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TECHNOTales

Teacher Guide

Lessons for Elementary School Students

Technology Course
using
ScratchJr

Create a tale using coding techniques.

In this course, students make a modern fairy tale. Using ScratchJr, they will combine coding blocks to form scripts that animate the story action. The tale will be about a character that overcomes a problem by going on a quest. To live happily ever after, they must find a hidden item and locate someone that can help. What will happen in the "Once Upon a Time" adventure?

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Table of Contents

Introduction

Introduction i
How to Use This Guide ii
TechnoTales Overview iii
Technology Integration Ideas iv

Session 1 Get to Know Scratch Jr

Session 1 Get to Know ScratchJr 1
Session 1 Getting Started 2
Assignment 1 Coding and Storytelling 8
What Is Coding? 8
Programs and Storytelling 9
Pick the Script that Will Tell the Story 9
Assignment 2 Explore the ScratchJr Window 10
Open a New Project in ScratchJr 10
Label the Parts of the ScratchJr Window 10
Close ScratchJr 10
Assignment 3 Discover ScratchJr Coding Blocks 11
Open ScratchJr 11
Add a Block to the Programming Area 11
Join Blocks to Build a Script 11
Watch the Script Play 12
Add a New Character 12
Build a Script 12
Close ScratchJr 12
Assignment 4 Tell a Story Using Coding Blocks 13
Open ScratchJr 13
Pick the Characters and Background 13
Build the Script 13
Close ScratchJr 13
Session 1 Review: Storytelling with ScratchJr 14
Session 1 Skill Review: The Tale of the Sad Fairy 15
Session 1 Extension Activity: Record a Sound 17

Session 2 Once Upon a Time

Session 2 Once Upon a Time 18
Session 2 Getting Started 19
Assignment 5 View a Techno Tale 25
Assignment 6 Plan Your Story 26
TechnoTale Story Ideas 27
Assignment 7 Set the Scene 28
Open a New Project in ScratchJr and Name It 28
Add a Background 28
Add a Title for the Story 29
Describe the Problem in the Story 29
Close ScratchJr 29
Assignment 8 What Is the Problem? 30
Open the Tale Project in ScratchJr 30
Add the Bad Guy Character 30
Change the Size of the Character 30
Delete Coding Blocks 31
Move a Character to Show the Problem in the Story 31
Close ScratchJr 31

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Assignment 9 Who Is the Hero? 32
Open the Tale Project in ScratchJr 32
Add the Good Guy Character 32
What Does the Good Guy Say? 32
How Does the Character React to the Problem? 33
View the Story in Full Screen 33
Close ScratchJr 33
Session 2 Review: ScratchJr Tools and Scripts 34
Session 2 Skill Review: The Tale of the Runaway Horse 35
Session 2 Extension Activity: How to Design a Character 37

Session 3 Embark on a Quest

Session 3 Embark on a Quest 39
Session 3 Getting Started 40
Assignment 10 Help the Hero 46
Open the Tale Project in ScratchJr 46
Insert a New Page 46
Add a Background 47
Describe How the Special Item Will Help 47
Add Instructions for the Reader 47
Close ScratchJr 47
Assignment 11 Hide the Special Item 48
Open the Tale Project in ScratchJr and View Page 2 48
Add the Special Item 48
Say Found It 49
Add an Object to Hide the Item 49
Find the Item 49
Close ScratchJr 49
Assignment 12 Animate Objects on the Story Page 50
Open the Tale Project in ScratchJr and View Page 2 50
Add an Object and Build a Script 50
Be Creative 51
Turn the Pages to View the Story 51
Close ScratchJr 51
Session 3 Review: About Wait and Repeat 52
Session 3 Skill Review: The Quest for the Fallen Star 53
Session 3 Extension Activity: Set the Speed 55

Session 4 Seek Help

Session 4 Seek Help 56
Session 4 Getting Started 57
Assignment 13 Count the Steps to Move a Character 62
Count the Steps 62
Assignment 14 Ask for Help 63
Open the Tale Project in ScratchJr 63
Insert a New Page 63
Add a Background 64
Describe How the Helper Will Solve the Problem 64
Close ScratchJr 64
Assignment 15 Bump to Trigger an Action 65
Open the Tale in ScratchJr and Turn on the Grid 65
Add the Characters 66
Ask for Help 66
When Bumped Go to the Bad Guy 66
When Bumped Show the Problem is Solved 67
Turn the Pages to View the Story 67
Close ScratchJr 67

Session 4 Review: About If-Then Logic....68
Session 4 Skill Review: Under Attack....70
Session 4 Extension Activity: Explore the Kingdom....72
Session 4 Extension Activity: Design Your Own Quest....73

Session 5 Happily Ever After

Session 5 Happily Ever After....74
Session 5 Getting Started....75
Assignment 16 What Happens Next?....79
Complete the Script....79
Assignment 17 Celebrate a Happy Ending....80
Open the Tale Project in ScratchJr and Insert a New Page....80
Use Your Skills to Describe the Story Action....80
Close ScratchJr....80
Assignment 18 Trigger Events Using Messages....81
Open the Tale Project in ScratchJr and Insert the Characters....81
Send a Message from the Good Guy to the Helper....81
Have the Helper Open a Message and Reply to the Good Guy....82
Cause a Character to Open a Message and Celebrate....82
Turn the Pages to View the Story....82
Close ScratchJr....82
Session 5 Review: About Messages....83
Session 5 Skill Review: Make Them Laugh....84
Session 5 Extension Activity: Animate with Coded Messages....86

Session 6 Story Time

Session 6 Story Time....87
Session 6 Getting Started....88
Assignment 19 Edit the Techno Tale....90
Assignment 20 Share the Techno Tale....91
Invite a Friend to Watch Your Story....91
You Are a Great Storyteller....91
Close ScratchJr....91
Assignment 21 I am a Coder....92
Session 6 Extension Activity: Connect the Pages....93

Appendices

Appendices....94
Appendix A: Assessment Tools....95
TechnoTales Skill Summary....95
Tales Marking Sheet....97
Appendix B: Glossary....98
Appendix C: Contact Information....99

Introduction

This section provides valuable information about teaching TechnoTales. It includes a description of the Teacher Guide, as well as an overview of the course. In addition, there are ideas for implementation and technology integration.

