

Credits

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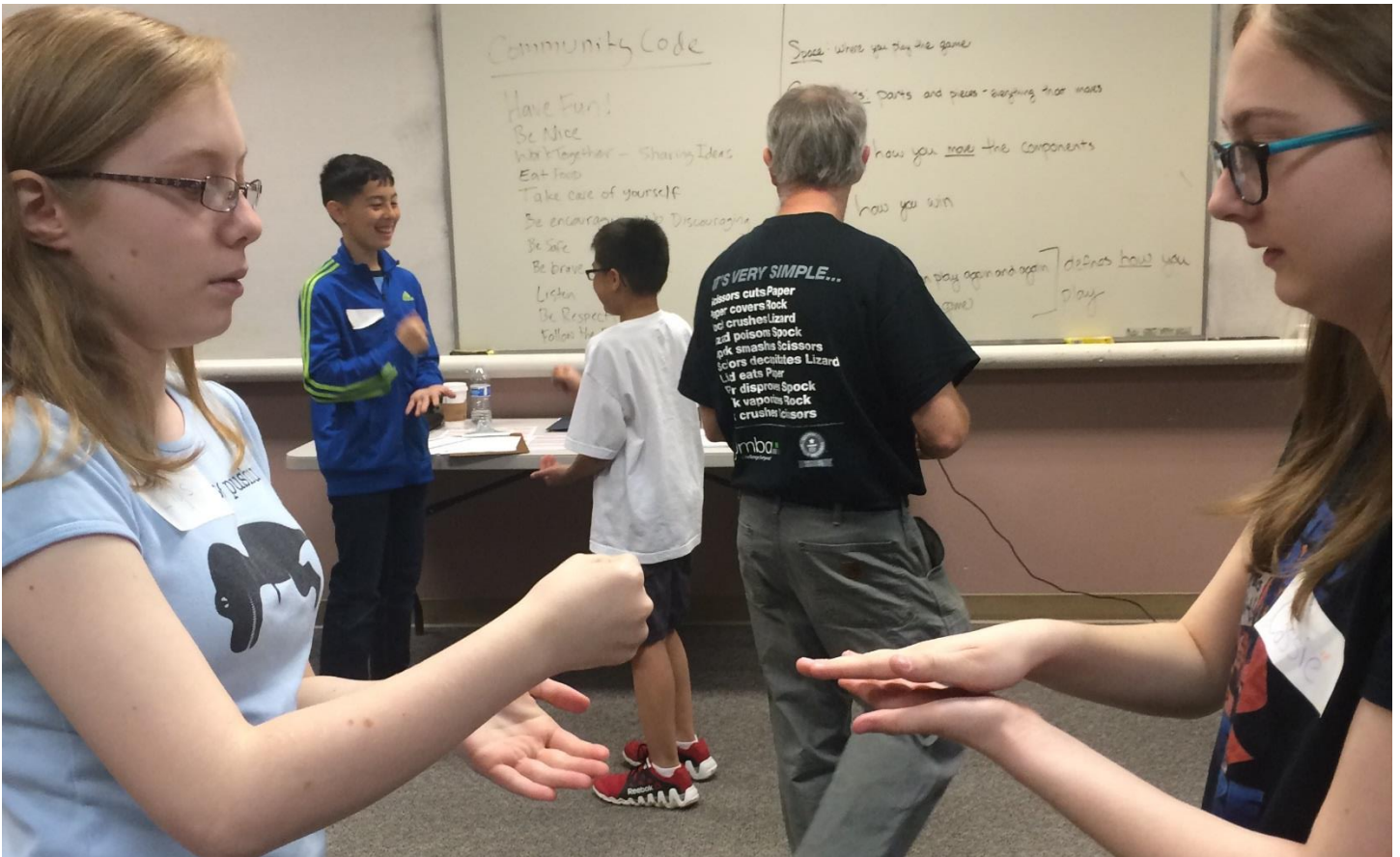
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INTRODUCTION

Camp Code: Game Lab Is...



Camp Code: Game Lab is a program that encourages participants to explore game design concepts across analog and digital platforms using 21st-century skills to deconstruct, revise, and originate play-able games through the application of design thinking and computer programming principles.

Camp Code: Game Lab supports strength-based, interest-driven, and peer-to-peer learning.

Program activities can be used by educators to support K-12 curriculum standards, including the Common Core State Standards, the CSTA K-12 Computer Science Standards, NGSS, and ISTE NETS. Activities also introduce and encourage computational thinking.

In *Camp Code: Game Lab*, participants walk through the process of creating original games using a variety of physical objects as well as the educational programming tool [Scratch](https://scratch.mit.edu/).

In **Part One**, participants are introduced to the idea of games as dynamic systems through a series of three hands-on activities that ask them to identify the elements of common games, make modifications to those elements, and then playtest their modified games through a process of design and iteration. Part One uses lessons and activities from the [Gamestar Mechanic: Learning Guide](#).

In **Part Two**, participants translate their learning into digital game design. Participants now identify the elements of common online and computer games. Through a scaffolded introduction to the [Scratch](#) environment, participants begin to apply computer science vocabulary and programming principles to the same game elements discussed in Part One. They remix and modify existing Scratch games, and then playtest their modified games through design and iteration. Part Two uses lessons and activities from [Creative Computing: An Introductory Curriculum Using Scratch](#) developed by Harvard and licensed under Creative Commons.

Camp Code: Game Lab is designed for 5th - 8th grade learners. *Camp Code: Game Lab* can also be adapted for an intergenerational audience of children and adults. We recommend consulting the [Family Creative Learning](#) guide for more resources for developing and implementing family technology programs.

Depending on staffing, we recommend registering 12 - 20 participants, with no more than 25. We recommend running this program with two to three staff members, as well as teen or community volunteers.

Camp Code: Game Lab Contains...

