Makey- Makey Games

Scenario 4 – 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

Healthy Heroes is a simple, hands-on game that introduces students aged 8–13 with Autism Spectrum Disorder (ASD) to key vitamins and the foods that contain them. Five foods – nuts, milk, carrot, spinach and orange – are connected to a Makey Makey board. When the student touches a food, a sound plays and Scratch shows a short message about the vitamins in that food and how they help the body.

The game is built in Scratch, a free visual block-coding platform, and uses Makey Makey to turn real foods or food cards into touch buttons. No keyboard or mouse skills are needed to play.

1.2 Goal of the Game

The goal is to introduce students to key vitamins and help them understand how different foods provide vitamins that support the body. Using Makey Makey and Scratch, students explore foods, discover their vitamins and learn about their basic health benefits through touch, sound and visual information.

1.3 How the Game Is Played

The start screen shows the five foods and the message “Pick a food to discover its vitamins!”. The student holds or touches the ground (Earth) cable and then touches one of the foods:

Food touched	**Makey Makey input**	**What the message explains**
Nuts	Space	Vitamin E, which helps protect the body’s cells
Milk	Up arrow (↑)	Calcium and vitamin D, which help bones and teeth grow strong
Carrot	Down arrow (↓)	Vitamin A, which helps the eyes see well
Spinach	Right arrow (→)	Iron and vitamins, which help the body stay strong and full of energy
Orange	Left arrow (←)	Vitamin C, which helps the body fight illness

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Each message appears in a speech bubble for about 13 seconds. While a message is showing, the other foods do not react, so the student can read one message at a time. The student can explore the foods in any order and revisit them as often as needed.

1.4 Why This Game Works for Students with ASD

- Real foods or picture cards make the link between food and vitamins concrete.
- Only one message is shown at a time, which keeps the screen calm and easy to follow.
- Each touch gives immediate sound and visual feedback, reinforcing cause and effect.
- Short, simple messages follow the same pattern for every food, which makes them predictable.
- Students can explore at their own pace and repeat any food as often as they like.
- Touching the foods supports sensory exploration, fine motor skills and hand–eye coordination.

1.5 Learning Outcomes

- Students develop a basic understanding of key vitamins (A, C, D and E) and their role in the body.
- Students learn to connect different foods with the vitamins they provide.
- Students strengthen food recognition through interaction with real foods or food cards.
- Students understand the simple chain food → vitamin → body benefit.
- Students receive immediate visual and sound feedback, supporting an interactive, sensory learning experience.
- The game encourages healthy eating awareness while supporting fine motor skills and hand–eye coordination.

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.

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- 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/1315260848/

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. Add a calm backdrop with the text “Pick a food to discover its vitamins!”.
3. Add one sprite for each food: nuts, milk, carrot, spinach and orange. Place them around the text.
4. In the Sounds tab of each sprite, record or upload a short sound or spoken message (for example, a sound called “Spinach”).
5. In the Variables category, click “Make a Variable” and create a variable called “flag”, for all sprites. This variable makes sure only one message is shown at a time.

2.3 Get Ready at the Start

Add this script to one sprite (or to the Stage), so the game is ready to accept a touch:

- **Events:** “when green flag clicked”
- **Variables:** “set [flag] to 1”

2.4 Show the Vitamin Message When a Food Is Touched

Select the Spinach 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 food can react now)
- Inside “if”: **Sound:** “start sound [Spinach]”
- Inside “if”: **Looks:** “say [Well done, you chose the spinach! …] for 13 seconds”
- Inside “if”: **Variables:** “change [flag] by 1” (the next food can now be touched)

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

Sprite	**Key**	**Example message**
Nuts	space	Well done, you chose the nuts! Nuts are rich in vitamin E, which helps protect your body’s cells.
Milk	up arrow	Well done, you chose the milk! Milk is rich in calcium and vitamin D, which help your bones and teeth grow strong.
Carrot	down arrow	Well done, you chose the carrot! Carrots are rich in vitamin A, which helps your eyes see well.
Spinach	right arrow	Well done, you chose the spinach! Spinach is rich in iron and vitamins, which help your body stay strong and full of energy.
Orange	left arrow	Well done, you chose the orange! Oranges are rich in vitamin C, which helps your body fight illness.

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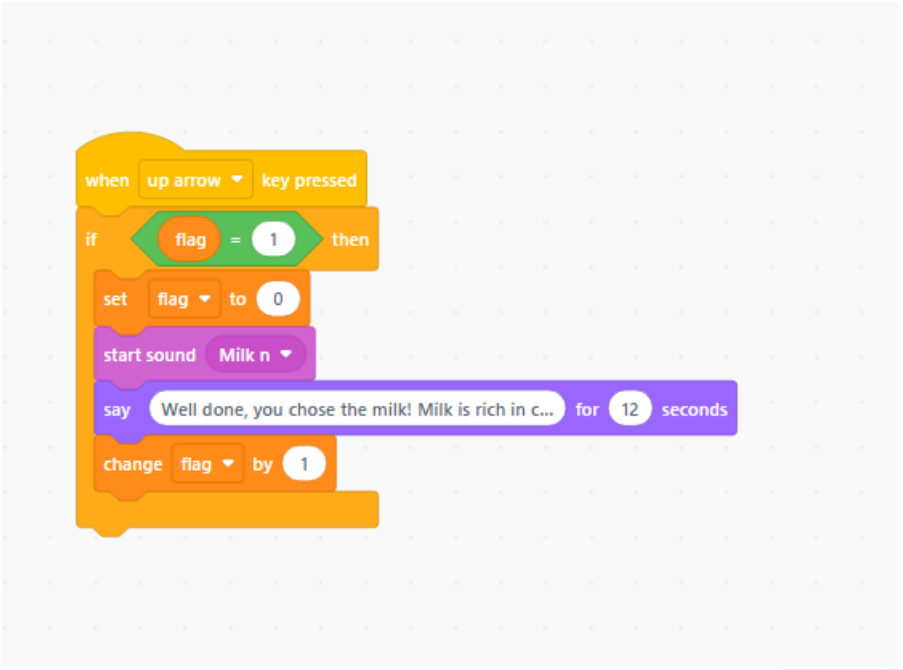
2.5 Test and Save

- Click the green flag. The start screen should appear and “flag” should be 1.
- Press Space and each arrow key on the keyboard. Check that the right sound and message appear.
- While a message is showing, press another key. Check that nothing happens until the message has finished.
- If the “flag” counter distracts the student, untick the box next to “flag” in the Variables category to hide it.
- 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 real foods or printed food cards: nuts, milk, carrot, spinach and orange
- 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**	**Vitamin**
Space	Nuts	Vitamin E
Up arrow (↑)	Milk	Vitamin D (and calcium)
Down arrow (↓)	Carrot	Vitamin A
Right arrow (→)	Spinach	Iron and vitamins
Left arrow (←)	Orange	Vitamin C

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. Read the message “Pick a food to discover its vitamins!” together with the student.
3. Ask the student to hold the ground cable with one hand and touch one food.

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4. Read the message together and wait until it disappears before the student touches the next food.
5. Let the student explore all five foods in any order.

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.
- Set the computer volume to a comfortable level before starting.
- Explain that only one message appears at a time, so the student waits before touching the next food.
- If you use real food, check for allergies first – especially nuts and milk – and use picture cards where needed.

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