For additional guidance, open the course in TechnoHub and select Get Started to access preparatory steps, resource list, and scheduling timetable.

How to Use this Guide

Course Overview

Implementation and Technology Integration Ideas

How to Use This Guide

This Teacher Guide contains the following:

Getting Started – This section contains a course description, as well as ideas for implementation.

Course Instructions – The course is comprised of six sessions, each focused on a problem-solving task that aligns with the project theme. Each session includes assignments that break down the task into manageable steps. The components of each session are as follows:

- Overview – An explanation of the session activities and their purpose.
- Materials – A list of handouts, sample files, templates, and teacher resource materials needed to teach the session.
- Teaching Strategies – Instructional methods recommended for teaching the activities.
- Lesson Plan – A detailed list of each step in the session.
- Learning Objectives – A summary of the content knowledge and technical skills taught throughout the session.
- Assignments – A session consists of assignments completed by students. Actions to be performed on the computer by the student are indicated with a triangle (▷). Background information is indicated with a dash (–).
- Review – A session review contains a list of fill-in-the-blank, multiple choice, or short-answer questions intended to review ScratchJr tools and programming knowledge (answers included).
- Skill Review – An additional assignment intended to review coding skills (includes completed sample).
- Extension Activity – An additional activity that relates to the problem-solving task presented in the session.

Appendices – this section contains additional information or materials including the following resources.

- Assessment Tools – Skill summary and marking sheet to evaluate coding skills and the final ScratchJr project.
- Glossary – A definition of each term.
- Contact Information – How to contact TechnoKids Inc. for curriculum support.

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TechnoTales Overview

Introduction to TechnoTales

In this course, students make a modern fairy tale. Using ScratchJr, they will combine coding blocks to form scripts that animate the story action. The tale will be about a character that overcomes a problem by going on a quest. To live happily ever after, they must find a hidden item and locate someone that can help. What will happen in the "Once Upon a Time" adventure?

Students complete the following tasks:

- In session 1, students are introduced to programming with ScratchJr. To start, they explore the program window to learn about commonly used tools. Afterwards, they investigate the Triggering, Motion, Looks, Sound, Control, and End blocks to discover their function. Once familiar with the coding blocks they build simple scripts to create an animated scene.
- In session 2, students begin to create their *Techno Tale*. Their modern fairy tale will be told by building scripts using coding blocks in ScratchJr. To gain inspiration they watch an example story and answer questions about the setting, characters, and plot. Next, they complete a planning sheet to organize their ideas. Students then design their first story page. It introduces the problem and shows the hero embarking on a quest to find a solution. Motion and Looks blocks are used to animate the action.
- In session 3, students design another page in their *Techno Tale*. In this part of the story, the hero embarks on a quest. They travel in search of a special item. The reader will join in the hunt by tapping objects on the page. When the correct location is found, the item will reveal itself. Wait and Repeat blocks are used to control the timing of each action.
- In session 4, students create the third page in their *Techno Tale*. In this part of the story, the hero seeks help. If-then logic is used to control the animation. Scripts start only when characters bump into one another. This produces a fun sequence of events. First the hero asks for help. Then the helper goes after the villain. Finally, the bad guy does an action to show the problem is solved. To create this story page, students learn how to display the grid and count steps to direct movement.
- In session 5, students animate their final page in their Techno Tale. At the ending of the tale the characters live happily ever after. Broadcasting is used to organize the timing of events. This form of conditional logic directs scripts to start only when a message is received. It is used to trigger characters to do an action to celebrate the problem being solved.
- In session 6, students share their Techno Tale. To prepare the project for viewers, a checklist is used to guide revisions. The story is then shown to friends and family. At the end of TechnoTales, the young coders reflect upon the learning experience.

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Technology Integration Ideas

TechnoTales blends creative writing with coding skills. The activities develop an understanding of programming concepts using a scenario that is fun for children. Your students will enjoy building a modern fairy tale. There are several ways to integrate TechnoTales into curriculum. Below are some suggestions:

- *STEM Project*: Use the activities in TechnoTales to introduce programming to beginners. They learn how to divide a task into steps, sequence instructions, and debug code. In addition, they become aware of how conditional logic can be used to trigger actions. TechnoTales provides a solid foundation for mastering Scratch or other text-based programming languages in the future.
- *Creative Writing Unit*: Include TechnoTales as a language arts unit. The coding activities are a form of visual storytelling and follow the stages of the writing process. To begin, students plan their tale. They select story elements including characters, setting, and plot. Next, they design pages that explain the events. Scripts are built to animate the action. Students use a checklist to review their tale and make revisions. Upon completion, their story is shared with an audience.
- *Mathematics Problem Solving Unit*
  Integrate TechnoTales into Math class. To construct a digital story using code is an ideal problem-solving task. Students must determine how to design a set of instructions that will animate story events. Instantly they can see the results of their solution. This allows them to continue to improve their scripts. Coding a modern fairy tale is a meaningful way to apply computational thinking and logical reasoning.
- *Social Studies Assignments*: TechnoTales includes map making activities that develop spatial thinking. In Session 4 students transform the ScratchJr stage into a grid. They map how to move a character to an exact location. In addition, several extension activities include off-line coding activities that have players provide directions to get from one destination to another.
- *Visual Arts Workshop*: Teach the Session 2 extension activity to explore digital paint tools. Students explore how to create original characters using the ScratchJr Paint Editor tools. They can also edit a character and use a camera to insert their own face. This is a great way to express creativity.

