Makey- Makey Games

Scenario 3 – Low

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

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Contents

1. About the Game 4

1.1 Game Overview 4

1.2 Goal of the Game 4

1.3 How the Game Is Played 4

1.4 Why This Game Works for Students with ASD 5

1.5 Learning Outcomes 5

1.6 About Makey Makey and Scratch 6

2. Creating the Code in Scratch 7

2.1 Open the Project 7

2.2 Prepare the Backdrop, Sprites and Sounds 7

2.3 Code the Foods That Do Not Change 7

2.4 Code the Changing Food 8

2.5 Test and Save 8

3. Setting Up the Game Using Makey Makey 11

3.1 What You Need 11

3.2 Connect the Makey Makey 11

3.3 Start the Game 11

3.4 Tips for a Smooth Session 12

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1. About the Game

1.1 Game Overview

Food Memory Challenge is a simple, hands-on memory game for students aged 8–13 with Autism Spectrum Disorder (ASD). Five foods are placed in front of the student, each connected to a Makey Makey board. The student looks at the foods, covers their eyes, and the educator changes one food. The student then finds and touches the food that has changed.

When the student touches the correct food, Scratch shows a short, factual health message about that food. If the student touches a food that has not changed, a gentle “no” sound invites them to try again. The game mixes healthy foods (such as bananas and oranges) with foods to eat only sometimes (such as crisps, cake and chocolate). No keyboard or mouse skills are needed to play.

1.2 Goal of the Game

The goal is to strengthen memory, attention and observation skills while helping students recognise different foods and understand the difference between healthy foods and foods we should eat only sometimes. Using Makey Makey and Scratch, students connect a physical memory task with short, clear health information.

1.3 How the Game Is Played

The student holds or touches the ground (Earth) cable. Five foods are connected to the Makey Makey. Four foods stay the same, and the food connected to Left (←) is the “changing food”:

Step	**What happens**
1. Look	The student looks carefully at the five foods for 5–10 seconds.
2. Cover eyes	The student covers their eyes. The educator replaces only the food connected to Left (←) with a different food.
3. Find the change	The student opens their eyes, finds the food that has changed and touches it.

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Step	What happens
4. Feedback	Correct food (Left ←): Scratch shows a short health fact about the new food. Unchanged food: a gentle “no” sound plays and the student can try again.
5. New round	The educator replaces the food on Left (←) with another food and the game starts again.

1.4 Why This Game Works for Students with ASD

- The game follows the same clear steps in every round (look, cover eyes, find, touch), which makes it predictable.
- Only one food changes at a time, so the task stays manageable.
- Real foods or picture cards make the activity concrete and multi-sensory.
- Immediate sound and visual feedback reinforces cause and effect.
- A gentle “try again” sound avoids a strong sense of failure.
- The observation time and number of rounds can be adapted to each student.

1.5 Learning Outcomes

- Students strengthen working memory and visual attention by observing and remembering different foods.
- Students improve food recognition by identifying which food has changed between rounds.
- Students develop a basic understanding of healthy foods and foods to eat only sometimes, through short factual information.
- Students practise observation, comparison and decision-making skills.
- Students receive immediate visual and sound feedback, supporting interactive learning.
- Students develop cause-and-effect understanding, as touching the changed food triggers health information in Scratch.

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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.

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.

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- 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.

2. Creating the Code in Scratch

2.1 Open the Project

The ready-made game is available here: https://scratch.mit.edu/projects/1315930598/

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 Sounds

1. Create a new project on scratch.mit.edu and delete the default cat sprite.
2. Choose a plain, calm backdrop (for example, plain white).
3. Add one sprite for each food: bananas, orange, crisps (chips), cake and chocolate. Arrange them on the stage so they match the layout of the real foods or cards on the table.
4. In the Sounds tab of each sprite, add a gentle "no" sound (used when the student touches a food that has not changed).
5. In the sprite used for the changing food, also add a short positive sound.

2.3 Code the Foods That Do Not Change

Select each food sprite connected to Space, Up (↑), Down (↓) and Right (→), and add this script, changing the key for each sprite:

- **Events:** "when [down arrow] key pressed" (choose the key for this food)
- **Sound:** "start sound [no]"

In the ready-made project, for example, the Orange sprite uses "when [down arrow] key pressed" followed by "start sound [no]".

2.4 Code the Changing Food

Select the sprite for the food connected to Left (←) and add this script:

- **Events:** “when [left arrow] key pressed”
- **Sound:** “start sound [positive sound]”
- **Looks:** “say [short health fact about the new food] for 10 seconds”

Keep each health message short and factual. Examples:

Food	**Example health message**
Bananas	Well done, you found it! Bananas give you energy and potassium, which helps your muscles work.
Orange	Well done, you found it! Oranges are full of vitamin C, which helps your body fight colds.
Crisps (chips)	Well done, you found it! Crisps have a lot of salt and fat, so we eat them only sometimes.
Cake	Well done, you found it! Cake has a lot of sugar, so it is a treat for special days.
Chocolate	Well done, you found it! Chocolate has a lot of sugar and fat, so we eat only a small piece, sometimes.

