

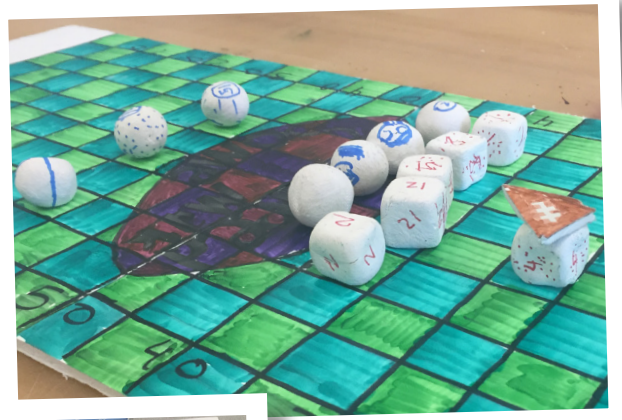
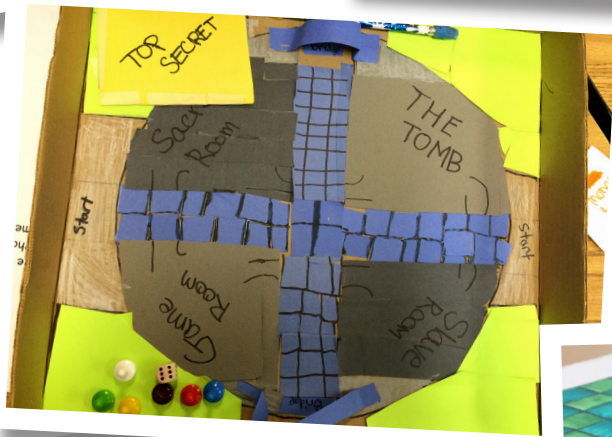


**PRESENTS**



**GAME ON!**

**A GAME DESIGN CURRICULUM**





# GAME ON!

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# GAME ON!

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**Important Note:** This curriculum has been developed as two companion units in order to meet the needs of diverse learners and classrooms:

The **Roll and Move** Curriculum is intended for grades 2-12. It presents unique challenges that will offer the opportunity to develop several 21st Century Skills in younger learners and those less comfortable with abstract and complex systems. If you are looking for something more complex, please consider using the companion unit, the **Resource Management** curriculum.

The **Resource Management** Curriculum is intended for grades 6-12. Development of a **Resource Management** game requires the ability to weave abstract ideas into a unified vision. Therefore, PCC recommends that it be used with 6-12th grade students who have some experience with project-based learning. The unit will provide many opportunities to develop 21st Century Skills for all participants. If you are looking for something simpler, please consider starting with PCC's companion unit, the **Roll and Move** Curriculum.





# PROGRAM INTRODUCTION



Pop Culture Classroom's Game On! is a new interactive, standards-based curriculum that introduces students to game design, teaches them Game Design principles, enhances their critical thinking and problem-solving skills, and promotes literacy and art development using Roll & Move (Life, Sorry, Candyland) and Resource Management games (Monopoly, Risk, Settlers of Catan). This program, designed for 2nd-12th grade teachers, is currently conceived as a stand-alone unit, a complement to any existing classroom curriculum, or an after-school course.

## PROGRAM OVERVIEW

Game On! is a 21st Century Standards-aligned curriculum that allows students to study, analyze, and then create their own games based on a topic/subject of the teacher's choosing, with the intent of furthering literacy, art, critical thinking, problem-solving, research, and cooperation skills. Gaming experts and master educators designed Game On! to provide step-by-step, research-based lesson plans that give teachers the necessary tools to engage all learners in a progressive, project-based unit of study.

