Appendix

Example 1 - The Beekeeper's game

DESIGN THINKING ACTIVITY PLAN TEMPLATE	YEAR 2

1. BASIC INFORMATION

PROJECT TITLE:

The Beekeepers' game

AUTHOR(S):

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ISSUE:

One of the big issues related to environmental sustainability during the recent Years is the decline of bees' population. Consequently, scientists emphasize the importance of protecting their population, and beekeepers are those who lead the way, facing though various difficulties in maintaining their beehives healthy.

FINAL STUDENT PRODUCTION:

Students develop a ChoiCo game about suitable spots where beekeepers can move their beehives taking into account bees' needs and factors that put beehive's wellbeing in danger.

TECHNOLOGIES TO BE USED:

Select the Exten.(D.T.)² technologies that will be used by students during the DT Project

☐ MaLT2 ☑ ChoiCo ☐ SorBET ☐ VRobotics ☐ NQuire

2. FOCUS, SET UP & REQUIREMENTS OF THE ACTIVITY

2.1 LEARNING OUTCOMES

You can find the Learning objectives Verbs here

Domain Related	
Environmental sustainability	***Recognize*** *beehives' problems and needs* ***Explain*** *the suitability of a geographical location for beehives wellbeing*
Geography	***Decide*** *on places suitable for beehives* ***Use*** *geographical coordinates to refer to specific locations* ***Recognize*** *the relationship between a geographical location and its climate conditions*
Design Thinking & innovation with Emerging Technologies Related	
Prototyping	***Create*** *different prototypes of ChoiCo games* ***Interpret*** *questionnaires answers to design criteria for the game they create.*

Empathizing	***Identify** beekeepers' problems and beehives' needs*
Feedback and testing	***Relate** the feedback from their peers and beekeepers to iterations they did to the prototype*
21st century Skills Related	
Communication	**Explain** their ideas to others.
Presentation	***Present** their final artefact by demonstration*

2.2 PARTICIPANTS & CONTEXT

STUDENTS

Age	10-11 Years old
Prior knowledge	none or basic knowledge of block programming
Nationality, gender, cultural background	*1 pupil is from Albania and 21 from Greece, 15 boys & 7 girls*
Language	*Greek*
Special needs and abilities	-

TIME

ACTIVITY DURATION: 8 hours divided into 4 times

IMPLEMENTATION DURATION: 4 weeks

SCHEDULE: 2 hours/week

SPACE

Specify where the activity will take place

ACTIVITY TYPE: ✓ In-person ☐ At distance ☐ Mixed

PHYSICAL SPACE: computer laboratory, outdoors

VIRTUAL SPACE: -

2.3 SOCIAL ORCHESTRATION

PEOPLE INVOLVED

NO OF STUDENTS: 20 NO OF GROUPS : 5 NO OF TUTORS: 2 NO OF ASSISTANTS:1

STUDENT GROUPING & INTERACTIONS

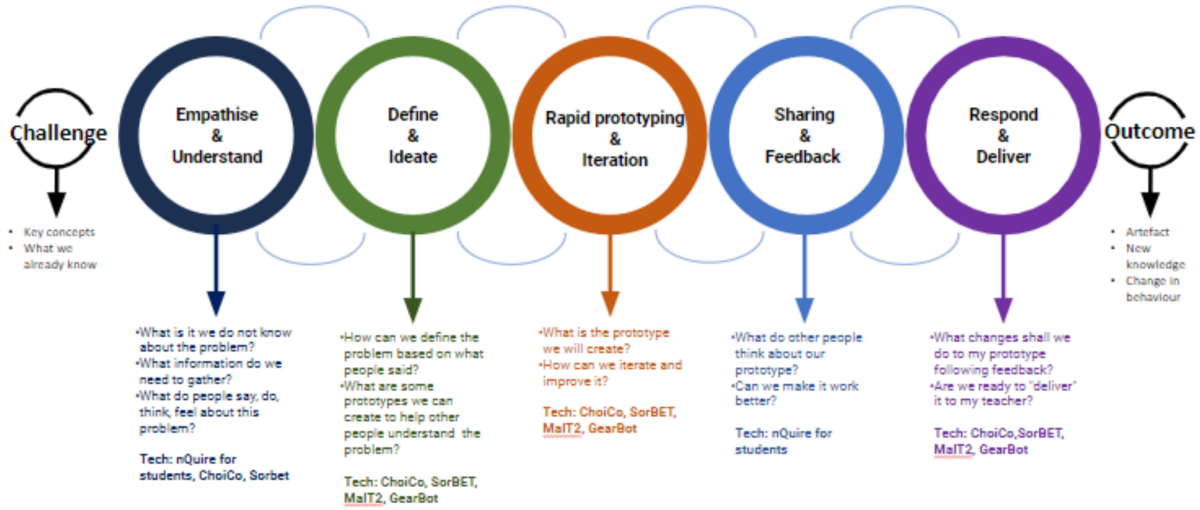
Grouping Criteria	mixed school performance, student preferences
Organisation	4 students per group using 1 device per group
Roles in the group	emergent roles; role exchange in the group
Tutor(s) role(s)	intervene; monitor; facilitate; guide; observe