The *Camp Code: Game Lab* curriculum includes:

- A detailed guide to **Parts One and Two**, including a checklist of materials, program overviews, activity details, and learning outcomes.
- PDFs of all handouts for Parts One and Two for easy printing and copying.
- Assessment tools for librarians and educators.
- A template for tracking staff and volunteer roles and assignments.

Remix This (Please!)

Camp Code: Game Lab is released under a **Creative Commons Attribution-ShareAlike 4.0 International** License.

- *Camp Code: Game Lab* is designed to be scaled. You use single activities for one hour programs, or run each half of the program separately. *Camp Code* can be run with 5 or 25 participants.
- Please feel free to adapt, remix, share, change, shift, modify, exclude, include, or do anything else that you want to these materials, **provided that you give Pierce County Library System and Scott Norris appropriate credit** and provided that you license your own work under the same license. We chose this license because it allows you great freedom to make this work your own and to share it widely.
- We'd be pleased if you would tell us about any modifications, remixes, or how things went when you put on your own *Camp Code* programs – you might provide us with something we want to incorporate into our next version of *Camp Code*!
- We'd also love to hear from you if you have questions about the program, its materials, components, or if you just want to chat about how awesome it is.

Send your feedback, questions, praise, squee, and other comments to any of the creators listed on the first page of this guide. You can also touch base with us on:

- Facebook: facebook.com/PierceCoLibrary

We hope that you enjoy *Camp Code: Game Lab* as much as we had fun creating it!



FACILITATOR QUICK GUIDE

Who to contact?

- If you have any questions about Camp Code at any time, contact _____.
- If they are not available, and you need immediate assistance, please contact _____.

Who does what?

Admin will provide...

- Flyers and posters
- Food and/or snacks
- Reservation and delivery of additional laptops
- Board games
- Game kits
- Blank Certifications of Completion
- Additional staff support

Branches will provide...

- Branch laptops, where available
- Screen and/or projector
- White board or flip chart or butcher paper
- Tables and Chairs
- Name Tags
- Paper for participants
- Pens/Markers
- Printed Handouts
- _____

Set Up:

Part One:

Tables:

- 1-2 welcome tables near door:
 - Check-in registration
 - Name tags and markers

Part Two:

Tables:

- Classroom style facing the screen.

Computers:

- One laptop connected to the

- One laptop open to Scratch for participant account sign-up
 - 1-2 supply tables to the side:
 - Board games, game kits, supplies, handouts
 - 5 groups of 2 tables each:
 - Game review handouts and pens at each
- screen, with websites queued.
(see Materials for website list)
- Laptops: One per participant. Remaining laptops ready to hand out.

Music playing

Whiteboard, or flip chart with markers

Program Overview:

Part One Physical games: Game Design Basics (~3 Hours)

- Icebreaker and Community Code
- ACTIVITY 1: Rock-Paper-Scissors
- ACTIVITY 2: Modify a Classic Game
- ACTIVITY 3: Game Kit Exercise

Part Two Digital games: Coding Basics in Scratch (~3 Hours)

- Demonstrate Scratch
- ACTIVITY 1: Scratch Scavenger Hunt
- ACTIVITY 2: Pong Game
- ACTIVITY 3: Modify a Classic Game

Staff Roles:

Logistics: One point person to monitor and manage logistical details, including charging the laptops, checking in participants, verifying participant contact info, keeping time, setting up lunch (if applicable), queuing websites for the second half of the day, passing out participant folders and evaluation sheets at the end of the program.

Activity Leads: Assign staff or volunteers to lead various activities throughout the day.



MATERIALS

Part One: Physical Games: Game Design Basics

- Nametags and markers
- Butcher Paper and Markers, or Whiteboard and Markers for Community Agreements
- Pens, markers, pencils, masking tape
- Handouts:
 - Write a Game Review
 - Rules for Simple Games
 - Modify a Game Worksheet
 - Game Kit Worksheet
- Board and Card Games (examples below)
 - Scrabble
 - Cards
 - Checkers
 - Tic-Tac-Toe
 - Dominoes
 - Hopscotch
 - Mancala
 - Uno
- Game Kits (one for each group of 3-5)
 - Game Kit Materials:
 - 1 marker (such as a Sharpie)
 - 3 paper cups
 - 1 small sponge cube - a square cut from a larger kitchen sponge works
 - sticky notes (a portion of a 1" small stack will do)
 - 7 inches of string
 - paper/board rectangle - half of one side of a manila file folder is good
 - a die – polyhedral dice are more interesting than 6-sided dice
 - 3 small binder clips
 - 1 big binder clip
 - 3 rubber bands
 - 1 package of a small candy – for example, a pack of Smarties because they work as a unit or are divisible
 - 1 small 'better' candy – for example, a Starburst

- 1 pointy eraserhead
- 1 sheet of color-coded label stickers - we use sheets with circular stickers in four colors (usually red, yellow, green, blue) because these correspond with the paperclips
- 4-6 multicolor paper clips - we use a package that comes with six colors because the colors often correspond to the sticker colors)
- 1 gallon ziplock bag (Store Game Kit items)

Part Two: Digital Games: Coding Basics in Scratch

- Nametags, or the paper to make them, and markers
- Butcher Paper and Markers, or Whiteboard and Markers for Community Agreements
- Laptop connected to a screen or projector
- Queued websites:
 - “Why Does Mario’s Jump Feel So Awesome?” by PBS Game/Show
<https://www.youtube.com/watch?v=z2oV2DQ2dEA>
 - Scratch homepage
<http://scratch.mit.edu/>
 - Camp Code: Game Lab Scratch Studio
<http://scratch.mit.edu/studios/982556/>
 - “Scratch Overview”
<https://vimeo.com/65583694>
 - Pong Tutorial
http://scratch.mit.edu/projects/editor/?tip_bar=pong
 - Starter Projects
 - Maze: <http://scratch.mit.edu/projects/10128431/>
 - Scrolling: <http://scratch.mit.edu/projects/2216201>
 - Collection: <http://scratch.mit.edu/projects/10859244/>
 - Scratch Wiki
http://wiki.scratch.mit.edu/wiki/Scratch_Wiki
- Pens, markers, pencils
- Handouts:
 - Scratch Account
 - Scratch Challenges
 - Maze Starter Project
 - Scrolling Starter Project
 - Collection Starter Project