Game On! is designed to be adaptable to all classrooms and student learning levels. The goal of this program is to motivate student engagement and participation subjects by providing multiple inroads for students to engage with subjects and topics from across the educational spectrum. For example, teachers discussing The Revolutionary War might have students create a Roll & Move game that demonstrates their understanding of American troop movements or the Declaration of Independence; a math teacher might have students design a basic card or board game to learn and/or practice addition/subtraction, multiplication, or probability; and a science teacher might have students create a Resource Management game focusing on plant biology or the water cycle. By creating their own games, students are able to better demonstrate their knowledge and improve their problem-solving and comprehension skills, while providing an outlet for self-expression, individuality, and social interaction.

Pedagogically, Game On! is designed to meet the needs of students at all stages of educational development. The program

achieves this through teaching basic game design principles, facilitating the discussion and usage of vocabulary and terminology, and allowing students to play through different types of games, culminating in students' direct application of knowledge via the creation of their own games. What's more, the game development process has been proven to deepen abstract and critical thinking skills. By creating their own Roll & Move and/or Resource Management game, students may also be better equipped to tackle problems in their own lives or communities, interrogate choices they and others have made, and probe difficult subjects in ways previously unavailable to them.

The larger goals of the curriculum are to teach critical thinking and give students the opportunity to view topics through new lenses both individually and collaboratively, thus fostering community development, communication skills, identity growth, and positive peer relation skills among participants. The Spring 2016 pilot program of Game On! formally and informally showed student growth across a spectrum of educational areas, including resource management, cooperation, social interaction, engagement, literacy, art, creativity, self-awareness, research, critical thinking, and design.

1. <http://www.newmedia.org/game-based-learning--what-it-is-why-it-works-and-where-its-going.html>



# GOALS OF GAME ON!



PCC's Game On! Unit offers a robust and engaging tabletop game-creation program. The program achieves this by critically analyzing, playtesting, and reflecting on various modifications of Roll & Move and Resource Management games, providing students fun, innovative opportunities to integrate content study with critical thinking and project management. After discussing how game components work together to make a game succeed or fail, students are asked to create a tabletop game of their own centered around content or a topic of the teacher's choosing.

## **Through the use of the Game On! Curriculum, Pop Culture Classroom seeks to:**

**Motivate student engagement** — We help students find meaning and connection by providing multiple inroads (art, literacy, design, math, science, etc.) for students to engage with subjects and topics from across the educational spectrum.

**Enhance 21st Century Skills** — We provide the opportunity for students to develop the skills necessary for success in the information age. While participating in the game design process, students will develop their critical and creative thinking, collaboration, communication, flexibility, as well as media, tech, and information literacy, among other vital skills.

**Emphasize problem-solving and critical thinking** — We encourage problem-solving and critical thinking by allowing students to experiment with different game components and principles in order to better understand what makes a game succeed or fail.

**Examine topics through new lenses** — We use the game design process to encourage students to examine and interact with content in innovative ways, helping solidify learning objectives and content.

**Foster self-awareness and social growth** — We ask students to consider how content might be taught through the process of playing a game, as well as how others might interact with their own game in order to better understand a topic/subject. In doing so, students build deeper, more complex cognitive connections to content, helping foster community development, communication skills, identity growth, positive peer relations, and self-awareness.

**Critically consume, and contribute to, popular culture** — We give students the tools to critically analyze game design and other aspects of pop culture through new social, analytical, and educational lenses. By creating a game of their own, students develop a product that gives them a sense of empowerment, individuality, and self-esteem amongst the ever-widening spectrum of media in today's world.

**Provide stated, measurable learning outcomes** — We give students the tools to critically analyze game design and other aspects of pop culture through new social, analytical, and educational lenses. By creating a game of their own, students develop a product that gives them a sense of empowerment, individuality, and self-esteem amongst the ever-widening spectrum of media in today's world.

**Provide educators with a malleable and useful curricular tool** — Game On! is intended to offer a solid game design foundation for educators teaching across a vast spectrum of educational situations. It is our hope, and expectation, that you make this curricular resource work for you and whatever your specific educational situation looks like. Don't ever feel like you have to stick to the script; make it your own!