Understand the Big Picture

Not sure where to integrate TechnoTales? There are three samples provided for this course. The first sample is a typical fairy tale about a princess saving the kingdom from a dragon. The second sample is about a boy who must find a way to get a hungry polar bear away from his home; and the third is about jungle animals building friendships. View the examples to determine how these activities can be incorporated into your curriculum.

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SAMPLE

Session 2
Once Upon a Time

In this session, students begin to create their *Techno Tale*. Their modern fairy tale will be told by building scripts using coding blocks in ScratchJr. To gain inspiration they watch an example story and answer questions about the setting, characters, and plot. Next, they complete a planning sheet to organize their ideas. Students then design their first story page. It introduces the problem and shows the hero embarking on a quest to find a solution. Motion and Looks blocks are used to animate the action.

Assignment 5: View a Techno Tale

Assignment 6: Plan Your Story

Assignment 7: Set the Scene

Assignment 8: What Is the Problem?

Assignment 9: Who Is the Hero?

Session 2 Review: ScratchJr Tools and Scripts

Session 2 Skill Review: The Tale of the Runaway Horse

Session 2 Extension Activity: How to Design a Character

Session 2 Getting Started

Overview

In this session, students begin to create their *Techno Tale*. Their modern fairy tale will be told by building scripts using coding blocks in ScratchJr. To gain inspiration they watch an example story and answer questions about the setting, characters, and plot. Next, they complete a planning sheet to organize their ideas. Students then design their first story page. It introduces the problem and shows the hero embarking on a quest to find a solution. Motion and Looks blocks are used to animate the action.

Materials

- ScratchJr
- Assignment 6 worksheet
- ScratchJr Flashcards: (optional)
  - ScratchJr Coding Blocks
  - Interface, Block Categories, Triggering Blocks, Motion Blocks, Looks Blocks, Sound Blocks, End Blocks, Paint Editor
- Sample files:
  - Tale 1 video
- Session 2 Review: ScratchJr Tools and Scripts
- Session 2 Skill Review: The Tale of the Runaway Horse
  - horse video
- Session 2 Extension Activity: How to Design a Character

Teacher Preparation

(Refer to the Preparing to Teach section of this guide for instructions)

- Make the files in the Tales folder available to students.
- View the *Tale 1 video* to gain an understanding of the completed project.
- Gather flashcards to introduce and/or review programming blocks and ScratchJr tools. (optional)

Teaching Strategy

In this session, students plan and organize their ideas. Afterwards, they create the first story page. It will include a title, description, and background. Coding will be used to animate the villain and hero to show what is happening in the beginning. Explain scenario:

> *In this session, you begin to tell your modern fairy tale. To spark the imagination, you will view sample stories. Next, you complete a planning sheet to decide upon the characters, setting, and plot. ScratchJr is then used to create the first story page. Motion and Looks blocks are combined into scripts to explain what is happening.*

Assignment 5: View a Techno Tale

In this assignment, students view a sample video of a Techno Tale created using ScratchJr. To recognize the parts of the story, students answer questions about the characters, setting, and plot. Additional videos are available in the *Tales folder*.

The Techno Tale story is about a princess that must stop a dragon from scaring everyone. The quest begins with the search for a rare mushroom. It will be given as a gift to the wizard. When the wizard is given the mushroom, he agrees to scare away the dragon. At the end of the story, everyone lives happily ever after.

Draw students' attention to the coding techniques used on each story page:

Beginning

Once Upon a Time

- Use the Green Flag to play many scripts.
- Animate using Motion and Looks blocks.

Middle

Find a Hidden Item

- Tap an object to trigger an action.
- Pause the action or repeat a sequence.

Get Help

- Bump into an object to trigger an action.
- Count the number of steps usng the grid.

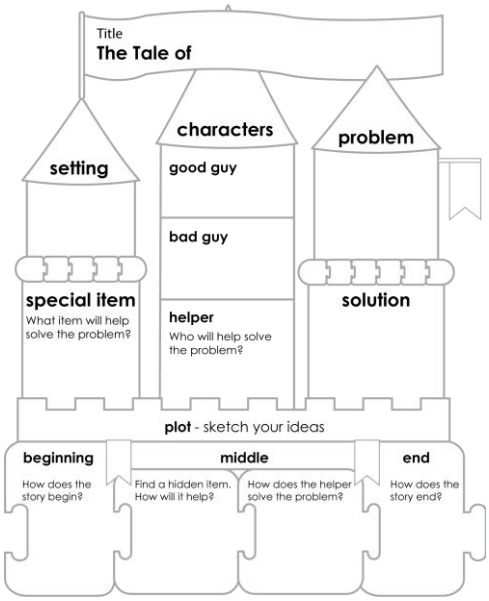
End

Happily Ever After

- Send a message to another character.
- Receive the message to trigger an action.

Assignment 6: Plan Your Story

In this assignment, students use a planning sheet to organize their ideas. They must select a title, setting, characters (good guy, bad guy, and helper), special item, problem, and solution.



Story Planning Tips:

- Watch other Techno Tale sample videos to see the variety of stories that can be told.
- Plan a story together to guide students through the organization of ideas.
- View the ScratchJr background and character libraries to recognize the possibilities.
- Use the idea worksheet to help develop a plan
- Complete the Session 2 Extension Activity to edit or paint a character to use in the story.

TIP: Have a look at the available characters and backgrounds to help you choose a story line.

