√			√
Involves decision-making		√				√	√	
Not serious and Absorbing			√					
Never associated with material gain			√	√				
Artificial/Safe/Outside ordinary life			√	√		√		
Creates special social groups			√					
Voluntary				√	√			√
Uncertain				√				
Make-believe/Representational				√		√		
Inefficient					√			
System of parts/Resources and Tokens						√	√	
A form of art							√	

GAME DESIGN CONCEPTS

- THE MAGIC CIRCLE (JOHAN HUIZINGA– HOMO LUDENS (MAN THE PLAYER) BOOK 1938)
  - ‘PLAYING IS THE PRIMARY FORMATIVE ELEMENT IN HUMAN CULTURE.
  - THE IDEA OF THE MAGIC CIRCLE REFERS TO A GAME AS THE ACTUAL PLAYGROUND OR A PHYSICAL SPACE FOR PLAYING. (E.G. A TENNIS COURT, A FOOTBALL PITCH, THE THEATRE STAGE, THE CLASSROOM)
  - INSIDE THE MAGIC CIRCLE, REAL-WORLD EVENTS HAVE SPECIAL MEANINGS

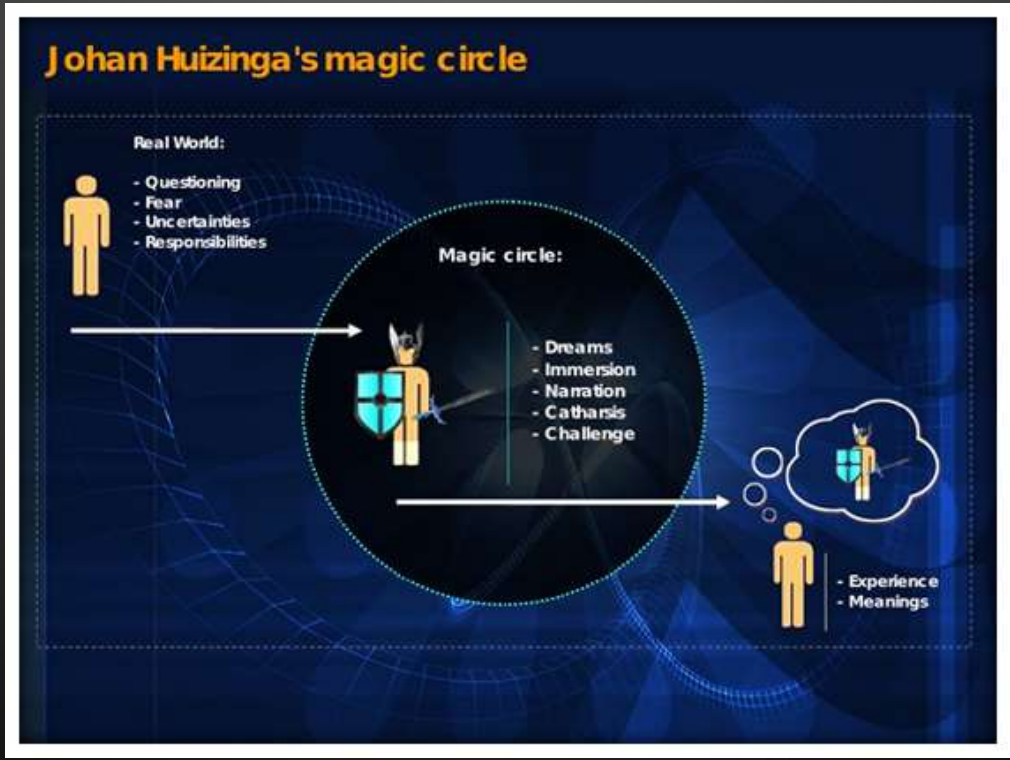
GAME DESIGN CONCEPTS



GAME DESIGN CONCEPTS

- THE MAGIC CIRCLE IS A PLACE OF DREAMS AND FANTASY.
- IT'S AN ESCAPE OF EVERYDAY PROBLEMS
- EVERYTHING INSIDE THE MAGIC CIRCLE IS TRANSFORMATIVE: EACH TIME A PERSON LEAVES A MAGIC CIRCLE IS, IN SOME WAY BRINGS MEANING AND EXPERIENCE TO REAL LIFE.
- THE MAGIC WORLD EMANATED IN PLAYGROUNDS IN A FORM OF (A THEATRIC PLAY, A TENNIS GAME, A COMEDY ACT ETC) ARE ALL TEMPORARY WORLDS WITHIN THE ORDINARY WORLDS DEDICATED TO THE PERFORMANCE OF AN ACT.
- THERE IS A BOUNDARY THEREFORE THAT EXISTS BETWEEN A GAME AND THE OUTSIDE WORLD (OUTSIDE YOU ARE A TEACHER, INSIDE YOU ARE A GRAND HALF DEVIL HALF HUMAN WARRIOR WITH SUPER NATURAL SKILLS NAMED DANTE. OUTSIDE THE MAGIC CIRCLE THERE IS A TENNIS COURT, INSIDE THERE IS A SPECIAL TENNIS SKILL THAT HELPS ME SCORE – AND THE GAME OF TENNIS HAS SPECIFIC RULES ABOUT WHO CAN TOUCH IT, WHERE, WHEN, AND IN WHAT WAYS.
- THE MAGIC CIRCLE APPLIES IN GAMES AS: GAMES ARE FORMAL STRUCTURES COMPLETELY SEPARATED FROM HUMAN LIFE. THE MAGIC CIRCLE EMPHASIZES THE FORMAL RULES OF THE GAME AND IGNORES THE FACT THAT PLAYING A GAME IS A LIVED EXPERIENCE SITUATED IN PLAYERS CULTURAL AND SOCIAL CONTEXT.