# SUMMARY OF GAME DESIGN PRINCIPLES



Game design provides students multiple educational benefits while spurring creativity, comprehension, and personal growth. The basic game design principles listed below are applicable to both Roll & Move and Resource Management games, and students are expected to learn, master, and apply each principle to their own games over the course of the curriculum.

## GAME DESIGN PRINCIPLES

**1. Mechanics:** This covers how a game functions within an individual turn and over the entire duration of play. The best mechanics involve and engage all players in all aspects of gameplay, boosting participation and adding complexity to each turn and the overall game. Mechanics can include rolling dice, drawing/playing cards, moving characters across the board, earning/paying tokens, and so on.

**2. Goal:** This is the end-goal, or way(s) of “winning” the game, as well as motivation for players to continue playing toward this goal. Common motivating factors include luck, joy, challenge, and strategy, all depending on the type of game. The best games provide goals of varying difficulty within individual turns and over the entire duration of play in order to keep players invested and challenged. For example, a game like Tic-Tac-Toe provides a clear, singular goal based almost purely on strategy, while a game like Monopoly offers multiple goals (earn money, buy or trade property/houses, escape “jail,” avoid taxes) throughout the game, thus combining luck, strategy, and competitive challenge as motivating factors.

**3. Materials:** These are the physical components of games, including cards, dice, physical boards, tokens, and other resources that add to and/or complicate gameplay. The best game materials are original, aesthetically appealing, and directly enhance the game’s content, interactivity, and mechanics.

**4. Interactivity:** This is the way/s in which players specifically interact (cooperatively, combatively, or a combination of the two) during a game in order to reach one or more particular goal/s.

The best games are fun, rather than methodical, and designed to encourage equal and constant participation for all players, whether it be competitively, cooperatively, or both. For example, a game like Candy Land is built around each individual player competing to be the first to reach the finish line, while the game Cranium requires groups of players to cooperate and compete towards a common goal. Games that are entirely cooperative, like Escape: Curse of the Temple, require players to work together to solve a puzzle or achieve a goal.

**5. Instructions:** Clear, concise, and in-depth instructions are vital for any game. Instructions must fully explain the thematic connection to content/story, end goal/s, game setup, materials and their usage, general gameplay, turn sequencing, and any special directions.

**6. Content:** The story, or “theme,” of a game should be engaging and provide a deeper understanding of the topic and content area, at least at some basic level. For example, a more complicated game like Monopoly provides a basic understanding of taxes and property ownership/fees, while a simple game like Chutes and Ladders uses the basic functions of these objects (chutes to fall, ladders to climb) to guide players across the board.

**7. Aesthetic Appeal:** Games must be visually engaging, reflect the content and/or topics involved, and enhance gameplay. Areas where aesthetic appeal is most important include game materials and, to a lesser degree, instructions. For example, a game like Candy Land uses a brightly colored path and simple illustrations of candy-themed areas (Peppermint Stick Forest, Molasses Swamp, Gumdrop Mountains) to reinforce the game’s theme and enhance gameplay for players.





# GAME DESIGN AND 21ST CENTURY SKILLS



Pop Culture Classroom's mission to ignite a love of learning, increase literacy, celebrate diversity and build community aligns with P21's Framework for 21st Century Learning, which defines and illustrates the skills and knowledge students need to succeed in work, life and citizenship. This framework, "has been used by thousands of educators and hundreds of schools in the U.S. and abroad to put 21st Century skills at the center of learning."<sup>1</sup>

## AREAS OF 21st CENTURY STUDENT OUTCOME ALIGNMENT

**1. Content Knowledge and 21st Century Themes:** This unit can support mastery of the following curricular themes: English, reading or language arts, World languages, Arts, Mathematics, Economics, Science, Geography, History, and Government and Civics. Additionally, the critical thinking associated with content-oriented game design will promote understanding at much higher levels.

**2. Learning and Innovation Skills:** Creativity and Innovation, Critical Thinking and Problem Solving, Communications and Collaboration connect directly to the entire game design process.

