Makey- Makey Games

Scenario 1 – High

AiM| Autism in Motion

Encouraging well-being and healthy habits among children with autism through professional training and the integration of emerging technologies (2024-2026)

KA220-SCH -CDAB7AB2

Developed by Emphasys

Co-funded by the European Union

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Grant agreement	2024-1-PL01-KA220-SCH-000248166
Programme	Erasmus+ Program
Type of action	KA220- SCH
Granting Authority	National Agency
Project acronym	AiM (AUTISM IN MOTION)
Project title	Encouraging well-being and healthy habits among children with autism through professional training and the integration of emerging technologies (2024-2026)
Project starting date	01/11/2024
Project end date	31/10/2026
Project duration	24 months

Key Information	
Deliverable description	AiM MAKEY MAKEY GAMES COLLECTION
Deliverable type	Educational Resource
Date of publication (month number/date)	June 2026
Principal Author (name/entity)	A & A Emphasys Interactive Solutions Ltd
Partners Contributing (name/entity)	POLITECHNIKA LODZKA (TUL); Directorate of Primary Education of Western Thessaloniki (DPEWT); Associação Portuguesa para as Perturbações do Desenvolvimento e Autismo de Coimbra (APPDA Coimbra); NATSIONALNA ASOTSIATSIA NA RESURSNITE UCHITELI (NARU); HPO MEDIA MANAGEMENT LTD

Acknowledgements and Disclaimer

This report has been researched and produced by the AiM Consortium, under the collective editorial direction and contribution of all project partners.

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1. About the Game

1.1 Game Overview

Nutrition Mission: Energy, Focus & Sugar Balance is a game for students aged 8–13 with Autism Spectrum Disorder (ASD) that shows how different foods affect the body. Six food cards – cheese, apple, bread, yogurt, cookie and chicken – are connected to a Makey Makey board. Each time the student touches a food, points are added to three scores on the screen: Energy, Focus and Sugar.

A friendly dinosaur introduces the mission: to build a balanced diet with high Energy and Focus and low Sugar. The student watches the scores change and plans which foods to choose. The game is built in Scratch, a free visual block-coding platform, and uses Makey Makey to turn the cards into touch buttons.

1.2 Goal of the Game

The goal is to help students understand how different foods contribute to Energy, Focus and Sugar, and to encourage them to make balanced food choices. Using Makey Makey and Scratch, students explore six foods and observe how each choice changes their scores.

1.3 How the Game Is Played

The student holds or touches the ground (Earth) cable. First, the student touches the introduction card (Space) and the dinosaur says: “Hello friend! Make sure to have high levels of Energy and Focus and low levels of Sugar, to have a balanced diet!” The student then touches the food cards one at a time:

Food card	**Makey Makey input**
Cheese	Up arrow (↑)
Apple	Down arrow (↓)
Bread	Right arrow (→)
Yogurt	Left arrow (←)
Cookie	W
Chicken	S

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Each food plays a short sound, adds points to the Energy, Focus and/or Sugar scores at the top of the screen, and shows a thought bubble with the points for that food. The student uses the scores to choose a combination of foods with high Energy and Focus and low Sugar.

1.4 Why This Game Works for Students with ASD

- Three clearly labelled scores make the effect of each food visible and concrete.
- Every touch gives immediate sound and visual feedback, reinforcing cause and effect.
- The dinosaur gives one clear mission at the start, so the student knows what to aim for.
- Familiar foods and colourful pictures make the activity easy to understand.
- The challenge encourages planning and comparing, not only recognising foods.
- The game can be restarted at any time with the green flag, so students can try again.

1.5 Learning Outcomes

- Students understand how different foods contribute to Energy, Focus and Sugar levels.
- Students develop nutritional reasoning by comparing the effects of cheese, apple, bread, yogurt, cookie and chicken.
- Students strengthen planning and decision-making skills by choosing foods that increase Energy and Focus while keeping Sugar low.
- Students develop cause-and-effect understanding, as each food changes the scores on the screen.
- Students use clear visual feedback to evaluate and adjust their food choices.
- The game encourages healthy eating awareness while supporting problem-solving, self-regulation and independent learning.

