Makey- Makey Games

Scenario 4 – 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

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1. About the Game

1.1 Game Overview

Vitamin Power: Food for a Healthy Body is a quiz game for students aged 8–13 with Autism Spectrum Disorder (ASD). The screen shows four foods – banana, carrot, cheese and cookie – and a friendly character asks: “Which of the foods contain Vitamin A?”. The student answers by touching one of four food cards connected to a Makey Makey board.

If the student chooses the carrot, the character confirms the answer and explains how vitamin A helps the body. If the student chooses another food, a gentle message invites them to try again. 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 connect vitamins with the foods that contain them, starting with vitamin A, and to understand how vitamins support the body. Using Makey Makey and Scratch, students answer a simple question by touching a food card and receive immediate feedback.

1.3 How the Game Is Played

The student holds or touches the ground (Earth) cable, reads the question on the screen and touches the food card they think is correct:

Food card	**Makey Makey input**	**Answer**	**Message**
Carrot	Up arrow (↑)	Correct	Yes, well done! Carrots are rich in vitamin A, which helps your eyes see well.
Banana	Down arrow (↓)	Try again	Not this one – try again!
Cheese	Right arrow (→)	Try again	Not this one – try again!

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Food card	Makey Makey input	Answer	Message
Cookie	Left arrow (←)	Try again	Not this one – try again!
Next Backdrop	Space	-	-

The student can keep trying until they find the correct answer.

1.4 Why This Game Works for Students with ASD

- One clear question and four picture choices keep the task simple and focused.
- Every touch gives immediate visual and sound feedback, reinforcing cause and effect.
- A gentle "try again" message avoids a strong sense of failure and encourages another attempt.
- The correct answer is followed by a short explanation, linking the food to a body benefit.
- Familiar foods and colourful pictures make the activity easy to understand.

1.5 Learning Outcomes

- Students learn that carrots are a good source of vitamin A.
- Students understand that vitamin A helps the eyes see well.
- Students strengthen food recognition by comparing four different foods.
- Students develop decision-making skills by choosing an answer and checking the result.
- Students develop cause-and-effect understanding, as each card triggers immediate feedback in Scratch.
- The game encourages healthy eating awareness while supporting attention 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.

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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/1365058830/

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 plain white backdrop.
3. Add one sprite for each food: banana, carrot, cheese and cookie. Place them in the four corners of the stage.
4. Add a friendly character sprite in the middle, with the question “Which of the foods contain Vitamin A?” below it (as text on the backdrop or in a speech bubble).
5. In the Sounds tab of the character, add a short “correct” sound and a gentle “try again” sound.

2.3 Show the Question at the Start

Select the character sprite and add this script:

- **Events:** “when green flag clicked”
- **Looks:** “say [Which of the foods contain Vitamin A?]”

2.4 Give Feedback on the Student’s Answer

In the character sprite, add a script for the correct answer (carrot):

- **Events:** “when [up arrow] key pressed”
- **Sound:** “start sound [correct]”

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- **Looks:** “say [Yes, well done! Carrots are rich in vitamin A, which helps your eyes see well.] for 6 seconds”
- **Looks:** “say [Which of the foods contain Vitamin A?]”
- Then add one script for each wrong answer, changing only the key:
- **Events:** “when [down arrow] key pressed” (then repeat for right arrow and left arrow)
- **Sound:** “start sound [try again]”
- **Looks:** “say [Not this one – try again!] for 3 seconds”
- **Looks:** “say [Which of the foods contain Vitamin A?]”

Food	**Key**	**Message**
Carrot	up arrow	Yes, well done! Carrots are rich in vitamin A, which helps your eyes see well.
Banana	down arrow	Not this one – try again!
Cheese	right arrow	Not this one – try again!
Cookie	left arrow	Not this one – try again!
Next Vitamin	Space	-

To add more questions (for example about vitamin C or calcium), add a new backdrop for each question and change the correct key for that question.

2.5 Test and Save

- Click the green flag. The four foods and the question should appear.
- Press each arrow key on the keyboard. Check that Up (carrot) gives the “correct” feedback and the other keys give “try again”.