SCHEDULE OVERVIEW

Part One: Physical Games: Game Design Basics

5 min	Icebreaker	All Staff
10 min	Welcome and Introductions	Assigned Staff: _____
15 min	Create a Community Code	Assigned Staff: _____
<p>Facilitate a discussion about expectations for behavior during the camp. Introduce the idea of a community code and invite participants to generate 4-5 community agreements.</p> <p>Write community agreements somewhere visible and refer to them throughout the camp.</p>		<p>Staff are encouraged to contribute to the code!</p> <p>Consider sharing your ideas about respect, listening, being adventurous, or trying new things!</p>
10 min	“Biggest Fan”	All Staff
<p>Play the “Biggest Fan” to introduce the discussion of Rock-Paper-Scissors as a game system with elements.</p>		
30 min	Activity 1: Rock-Paper-Scissors	Assigned Staff: _____
<p>Identify the game elements of rock-paper-scissors.</p> <p>Practice changing the elements together and in pairs to investigate how a change to a small piece of a game impacts the entire game system.</p>		
5 min	Stretch Break	
45 min	Activity 2: Modify a Classic Game	1 staff per group
<p>In groups, students experience how different elements of a game can be modified to change its play.</p> <p>The more examples that come out of the activity, the better!</p>		

Play Each team plays one non-digital game with a simple set of rules. Encourage each team to try to identify the game elements.		Modify Change one rule <i>or</i> Change one component <i>or</i> Change the goal of the game <i>or</i> Change the core mechanic.		Present Have the students present their games and play each other's modified games.	
5 min	Stretch Break				
60 min	Activity 3: Game Kit Exercise			1 staff per group	
In groups, participants will make a game from a kit of everyday objects in order to examine the relationship between game elements and game design patterns.			Requirements: <ul style="list-style-type: none"> • The game must be playable. • Each team must write an intro to their game. • Teams must give their game a name. 		
15 min	Wrap-up and Dismiss			Assigned Staff: _____	
<p>Talk about the activities for the next session, and briefly introduce Scratch.</p> <p>Show a basic Scratch game on the class display, and ask the group to identify the core elements.</p> <p>Remind everyone that they should have Scratch logins for next time.</p> <p>Wrap up activity to come back together as a group.</p>					



Part Two: Digital Games: Coding Basics in Scratch

5 min	Icebreaker	All Staff					
15 min	Welcome and Facilitated Review	Assigned Staff: _____					
REVIEW Community Agreements REVIEW Game Design Concepts <ul style="list-style-type: none"> Games are systems Elements: Space, Components, Mechanics, Rules, Goals Modifying game elements impacts the play of the game 		How do these concepts translate to computer games? <u>Example:</u> Watch “ <i>Why Does Mario’s Jump Feel So Awesome?</i> ” by PBS Game/Show https://www.youtube.com/watch?v=z2oV2DQ2dEA					
5 min	Introduction to Programming	Assigned Staff: _____					
Programming means writing instructions for all the elements of your game in a language that a computer can understand. The set of instructions you create is called a program.							
15 min	Demonstrate Scratch	Assigned Staff: _____					
Before handing out computers, demonstrate these key Scratch concepts / vocabulary:							
Screen Layout	Stage	Backdrop	Sprites	Costumes	Scripts	Block Types	X:Y Coordinates
Watch “Scratch Overview” video: https://vimeo.com/65583694							
15 min	Pass Out Laptops	All Staff					
Pass out computers. Students sign on to Scratch and open a new project.							
25 min	Activity 1: Scratch Scavenger Hunt	All Staff					
Students learn how to use Scratch by completing a series of puzzles and challenges.							
5 min	Activity review: what did everyone figure out?						
35 min	Activity 2: Complete the Pong Tutorial	All Staff					

Students follow the Pong Tutorial to create their first video game and learn Scratch skills:

http://scratch.mit.edu/projects/editor/?tip_bar=pong

5 min

Activity Review

Assigned Staff: _____

Roses and Thorns check-in: What was awesome? What was tricky or confusing? Review the game elements in pong.

5 min

Stretch Break

45 min

Activity 3: Modify a game in groups

1 Staff per Group

In groups, students re-mix, modify, and build on one of the Starter Game projects:

Maze (easy):

<http://scratch.mit.edu/projects/10128431/>

Collection (intermediate):