Before each new round, update the message (and picture) of the Left (←) sprite so it matches the new food on the table.

2.5 Test and Save

1. Click the green flag.

2. Press Space, Up, Down and Right on the keyboard. Check that the “no” sound plays.
3. Press Left. Check that the positive sound plays and the health message appears.
4. Adjust the “say … for … seconds” time so the student has enough time to read the message.
5. Save the project (File > Save now) and click “Share” so the link can be opened by others.

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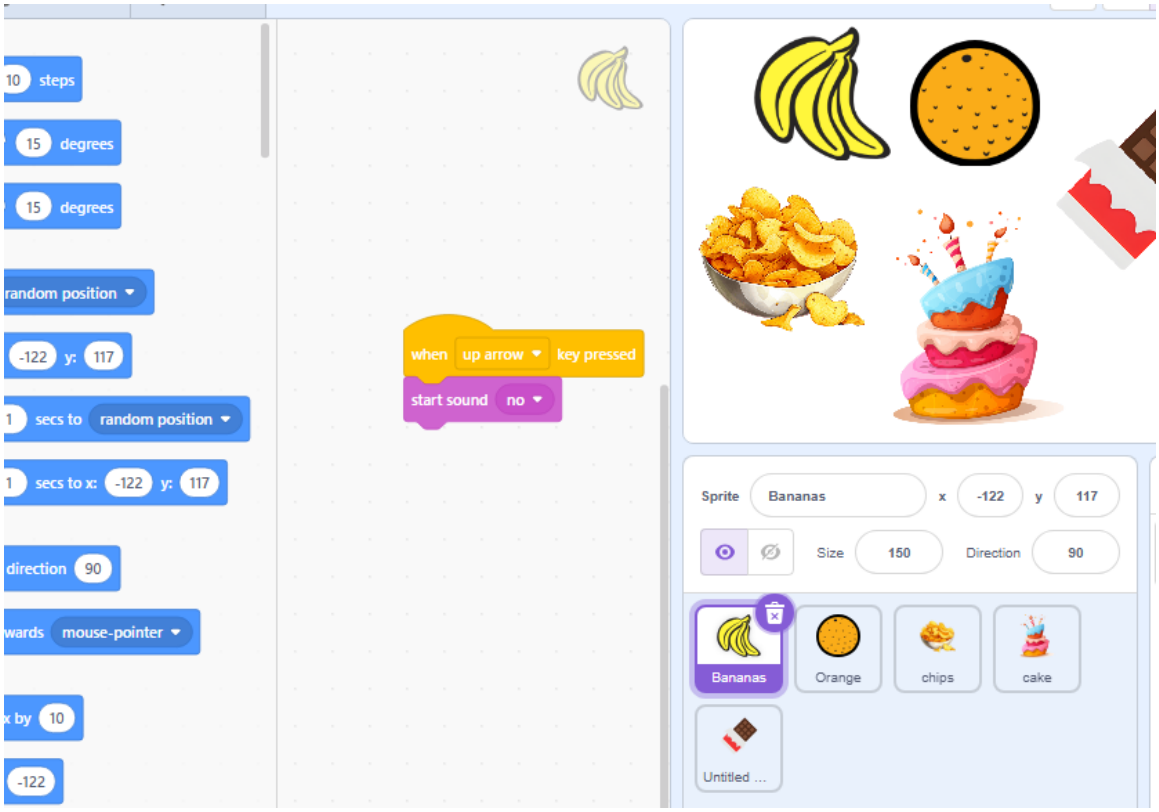

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3. Setting Up the Game Using Makey Makey

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
- Five real food items or printed food cards (for example bananas, orange, crisps, cake and chocolate)
- Extra foods or cards to swap in for new rounds
- Aluminium foil or another conductive connector for each food or 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 foods.
3. Connect the other alligator clips to the following Makey Makey inputs and attach the other end of each clip to the matching food, using aluminium foil or another conductive connector:

Makey Makey input	**Food**	**Role in the game**
Space	Food 1	Stays the same
Up arrow (↑)	Food 2	Stays the same
Down arrow (↓)	Food 3	Stays the same
Right arrow (→)	Food 4	Stays the same
Left arrow (←)	Changing food	Replaced by the educator in each round

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.

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2. Ask the student to hold the ground cable with one hand and look at the five foods for 5–10 seconds.

3. Ask the student to cover their eyes. Replace only the food connected to Left (←).

4. Ask the student to open their eyes, find the food that has changed and touch it.

5. Read the health message together, then start a new round with a different food on Left (←).

3.4 Tips for a Smooth Session

- Test every food before the student arrives, so the game works first time.
- Keep the table clear of extra objects and cables to reduce distractions.
- Tell the student in advance how many rounds you will play, so they know when the activity ends.
- Start with very different foods, then make the change harder as the student gains confidence.
- Set the computer volume to a comfortable level before starting.
- If you use real food, check for allergies first and keep the food wrapped where possible.

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