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Assignment 7: Set the Scene

In this assignment, students introduce their story to readers. They add a background to illustrate the setting. As well, they type a title and a few sentences to describe the problem.

Introduce the following ScratchJr tools:

Project Information: Name a project.

Add Text: Type a title and sentences on the story page.

Font Size: Pick a size for the text.

Font Color: Pick a color for the text.

Assignment 8: What Is the Problem?

In this assignment, students animate the problem in the story. To start, they learn how to size a character using coding blocks as buttons. Afterwards, they use Motion blocks to move the villain or "bad guy" on the story page. Demonstrate how to change the number of steps in a block.

Introduce the following ScratchJr Looks blocks. They will be used as buttons:

Grow: Increase the size of a character.

Shrink: Decrease the size of a character.

Reset Size: Return a character to its original size.

Introduce the following ScratchJr Motion blocks:

Move Right: Step the character to the right.

Move Left: Step the character to the left.

Move Up: Step the character towards the top of the stage.

Move Down: Step the character towards the bottom of the stage.

Turn Right: Rotate the character clockwise.

Turn Left: Rotate the character counterclockwise.

Hop: Move the character up by an amount and then down again.

Go Home: Return the character to its start point.

Introduce the following ScratchJr tool to help student troubleshoot scripts:

Reset Characters: Place characters in their starting positions on the Stage.

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Assignment 9: Who Is the Hero?

In this assignment, students introduce the hero or "good guy". They use the Looks blocks to show how the character reacts to the problem. Upon completion, the story page is viewed as full screen using Presentation Mode.

Introduce the following ScratchJr Looks coding blocks and tools:

Say: Show words in a speech bubble to make a character talk.

Hide: Fade out the character so that it cannot be seen.

Show: Fade in the character so that it is seen.

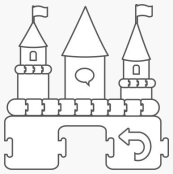
Presentation Mode: Expand the stage to fill the full screen.

Exit Presentation Mode: Close the full screen.

Want to Learn Advanced Animation Techniques?

In the Session 2 Skill Review, *The Tale of the Runaway Horse*, students learn how to:

- move two characters at one time
- change the object order
- make two scripts for one character
- flip a character from left to right
- turn a character all the way around.



Lesson Plan

Assignment 5: View a Techno Tale

- View an example story.
- Answer questions about the characters, setting, and plot.

Assignment 6: Plan Your Story

- Complete the story organizer.
- Use the story ideas to spark creativity. (optional)

Assignment 7: Set the Scene

- Open a new project in ScratchJr.
- Rename the project tale.
- Delete the *Cat* character.
- Insert a background to illustrate the story setting.
- Add a title to the story. Format the size and font color.
- Describe the problem in the story.
- Close ScratchJr.

Assignment 8: What Is the Problem?

- Open the saved *tale* project in ScratchJr.
- Insert the villain or "bad guy" onto the story page.
- Adjust the size of the character using *Grow*, *Shrink*, and *Reset Size* blocks as buttons.
- Delete the coding blocks from the programming area.
- Animate the villain. Build a script using Motion blocks to move the character. Set the number of steps to direct the action.
- Close ScratchJr.

Assignment 9: Who Is the Hero?

- Open the saved *tale* project in ScratchJr.
- Insert the hero or "good guy" onto the story page.
- Build a script to have the hero say I need to get help!
- Animate the hero. Edit the script using Looks blocks to show the character reacting to the problem.
- View the story in *Presentation Mode*.
- Exit *Presentation Mode*.
- Close ScratchJr.

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Learning Objectives

Language Arts Skills

- identify story elements including characters, setting, and plot
- plan a story using an organizer
- title a story to summarize what it is about
- apply writing skills to describe the problem in a story
- illustrate the setting and characters in a story using images from a digital library

Programming Skills

Programming Basics

- add a coding block into the programming area
- use a coding block as an action button
- connect coding blocks together to form a script
- direct how a character moves and looks using coding blocks
- edit a script by adjusting the values of a coding block to achieve a desired outcome

ScratchJr Basics

- open and close a program
- create a new project
- name a project
- run or stop a program
- view a project in Presentation Mode

Working with Text and Backdrops

- add text to the stage
- format the font size and color of the text
- position the text on the stage
- add a backdrop from a library

Trigger a Script

- trigger a script to run when the Green Flag is pressed

Move a Character with Motion Blocks

- move a character left, right, up, or down on the stage
- turn a character clockwise or counterclockwise on the stage
- cause a character to hop up and down on the stage
- return a character to its starting position on the stage
- set the number of steps in a Motion block to control the amount of movement

Set Character Appearance with Looks Blocks

- delete a character from the stage
- add a character from a library
- position the start point of a character on the stage
- set the amount the character grows or shrinks
- reset to return a character to its original size
- make a character talk using a speech bubble
- show or hide a character from view
- insert a photo inside a ScratchJr character's face using the Paint Editor and a digital camera (optional)
- edit a character using the Paint Editor (optional)