<http://scratch.mit.edu/projects/10859244/>

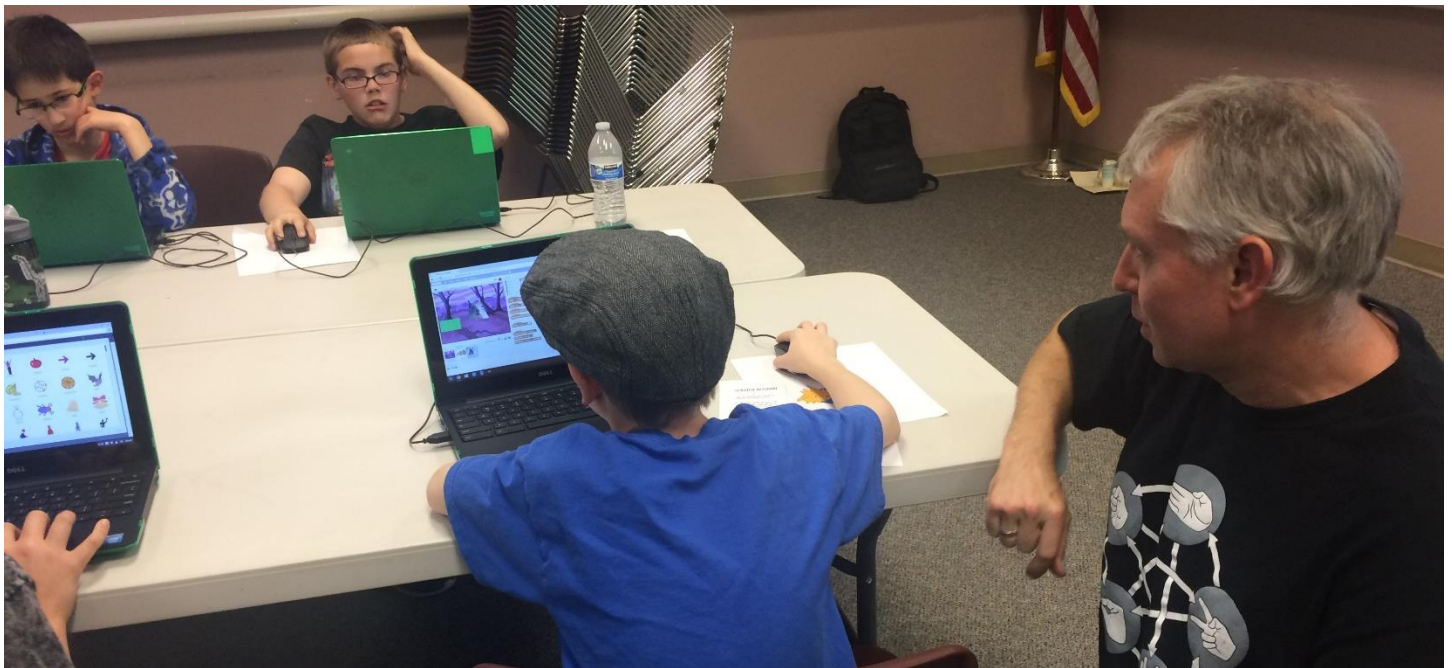
Scrolling (advanced):

<http://scratch.mit.edu/projects/22162012>

Step 1: Play the game

Step 2: Modify ONE element

Step 3: Get creative! Change the art, add challenges, add a score, add levels, add a timer, add sounds and music, add enemies!



PART ONE

ACTIVITY DETAILS

Create a Community Code / 15 minutes

Big Idea

Introduce participants to each other and collaborate on a community agreement for the workshop.

Student Outcomes

- Students will collaborate to create a community agreement.
- Students will begin to think of themselves as a group.

Assessing Student Work

- Do students participate in group discussion while crafting the community agreements?

Activity Details

Assigned Staff: _____

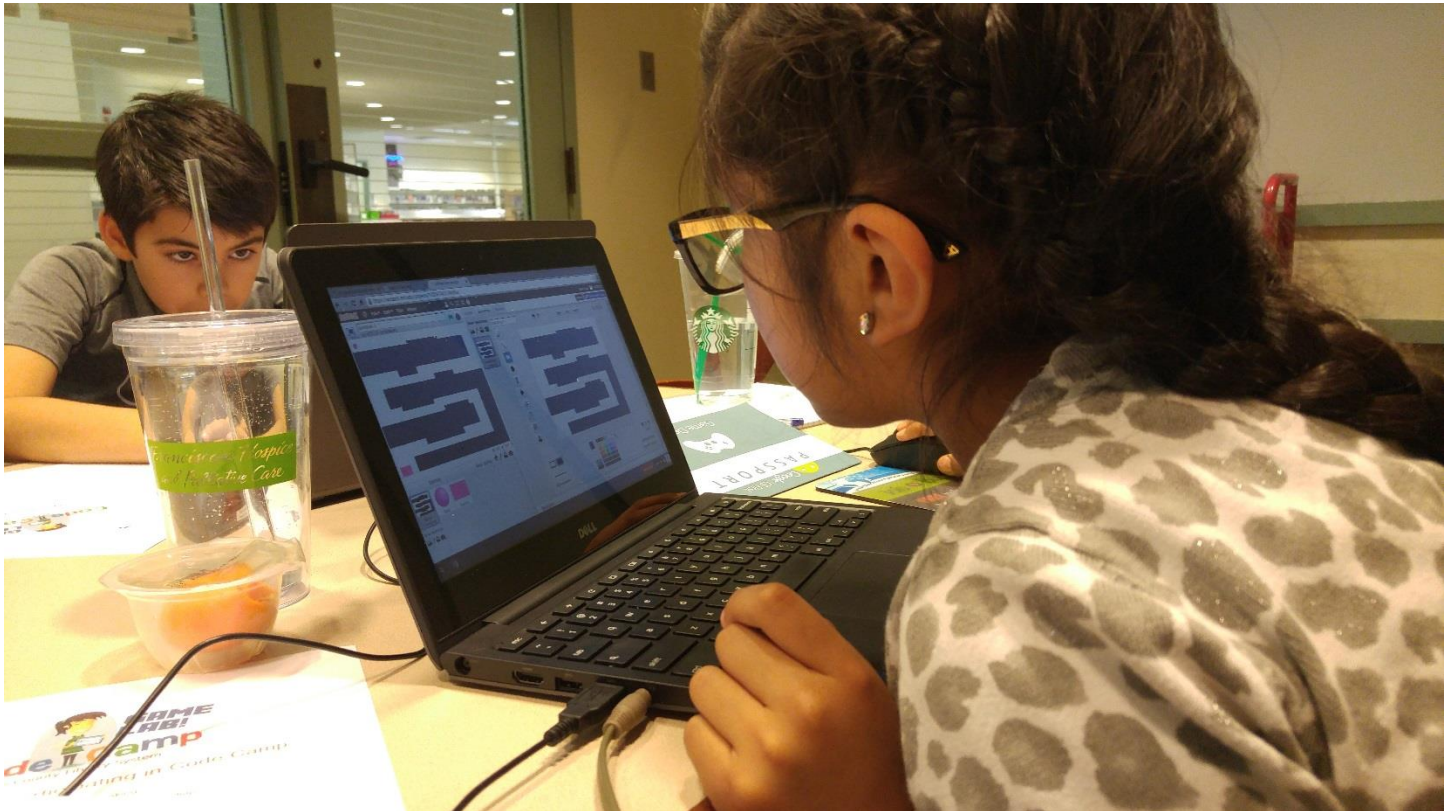
Create a Community Code: The goal of community agreements is to establish a culture of fearlessness, exploration, and peer collaboration. It is expected that we will not be experts - and the environment becomes a space where everyone is learning together.