**3. Information, Media and Technology Skills:** Creating a unique game supports IMT skills in layered ways that teach students how to both use information accurately and creatively for the issue or problem at hand, as well as examine how individuals interpret messages differently, how values and points of view are included or excluded, and how media can influence beliefs and behaviors. These skills are becoming increasingly necessary as our students consume increasingly distracting and disreputable 'informational' content.

**4. Life and Career Skills:** Complex, project-based learning provides teachers and students opportunities to develop these necessary skills: Flexibility & Adaptability, Initiative & Self Direction, Social & Cross-Cultural Skills, Productivity & Accountability, and Leadership & Responsibility.

## AREAS OF 21st CENTURY SUPPORT SYSTEMS ALIGNMENT

The elements described below are the critical systems necessary to ensure student mastery of 21st Century Skills. PCC's Game On! Unit provides alignment between the following areas, ensuring your ability to prepare your students for the 21st Century World.

### 1. 21st Century Standards:

- Focus on 21st century skills, content knowledge and expertise.
- Build understanding across and among academic subjects as well as 21st Century interdisciplinary themes
- Emphasize deep understanding rather than shallow knowledge
- Engage students with the real world--students learn best when actively engaged in solving meaningful problems
- Allow for multiple measures of mastery

### 2. Assessment of 21st Century Skills:

- Support a balance of assessments, including effective classroom formative and summative assessments
- Emphasize useful feedback on student performance that is embedded into everyday learning
- Require a balance of technology-enhanced, formative and

summative assessments that measure student mastery of 21st Century skills

- Enable development of portfolios of student work that demonstrate mastery of 21st Century skills to educators and prospective employers

### 3. 21st Century Curriculum and Instruction:

- Teaches 21st Century skills discretely in the context of key subjects and 21st Century interdisciplinary themes
- Focuses on providing opportunities for applying 21st Century skills across content areas and for a competency-based approach to learning
- Enables innovative learning methods that integrate the use of supportive technologies, inquiry- and problem-based approaches and higher order thinking skills.

### 4. 21st Century Professional Development

- Highlights ways teachers can seize opportunities for integrating 21st Century skills, tools and teaching strategies into their classroom practice — and help them identify what activities they can replace/de-emphasize
- Balances direct instruction with project-oriented teaching methods
- Illustrates how a deeper understanding of subject matter can actually enhance problem-solving, critical thinking, and other 21st Century skills
- Enables 21st Century professional learning communities for teachers that model the kinds of classroom learning that best promotes 21st Century skills for students
- Cultivates teachers' ability to identify students' particular learning styles, intelligences, strengths and weaknesses
- Helps teachers develop their abilities to use various strategies (such as formative assessments) to reach diverse students and create environments that support differentiated teaching and learning
- Supports the continuous evaluation of students' 21st Century skills development

### 5. 21st Century Learning Environments

- Create learning practices that will support the teaching and learning of 21st century skill outcomes
- Enable students to learn in relevant, real world 21st Century contexts (e.g., through project-based or other applied work)
- Allow equitable access to quality learning tools, technologies and resources
- Support expanded community and international involvement in learning, both face-to-face and online

1. <http://www.p21.org/our-work/p21-framework>



# GAME SKIN IDEAS



As the teacher, it's up to you to determine what the theme of the students' games will be. We encourage you to make it general and applicable to what you are studying in class. This way, the game can serve as a tool to deepen comprehension and connections to the content. Examples could include the following:

## **HISTORY:**

A game that mirrors the journey of notable figures (Marco Polo, Alexander the Great, Paul Revere)

Revolutionary War troop/resource movements

A path towards a significant invention (light bulb, cotton gin, etc)

Over the course of a game, players need to collect all resources necessary to build a Mayan temple and society

## **SCIENCE:**

Students create a game that reinforces topics and aspects of the periodic table

Students can create gameplay that simulates and/or demonstrates the water or rock cycle, photosynthesis, and more

Games can track and or use notable scientific figures from history; their achievements can have implications for gameplay

Characters in a game could be racing against climate change, with Advantages and Obstacles that slow or accelerate climate change