GAME DESIGN CONCEPTS

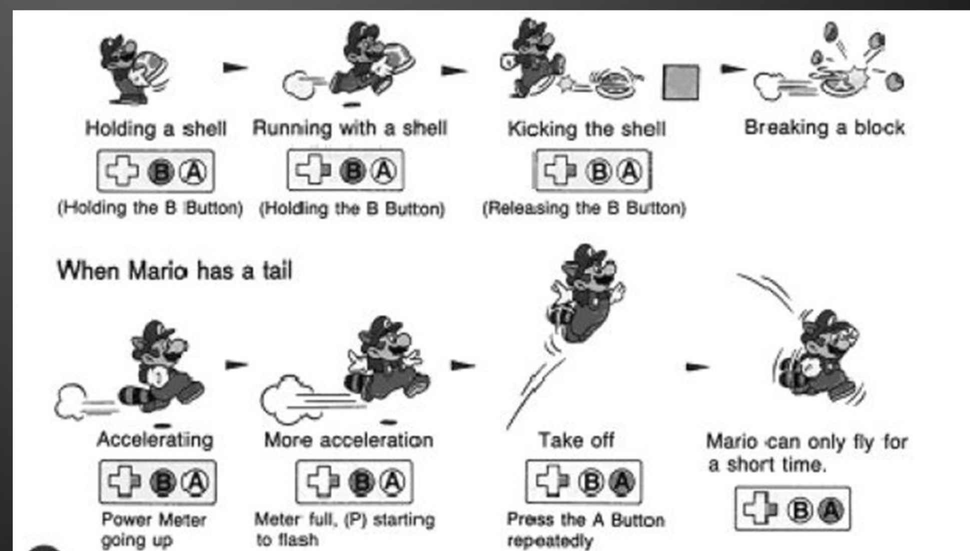


GAMES RULES

- RULES ARE ABSTRACT PRINCIPLES FOR THINKING ABOUT THE FORMAL STRUCTURE OF A GAME AND ARE NOT MANIFESTED NECESSARILY IN THE GAME'S CODE
- THE RULES OF DIGITAL GAME ARE THE SAME AS THE RULES OF A DIGITAL GAME: THEY ARE DIRECTLY CONCERNED WITH THE ACTIONS PLAYERS TAKE AND THE OUTCOMES OF THESE ACTIONS
- TAKING IN PLAYERS INPUT AND DETERMINING GAME'S OUTPUT CONSTITUTE GAME'S RULES
- THE INTERNAL FUNCTIONING OF FORMAL GAME LOGIC (THE WAY THAT TETRIS DECIDES THE SHAPE OF THE NEXT BLOCK) IS ALSO PART OF THE RULES OF THE GAME
- THE CONSTITUATIVE RULES SERVE AS THE CORE LOGIC OF THE GAME ARE USUALLY PART OF THE GAME'S CODE AND HANDLE THE GAME'S INTERNAL EVENTS.
- THE OPERATIONAL RULES ARE NOT ONLY CONCERNED WITH THE INTERNAL EVENTS BUT ALSO WITH THE EXTERNAL EVENTS (I.E. THE GAME PLAYER INPUT AND THE GAME OUTPUT, VISUALISING CHOICES AND OUTCOMES TO THE PLAYER)
- IMPLICIT RULES – IMPLICIT ASSUMPTIONS OF THE GAME WHICH ARE QUITE SIMILAR WITH TRADITIONAL GAME RULES

SALEN AND ZIMMERMAN (2014)

GAME RULES


Holding a shell
(Holding the B Button)
Running with a shell
(Holding the B Button)
Kicking the shell
(Releasing the B Button)
Breaking a block
When Mario has a tail
Accelerating
Power Meter going up
More acceleration
Meter full, (P) starting to flash
Take off
Press the A Button repeatedly
Mario can only fly for a short time.

WHAT IS A DIGITAL GAME?

- IT IS A SYSTEM DEFINED BY RULES WHERE A PLAYER NEEDS TO APPLY THEE RULES FOR MAKING CHOICES TRANSLATED INTO ACTIONS THAT AFFORD CERTAIN **QUALITATIVELY** DIFFERENT OUTCOMES THAT DISCERN MEANING FOR THE PLAYER WHEN INTERACTING WITH THE GAME (LAMERAS ET AL 2018).
- A GAME IS A SYSTEM IN WHICH PLAYERS ENGAGE IN AN ARTIFICIAL CONFLICT, DEFINED BY RULES, THAT RESULTS IN A QUANTIFIABLE OUTCOME (SALEN AND ZIMMERMAN 2014).

IMPARTING MEANING INTO GAME

- THE DESIGN OF MEANINGFUL PLAY: THE GOAL OF GAME DESIGN
- MEANINGFUL PLAY IS THE MEANING ATTRIBUTED THROUGH THE ACTIONS CHOSEN BY THE PLAYER AND THE PERSONAL INTERPRETATION OF THE QUALITATIVELY DIFFERENT OUTCOMES INFLUENCED BY THE GAMES CONSTITUENT, OPERATIONAL AND IMPLICIT RULES.
- DESCRIPTIVE MEANING: THE PRINCIPLES THAT GAMES USE FOR MEANING-MAKING
- EVALUATIVE: UNDERSTANDING AND MEASURING WHY SOME GAMES ARE MORE MEANINGFUL THAT OTHERS.
- DISCERNING: THE WAY THAT MEANING IS COMMUNICATED IN A PERCEIVED WAY TO THE PLAYER

WHAT IS GAME DESIGN AFTER ALL?

- GAME DESIGN IS A PROCESS IS WHEN A GAME DESIGNER CONSTRUCTS RULES, VISUAL AESTHETICS , SOCIAL INTERACTION, FORMAL RULES FOR MAKING A GAME.
- TO DESIGN IS TO CREATE MEANING AND DESIGNERS CREATE SYSTEMS
- A GAME DESIGNER'S DESIGNS THE GAME RULES DIRECTLY BUT DESIGNS THE PLAYER'S EXPERIENCE INDIRECTLY (I.E. THE MEANING OF THE EXPERIENCE IS STRUCTURED BY EACH PLAYER - QUALITATIVELY DIFFERENT EXPERIENCES OF PLAYING THE GAME) - A SECOND-ORDER DESIGN APPROACH.

