ESC4SDG

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Case Study

ESC4SDG Project

Escape Games and Gamified Challenges for Sustainable Development Goals

Erasmus+ KA220-SCH | Project No 2025-1-LT01-KA220-SCH-000356191

0. Case details

Title of the escape room	Ratleikur í heimilisfræði (Home Economics Kitchen Escape Room)
Country	Víkurskóli, Vík, Iceland
Subject(s)	Home Economics / Cooking Class (Heimilisfræði) & Sustainable Development Goals (SDG 12 & SDG 3)
Grade / age group	10th Grade / 10. bekkur (15–16 years old)
Number of students	10–13 students (3-4 groups of 3 students each)
SDG addressed	SDG 12 – Responsible Consumption and Production & SDG 3 – Good Health and Well-being

1. Pedagogical purpose

Subject and curricular unit / content	Home Economics (Heimilisfræði) – Practical kitchen operations, nutrition science (macronutrients, micronutrients, hidden sugars), culinary chemistry (leavening agents, pizza dough composition), kitchen hygiene/organization (correct cleanup sequencing), and resource efficiency.
Learning outcomes (2–3, observable)	1. Identify and categorize essential macronutrients, micronutrients, and hidden added sugars in everyday food/beverages to make healthy, sustainable choices. 2. Apply correct food safety, kitchen hygiene, and sequential cleanup procedures (Braut 2) to maintain a safe cooking environment. 3. Analyze chemical processes in baking (leavening agents like dry yeast, baking soda) and select appropriate natural ingredients/substitutes.
Key competences	• Personal, social and learning to learn competence (collaborative cooking, division of tasks, teamwork) • Literacy and STEM/Practical competence (nutrition analysis, ingredient measurements, chemical reaction understanding) • Citizenship competence (sustainable consumption, healthy living, reducing food/energy waste) • Entrepreneurship and problem-solving competence

2. SDG and playable problem

SDG chosen	SDG 12 (Responsible Consumption and Production) & SDG 3 (Good Health and Well-being)
Specific SDG target	Target 12.8 – Ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature; Target 3.4 – Promote mental health and well-being, reducing non-communicable diseases through healthy diet/nutrition.
Problem presented to students	Kitchen efficiency, nutrition, and hygiene are essential for healthy living, but unsustainable consumption (excess hidden sugars, food waste, improper sanitation) harms health and the environment. Students must solve 11 culinary and nutritional stations to unlock the final kitchen tool.
Curricular justification	Aligns directly with the Icelandic National Curriculum (Aðalnámskrá grunnskóla) for Home Economics (Heimilisfræði) at the 10th-grade level (15–16 years old), combining practical cooking skills, food chemistry, hygiene sequencing, and nutritional literacy with SDG-aligned sustainable consumption.

3. Narrative and structure · MOOC Task 3

Students' mission	Navigate 11 challenge stations (10 along the first-floor corridor and 1 inside the home economics kitchen) to decode food nutrition, kitchen sanitation, baking chemistry, and ingredient mysteries to discover the final key tool ('Uppþvottavél' / Dishwasher) and complete the session.
Students' role	Kitchen operations team with designated roles: Fréttamaður (Reporter/Scribe), Tímastjóri (Timekeeper), and Póstmaður (Messenger delivering solutions to the teacher).
Narrative context	The school kitchen and first-floor hallway at Víkurskóli during a practical Home Economics challenge.
Opening story (max. 10 lines)	"Welcome to the ultimate Heimilisfræði Kitchen Challenge! Today, you are master chefs and nutrition experts tasked with unlocking the secrets of healthy, sustainable cooking. The main kitchen key is hidden, and to unlock the final kitchen station, your team must complete 11 stations covering nutritional science, baking chemistry, hidden sugars, and kitchen hygiene. Work together in your roles, respect school rules, and solve every station correctly. Communicate with your teacher after each station to proceed. Can your team show culinary excellence and master sustainable kitchen practices before time runs out?"
Type of structure	Open / Non-linear structure for Stations 1–10 (can be solved in any order along the hallway), leading to a final mandatory station (Station 11) inside the Home Economics classroom.
Final goal of the game	Successfully solve all 10 hallway stations, unlock Station 11 inside the kitchen, identify the master kitchen appliance ('UPPÞVOTTAVÉL'), and verify all answers with the teacher.

4. Challenges and cognitive progression

At least three challenges, from basic to high cognitive level (Bloom's taxonomy). Add rows if needed.