2.4 TEACHING RESOURCES

Digital resources	Half-baked ChoiCo game (The Beekeeper game)
Physical resources	mini guide for ChoiCo design mode

3. IMPLEMENTATION - DESIGN THINKING ACTIVITY FLOW

This section describes how the teaching and learning process is expected to evolve through the 5 phases of the Design Thinking Methodology: 1. Empathise & Understand, 2. Define & Ideate, 3. Rapid prototyping & Iteration, 4. Sharing & Feedback, 5. Respond & Deliver. The described activities support the objectives stated and make use of the technologies, supporting material, and teaching and learning processes mentioned earlier in the activity plan.



PHASE 0: Challenge

One of the big issues related to environmental sustainability during the recent Years is the decline of bees' population. From pollinating human crops to playing a crucial role in the food chain, bees are essential for the ecosystem. Consequently, scientists emphasize the importance of protecting their population, and beekeepers are those who lead the way. Though having the best intentions, beekeepers face various difficulties in maintaining their beehives healthy and their bees happy. During this activity, students visit places where beekeepers can place their beehives taking into account bees' special needs and avoiding possible dangers that can endanger beehive wellbeing. Students first play the ChoiCo game "Beekeeper". Then they create a questionnaire for beekeepers in order to gather information on their opinion of the game. According to their answers, students define the main dangers beekeepers face. Following they visit places in their town (or near their town) in order to find spots where beekeepers can leave their beehives. During the develop phase they modify the game "Beekeeper", adding the spots they believe are suitable and information about how to keep a beehive healthy. Finally, they present their game to their peers as a tool to learn more about bees and to beekeepers as a tool for them to experiment with different spots and paths where they can move their beehives avoiding the danger of losing them.

PHASE 1: Empathise & Understand

DURATION: 2 hours

DESCRIPTION OF THE ACTIVITIES:

During the 1st phase students explore supporting material (videos and links to sites selected by the teacher) in order to get familiar with beekeeper's needs and problems. Then they play the game "Beekeepers' game" and create a questionnaire using nQuire in order to gather their peers' and professional beekeepers' opinion about it.

EXPECTED USE OF EXTEN.(D.T.)² TECHNOLOGY:

☐ MaLT2 ☐ ChoiCo ☐ SorBET ☐ VRobotics ✓ NQuire ☐ No technology

STUDENTS' CONSTRUCTIONS: Online questionnaire

STUDENTS' EXPECTED INTERACTIONS:

Between the members of the group	discussion and argumentation on what questions need to be included in the questionnaire
Between the groups	-same

PHASE 2: Define & Ideate

DURATION: 2 hours

DESCRIPTION OF THE ACTIVITIES:

Students discuss with their group interesting findings that may be useful for making their game more accurate and integrate into its useful information. They then decide on specific changes or additions they could integrate in the game in order to improve it.

EXPECTED USE OF EXTEN.(D.T.)² TECHNOLOGY:

☐ MaLT2 ✓ ChoiCo ☐ SorBET ☐ VRobotics ✓ NQuire ☐ No technology

Experiment with design mode in ChoiCo in order to test which modifications are applicable

STUDENT CONSTRUCTIONS: a list of 5 changes/additions in the game

STUDENTS' EXPECTED INTERACTIONS:

Between the members of the group	discussion and argumentation on which conclusions from the first phase are valuable and applicable
Between the groups	-

PHASE 3: Rapid prototyping & Iteration

DURATION: 2 hours

DESCRIPTION OF THE ACTIVITIES:

Students design prototypes for their game, testing it internally in their group and redesigning it until a final version is ready. They constantly transit between play & design mode and save different versions of their game.