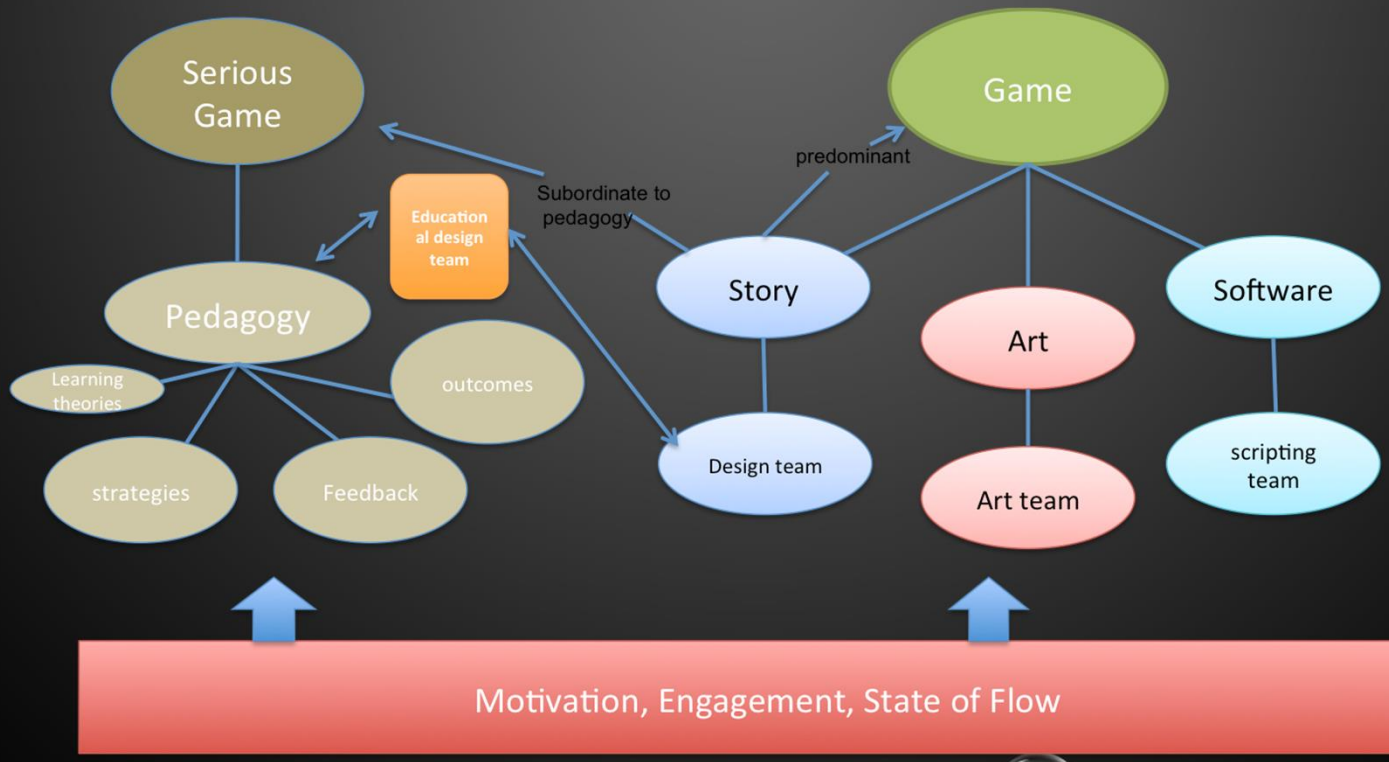
WHAT ARE THE DIFFERENCES BETWEEN GAMES VS SERIOUS GAMES

Games (Huizinga's definition of play	Serious Games
Playing is not obligatory	Playing is sometimes obligatory
Is outside ordinary life	It may take-in skills useful in real-life and train players to take-out these skills and apply in real life
Not Serious	Serious - as there is a specific learning purpose that needs to be mastered.
Utterly absorbing	Not necessarily to be absorbing for achieving learning
Fun or entertainment is the basic objective – not a formal objectives to learn	A learning outcome or acquiring a skill is the basic objective
Engaging in an activity that it is not predominantly for learning	Engaging in an activity that it does involve learning
A goal that is unrelated or implicitly linked to learning	A goal that is explicitly linked to learning

A SERIOUS GAME IS

- A SYSTEM WITH A SET OF RULES THAT THE PLAYER NEEDS TO FOLLOW FOR MAKING CHOICES THAT LEAD TO THE ACHIEVEMENT OF INTENDED IN-GAME LEARNING OUTCOMES.
- A MORE COMPLEX SYSTEM THAN A GAME, AS THEIR DESIGN INVOLVES NOT JUST A STORY, A PUZZLE, A CHOICE OR AN OUTCOME BUT RATHER CHOICES, TASKS AND OUTCOMES THAT ARE PURPOSEFULLY DESIGNED FOR LEARNING CONTENT, ACQUIRING A SKILL OR DEVELOPING A LEARNING CAPABILITY THAT CAN BE TRANSFERED FOR SOLVING A REAL-WORLD PROBLEM.
- INCORPORATING LEARNING ELEMENTS ON TOP OF GAME MECHANICS FOR BRINGING LEARNING TO THE FORE.