1.6 About Makey Makey and Scratch

Makey Makey is a simple invention kit that connects to a computer by USB and turns everyday objects – such as fruit, cards or aluminium foil – into keyboard keys. When a student touches a connected object while also touching the ground cable, Makey Makey sends a key press (for example, the Space key or an arrow key) to the computer.

Scratch is a free, block-based coding platform. Instead of typing code, you drag and drop coloured blocks to build a program. Together, Makey Makey and Scratch offer schools and parents an easy way to introduce STEM-based projects into classrooms and homes, even without a technical background.

SCRATCH

Key features for students with ASD:

- Customisable sensory inputs: sound, visuals and touch can be adapted to the sensory preferences of students aged 8–13 with ASD.
- Visual block coding: games are created with drag-and-drop blocks, which simplifies the design process.
- Adaptable game elements: messages, sounds and images can be changed easily to suit each student's comfort level.
- Educational and recreational focus: the same approach can be used for memory games, matching games and interactive stories.

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2. Creating the Code in Scratch

2.1 Open the Project

The ready-made game is available here: https://scratch.mit.edu/projects/1364822559/

1. Open the link above in a web browser (Chrome, Edge or Firefox).
2. Click “See inside” to view the code.
3. To make your own editable copy, sign in to Scratch and click “Remix”. You can then change the messages, sounds and pictures.

If you prefer to build the game from the beginning, follow the steps below.

2.2 Prepare the Backdrop, Sprites and Variables

1. Create a new project on scratch.mit.edu and delete the default cat sprite.
2. Add a plain white backdrop with the titles “Energy”, “Focus” and “Sugar” along the top.
3. Add one sprite for each food (cheese, apple, bread, yogurt, cookie and chicken) and a dinosaur sprite.
4. In the Variables category, click “Make a Variable” and create three variables for all sprites: “Energy”, “Focus” and “Sugar”. Tick their boxes so the scores are shown on the stage.
5. Add a short, positive sound to each food sprite (the ready-made project uses the “Coin” sound).

2.3 Reset the Scores and Add the Introduction

Select the dinosaur sprite and add these two scripts:

- “when green flag clicked” → “set [Energy] to 0” → “set [Focus] to 0” → “set [Sugar] to 0”
- “when [space] key pressed” → “say [Hello friend! Make sure to have high levels of Energy and Focus and low levels of Sugar, to have a balanced diet!] for 8 seconds”

2.4 Add Points When a Food Is Touched

Select the Chicken sprite and add the following blocks, in this order:

- **Events:** “when [s] key pressed”
- **Sound:** “play sound [Coin] until done”

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- **Variables:** “change [Energy] by 3”
- **Variables:** “change [Focus] by 3”
- **Variables:** “change [Sugar] by 1”
- **Looks:** “think [Energy + 3, Focus + 3, Sugar + 1] for 4 seconds”

Repeat the same script for the other food sprites, changing the key and the points. The points below are examples – you can adjust them to match your lesson:

Sprite	Key	Energy	Focus	Sugar
Cheese	up arrow	+2	+2	0
Apple	down arrow	+2	+1	+1
Bread	right arrow	+3	+1	0
Yogurt	left arrow	+1	+2	+1
Cookie	w	+1	0	+3
Chicken	s	+3	+3	+1

Make sure the text in each “think” block matches the numbers in the “change” blocks, so the student sees the correct points.

2.5 Test and Save

1. Click the green flag. All three scores should be 0.
2. Press Space. Check that the dinosaur says the mission.
3. Press each food key (arrow keys, W and S). Check that the sound plays, the scores change and the thought bubble shows the right points.
4. Save the project (File > Save now) and click “Share” so the link can be opened by others.

