Makey- Makey Games

Scenario 5 – 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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1. About the Game

1.1 Game Overview

Food Groups Explorer is a simple, hands-on game that helps students aged 8–13 with Autism Spectrum Disorder (ASD) recognise the five main food groups: Grain, Vegetables, Fruits, Dairy and Protein. Five food group cards are connected to a Makey Makey board. When the student touches a card, Scratch shows an information screen about that food group, with pictures of example foods and a spoken explanation of its nutritional value.

When the explanation ends (after about 15 seconds), the game returns to the main screen and the student can choose another card. The game is built in Scratch, a free visual block-coding platform, and uses Makey Makey to turn the cards into touch buttons. No keyboard or mouse skills are needed to play.

1.2 Goal of the Game

The goal is to help students recognise and understand the five main food groups and their nutritional value. Using Makey Makey and Scratch, students explore Grain, Vegetables, Fruits, Dairy and Protein through simple physical interaction and clear visual and spoken information.

1.3 How the Game Is Played

The main screen shows five cards with the names of the food groups. The student holds or touches the ground (Earth) cable and then touches one of the food group cards:

Card touched	**Makey Makey input**	**What the information screen explains**
Grain	Space	Carbohydrates for energy, plus fibre
Vegetables	Up arrow (↑)	Vitamins, minerals and fibre that help the body grow and stay healthy
Fruits	Down arrow (↓)	Vitamins (such as vitamin C) and fibre
Dairy	Right arrow (→)	Calcium for strong bones and teeth
Protein	Left arrow (←)	Protein that helps muscles grow and repair

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The information screen stays for about 15 seconds while the explanation is played. During this time, the other cards do not react. The game then returns to the main screen, and the student can choose another card until all five food groups have been explored.

1.4 Why This Game Works for Students with ASD

- Five clearly labelled cards make the choices simple and easy to recognise.
- Each food group has its own full screen with pictures and a spoken explanation, supporting both visual and auditory learners.
- Only one information screen is shown at a time, and the game always returns to the same main screen, which makes it predictable.
- The fixed viewing time of about 15 seconds gives students enough time to look and listen without being rushed.
- Students can explore at their own pace and repeat any food group as often as they like.

1.5 Learning Outcomes

- Students develop a basic understanding of the five main food groups: Grain, Vegetables, Fruits, Dairy and Protein.
- Students learn about the nutritional value of each food group.
- Students strengthen food recognition and categorisation skills by linking example foods with their food group.
- Students develop cause-and-effect understanding, as touching each card shows information about that food group.
- Students receive clear visual and audio feedback, supporting an accessible and interactive learning experience.
- The game encourages healthy eating awareness while supporting motor skills, repetition and independent exploration.

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.

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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/1316124492/

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 Backdrops, Sprites and Sounds

4. Create a new project on scratch.mit.edu and delete the default cat sprite.
5. Add a plain main backdrop (in the ready-made project it is a light blue backdrop called “Blue Sky 2”).
6. Add one information backdrop for each food group, named Grain, Vegetables, Fruits, Dairy and Protein. Each backdrop shows pictures of example foods and a short text about the group’s nutritional value.
7. Add one sprite for each food group: a card with the group’s name (Grain, Vegetables, Fruits, Dairy, Protein). Arrange the five cards on the main backdrop.
8. In the Sounds tab of each sprite, record a spoken explanation that reads the text on its information backdrop (about 15 seconds long) and give it the group’s name (for example, “Dairy”).
9. In the Variables category, click “Make a Variable” and create a variable called “Flag”, for all sprites. This variable makes sure only one food group is shown at a time.

2.3 Get Ready at the Start

Add this script to one sprite, so the game always starts on the main screen:

- **Events:** “when green flag clicked”
- **Looks:** “switch backdrop to [Blue Sky 2]”
- **Variables:** “set [Flag] to 1”

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Then add these short scripts to every card sprite, so the cards appear only on the main screen:

- “when backdrop switches to [Blue Sky 2]” → “show”
- “when backdrop switches to [Grain]” → “hide” (repeat for Vegetables, Fruits, Dairy and Protein)