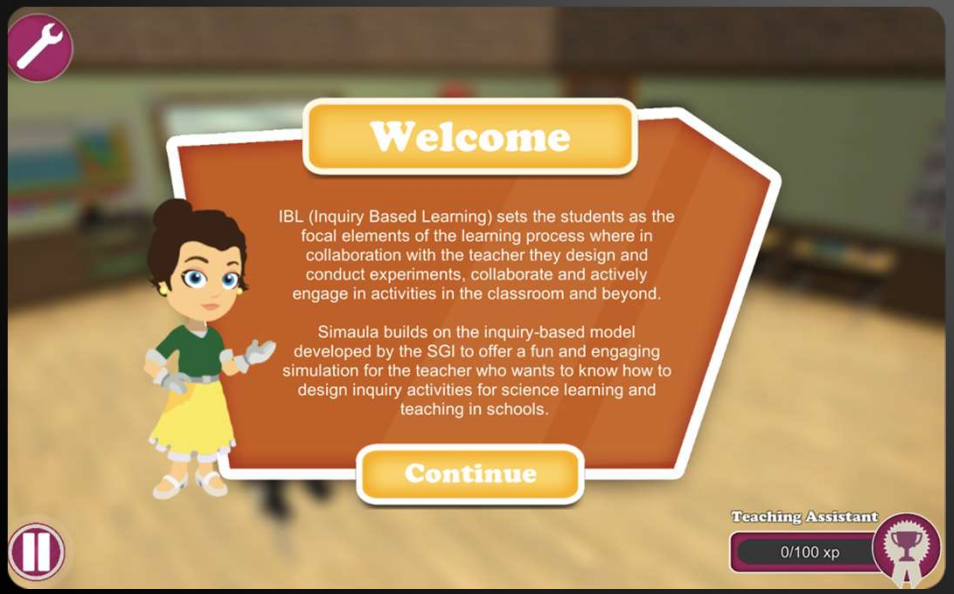
A SERIOUS GAME IS



A SERIOUS GAME HAS

- BOTH GAME MECHANICS SUCH AS RULES, CHARACTERS, ENVIRONMENTS, INNER LOGIC COMPLEMENTED WITH LEARNING ELEMENTS FOR ACHIEVING AN INTENDED LEARNING GOAL.
- SUCH LEARNING ELEMENTS MAY CONSIST OF:
  - LEARNING ACTIVITIES (LECTURE, DISCUSSION, GROUP PROJECT, SEARCHING AND RETRIEVING INFORMATION, SOLVING A MATH PROBLEM, REFLECTION, POSING / ANSWERING A QUESTION, BRAINSTORMING, DEBATES, CHOICES..)
- LEARNING OUTCOMES
  - ACQUIRE KNOWLEDGE AND SKILLS IN UNDERSTANDING FRACTIONS
  - UNDERSTAND THE PRINCIPLE OF THE ELECTROMAGNETIC SPECTRUM
  - IDENTIFY HOW THE GREENHOUSE EFFECT INFLUENCES PLANT GROWTH
- TRANSFORM TO GAME-LIKE CONTENT
  - ACHIEVE 2 FRACTIONS IN A ROW
  - USE X-RAY AND LIGHT TO IDENTIFY RADIATION
  - BUILD A VIRTUAL GREENHOUSE AND GROW YOUR OWN VEGETABLES THROUGH NATURAL HEATING.

EXAMPLES OF SERIOUS GAMES: GAMES FOR TEACHER TRAINING

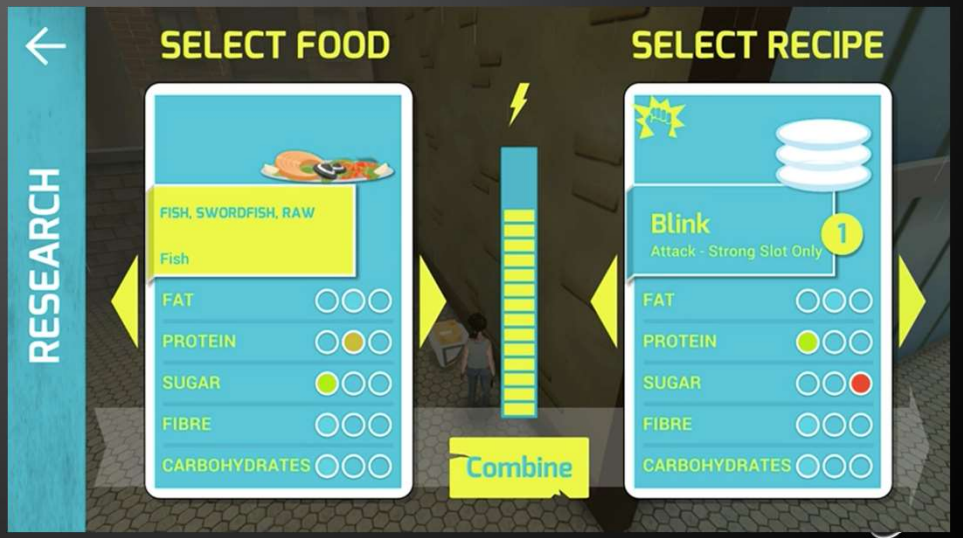


EXAMPLES OF SERIOUS GAMES: GAMES FOR TEACHER TRAINING

EXAMPLES OF SERIOUS GAMES: GAMES FOR TEACHER TRAINING

EXAMPLES OF SERIOUS GAMES: GAME FOR CULTURAL DIFFERENCES

EXAMPLES OF SERIOUS GAMES: GAME FOR HEALTH



FOLD.IT

- PREDICTING THE WAY PROTEINS FOLD
- PROTEIN FOLDING SOLUTIONS FROM HUMAN PLAYERS
- FOLD.IT SERIOUS GAME

GAMES AUTHORING ENVIRONMENTS

- A GAME AUTHORING ENVIRONMENT IS A FORMAL SYSTEM / PRACTICAL FRAMEWORK THAT OFFERS THE MECHANISMS, TOOLS AND SCRIPTING EDITORS FOR A GAME DESIGNER TO CREATE THEIR OWN GAMES.
- LEVELS, ENVIRONMENTS, CHARACTERS, GAME-PLAY ELEMENTS, SCORING, GOALS, LEVELS, STRORY-LINE, AUDIO, TEXT, DIALOGUES, ANALYTICS, INPUT SYSTEMS, RESOURCE MANAGER, PHYSICS, USER INTERFACE.