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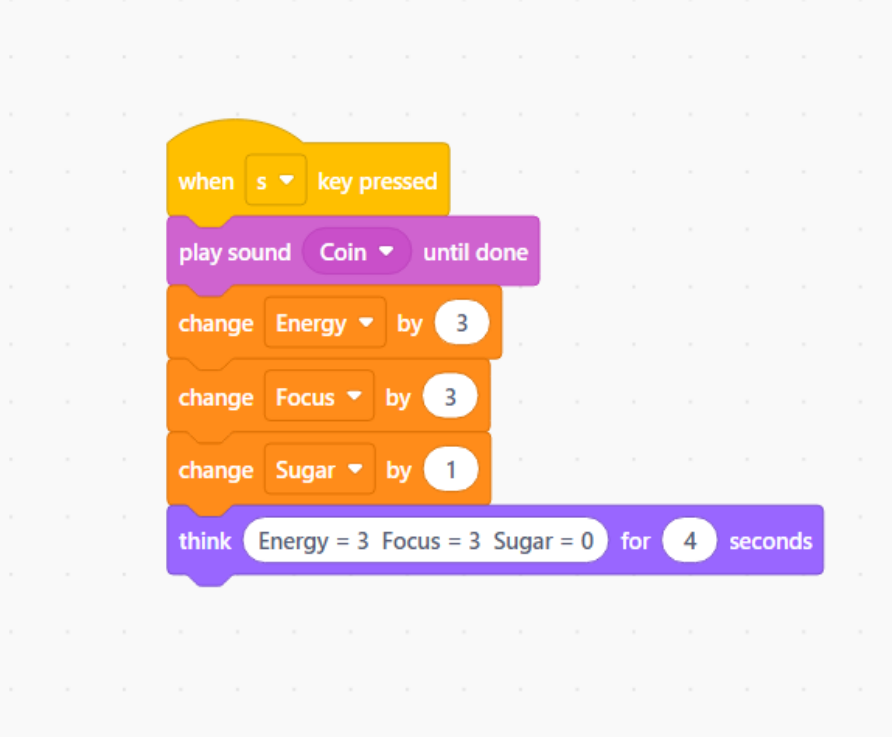

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3. Setting Up the Game Using Makey Makey

3.1 What You Need

- A Makey Makey kit (board, USB cable and alligator clips)
- A computer with internet access and the Scratch project open
- Seven printed cards: introduction, cheese, apple, bread, yogurt, cookie and chicken
- Something conductive for each card, for example aluminium foil on the back of the card

3.2 Connect the Makey Makey

1. Plug the Makey Makey into a USB port on the computer.
2. Connect one alligator clip to the ground (marked “Earth” on the Makey Makey). The student holds or touches this ground cable while touching the cards.
3. Connect the other alligator clips to the following Makey Makey inputs and attach the other end of each clip to the matching card, using aluminium foil or another conductive connector:
4. The W and S inputs are on the back of the Makey Makey board. Connect them using the header pins or jumper wires that come with the kit.

Makey Makey input	**Card**
Space	Introduction (dinosaur)
Up arrow (↑)	Cheese
Down arrow (↓)	Apple
Right arrow (→)	Bread
Left arrow (←)	Yogurt
W	Cookie
S	Chicken

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3.3 Start the Game

1. Open the Scratch project in the browser and click the green flag. Use full-screen mode to keep the screen simple.
2. Ask the student to hold the ground cable with one hand and touch the introduction card (Space).
3. Read the dinosaur's mission together: high Energy and Focus, low Sugar.
4. Let the student touch the food cards one at a time and watch the scores change.
5. Talk about the result together, then click the green flag to reset the scores and try a different combination.

3.4 Tips for a Smooth Session

- Test every card before the student arrives, so the game works first time.
- Keep the table clear of extra objects and cables to reduce distractions.
- Set the computer volume to a comfortable level before starting.
- Show the student how to hold the ground cable and touch a card before they play on their own.
- Start with a small number of foods (for example three) and add more as the student gains confidence.
- Ask simple questions such as "Which food added the most Sugar?" to support reasoning.

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