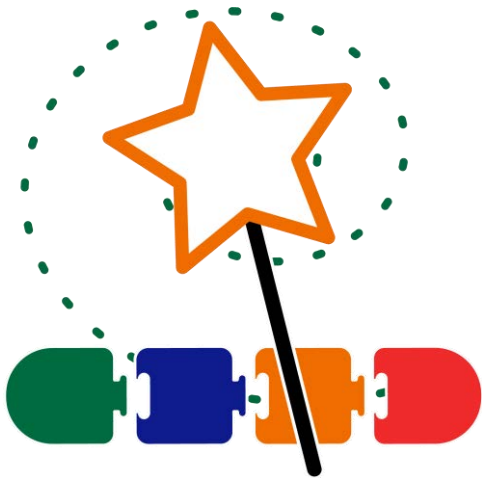


# TECHNO Whiz

## Teacher Guide

Lessons for Primary and Elementary School Students



### Technology Project using Scratch Jr

Become a programming whiz kid. Build animated scenes, collages, and games.

In this project, students jump into the world of coding. They learn how to sequence blocks in Scratch Jr to build simple scripts and loops. Have fun! Design silly scenes, feed a pet monster, explore a magical land, race to the finish line, and more! This fun-filled introduction to programming will spark students' imaginations. Invite curious young minds to become whiz kids!

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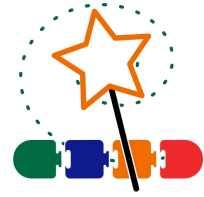
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# TechnoWhiz Overview

## Introduction to TechnoWhiz

In this project, students jump into the world of coding. They learn how to sequence blocks in Scratch Jr to build simple scripts and loops. Have fun! Design silly scenes, feed a pet monster, explore a magical land, race to the finish line, and more! This fun-filled introduction to programming will spark students' imaginations. Invite curious young minds to become whiz kids!



Students complete the following tasks:

- In session 1, students become programming whiz kids. Their first assignment is to sequence a series of tasks to learn about the job of a programmer. Next, they open Scratch Jr to investigate the function of many of the tools. By adding Motion blocks to the programming area, they learn how to code a character's movement. Next, they connect blocks together to form a script that sequences actions. Finally, students cause the script to loop. At the end of the session, they combine their coding skills to create a silly scene. It comes to life by combining a colorful background with moving characters.
- In session 2, the programming whiz kids take the Counting Challenge. They learn to direct how many steps a character moves to reach a goal. To start, they solve puzzles to help the cat eat the cake, the dog catch the ball, and the horse reach the barn. Next, they explore how to edit the Motion coding blocks to set the number of steps. Once they have mastered this skill, students build scripts to help characters get home. Can they do it?
- In session 3, the programming whiz kids design a game. They build code that has a player feed a pet monster. To start, they create an opening sequence to attract attention. It has the character talk, grow, shrink, and blink. The action is controlled using the Wait and Repeat blocks. Afterwards, students apply their knowledge to add food to the stage that when clicked moves to the pet monster and then disappears. What does the pet monster like to eat?
- In session 4, the programming whiz kids design an interactive magical land. The game invites players to explore the place to discover surprises. By clicking on objects, they can cause flowers to grow, a sun to spin, or dragons to hop. The speed of the action is controlled to make it happen slow or fast. What amazing things are hidden in the scene?
- In session 5, the programming whiz kids build a racing game. Players watch the action and then must select the winner. If they pick correctly, the racer will do a celebration dance. Who will reach the finish line first?
- In session 6, the programming whiz kids invite others to play their racing game. Players rate what they liked the most about the activity. Afterwards, the young game designers answer questions about coding the Scratch Jr project.

# Implementation and Technology Integration Ideas

TechnoWhiz develops computational thinking in primary and elementary school students. The programming activities are ideal for Grades 2 and up. Step by step instructions explain how to build animated scenes, interactive collages, and games using Scratch Jr. Have fun! Animate silly scenes, feed a pet monster, design a magical land, or create a race.