- Start with the idea of respect. How can we be respectful while others share their ideas out loud? How can we respect ourselves, our friends, and the equipment?
- Move on to creating the rest of the Code. Try to refer to the concrete activities you'll be engaging in such as sharing projects, asking questions, giving feedback, and working with someone. Ask participants how they would like to act in those activities and how they would like others to act in those situations.
- Staff are also encouraged to contribute to the code. Consider sharing your ideas about respect, listening, meeting new people, being adventurous, or any of the suggestions listed below!

Facilitating review of community agreements:

If your group is slow to respond, try some of these agreements that work well with this age group:

- **“Step up, step back”**: If you are the type of person to be quiet, today you can try ‘stepping up’ to share your ideas. If you are the type of person to speak up in class, today you can try ‘stepping back’ to let other people share.
- **“Don’t yuck my yum!”**: We all like different things! We all agree to respect what other people think is cool, even if it’s not something we like.
- **“Trust the process”**: We might feel shy or get tired or frustrated. That’s ok. Take a break if you need it. If things don’t make sense at first, don’t worry, you’ll get there.
- **“Fail spectacularly”**: Try new things and experiment. Sometimes the only way to learn how code works is to break it.



“Biggest Fan” Icebreaker / 10 Minutes

Big Idea

This icebreaker leads into the discussion of Rock-Paper-Scissors as a game system with elements.

Student Outcomes

Students will understand that even simple games can be composed of various elements.

Assessing Student Work

- Do students participate and reflect on the activity?

Activity Details

All Staff

Explain the rules of the game.

- Everyone finds a partner.
- Each person and their partner play a game of rock-paper-scissors. Make sure to agree on the rules (do you throw on three or after the count of three?)
- The loser becomes the biggest fan of whoever defeated them. They have to cheer and clap and rev up their winner. It’s going to get loud!
- The winner progresses to the next round and plays another winner. When one winner loses to another winner, everyone following the old winner now follows the new winner as a large cheering group.
- The very last round consists of only two people, each with a legion of fans, facing off for the last rock-paper-scissor game. The winner of the last round wins the game and everyone cheers for that person.

Play the game, including staff.

Staff can participate in the activity by playing Rock-Paper-Scissors and cheering on the winners!

Staff can facilitate helping each winner to find another winner to play.

Reflect on the game.

Ask for volunteers to share their ideas about what makes a game a game. How is rock-paper-scissors a game?

Activity 1: Rock-Paper-Scissors / 30 minutes

Big Idea

In this activity, you'll take apart and change the elements of the classic game Rock-Paper-Scissors to investigate how a change to a small piece of a game system is reflected in the entire game system.

Student Outcomes

- Students will be able to identify the five elements of game design in classic physical games.
- Students will be able to change a single element in the game.
- Students will be able to understand how the game system reflects that change.

Assessing Student Work

- In small groups, are students able to successfully change their assigned game element?
- Are students able to articulate how their modification changed the other game elements in the system?

Activity Details

Assigned Staff: _____

Introduce games as systems:

“All games are systems designed to be played. Like any system, games have interconnected elements that make the system what it is. If one element of a system is changed, the entire system will adapt to reflect that change.

There are many elements in a game system, but for now we'll look at the basic five:

- 1. Space** **2. Components** **3. Mechanics** **4. Goals** **5. Rules**

For example, let's think about the game of basketball. Basketball is played on a court, using 5 players to a team, one basketball and two hoops. The mechanics of the game include dribbling, passing, and shooting the ball. The goal is to get the ball into the hoop! Some rules include 2 and 3-pt shots and rules against fouling other players.”

(Prepare additional game examples to demonstrate concepts of systems and elements).

Invite participants to identify the elements of the rock-paper-scissors game:

1. **Space:** the space of Rock-Paper-Scissors is a close, but not intimate, area between two players.

2. **Components (the pieces of the game):** the hand symbols for rock, paper, and scissors; two players.
3. **Mechanics (what you do in the game):** a player “throws” a hand symbol into the game space.
4. **Goals:** A player wins a round by throwing a winning hand symbol. Another common goal is to win 2 out of 3 rounds.
5. **Rules (the parameters of gameplay):** One hand symbol beats another and the player who threw the winning symbol gets a point. Paper beats rock. Rock beats scissors. Scissors beats paper. Players throw the hand symbols at the same time (often after counting to 3). Players cannot change a hand symbol once it’s thrown, and the symbol must be in both players’ lines of sight.

Demonstrate rock-paper-scissors:

Invite two volunteers to demonstrate a normal game of rock-paper-scissors for the group.

Note: “normal” may mean different things to different players. Some may start the game by counting to 3, other may start it by saying “rock, paper, scissors, shoot”.

Then ask the demonstrators to change only one element of the game, starting with **space**.

- Have the players stand back to back, so that they cannot see each other.
- Have them play a round of Rock-Paper-Scissors like this and note what happens.

How do they know who’s won?!

- Now, the two players alone cannot tell who has won the round without the help from a judge who can see both of the hand symbols.
- Ask another participant to be the judge and play again.
- So, by changing the game space, we’ve also changed the **components**; we need at least three players instead of two!

Have any other elements changed in this version of Rock-Paper-Scissors?

Practice modifying rock-paper-scissors in small groups:

Divide participants into small groups of 2 or 3 and assign each group an element of Rock-Paper-Scissors to change. Give the groups 5 minutes to change their element and then play the game in front of the class.