EXAMPLES OF GAME ENGINES

- UNITY 3D
  - FOR EXPERIENCED GAME DESIGNERS / DEVELOPERS WITH TECHNICAL EXPERIENCE
  - 34% OF FREE MOBILE GAMES ARE DESIGNED IN UNITY 3D
  - POPULAR WITH MOBILE GAMES
  - INCREASINGLY USED FOR VR MARKET – 90% OF SAMSUNG GEAR AND 53% OF OCULUS RIFT
  - GAMES DEVELOPED WITH UNITY: POKEMON GO, SUPER MARIO RUN ANGRY BIRDS 2
  - PRICING: FREE FOR PERSONAL USE.

EXAMPLES OF GAME ENGINES

- UNREAL ENGINE
  - LARGE AND TECHNICALLY DIFFICULT GAMES
  - PC AND CONSOLES
  - GAMES: MARVEL HEROES, NEED FOR SPEED, BATMAN, INFINITY BLADE
  - PRICING: FREE TO USE 5% ROYALTY AFTER THE FIRST 3000

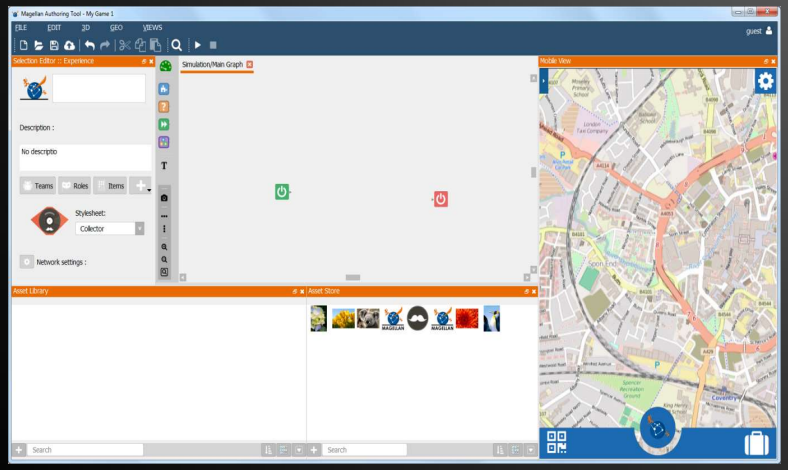
SERIOUS GAMES AUTHORING ENVIRONMENTS

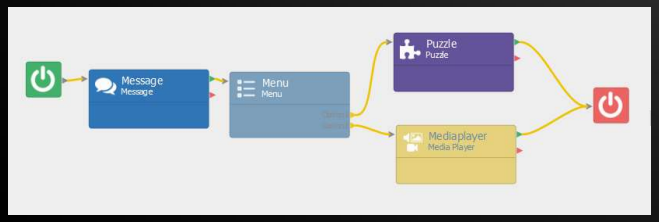
- IDENTICAL WITH GAME ENGINES, WITH FOCUS ON DESIGNING THE LEARNING ELEMENTS IN THE GAMES.
- VERY FEW, IF ANY, GAME ENGINES THAT FOCUS EXPLICITLY ON LEARNING ELEMENTS EXIST
- MAINLY BECAUSE IT IS CHALLENGING TO DESIGN TANGIBLE LEARNING OBJECTS IN GAMES
- NO PRACTICABLE MAPPING OF LEARNING AND GAME ASPECTS PER TYPE OF GAME, LEARNING CONTENT AND LEARNING OUTCOMES.
- CHALLENGE IN OFFERING A CODE-FREE GAME ENGINE FOR TEACHERS WHO WISH TO DESIGN THEIR OWN GAMES FOR USE IN CLASSROOMS AND DESIGN LEARNING AND CORE MECHANICS IN THEIR GAME.
- VISUAL-SCRIPTING IN A DRAG AND DROP STRUCTURE IS NOT YET DESIGNED IN A WAY THAT A TEACHER CAN SELECT THE LEARNING ELEMENT AND POPULATE IT WITH CONTENT.

EXAMPLES OF VISUAL-BASED SERIOUS GAMES AUTHORING ENVIRONMENTS

- ITY STUDIO –
  - HTTPS://ITYSTUDIO.COM
  - BUILDING SIMULATIONS
  - LIBRARY OF DIFFERENT SETTINGS AND CHARACTERS (SCHOOL, CLASSROOM, OFFICE, MUSEUM, STUDENTS, TEACHERS.)
  - LINEAR TREES WITH DIFFERENT OUTCOMES - SCENARIO SCRIPTING
  - INSERT YOU OWN MEDIA LIKE TESTS, QUIZZES, VIDEOS AND PHOTOS
  - TRANSLATION TO DIFFERENT LANGUAGES.
  - IT DOES NOT APPROACH LEARNING ELEMENTS AS PRE-DEFINED OBJECTS.
  - EXPENSIVE: 15-DAY TRIAL AFTER $35 PER MONTH