## Ideas for Implementation

TechnoWhiz introduces basic programming concepts to beginners. The activities are suitable for any teaching situation. Select the option that works best for you and your students:

- *Coding Unit with Primary Students:* Assignments in Sessions 1-3 in TechnoWhiz are ideal for students new to Scratch Jr. They learn how to design animated scenes and a simple game. The emphasis is on coding basics including how to build scripts, sequence commands, and create simple loops. The activities focus upon intentionally coding characters to move.
- *Coding Unit with Elementary Students:* Once students understand the fundamentals of coding in Sessions 1-3, they extend their learning in Sessions 4-6. The activities are ideal for young programmers that are ready for a challenge. They learn how to direct the timing of events to produce an interactive collage and original racing game.
- *Hour of Code:* If you only have one class to teach coding there are many assignments in TechnoWhiz that can be used for this purpose. If your students are beginners, they can develop simple animations. Assignment 3 targets how to build a looping script, Assignment 7 explores controlling movement, and Assignment 8 focuses upon changing the appearance of a character. If your students have existing knowledge of Scratch Jr, the skill reviews in Sessions 1-5 are excellent challenges.
- *Makerspace Workshop Series:* If you are running a workshop series as part of an after-school program or community event, then you will need to select assignments that fit the number of classes offered. Consider the age range and coding abilities of students. Pick activities they will enjoy. For example, design a treasure hunt, far away planet, or hop to the top race.

## Technology Integration Suggestions

The TechnoWhiz project is primarily a STEM project that teaches coding. However, the activities also integrate into other areas of curriculum including language arts, mathematics, social studies, and visual arts.

- *Language Arts:* Include TechnoWhiz as a language arts unit. The coding activities are a form of visual storytelling. Apply story writing elements such as characters, setting, and plot to produce animated scenes and games. In addition, strengthen communication skills by having students reflect upon their programming decisions.
- *Mathematics:* Integrate TechnoWhiz into an existing problem-solving unit in Math class. The assignments are an ideal fit because coding requires mathematical and logical thinking. As well, the activities develop critical thinking skills by having students systematically plan, design, code, and test their projects.

- *Social Studies*: Transfer map making skills to a new task. The assignments in Session 2 have students apply knowledge of directions (left, right, up, and down) to move a character from one location to another.
- *Visual Arts*: Introduce digital paint tools. The Session 4 and 5 extension activities explain how to create original characters and backgrounds. This is a great way to express creativity.



## Assignment 4 Get Moving

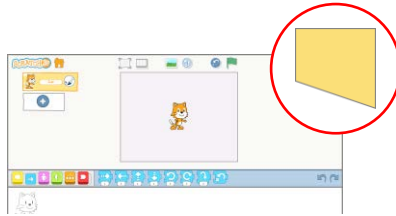
You are a programming whiz kid! Use your skills to make characters move around the stage to create a silly picture.

Open a New Project in Scratch Jr and Name It

- ▷ Open a new project in Scratch Jr.



- ▷ Click *Project Information*.



- ▷ Type Student loop. Click .

Add a Background

- ▷ Click *Change Background*.



- ▷ Double click on a background you like.



Drag down to see more backgrounds.

Delete the Cat Character

- ▷ Click and hold the character.

- ▷ Press *Delete*. 

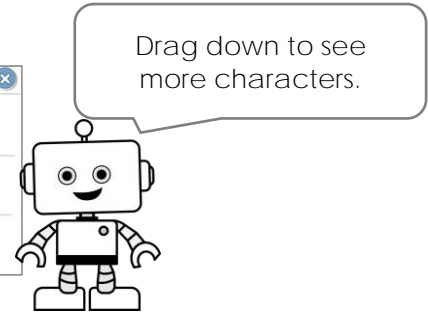
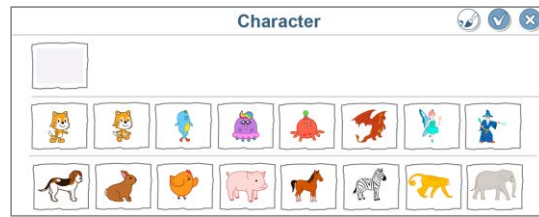


### Add a New Character

▷ Click *New Character*.



▷ Double click on a character you like.

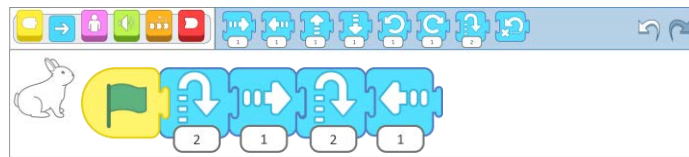


▷ Drag it to place the character on the stage.

### Build a Script that Loops

▷ Click *Triggering*.  Add *Start on Green Flag*. 

▷ Make the character move. Click *Motion*.  Use your skills to make a script.