Applied Technology

- convert story events into scripts that animate the action in a story

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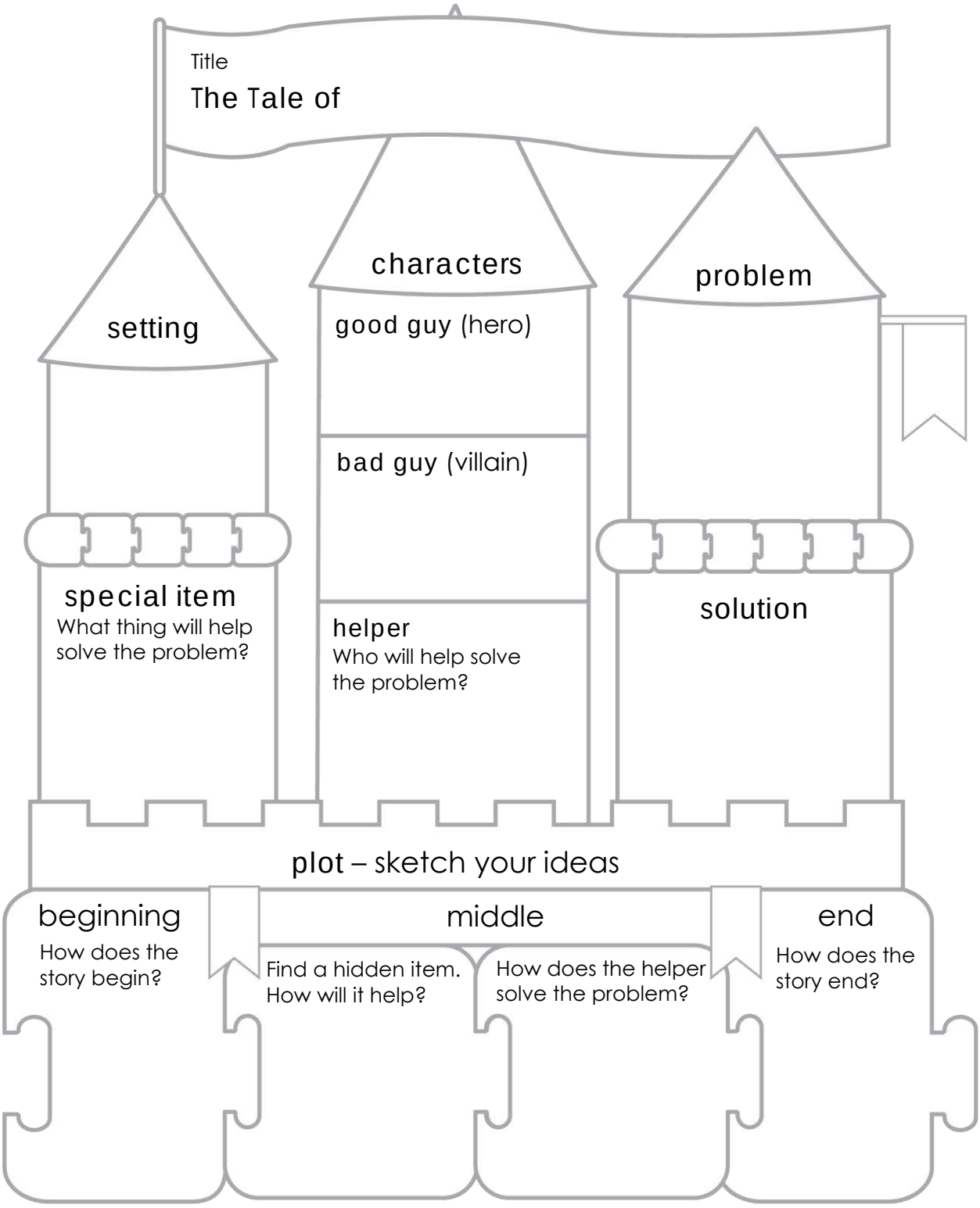
Assignment 6 Plan Your Story

What is your tale going to be about? If you need help read the ideas on the next page.

View the ScratchJr library to pick the setting, characters, item, and plot.



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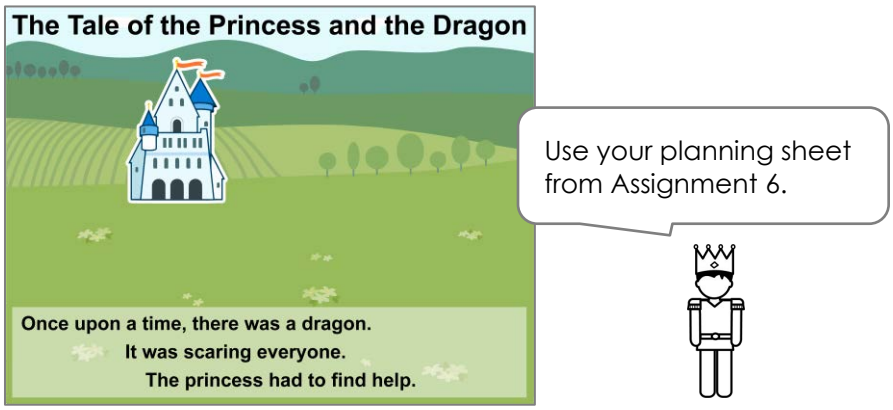
SAMPLE

Assignment 7 Set the Scene

You are ready to make the first page in your story. It will include a background, title, and a sentence that starts, *Once upon a time*….

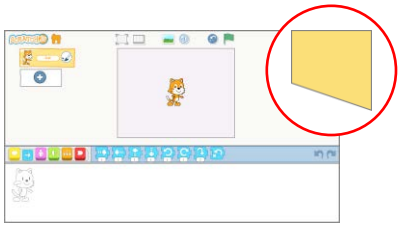


Example Story Page

Open a New Project in ScratchJr and Name It

1. ▷ Open a new project in ScratchJr.

   ▷ Click *Project Information*.



   ▷ Type tale. Click .

Add a Background

2. ▷ Click and hold to select the cat. Delete it .

   ▷ Click *Change Background*.

   ▷ Select a setting for the story. Click .

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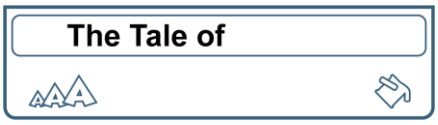
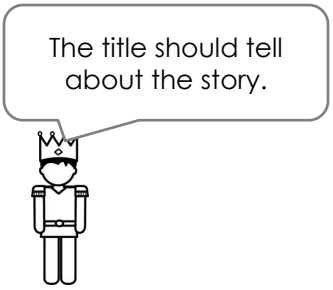
Add a Title for the Story

3. ▷ Click *Add Text*.