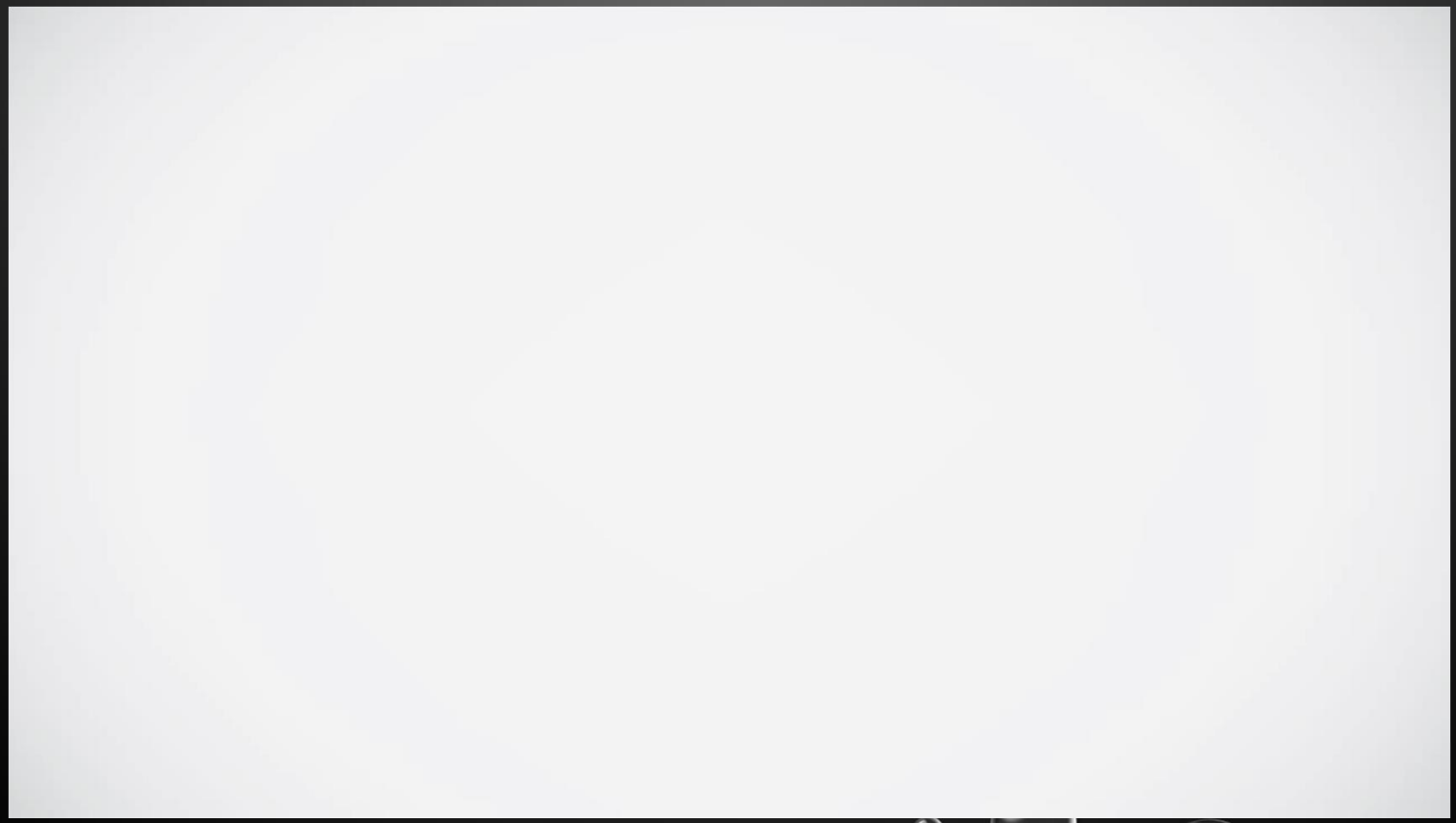
EXAMPLES OF VISUAL-BASED SERIOUS GAMES AUTHORING ENVIRONMENTS





- MAGELLAN'S MAT AUTHORING ENVIRONMENT
- HTTP://WWW.MAGELLANPROJECT.EU
- COLLABORATION BETWEEN DXT, EXUS AND COVENTRY UNIVERSITY.
- VISUAL AUTHORING ENVIRONMENT FOR THE CREATION, SHARING AND PUBLICATION OF INTERACTIVE LOCATION-BASED EXPERIENCES
- LARGE-SCALE OUTDOOR PLAYGROUNDS SUCH AS PARKS OR OPEN-AIR MUSEUMS AND INDOOR SPACES LIKE A SCHOOL CLASSROOM, MUSEUM OR SCIENCE CENTRE
- VISUAL BASED CONNECTING ACTIVITIES AND TASKS TOGETHER TO FORM A GAME
  - A GRAPH REPRESENTS THE GAME LOGIC
  - GAME START AND TERMINATION VISUALS
  - BOXES REPRESENT STEPS IN THE SCENARIO
  - LINKS REPRESENT THE SUCCESSION ORDER
- PROTOTYPE PHASE – STILL REQUIRES UPDATES AND DEBUGGING
- CLOSED SYSTEM THAT REQUIRES A LICENSE
- ONLY AVAILABLE ON PC.