Some example changes are:

Space: players hide their hands behind a folder while they place.

Components: add a component like fire, or bear.

Mechanics: speak the components instead of using hand symbols.

Goals: try to tie/throw the same hand symbol as your partner.

Rules: you have 2 seconds to change your hand symbol after you throw it.

After a group demonstrates its changed game, ask the group what element they changed originally and what other elements changed as a consequence of changing that first element.

Some roadblocks students may run into:

- **Students may have difficulty distinguishing between components and mechanics.** Components are all of the pieces and players in play. Mechanics refers to how those pieces move and interact. Mechanics determine the complexity of the game.



Activity 2: Modifying a Classic Game / 45 minutes

Big Idea

A game can be modified by making a change to one or more of its elements.

Student Outcomes

- Students will understand how rules organize a game.
- Students will build confidence in exploring how game mechanics and space work together to create an experience of play.

Assessing Student Work

- Can students explain how rules organize a game?
- Can students articulate how game elements work together to create an experience of play when presenting their modified games as well as playing other people's games?
- Do modified games demonstrate the students' ability to manipulate one game element to affect gameplay?

Activity Details

1 Staff per Group

The goal of the activity is to allow students to experience how different elements of a game can be modified to change its play. The more examples that come out of the activity, the better!

Play: 10 minutes

- Divide participants into small teams. (Setting up the teams based on what game participants want to play/modify works well.)
- Provide each team with a non-digital game that has a simple set of rules and a [Rule Modification worksheet](#). The size of each team will be determined by the number of games available.
- Choose a set of games that students are already familiar with and ones that can be easily modified, either by making a change to a rule or to the materials used in the game.

For example, Scrabble is a good choice because a simple change to a rule can radically alter play: adding a 26th letter to the game, for example, is an easy modification. On the other hand, Sorry is a game with an overcomplicated set of rules for this activity, and is hard to physically modify.

Other good choices include: Hopscotch, Dominoes, Checkers, and card games like Blackjack or War.

- Encourage each team to play the game for a few minutes, and try to identify the game elements.

Modify: 25 minutes

Challenge each team to come up with **2-3 new ways to play the game** they have been assigned by doing one or more of the following:

- Change one rule.
- Change one component in the game.
- Change the goal of the game.
- Change the core mechanic, or play pattern of the game: *For example, if the play pattern of Scrabble is building words, propose the play pattern to building towers of letters.*

Ask the teams to document their changes using the worksheets provided. Encourage students to keep track of modifications that worked, modifications that “broke” the game, and those that didn’t seem to make much of a difference.

Present: 10 minutes

Have the students present their games to each other. You can use either a science fair model where students rotate from group to group playing each other’s games, or a presentation model, where each group presents their modified games to the whole class. Ask the students to describe the play of the original game first, and then show the modifications they made in each category.

When presenting encourage the students think about the following:

- What kind of modification created the largest change in play? Why do you think this was the case?
- Did you have to change any of the other elements as a result? How did you know when to do this?
- Which new game was your favorite? Why? Do you think it is better than the original version? If so, why? If not, why not?
- What was challenging about this design activity?

Activity 3: Game Kit Exercise / 60 minutes

Big Idea

In this activity, participants will make a game from a particular set of everyday objects in order to examine the relationship between physical game pieces and other elements and game design patterns.

Student Outcomes

- Students will be able to explore the affordances of game components in a board or physical game.
- Students will be able to understand the relationship between elements within a game system (goals, rules, space, components, mechanics, story, etc.).
- Students will be able to iterate on a design within constraints.
- Students will be able to 'paper' prototype.

Assessing Student Work

At the end of this challenge, each group should have:

- A prototype game design
- Notes on their game design

Activity Details

1 Staff per Group

Intro: 5 minutes

There are many elements in a game system: rules, goals, story, space... but one of the most fundamental are the materials that comprise the game. Soccer/Football would be a very different game if the ball were extremely heavy, or if the players had to use sticks to hit it. Cards provide a different kind of randomness than dice as well as a different play experience. *Guitar Hero* is very different from *Dance Dance Revolution*, even though their underlying rules, goals, and mechanics are very similar.

A game is a system with interconnected elements. That means a game designer has to create these elements to work together in a fun and challenging way. When designing a game, a designer should playtest early and often to see how small changes to elements in the game can affect whole system . . . for better or worse!

In this challenge, you'll start a game design from a set of components from every day materials. The components in the kit are chosen for how they can work together, but a broad variety of games are possible with them. What kind of game can you make when you can only

use a few office supplies ... and what would you make if you iterated on your design using any materials you want?

The Challenge:

Make a game that can be played by two or more people using only the materials in the kit (described in the Materials section). Discuss how the design springs from and depends on the components used. Playtest the game.

Requirements:

Post the requirements on a screen, white board, or on butcher paper (or all of the above):

- The game must be playable - a set of players must be able to take at least a couple of turns with the materials you have, and you must have a way to win the game.
- Each team must write out an introduction to your game - the rules of the game or the framing/story.
- Teams must give their game a name, even if it's a silly one, because that will call out to players what the important parts of the game are or what the theme is.

Design: 40 minutes

Give the groups 30 minutes to devise a game that can be played using only the materials in the kit.

15 minutes in, check the time and make sure that the groups are on track to a game that will be playable at the end of the 30 minutes.

Playtest: 10 minutes

Have each group take 5-10 minutes to play their game, and discuss future improvements.

Discuss: 5 minutes

Discuss the process with the whole group. For example, you might encourage the design groups to share:

- Where did your game concept originate? Was it a physical property of the materials, or some relationship between them, or another element of game design?
- What mechanics did the materials encourage, or make difficult?
- If the game materials weren't restricted to paperclips and rubber bands, what would you use? Would those materials be as easy to find or make, and would the game play better with them?

PART TWO

ACTIVITY DETAILS

Welcome and Facilitated Review / 15 minutes

Big Idea

Review the key concepts covered in Part One.