   ▷ Type a title such as The Tale of _____.





4. ▷ Click *Font Size*.

   ▷ Pick a size.

   ▷ Click *Font Color*.

   ▷ Pick a color.

5. ▷ Click on the stage to close the text box.

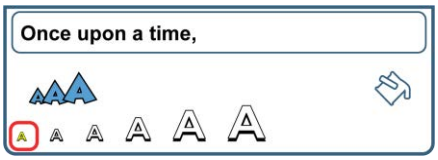
   ▷ Click the title. Drag it on the stage to move it.

Describe the Problem in the Story

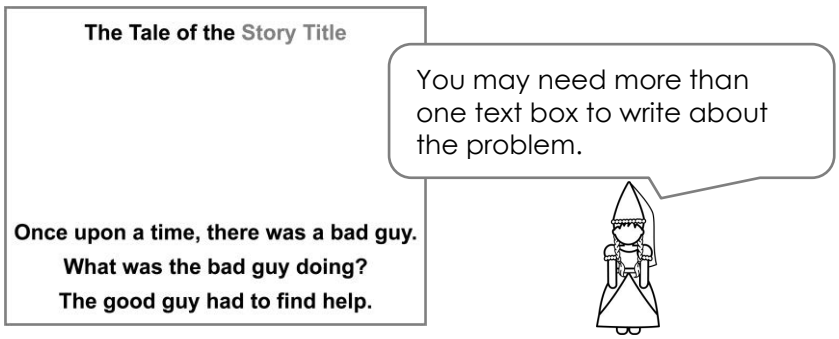
6. ▷ Click *Add Text*.

   ▷ Pick the smallest size.

   ▷ Type Once upon a time, what is the problem?



   ▷ Place the text on the story page.



Close ScratchJr

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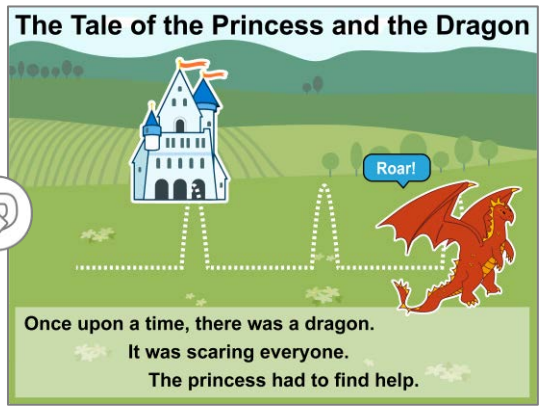
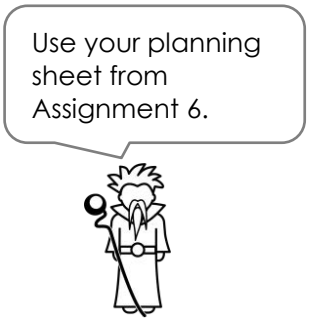
Assignment 8 What Is the Problem?

In this assignment, you add the "bad guy" character to the story page.
You will use Motion blocks to animate the problem.

Example Script



Example Story Page

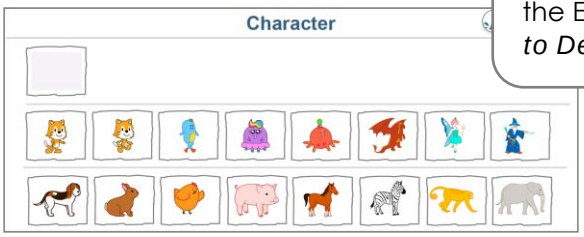


Open the Tale Project in ScratchJr

Add the Bad Guy Character

1. ▷ Click *New Character*.

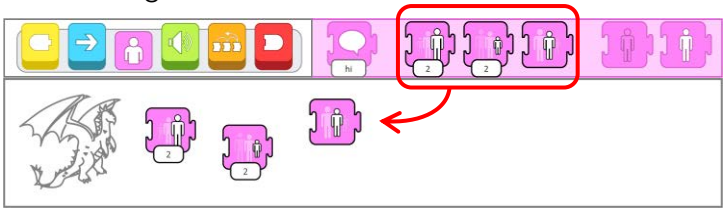
   ▷ Select a character for the ***bad guy***. Click .



Change the Size of the Character

2. ▷ Click *Looks*. Add *Grow* , *Shrink* , and *Reset Size* .

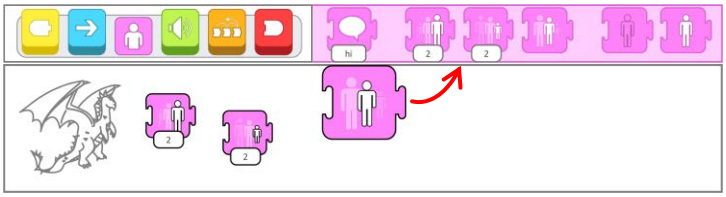
   ▷ Click each block to change the size.



Delete Coding Blocks

3. ▷ Drag a block back into the palette.

   ▷ Repeat for each block.

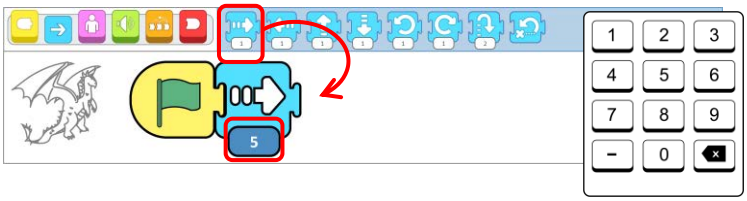


Move a Character to Show the Problem in the Story

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

   ▷ Click *Motion*. Add *Move Right*.