EXAMPLES OF VISUAL-BASED SERIOUS GAMES

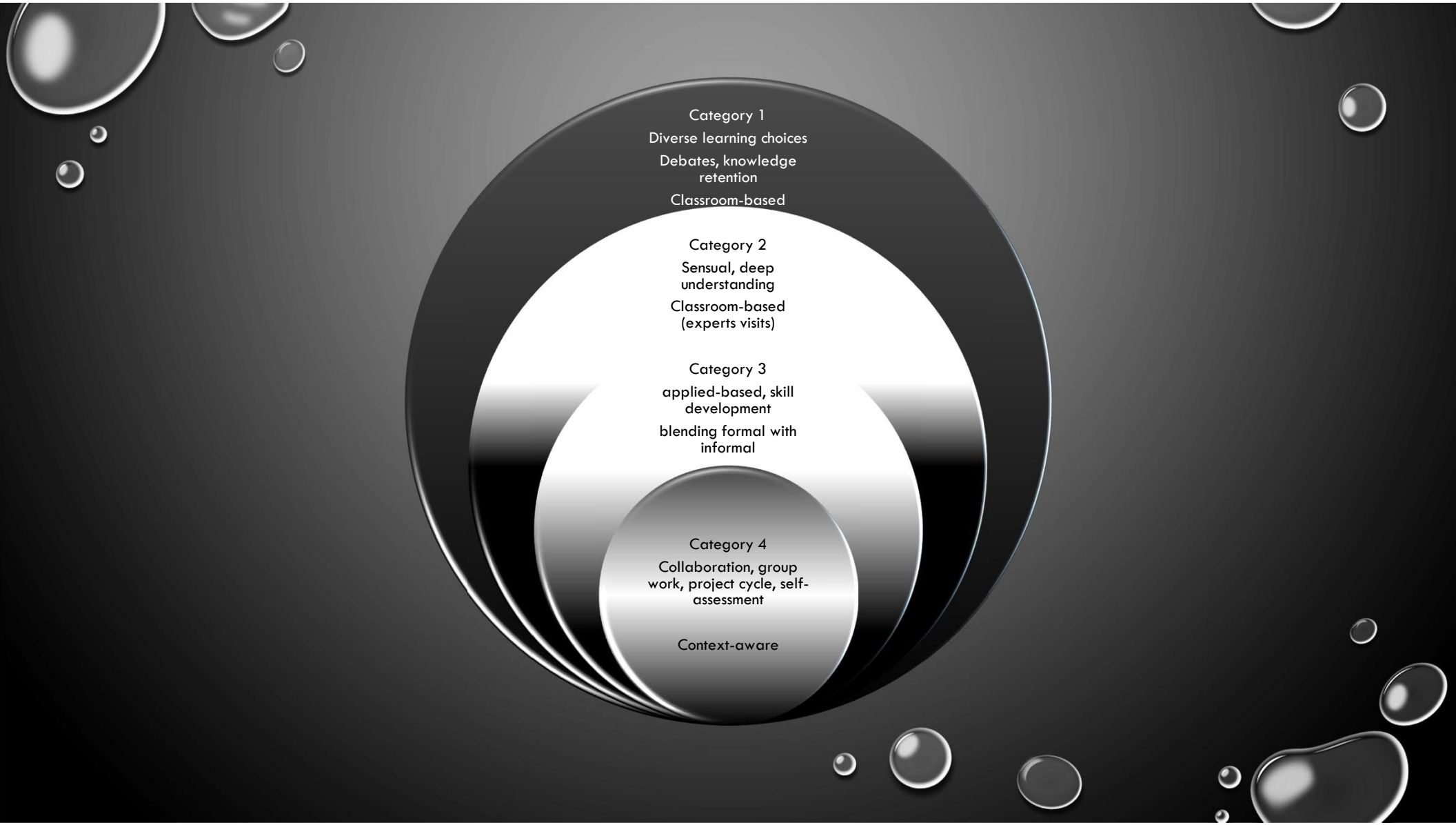


A GAME FOR MULTIMODAL TEACHING AND LEARNING

MULTIMODALITY BASED ON STRATEGY, TOOLS, LOCATIONS

AWARENESS ON TEACHING MULTIMODALITY THROUGH STEAM

Category 1	Category 2	Category 3	Category 4
Learning diversity for increasing engagement and motivation	Developing senses for attaining deeper understanding of the ssubject topic	Students into the design of teaching for hands-on learning	Supporting autonomy & self-direction through collaborative projects
Teaching strategies	**Teaching strategies**	**Teaching strategies**	**Teaching strategies**
Initiating discussions and debates	Increase attention and focus for explaining ideas and understandings	Design/applied-based strategies for co-developing learning activities with students	Inquiry, collaboration, problem, research, project, peer-assessment -based
Tools	**Tools**	**Tools**	**Tools**
Lectures, slideshows, videos, writing assignments	visual (videos) and audio files (podcasts), blogs, 3D applications	Video creation and editing, 3D modelling & 3D printing	3D printing, posing a question, blogs as peer-assessment tools
Location	**Location**	**Location**	**Location**
Classroom with extending activities at home, school, library	Classroom with visits from professionals giving insights about a complex topic	Classroom with field-trips, visits to companies, public spaces	out-of-class learning (museums, nature, city) for context-specific learning

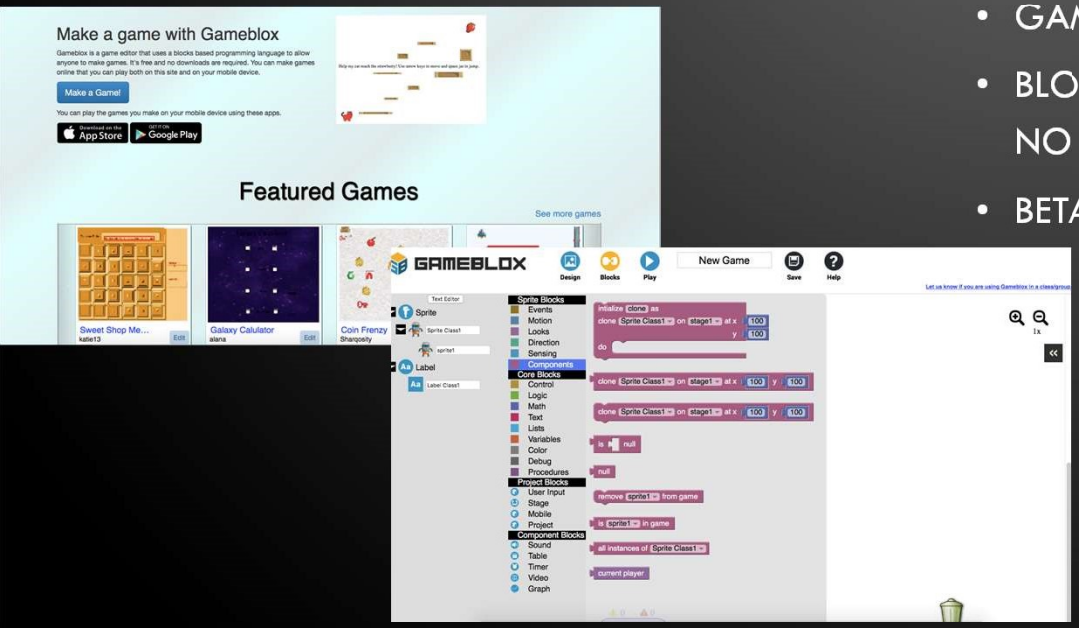

Category 1
Diverse learning choices
Debates, knowledge retention
Classroom-based
Category 2
Sensual, deep understanding
Classroom-based (experts visits)
Category 3
applied-based, skill development
blending formal with informal
Category 4
Collaboration, group work, project cycle, self-assessment
Context-aware