## **MATH:**

Students design a basic card game that allows players to reinforce their numeracy or functional facts

Students design a game that teaches order of operations

Estimation can become an important part of gameplay mechanics, where players need to estimate some outcome in advance of playing the game

Geometry games can involve shapes, definitions, area, perimeter, etc

## **LANGUAGE ARTS:**

Students can design a game that supports vocabulary retention

A roll and move game can demonstrate an understanding of story arc/plotlines

A game can mirror the hero's journey

A research project could use a game as one culminating project to show content understanding

**ELEMENTARY (GRADES 2-5)**

**Can't Stop – Roll and Move:** In this classic, players must press their luck with dice and choose combinations tactically to close out three columns. The board has one column for each possible total of two six-sided dice, but the number of spaces in each column varies: the more probable a total, the more spaces in that column and the more rolls it takes to complete. The player places or advances progress markers in the open column(s) associated with their chosen totals, then chooses whether to roll again or end their turn and replace the progress markers with markers of their color.

**Tsuro-The Game of the Path – Roll and Move:** Create your own journey with Tsuro: The Game of the Path! Place a tile and slide your stone along the path created, but take care. Other players' paths can lead you in the wrong direction—or off the board entirely! Paths will cross and connect, and the choices you make affect all the journeys across the board. Find your way wisely and be the last player left on the board to win!

**Basari – Roll and Move/Resource Management:** Basari is a game of gem merchants competing in a marketplace, racing, collecting, trading, and predicting what the other merchants will do. Several games use the simultaneous action selection mechanism, but this is perhaps one of the best.

**Catan Junior - Resource Management:** Catan Junior takes families with children ages 6 and up to a place quite different from Catan as we know it. Players slip into the role of pirates who build their hideouts - called pirates' lairs - all over the islands and set sail to find new places and build more pirates' lairs there.

**Dixit – Theme Discovery, Visual Literacy, ESL:** Dixit is the lovingly illustrated game of creative guesswork, where your imagination unlocks the tale. In this award-winning board game, players will use the beautiful imagery on their cards to bluff their opponents and guess which image matches the story. Guessing right is only half the battle - to really succeed, you'll have to get your friends to decide that your card tells the story!

**Mermaid Beach – Card Game:** They say that the ocean is the inspiration for countless works of great art. Such is the case with Mermaid Beach, a game that came about while 8-year-old Emily Ehlers spent an entire year living aboard a sailboat and travelling the world by sea. Emily, along with help from her brothers, Jake and Drew, came up this wildly imaginative card game that has all elements of a great Gamewright game: fantastic art, whimsical characters, and a set of rules that are easy to learn, yet engaging enough to lure you back for more.

**Escape – The Curse of the Temple – Cooperative Resource Management:** An adventure in Real Time! If a player is left behind, you need to rescue him. Otherwise, you'll all lose! You are a team of adventurers - trapped in a cursed temple. Together you must activate the magic gems in the temple chambers in order to banish the curse. Look out for one another. Some tasks can be accomplished only as a team - and you have only 10 minutes before the temple collapses! Escape is a cooperative real-time game that

is not played in rounds. Instead, each player rolls as quickly and as often as he can with his five dice.

**MIDDLE & HIGH SCHOOL (GRADES 6-12)**

**Catan – Resource Management:** Picture yourself in the era of discoveries: after a long voyage of great deprivation, your ships have finally reached the coast of an uncharted island. Its name shall be Catan! But you are not the only discoverer. Other fearless seafarers have also landed on the shores of Catan: the race to settle the island has begun!

**Forbidden Island – Card-Based Resource Management:** Dare to discover Forbidden Island! Join a team of fearless adventurers on a do-or-die mission to capture four sacred treasures from the ruins of this perilous paradise. Your team will have to work together and make some pulse-pounding maneuvers, as the island will sink beneath every step! Race to collect the treasures and make a triumphant escape before you are swallowed into the watery abyss!