   ▷ Click the number on the block. Use the number pad to set the steps.



   ▷ Build a script using Motion blocks that shows the problem in the story:

move right		turn right	
move left		turn left	
move up		hop	
move down		go home	

   ▷ Play the story.

> Tips:
>
> • Click *Reset Characters* to move the character back to its starting spot.
>
> • Add a *Say* block to the script to make the bad guy talk.
>
> • Add a *Repeat Forever* block to have the action loop and never stop.

Close ScratchJr

This is a preview of the teacher guide.
Pages have been omitted.

SAMPLE

Session 3
Embark on a Quest

In this session, students design another page in their *Techno Tale*. In this part of the story, the hero embarks on a quest. They travel in search of a special item. The reader will join in the hunt by tapping objects on the page. When the correct location is found, the item will reveal itself. Wait and Repeat blocks are used to control the timing of each action.

Assignment 10: Help the Hero

Assignment 11: Hide the Special Item

Assignment 12: Animate Objects on the Story Page

Session 3 Review: About Wait and Repeat

Session 3 Skill Review: The Quest for the Fallen Star

Session 3 Extension Activity: Set the Speed

This is a preview of the teacher guide.
Pages have been omitted.

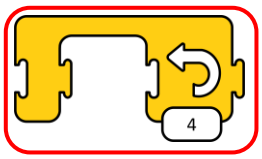
SAMPLE

Session 3 Review: About Wait and Repeat

What Block Will Do the Job?

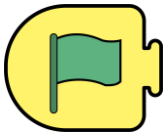
Circle the correct block.

1. Do a set of actions four times.

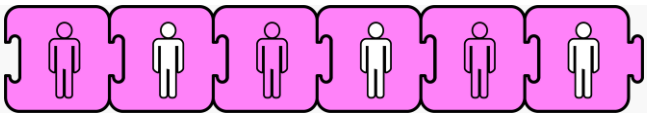


2. Wait before the next action happens.

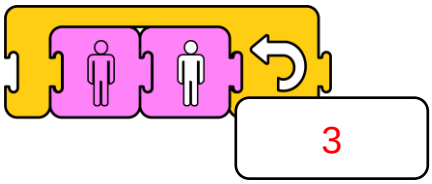
3. Tap to start an action.



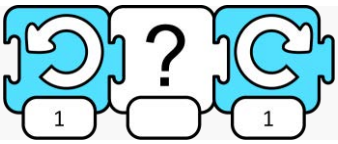
Rewrite the Code using Repeat



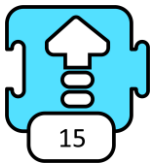
4. Look at the blocks above.
   How many times must you repeat the blocks to do the same action?



Add a Block to Fix the Code



5. Which block will wait before the character turns right?



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Session 3 Skill Review: The Quest for the Fallen Star

Apply your coding skills to design a *quest*. A quest is a search for something. You will make a hunt for a fallen star. When tapped, each item on the page will give a clue about where it is hidden.

1. Open a new project in ScratchJr.

2. Name the project **quest**. Click .

3. Delete the Cat.

4. Click *Change Background*. Pick **Jungle**.

---

5. Click *Add Text*.
   Type the title **The Quest for the Fallen Star**

6. Use *Add Text* to type the story:
   A star fell from the sky.
   Tap around to find it.

---

7. Click *New Character*. Pick **Star**.
   Build a script. Say Good job three times when tapped.

8. Click *New Character*. Pick a **Mushroom**.
   Place the *mushroom* over the star.
   Build a script. Hide the mushroom when tapped.

9. Add a **Snake**.

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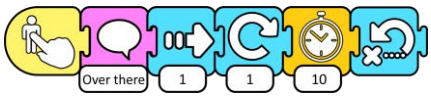
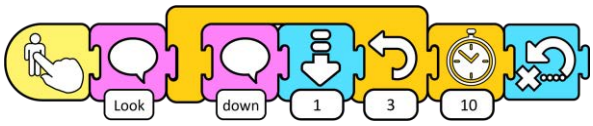
Build a script. Point to the star when tapped. For example:



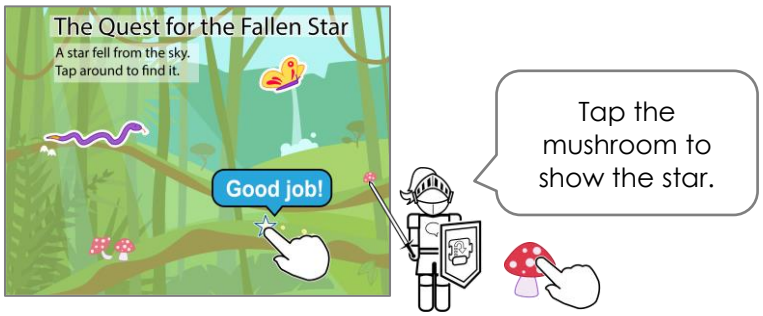
10. Add a **Butterfly**.

Build a script. Give a clue. For example:



---

11. Click Presentation Mode. Tap the objects on the story page.



12. Click *Reset Characters*.

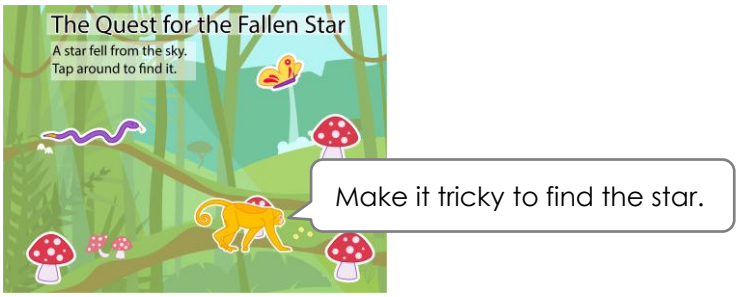
---

13. Use your skills to make the story page ***even better***! Pick an idea:

☐ Add a pop sound when the star is found.