Student Outcomes

- Students will re-commit to community agreements.
- Students will become re-acquainted with game concepts and vocabulary.
- Students will understand how physical game elements translate to digital games.

Assessing Student Work

- Do students participate in group conversation by reflecting on the community agreements, remembering game concepts and vocabulary, and sharing examples from digital games?

Activity Details

Assigned Staff: _____

Review Community Agreements: Ask if anyone would like to add anything to the agreements. Invite everyone to raise their hand if they agree to follow the community code.

Review Game Concepts: Ask the group identify the elements of a game (space, components, mechanics, rules, goals). Use examples from Part One.

How do these elements look different in video games?

What are some of your favorite games that you like to play on your phone, or computer, or XBox?

Pick one or two games to use as examples to demonstrate different game elements:

Facilitating review of game elements:

Prepare 2-3 popular video games to use as examples. For example, in Minecraft:

- **Space:** 3-D virtual build-able world that renders as you explore.

- **Components:** Blocks
- **Mechanics:** Move with WASD, Turn with the mouse, Jump and Fly, Mine, Craft, and Use materials, Type commands
- **Rules:** Crafting Table
- **Goals:** Build in Creative Mode, Survive in Survival Mode, Defeat monsters and creatures

Watch “*Why Does Mario’s Jump Feel So Awesome?*” by PBS Game/Show

<https://www.youtube.com/watch?v=z2oV2DQ2dEA>

Demonstrate Scratch / 15 minutes

Big Idea

Introduce students to the basics of Scratch.

Student Outcomes

- Students will know how to log in to Scratch.
- Students will know how to start a new project.
- Students will be able to start exploring.
- Students will be able to save a project.

Activity Details

Assigned Staff: _____

On the screen or projector, demo signing in to Scratch, creating a new project, and then walk through the layout of the screen. Be sure to cover:

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Adding a backdrop • Editing backdrops • Adding sprites • Viewing sprite costumes • Types of blocks | <ul style="list-style-type: none"> • Dragging and dropping blocks onto a script • X:Y Coordinates • Saving your project / saving to the studio |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Facilitating the introduction to Scratch:

- Consider using the theater metaphor: Characters perform a script on a stage wearing costumes.
- Use consistent terminology: Stage, backdrop, sprites, costumes, scripts, blocks.
- Watch “*Scratch Overview*” video: <https://vimeo.com/65583694>

Activity 1: Scratch Scavenger Hunt / 25 minutes

Big Idea

Students create their first project and explore different blocks to make a letter of their name do something surprising!

Student Outcomes

- Students will engage in an exploratory, hands-on experience with Scratch.
- Students will be able to create a script for a sprite of their choice.

Assessing Student Work

- Do students know how to create a new project?
- Do students understand the basic mechanism of snapping Scratch blocks together?

Activity Details

Assigned Staff: _____

Students have logged in using their Scratch Account handout.

Instruct students to delete the cat sprite and add a new Sprite. Demonstrate on the screen.

Pass out the Scavenger Hunt handout. Instruct students to complete each puzzles or scavenger hunt challenge.

Encourage students to work together, ask each other for help, and share what they find.

This is the time to let the students run with it. The most important thing to do now is to celebrate whatever they create.

Some roadblocks students may run into:

- **Their sprite disappears or goes off the screen!** Remind students that they can write instructions to find their sprite. You might show them the “Show” and “Hide” blocks, or the “Go to x: () y: ()” blocks to find their sprite.
- **The blocks may ‘disappear.’**
 1. Students may be on a costume, backdrops, or sounds page, and not know how to navigate back to the scripts page. Show them the “Scripts” tag.
 2. Students may have selected the stage, rather than a sprite, which has limited block commands available. Re-inforce that they need to select the sprite they want to give instructions to.

Allow time to formally share discoveries.

You might have each student share their creation with their neighbor.

Ask:

- Did anyone figure out how to add sound?
- Did anyone change the background?
- Did anyone figure out how to change color?

Demonstrate how to save the project to the Scratch Studio:

<http://scratch.mit.edu/studios/982556/>

Activity 2: Complete the Pong Tutorial / 35 minutes

Big Idea

Students follow the Pong Tutorial to create their first video game and learn Scratch skills:

http://scratch.mit.edu/projects/editor/?tip_bar=pong

Student Outcomes

- Students will be able to follow a tutorial in Scratch.
- Students will be able to complete a playable game.
- Students will know how to construct basic game mechanics, add effects, and add a variable in Scratch.

Assessing Student Work

- Are students able to complete the pong tutorial to create a playable game?

Activity Details

Assigned Staff: _____

Help students navigate to: http://scratch.mit.edu/projects/editor/?tip_bar=pong

Show what the final product will be on the screen and demonstrate how the tutorial works.

Encourage students to work together, ask each other for help, and share what they figure out.

Some roadblocks students may run into:

- **They miss instructions from the tutorial.** Remind students that they have to scroll all the way down before clicking “Next.”
- **The code doesn’t do what they expect.** First, make sure they haven’t skipped steps from the tutorial. Then encourage students to “read” their code out loud. What does the code say will happen? This might illuminate what they need to change. If not, encourage students to look at each other’s code to figure out what to do.

- **They don't understand how to edit values in a block.** Want the ball to move faster? Or change the score by 5 instead of 1? Show students how to click and change the values within a command. You might also need to show them how to snap a conditional into place.

If students complete the tutorial before others, encourage them to:

1. Build onto their game...
 - a. Can they add more balls flying through the air?
 - b. Can they figure out how to make the ball say "You lose!" if it hits the ground?
 - c. Can they figure out how to move the paddle with the left and right arrows instead of the mouse?
 - d. Can they figure out how to add a high score?
2. Or help their friends!

When students have completed the tutorial, check in with the group about how it went.

Ask what went well? What was awesome? What was tricky or confusing?

Ask students to name the elements of the pong game: space, components, mechanics, rules, goals.