**King of Tokyo – Competitive/Cooperative Resource Management:** Play mutant monsters, gigantic robots and other monstrous creatures, rampaging the city and vying for position as the one and only King of Tokyo! Combine your dice to gather energy, heal your monster or just slap the other monsters down! Spend your energy to trigger permanent or one-shot special powers: a second head, body armor, nova death ray... Stop at nothing to become the King of Tokyo... but that's when the real trouble begins for you!

**Ticket to Ride – Resource Management:** Ticket to Ride is a cross-country train adventure in which players collect and play matching train cards to claim railway routes connecting cities throughout North America.

**Pandemic – Cooperative Resource Management:** As skilled members of a disease-fighting team, you must keep four deadly diseases at bay while discovering their cures. You and your teammates will travel across the globe, treating infections while finding resources for cures. You must work as a team to succeed. Pandemic is a cooperative game, all players win or lose together. The clock is ticking as outbreaks and epidemics fuel the spreading plagues. Can you find all four cures in time? The fate of humanity is in your hands!

**Takenono – Resource Management:** A long time ago, the Emperor of China offered the Emperor of Japan as a symbol of peace. Your delicate mission is to take care of the animal by growing a bamboo plantation. But be careful with the animal and its unhealthy appetite for the crispy shoots....





# ASSESSMENTS



# ASSESSMENTS



These assessments provide you with the tools necessary to compare students' game design abilities both before and after this unit. Of course, the purpose of any assessment is to reveal, both to teacher and student, a learner's knowledge and/or performance at any point during instruction. Teachers can use this information to guide future instruction by eliminating unnecessary lessons and/or providing additional support where helpful. Additionally, comparing similar assessments that have been administered at different times can reveal student growth over a unit of study.

## PRE-ASSESSMENTS

**Game Design Pre-assessment** — Ask students to briefly design a game of their choosing, as best as they are able. Remember, it's OK if they have no idea what the form is, or how to design a game. This will be both telling to you as a teacher and demonstrative of their growth by the end of the unit. If time allows, evaluate this pre-assessment using the Game Design Rubric.

**Pre/Post Student Survey** — This survey is designed to gauge student interest in participating in school and game-based activities. Administer this survey before and after the Game On! Unit to track any growth in student interest in the aforementioned categories.

## POST-ASSESSMENTS

**Pre/Post Student Survey** — This survey is designed to gauge student interest in participating in school and game-based activities. Administer this survey before and after the Game On! Unit to track any growth in student interest in the aforementioned categories.

**Game Design Rubric** — Upon completion of the unit and game creation, teacher and/or students can evaluate their games with the Game Design Rubric. This will reveal the learning that has taken place during the time spent during the Game On! unit of study.



# GAME DESIGN PRE-ASSESSMENT



Game Name:	Game Duration:
# of Players:	Game Designer:
Age Range:	

Gameplay Instructions: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Draw your game board in this box. Draw and label all necessary materials.





# PRE/POST STUDENT SURVEY



Game Designer: \_\_\_\_\_

**How often do you play games? (Circle one)**

Never      Once a Month      Once a Week      A Few Times per Week      Every day

**How interested are you in playing games? (Circle One)**

None      A Little      Some      A Lot

**How would you describe your interest in school? (Circle One)**

Not Interested      A Little Interested      Somewhat Interested      Very Interested

**Please circle the term that describes your interest in participating in class activities and discussions.**

Not Interested      A Little Interested      Somewhat Interested      Very Interested

**Please circle the term that best describes your interest in working with other students.**

Not Interested      A Little Interested      Somewhat Interested      Very Interested

**How do you choose which games you play? (Circle all that apply)**

Fun      Appealing Artwork      Enjoyable Challenge      Play with friends  
Competition      Complexity of game      In-game strategy      Learn about a subject/idea  
Materials      Portability      Easy to play  
Other \_\_\_\_\_