☐ Add a in front of the mushroom. It hides when tapped.

☐ Add more mushrooms to make it harder to find the right one.



14. Close ScratchJr.

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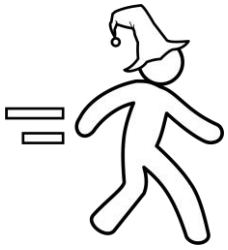
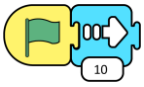
Session 3 Extension Activity: Set the Speed

You can set the speed of the action. It can be slow, medium, or fast. Try it!

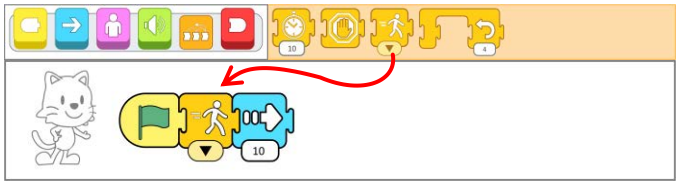


---

1. Open a project in ScratchJr.
2. Name the project **speed**. Click .
3. Select the Cat.
4. Build a script to move the cat ten steps. 
5. Watch the action.

---

6. Click ***Control***. Add ***Set Speed*** to the script:



7. Click the ***Set Speed*** arrow. Pick ***Slow***.

8. Watch the action.
9. Change the speed to fast. Watch the action again.

---

10. Use your skills to add more characters and move them at different speeds.
11. Close ScratchJr.

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Session 6
Story Time

In this session, students share their Techno Tale. To prepare the project for viewers, a checklist is used to guide revisions. The story is then shown to friends and family. At the end of TechnoTales, the young coders reflect upon the learning experience.

Assignment 19: Edit the Techno Tale

Assignment 20: Share the Techno Tale

Assignment 21: I Am a Coder

Session 6 Extension Activity: Connect the Pages

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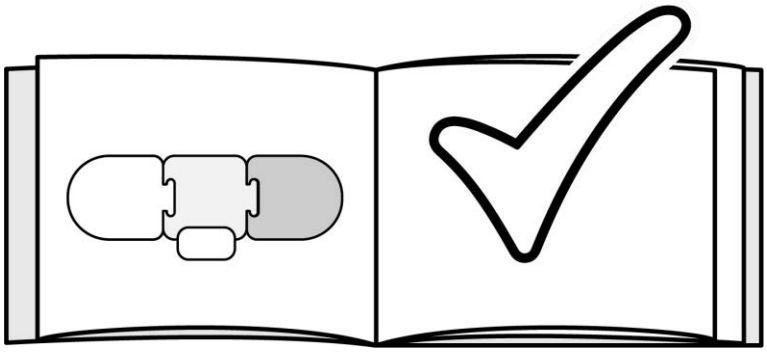
SAMPLE

Assignment 19 Edit the Techno Tale

Is your story ready to share?

Complete the checklist. Edit any item without a checkmark.



Once Upon a Time Page 1	The page tells about the problem in the story.	
	The hero and bad guy are in the scene.	
	Motion and Look blocks animate the action.	

Find a Hidden Item Page 2	The page tells why the hero needs a special item.	
	An object when tapped shows the special item.	
	Many objects on the page animate when tapped.	
	Wait or Repeat blocks set the timing of the action.	

Get Help Page 3	The page tells how the helper will solve the problem.	
	The action of the characters starts when bumped.	
	The number of steps sets how a character moves.	

Happily Ever After Page 4	The page tells what happens at the end of the story.	
	Messages trigger when an action happens.	
	The animation shows that the problem is solved.	

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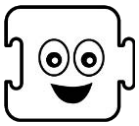
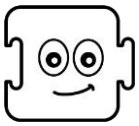
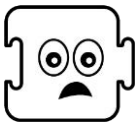
Assignment 21 I am a Coder

You did a great job making a story using ScratchJr.
What did you think about the course?

1. How much did you learn about coding?

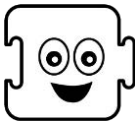

lots

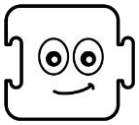

some

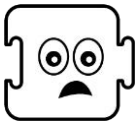

not much

---

2. What do you think about ScratchJr?


love it


like it


dislike it

Why?

---

3. What part of the story did you like to make the most?

Once Upon a Time
Page 1

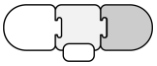
Find a Hidden Item
Page 2

Get Help
Page 3

Happily Ever After
Page 4

Why?

---

4. What was the most difficult part to code? 

---

5. What one tip would you give to someone new to using ScratchJr?

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Appendices

Refer to the appendices for additional resources:

Appendix A - Assessment Tools

Appendix B - Glossary

Appendix C - Contact Information

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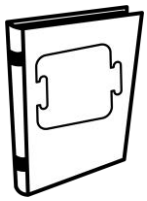
SAMPLE

Tales Marking Sheet

	Excellent Work!	Doing Great!	Keep Trying!
 **The Tale:** The story has a beginning, middle, and end. There is a hero, bad guy, and helper. There is a problem which is solved with a special item.			
Animation: Animated action helps to tell the story. Objects can be tapped to animate and to find a hidden item. Characters bump to move and solve the problem. Messages set the timing and control the order of the action.			
Creativity and Design: The story idea is original. The characters and backgrounds suit the story. The text is easy to read.			

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