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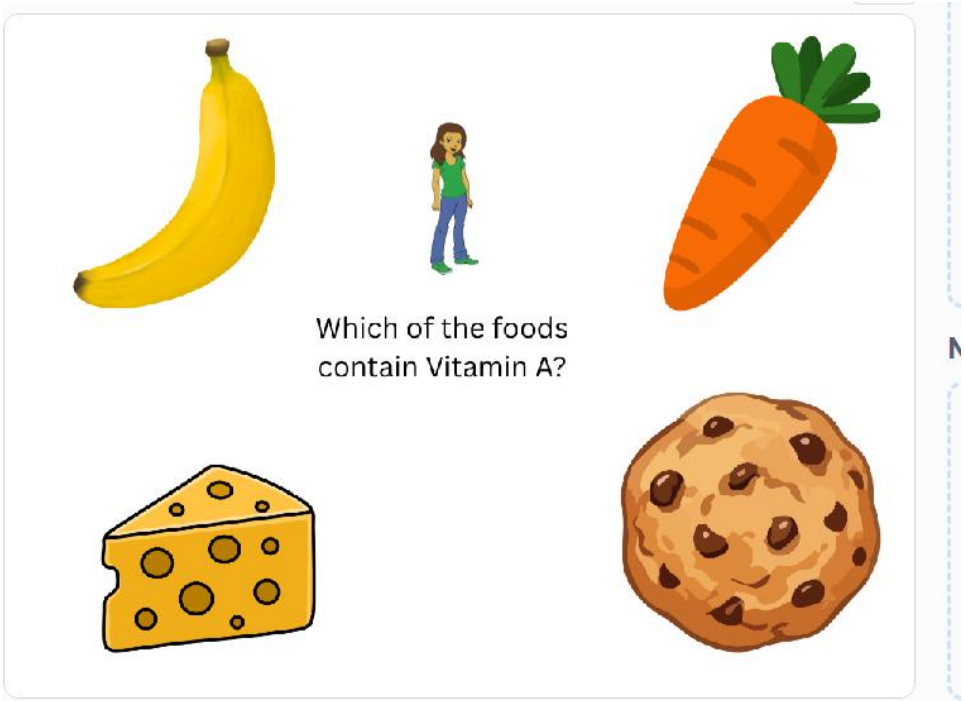
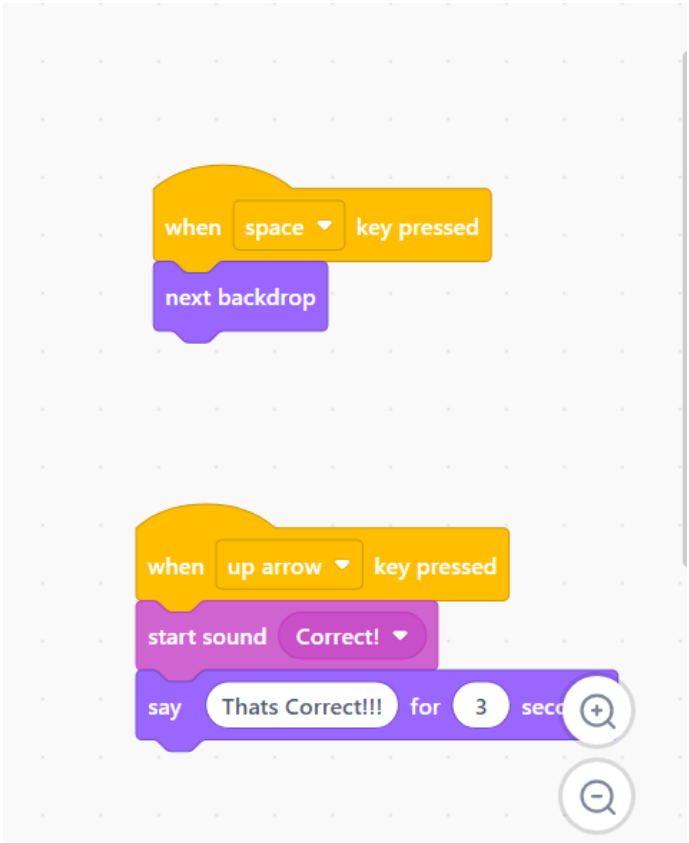
- Save the project (File > Save now) and click “Share” so the link can be opened by others.





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
- Four printed food cards: carrot, banana, cheese and cookie
- 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 food 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 card**
Up arrow (↑)	Carrot
Down arrow (↓)	Banana
Right arrow (→)	Cheese
Left arrow (←)	Cookie
Space	Next Backdrop

3.3 Start the Game

4. Open the Scratch project in the browser and click the green flag. Use full-screen mode to keep the screen simple.
5. Read the question “Which of the foods contain Vitamin A?” together with the student.

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6. Ask the student to hold the ground cable with one hand and touch the food card they think is correct.

7. Read the feedback together. If the answer was wrong, let the student try again.

8. When the student finds the carrot, talk about how vitamin A helps the eyes.

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.
- Place the cards on the table in the same positions as the foods on the screen, so they are easy to match.
- After the game, ask the student to name another food that contains vitamin A (for example, sweet potato or spinach).

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