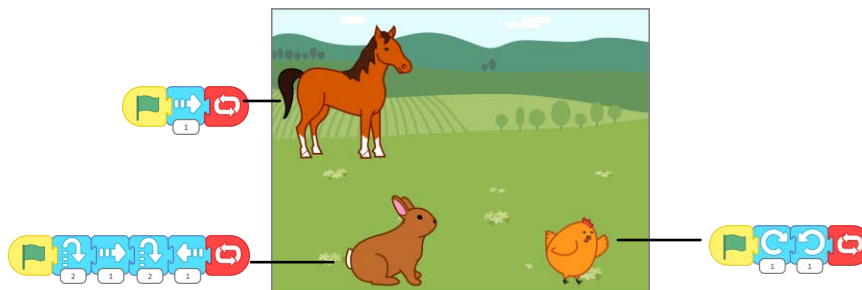
▷ Loop the script. Click *End*.  Add *Repeat Forever* .



▷ Click *Green Flag*  to see the character move.

### Make a Moving Picture

▷ Add more characters. Make each one move. Be creative!



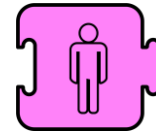
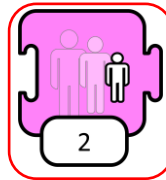
### Close Scratch Jr

## Session 2 Review: Pick the Correct Code

What Block Will Do the Job?

Circle the correct block.

1. Make a character small.



2. Make a character big.

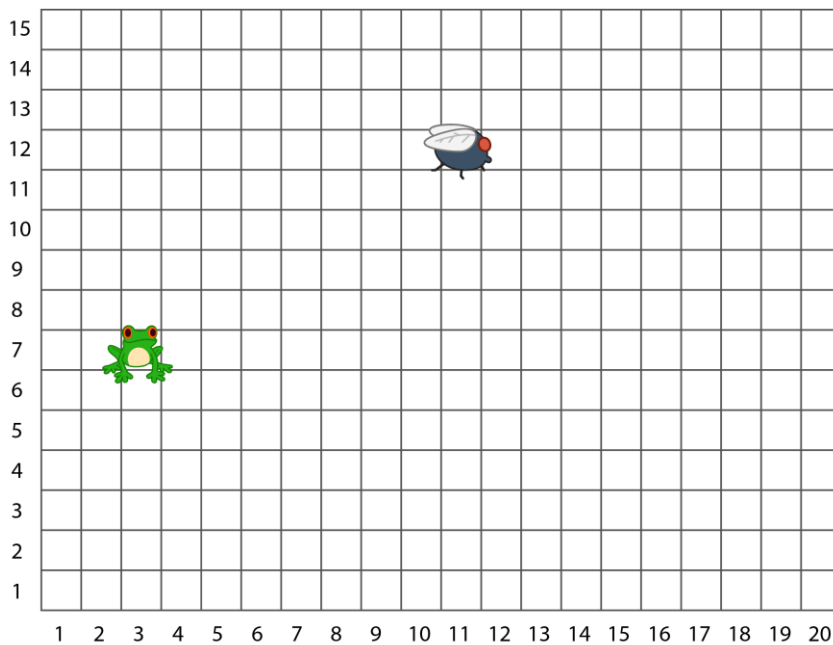


3. Change the background.



What Script Will Work?

4. Circle the script that will move the frog to catch the fly.



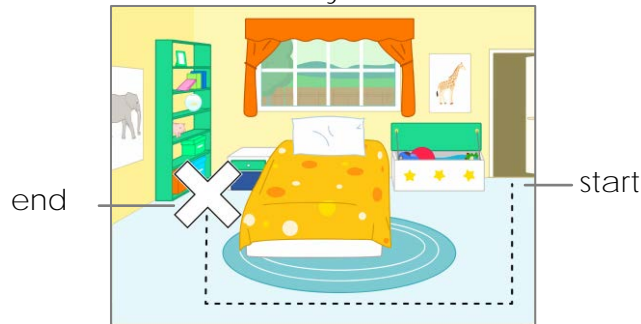
## Session 2 Skill Review: X Marks the Spot

Use your skills to move a character to a special spot.

Plan what happens!

- Where do you want the character to start?
- Where do you want the character to end?
- Why are they going there?

IDEA: Get the toy from the shelf.



Use this idea or come up with your own.