2.4 Show the Food Group When Its Card Is Touched

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

- **Events:** “when [right arrow] key pressed”
- **Control:** “if <(Flag) = 1> then”
- Inside “if”: **Variables:** “set [Flag] to 0” (no other card can react now)
- Inside “if”: **Looks:** “hide”
- Inside “if”: **Looks:** “switch backdrop to [Dairy]”
- Inside “if”: **Sound:** “play sound [Dairy] until done”
- Inside “if”: **Looks:** “switch backdrop to [Blue Sky 2]”
- Inside “if”: **Variables:** “change [Flag] by 1” (the next card can now be touched)

Repeat the same script for the other food group sprites, changing the key, backdrop and sound:

Sprite	**Key**	**Backdrop and sound**
Grain	space	Grain
Vegetables	up arrow	Vegetables
Fruits	down arrow	Fruits
Dairy	right arrow	Dairy
Protein	left arrow	Protein

The information screen stays for as long as the spoken explanation lasts. To change the viewing time, record a shorter or longer explanation.

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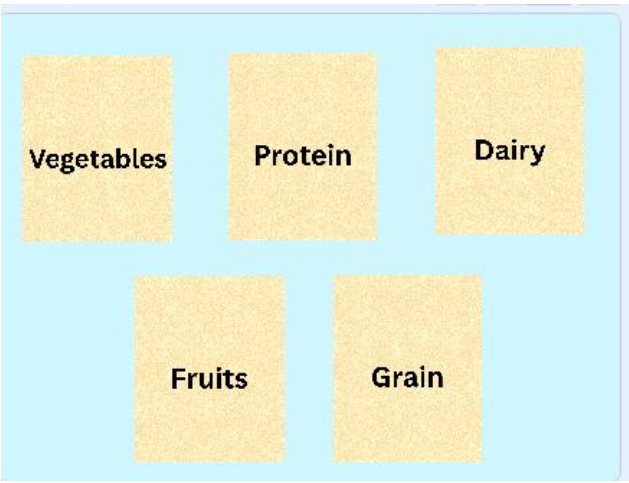
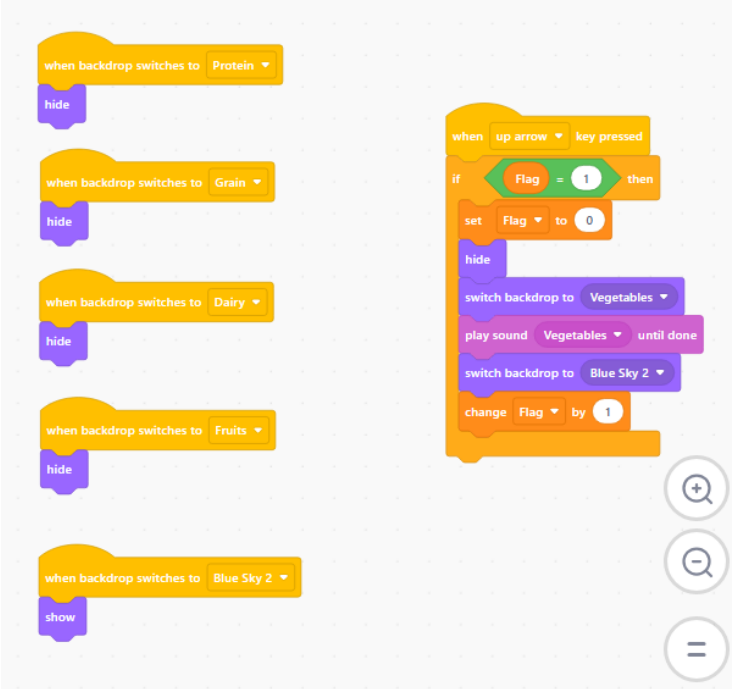
2.5 Test and Save

- Click the green flag. The main screen with the five cards should appear.
- Press Space and each arrow key on the keyboard. Check that the right information screen and explanation appear, and that the game returns to the main screen at the end.
- While an information screen is showing, press another key. Check that nothing happens until the explanation has finished.
- Save the project (File > Save now) and click “Share” so the link can be opened by others.





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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 printed food group cards: Grain, Vegetables, Fruits, Dairy and Protein
- 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:

Makey Makey input	**Food group card**
Space	Grain
Up arrow (↑)	Vegetables
Down arrow (↓)	Fruits
Right arrow (→)	Dairy
Left arrow (←)	Protein

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 one food group card.
3. Look at the information screen and listen to the explanation together.
4. When the main screen returns, invite the student to choose another card.