EXAMPLES OF VISUAL-BASED SERIOUS GAMES AUTHORING ENVIRONMENTS

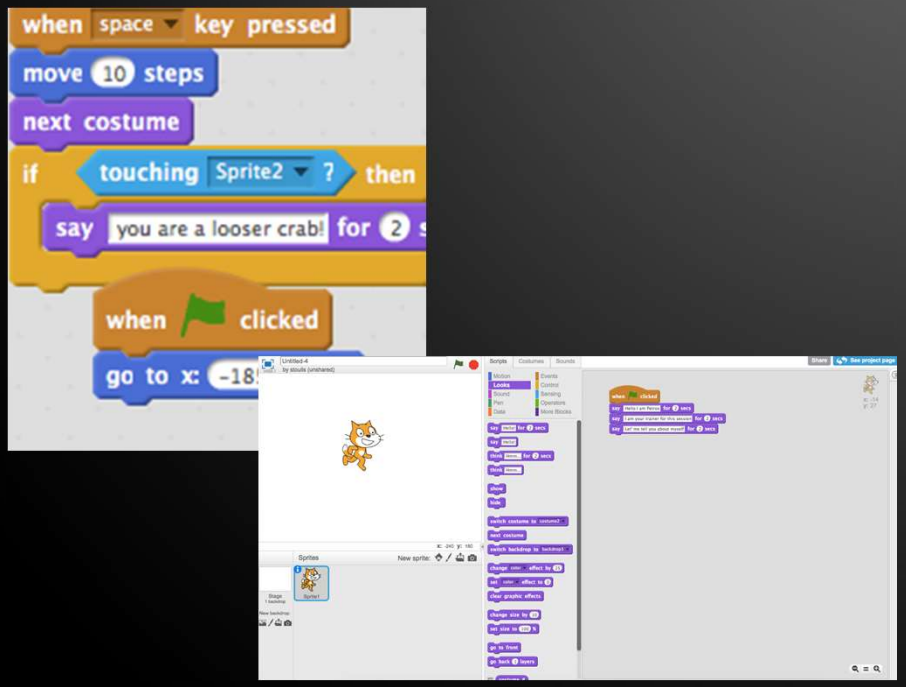
- GAME STAR MECHANIC
  - HTTPS://GAMESTARMECHANIC.COM
  - WEB-BASED ACCESSIBLE FROM ANY WEB-BROWSER
  - TEACHING STUDENTS HOW TO BUILD THEIR OWN GAMES
  - TEACHERS CAN DESIGN THEIR GAMES WITH THEIR OWN CONTENT BASED ON THE CURRICULUM
  - FREE OF USE

EXAMPLES OF VISUAL-BASED SERIOUS GAMES AUTHORING ENVIRONMENTS

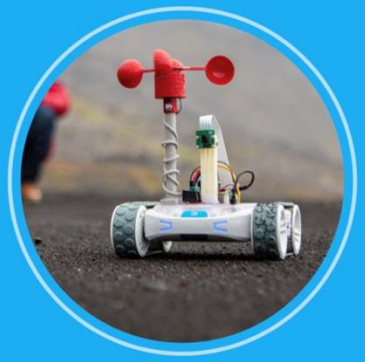
- GAME BLOX MIT
  - HTTPS://GAMEBLOX.ORG
  - SIMILAR TO SCRATCH BUT FOCUSED ON GAME DESIGN WOTH MORE ADVANCED BLOCKS
  - FREE OF USE
  - WEB-BASED AND MOBILE BASED
  - GAMES CAN BE PLAYED IN IOS AND ANDROID
  - BLOCKS-BASED FOR STUDENTS AND TEACHERS WITH NO CODING SKILLS
  - BETA VERSION



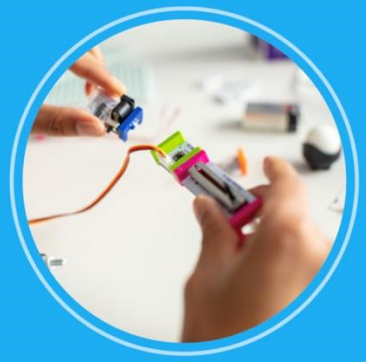
EXAMPLES OF VISUAL-BASED SERIOUS GAMES AUTHORING ENVIRONMENTS



- SCRATCH
  - MIT'S GAME ENGINE FOR STUDENTS
  - CREATE STORIES, ANIMATIONS AND SHARE
  - OPEN ACCESS
  - FREE
  - WEB-BASED
  - VISUAL SCRIPTING – BLOCK BASED
  - 30,341,867M GAMES SHARED
  - **21ST CENTURY SKILLS SUCH AS COMPUTATIONAL THINKING / LEARNING TO CODE (FOCUS OF THIS WORKSHOP) BY SIMPLY DRAGGING AND DROPPING CATEGORIZED OBJECTS.**
  - **SCRACTH-ED COMMUNITY FOR EXCHANGING RESOURCES AND DISCUSSIONS**



Science



Technology

Engineering

Art

Math

TANGIBLE PLAY

THANK YOU