1. Open a new project in Scratch Jr. 

2. Click *Project Information*. 

3. Type student count. Click 

4. Click *Change Background*. 

5. Pick a background. Here are some ideas:



go to bench



go to chair



go to spotlight



go to shelf



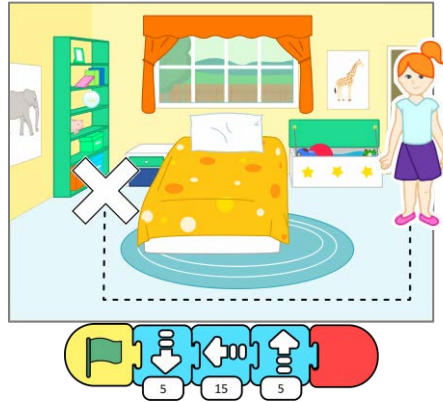
go to house


6. Delete the Cat. 


7. Use your skills to add a character. 

8. Click *Grid*. 

9. Make a script that moves the character from the start to the end. For example:

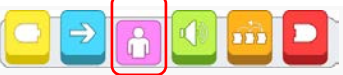



10. Test it! Run the program. 

11. Stop the program.  Edit it.


### CODING CHALLENGE


Have your character say what they are doing.

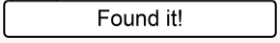
Click *Looks*. 

Add a *Say* block. 

Type what is happening.



At the end of the script add another *Say* block. 



12. Share your work. Tell someone about your program.

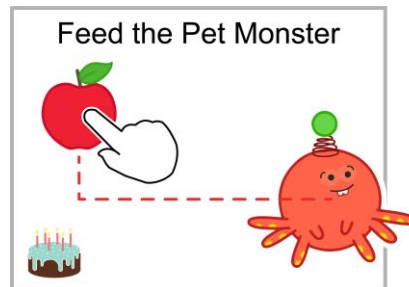
13. Close Scratch Jr.

## Assignment 9 Design a Pet Monster Game

Make a game for your friends to play.

What does your monster eat?

You will add food to the stage. When a player clicks on the food it will move to the pet monster. The food will then hide to make it look like the monster ate it.





About the Start on Tap Block



To make the game you will use the *Start on Tap* block. A person must click or tap the item on the stage. This makes the script run to move the food.

Open the Saved Pet Monster Project

- ▷ Open Scratch Jr. 
- ▷ Click *Home*. 
- ▷ In the *My Projects* list find Student pet. Click it.



Add a Title for the Game

- ▷ Click *Add Text*. 
- ▷ Type a title such as Feed My Pet Monster. Or, come up with your own idea!



## Format the Title

▷ Click *Font Size*. 

▷ Pick a size. 



▷ Click *Font Color*. 

▷ Pick a color. 



▷ Click on the stage to close the text box.

▷ Click the title and drag it on the stage to move it.

**Feed My Pet Monster**

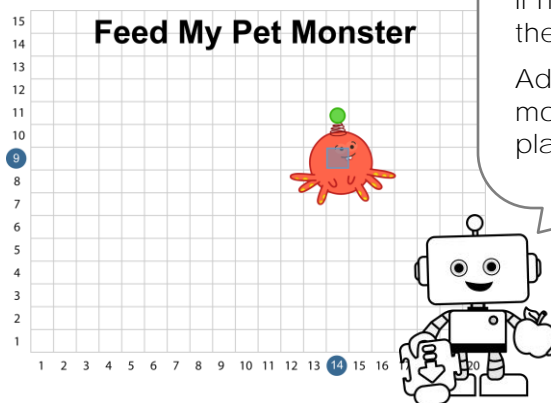


## Play the Start of the Game to See Where the Food Needs to Go

▷ Turn on the grid. 

▷ Click *Green Flag*  to run the monster's script.

– Where is the monster? This is where the food must go.




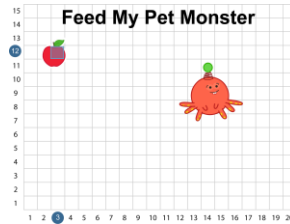
Is the pet monster in a good spot?  
If not, do not drag it on the stage.



Add Motion blocks to move it to a different place on the stage.

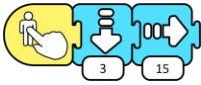
## Feed the Pet Monster

▷ Click *New Character*. 

▷ Pick an item the monster will eat.  Place it on the stage.

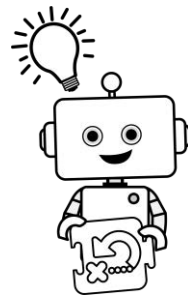


▷ Click *Triggering*.  Add *Start on Tap*.   
Build a script to have it move to the monster.