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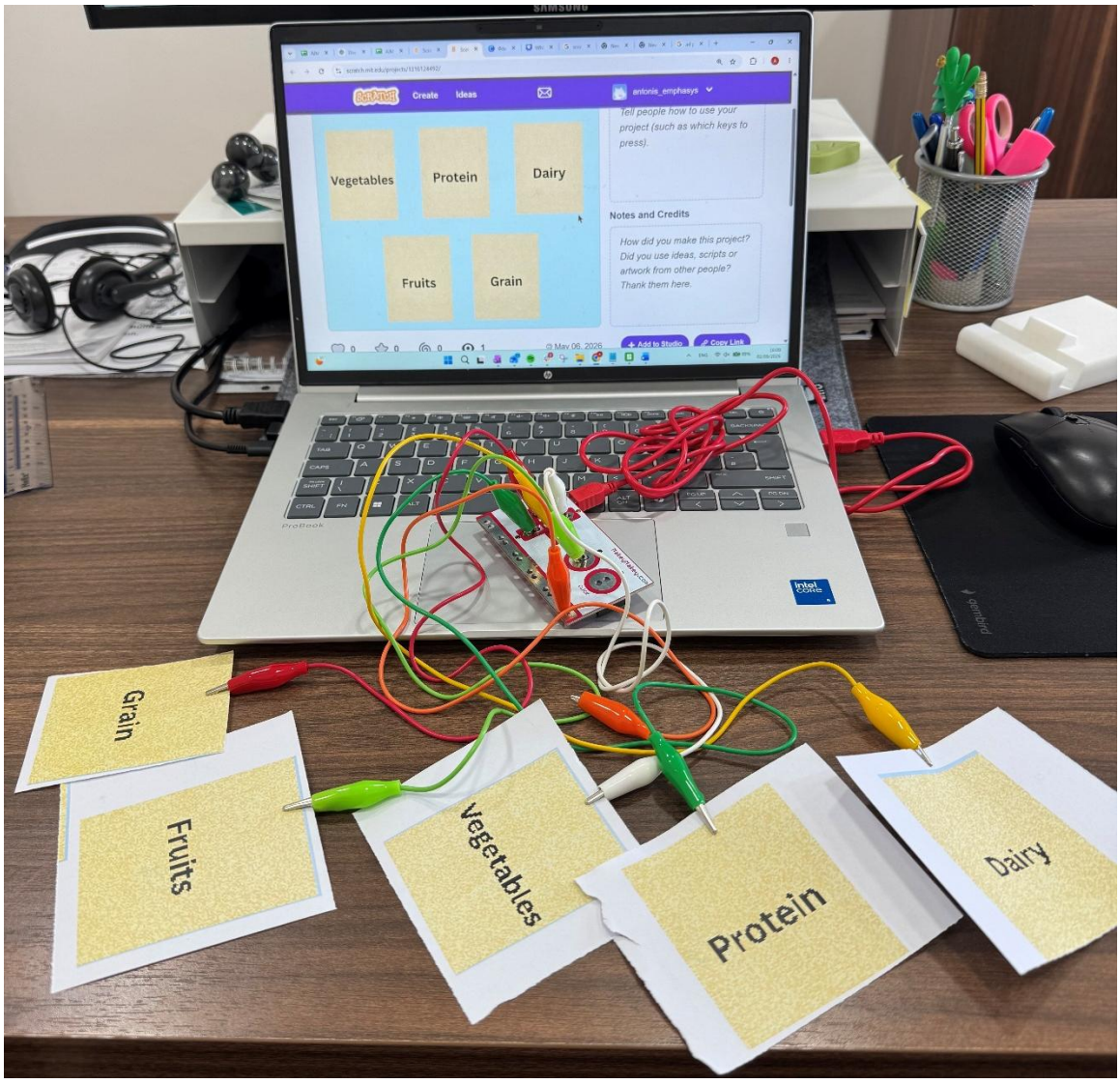
5. Continue until all five food groups have been explored.

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.
- Explain that each screen stays for a short time and then the cards come back.
- After the game, ask the student to name one food from each group to check understanding.



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