Activity 3: Modify a Game / 45 - 60 minutes

Big Idea

In groups, students re-mix, modify, and build on one of the Starter Game projects.

Student Outcomes

- Students will learn how to re-mix Scratch projects and modify code.
- Students will work on a self-directed game project.
- Students will develop greater fluency with computational concepts (conditionals, operators, data).
- Students will develop greater fluency with computational practices (experimenting and iterating, testing and debugging, reusing and remixing, abstracting and modularizing).
- Students will demonstrate understanding of game elements and game modification.

Assessing Student Work

- Do games demonstrate the student ability to manipulate one game element to affect gameplay?
- Do student games sufficiently change and expand on the starter projects?
- Do student games include conditionals, operators, and data?

Activity Details

Assigned Staff: _____

Demo the starter projects:

Maze: <http://scratch.mit.edu/projects/10128431/>

Collection: <http://scratch.mit.edu/projects/10859244/>

Scrolling: <http://scratch.mit.edu/projects/22162012>

Break into Groups:

Have students choose a game to work on and break students into groups organized by projects. (Depending on distributed interest, there can be more than one group working on a given game project).

Facilitators: Assign one staff member to each group to facilitate the project.

Pass out the Maze, Scrolling, or Collection handouts to each group. (See Handouts).

Play the game: 5 min

Give the students 5 minutes to just play the game!

Facilitators: Ask “What do you notice? How do you think the code works?” Identify the game elements.

Modify ONE element: 15 min

Open up the code and take a look! Play around with the code to see what happens.

Choose ONE game element to modify in order to change the gameplay.

Facilitators: Decide whether to have the whole group modify the same element, or to have each individual choose which element to modify. Talk about how the modification changes the game!

Get creative: 25 min

Change the art, add challenges, add a score, add levels, add a timer, add sounds and music, add enemies!

Facilitators: Encourage students to use the Scratch Wiki to find tips, tricks, and strategies. Use the Wiki to get ideas, figure out how to use specific blocks, or add features to your game!

http://wiki.scratch.mit.edu/wiki/Scratch_Wiki_Home

For advanced students, share the [Extensions](#) or [Interactions](#) handouts.



LEARNING OUTCOMES

Part 1

Community Code

- Do students participate in group discussion while crafting the community agreements?

“Biggest Fan”

- Do students participate and reflect on the activity?

Rock-Paper-Scissors

- In small groups, are students able to successfully change their assigned game element?
- Are students able to articulate how their modification changed the other game elements in the system?

Modifying a Classic Game

- Can students explain how rules organize a game?
- Can students articulate how game elements work together to create an experience of play when presenting their modified games as well as playing other people’s games?
- Do modified games demonstrate the students’ ability to manipulate one game element to affect gameplay?

Game Kit Exercise

At the end of this challenge, each group should have:

- A completed prototype game design
- Notes on feedback and what you would next do to iterate on the game
- Notes on what you would do with the game

Part 2

Facilitated Review

- Do students participate in group conversation by reflecting on the community agreements, remembering game concepts and vocabulary, and sharing examples from digital games?

Demonstrate Scratch

- Do students complete the Scratch Layout Handout to identify the different parts of the screen?

Animate Your Name

- Do students know how to create a new project?
- Do students understand the basic mechanism of snapping Scratch blocks together?

Pong Tutorial

- Are students able to complete the pong tutorial to create a playable game?

Modify a Game

- Do games demonstrate the student ability to manipulate one game element to affect gameplay?
- Do student games sufficiently change and expand on the starter projects?
- Do student games include conditionals, operators, and data?



ASSESSMENT NOTES

COMMUNITY CODE

Do students participate in group discussion while crafting the community agreements?

Notes:

"BIGGEST FAN"

Do students participate and reflect on the activity?

Notes:

ROCK-PAPER-SCISSORS

In small groups, are students able to successfully change their assigned game element?

Are students able to articulate how their modification changed the other game elements in the system?

Notes:

MODIFYING A CLASSIC GAME

Can students explain how rules organize a game?

Can students articulate how game elements work together to create an experience of play when presenting their modified games as well as playing other people's games?

Do modified games demonstrate the students' ability to manipulate one game element to affect gameplay?

Notes:

GAME KIT EXERCISE

At the end of this challenge, each group should have:

- A completed prototype game design
- Notes on feedback and what you would next do to iterate on the game
- Notes on what you would do with the game

Notes:

FACILITATED REVIEW

Do students participate in group conversation by reflecting on the community agreements, remembering game concepts and vocabulary, and sharing examples from digital games?

Notes:

DEMONSTRATE SCRATCH

Do students complete the Scratch Layout Handout to identify the different parts of the screen?

Notes:

ANIMATE YOUR NAME

Do students know how to create a new project?

Do students understand the basic mechanism of snapping Scratch blocks together?

Notes:

PONG TUTORIAL

Are students able to complete the pong tutorial to create a playable game?

Notes:

MODIFY A GAME

Do games demonstrate the student ability to manipulate one game element to affect gameplay?

Do student games sufficiently change and expand on the starter projects?

Do student games include conditionals, operators, and data?

Notes:

STAFF AND VOLUNTEER ASSIGNMENTS

Logistics Lead:

Photographer:

Part One: Physical Games

[Program date and Time]

Welcome and Introductions	
Create a Community Code	
“Biggest Fan” Icebreaker	
Activity 1: Rock-Paper-Scissors	
Activity 2: Modify a Classic Game	
Activity 3: Game Kit Exercise	

Wrap-up and Dismiss	
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Part Two: Digital Games

[Program date and time]

Welcome and Facilitated Review	
Introduction to Programming	
Demonstrate Scratch	
Activity 1: Scratch Scavenger Hunt	
Activity 2: Complete a Tutorial	
Activity 2: Review	
Activity 3: Modify a Game	Intro: Maze: Collection: Scrolling:
Wrap-up (Game Gallery op'tl)	