▷ Click the food to test it. Did it go to the monster?

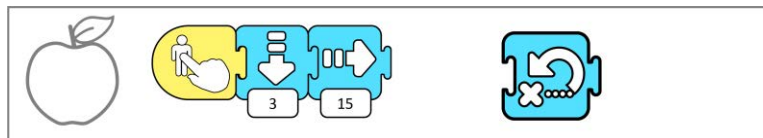
## Edit the Number of Steps to Move the Food



To fix the script the food needs to return to its starting point.

▷ Click *Motion*.  Drag *Go Home*  into the programming area.

▷ DO NOT connect it to the script.



▷ Press *Go Home*  to have the food return to its start point.

▷ Edit the number of steps. 

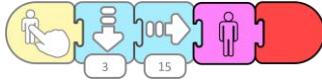
▷ Click the food to test it. Did it go to the monster?



## Hide the Food to Make It Look Like the Pet Monster Ate It



▷ Click *Looks*.  Add a *Hide* block. 

▷ Click *End*.  Add an *End* block. 

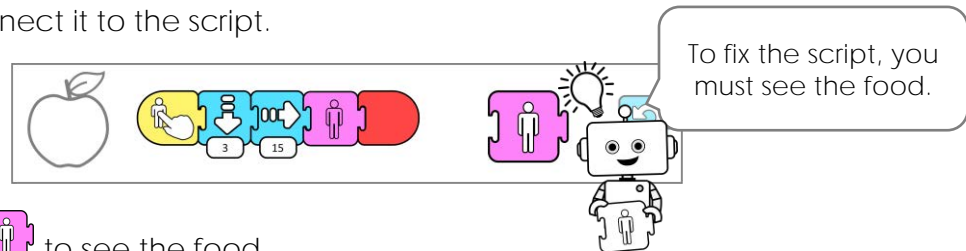



▷ Click the food to test it. Does it look like the monster is eating the food?

## Do You Need to Make More Changes to the Script?

▷ Click *Looks*.  Drag *Show*  into the programming area.

▷ DO NOT connect it to the script.






▷ Press *Show*  to see the food.

▷ Edit the script.




▷ Click the food to test it. Does it look like the monster ate it?

## Be a Game Designer

▷ Use your skills to make the game fun to play. Pick from the ideas:

- Have the monster say *Feed me!* 
- Add instructions that tell how to play the game. 
- Add more food items. 

▷ Play the game:

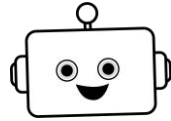
- Click *Presentation Mode* .
- Click *Green Flag*  to run the game. Feed the pet monster.
- When done, click .

## Close Scratch Jr

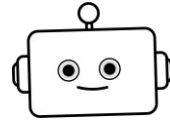
## Session 6 Extension Activity: I am a Programmer

Answer the questions about the TechnoWhiz project.

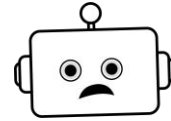
1. How much did you learn about coding?



lots

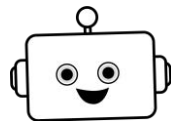


some

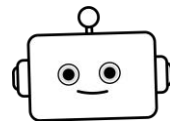


not much

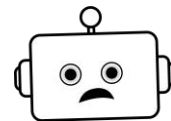
2. What do you think about Scratch Jr?



love it



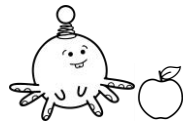
like it



dislike it

Why?

3. What game did you like to make the most?



feed pet monster



magic land

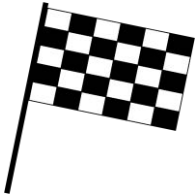










race

Why?

4. What one tip would you give to someone new to using Scratch Jr?

# Racing Game Marking Sheet

		Excellent Work!	Doing Great!	Keep Trying!
	<p>The Race:</p> <p>The game has a title.</p> <p>The game has three racers that move at different speeds.</p> <p>The background has a start and end point for the race.</p>			
	<p>Game Play:</p> <p>The instructions tell the player how to play the game.</p> <p>The racer that won does a happy dance when clicked by the player.</p> <p>The racers that lost tell the player to <i>try again</i> when clicked.</p>			
	<p>Creativity:</p> <p>The race idea is original.</p> <p>The racers suit the type of race.</p> <p>The game is fun to play.</p> <p>The happy dance is creative.</p>	