EXPECTED USE OF EXTEN.(D.T.)² TECHNOLOGY:

☐ MaLT2 ✓ ChoiCo ☐ SorBET ☐ VRobotics ☐ NQuire ☐ No technology

STUDENT CONSTRUCTIONS: ChoiCo game prototypes

STUDENTS' EXPECTED INTERACTIONS:

Between the members of the group	discussion and argumentation on which changes make the game better
Between the groups	-

PHASE 4: Sharing & Feedback

DURATION: 1 hour

DESCRIPTION OF THE ACTIVITIES:

Students focus on (converge) their final solution and its delivery to the target audience They use nQuire, to create an online survey sharing their game with other students, teachers, beekeepers and asking them to evaluate it, giving them feedback. They also test other's prototypes and give feedback (oral or written depending on the time left).

EXPECTED USE OF EXTEN.(D.T.)² TECHNOLOGY:

☐ MaLT2 ✓ ChoiCo ☐ SorBET ☐ VRobotics ✓ NQuire ☐ No technology

STUDENT CONSTRUCTIONS:

STUDENTS' EXPECTED INTERACTIONS:

Between the members of the group	discussion on how they can best present their game
Between the groups	Groups give feedback to each other and discuss ways the games can be improved further

PHASE 5: Respond & Deliver

DURATION: 1hour

DESCRIPTION OF THE ACTIVITIES

Students demonstrate their game by oral presentation. They explain the rationale behind their design and the changes they made to the original version. Finally, they discuss on the feedback they received in the previous phase in terms of what can be further improved and which points of the feedback find less important to take into account.

EXPECTED USE OF EXTEN.(D.T.)² TECHNOLOGY:

☐ MaLT2 ✓ ChoiCo ☐ SorBET ☐ VRobotics ☐ NQuire ☐ No technology

STUDENT CONSTRUCTIONS:

STUDENTS' EXPECTED INTERACTIONS:

Between the members of the group	Discussion on further improvements
Between the groups	-same

4. STUDENT ASSESSMENT AND FEEDBACK

What methods and tools will you use to facilitate the assessment of the learning outcomes stated at section 3.1. (e.g., post-activity tests, reflective videos, student worksheets, etc.).

TOOLS

Describe the assessment tools that will be used

e.g. student evaluation sheet, tutor's notes with a template for evaluating student activity, student worksheet, test

APPROACH

Describe the formative and summative assessment activities. How these assess the achievement of the learning objectives as described in section 2.1.

Learning Outcome	Assessment Activity
Recognize *beehives' problems and needs*	• *pop up messages added in the ChoiCo game*
Explain *the suitability of a geographical location for beehives' wellbeing*	• *pop up messages added in the ChoiCo game* • *teachers' notes during discussions and delivery phase*
Decide *on places suitable for beehives*	• *values of choices in the ChoiCo game*
Use *geographical coordinates to refer to specific locations*	• *pop up messages added in the ChoiCo game* • *teachers' notes during discussions and delivery phase*
Recognize *the relationship between a geographical location and its climate conditions*	• *values of choices in the ChoiCo game* • *pop up messages added in the ChoiCo game* • *teachers' notes during discussions and delivery phase*
Create *different prototypes of ChoiCo games*	
Interpret *questionnaire answers to design criteria for the game they create.*	• *teachers' notes during discussions of define* • *lists of changes to be made in the game*
Identify *beekeepers' problems and beehives' needs*	• *pop up messages added in the ChoiCo game* • *teachers' notes during discussions and delivery phase* • *values of choices in the ChoiCo game*
Relate *the feedback from their peers and beekeepers to iterations they did to the prototype*	• *teachers' notes during discussions of define and sharing and feedback*
Explain their ideas to others.	• *teachers' notes during discussions*
Present *their final artefact by demonstration*	• *teachers' notes during deliver phase*