Challenge / level	Description	Learning evidence	Planned hint	Solution
1. Basic (remember / understand)	Stations 3, 4, 6, 7 & 9: • Braut 3: Identify yeast (þurrger) for dough rising • Braut 4: Decode word 'heimilisfræði' • Braut 6: Identify missing ingredient in banana bread (Vaníludropar) • Braut 7: Word search / hidden word (UPPÞVOTTAVÉL) • Braut 9: Kitchen riddles (sponge, kg of feathers/rocks, towel, lunch/dinner)	Accurate recall of recipe ingredients, basic word decoding, and kitchen riddle solving.	Think about common household items that dry things or baking flavorings in liquid form.	Braut 3: Þurrger Braut 4: Heimilisfræði Braut 6: Vaníludropar Braut 7: Uppþvottavél Braut 9: Svampur, Jafnþung, Handklæði, Hádegismat og kvöldmat
2. Intermediate (apply / analyse)	Stations 1, 2, 5 & 8: • Braut 1: Explain 3 main macronutrients (Carbs, Fat, Protein) & 3 additional (Vitamins, Minerals, Water) and their body functions • Braut 2: Sequence 11 kitchen cleanup steps (A-K) in correct hygienic order • Braut 5: List 5 core pizza dough ingredients (lukewarm water, oil, salt, yeast, flour) • Braut 8: Rank 6 beverages by added sugar content (1 lowest to 6 highest: E, C, D/F, D/F, B, A)	Demonstrate functional understanding of human nutrition, baking formulations, and systematic sanitation workflow.	Consider hygiene logic: clean dry surfaces first, wash dishes before drying, and wipe counters last.	Braut 1: Kolvetni, Fita, Prótein + Vítamín, Steinefni, Vatn Braut 2: Ordered cleanup sequence (H->E->D->C->G->A->F->B->I->J->K) Braut 5: Volgt vatn, olía, salt, þurrger, hveiti Braut 8: 1-E, 2-C, 3-D/F, 4-D/F, 5-B, 6-A
3. High (evaluate / create)	Stations 10 & 11: • Braut 10: Analyze natural food coloring sources, identifying beetroot (Rauðrófa) for its antioxidants and color pigments • Braut 11: Solve key final riddle for kitchen equipment utilizing high heat and detergent (Uppþvottavél / Dishwasher)	Critical evaluation of natural vs. synthetic food additives and synthesis of all kitchen knowledge to reveal final key device.	Focus on root vegetables rich in antioxidants used for vibrant red/purple dye.	Braut 10: Rauðrófa (Beetroot) Braut 11: Uppþvottavél (Dishwasher)

5. Assessment and inclusion

Mini-rubric (3 observable criteria × 3 performance levels)

Criterion	Developing	Achieved	Excellent
1. Nutritional & Culinary Knowledge	Struggles to identify basic macronutrients or hidden sugars; incorrect ingredient listing.	Accurately identifies major nutrients, hidden sugars, and baking ingredients with minor errors.	Demonstrates comprehensive knowledge of nutrition, chemical processes, and natural ingredients.
2. Kitchen Hygiene & Workflow Logic	Unable to sequence kitchen cleanup tasks; ignores safety or sanitation rules.	Correctly sequences most kitchen cleanup steps (Braut 2) and follows safety procedures.	Flawlessly organizes kitchen sanitation sequence and articulates rationale for food safety.
3. Teamwork & Role Execution	Fails to execute assigned role (Scribe, Timekeeper, Messenger); works in isolation.	Fulfills designated team role and collaborates effectively during station challenges.	Actively supports peers, ensures equitable role participation, and maintains efficient group pacing.

Self-assessment mechanism	Exit ticket / kitchen reflection sheet: Students evaluate their group's cleanup efficiency, rate their understanding of hidden sugars/macronutrients, and answer 'What surprised you most about added sugars in beverages?'
Inclusive adaptations (UDL) – at least 2	1. Multi-modal and visual task sheets: Integration of visual beverage images, graphic organizers for cleanup ordering, and multi-choice clues supporting visual and practical learners. 2. Role-based structured collaboration: Distinct responsibilities (Fréttamaður/Reporter, Tímastjóri/Timekeeper, Póstmaður/Messenger) allowing students with diverse strengths (writing, spatial movement, executive functioning) to contribute equally.

6. Implementation in the classroom

Implementation	• Sessions: 1 session (60–80 minutes) in Home Economics. • Grouping: Teams of 3 students with assigned roles (Fréttamaður, Tímastjóri, Póstmaður). • Materials: Printed task worksheets (Ratleikur í heimilisfræði verkefnablað), pens, station cards on 1st-floor corridor & kitchen. • Role of Teacher: Evaluator at check station, hint provider, supervisor of corridor/kitchen safety.
Difficulties	Managing group movement across 10 corridor stations without noise disruption to other classes; preventing fast groups from crowding specific stations.
Areas for improvement	Incorporate a practical cooking session immediately following the game using the pizza dough/banana bread recipes, and use digital sugar-calculating apps (e.g. Kahoot/Genially) for extended data visualization.

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