**How much do you know about building a game? (Circle One)**

Nothing      A Little      Some      A Lot

**How much effort do you think it takes to build a game? (Circle One)**

Nothing      A Little      Some      A Lot

**How would you describe your ability to design your own game? (Circle one)**

Not Able      Weak      Medium      Strong      Very Strong

**How excited are you to learn more about Game Design? (Circle One)**

Not Excited      A Little Excited      Somewhat Excited      Very Excited



# GAME DESIGN RUBRIC



Game Designer(s): \_\_\_\_\_

Game Title: \_\_\_\_\_

CATEGORY	1	2	3	4	5
<b>Mechanics</b>	Players have one choice during each turn. Game is methodical with little to no variation in participation (cooperative, competitive, mixed).	Players have a few choices during each turn. Game is somewhat methodical with minor variation in participation.	Players have multiple choices during each turn, leading to some variation in participation.	Players have a mostly simple and a few complex choices during each turn, leading to frequent variation in participation.	Players have several fun, enjoyable and complex participation choices during each turn, leading to constant variation in participation.
<b>Goal</b>	No goal for playing the game (story, luck, joy, competitive challenge, and/or strategy) is present	A simple goal is present, but it is unclear or confusing to players what this goal is or how to achieve it.	One or more simple goals are present, but little challenge and/or fun is involved in achieving these goals.	Multiple goals of varying difficulty are defined, keeping players invested in most of the gameplay.	Multiple goals of varying difficult are clearly defined, challenging, and fun, keeping players invested throughout all of gameplay.
<b>Materials</b>	1-2 simple materials are used. Little to no connections to the game's content, aesthetics, mechanics, or interactivity are present.	At least 2 simple materials are used. Materials are aesthetically appealing, but connections to content, mechanics, and interactivity are unclear or confusing.	2 or more types of aesthetically appealing materials are used. Each type connects to the game's content, mechanics, and interactivity.	3 or more types of aesthetically appealing materials are used. Each type enhances the game's content, mechanics, and interactivity.	4 or more types of aesthetically appealing materials are used. Each type directly connects to and greatly enhances the game's content, mechanics, and interactivity.
<b>Interactivity</b>	Only one player is engaged in each turn. Player actions rarely influence overall gameplay.	Opportunities for more than one player to be engaged in each turn exists, but player actions have little to no influence on overall gameplay.	Opportunities for multiple players to be engaged during each turn exist, and player actions have some influence on overall gameplay.	Multiple players are expected to be engaged during each turn, and player actions greatly influence gameplay.	All players are expected to be fully engaged and participate during each turn to continually influence and complicate overall gameplay.
<b>Instructions</b>	No instructions are present.	Instructions are present but incomplete, superficial, unclear, and/or confusing.	Instructions partially explain how to play the game, but are at times vague, confusing, and/or missing elements of gameplay.	Instructions clearly and fully explain how to play the game in simple, direct ways.	Instructions are aesthetically appealing, connected to content, and fully explain how to play the game in a clear, concise, and in-depth way.
<b>Content</b>	Little to no connection to content or theme is present.	Connections to content or theme are unclear or confusing. No understanding of content is shown.	Connections to content or theme are simple. A basic understanding of content is shown.	Connections to content or theme are complex and unique, but do not affect gameplay in a significant way.	Connections to content or theme are layered, complex, engaging, and a significant part of the game. Both the game's design and gameplay shows a deeper level of comprehension.
<b>Aesthetic Appeal</b>	Little to no aesthetic design is present on game materials (board, cards, tokens, character/game pieces).	Aesthetic design is present on few game materials, though it is unclear or confusing as to how this connects to the content and/or overall gameplay.	Aesthetic design is clearly included in some game materials, but parts of game do not show any aesthetic design.	Aesthetic design is visually engaging, included in most game materials, and clearly connects to the game's content.	Aesthetic design is visually engaging, included in all gameplay materials, clearly connects to content, and greatly enhances gameplay.



# UNIT PLANNING





# GAME ON! UNIT OVERVIEW



	<b>LESSON 1</b> GAME ON!	<b>LESSON 2</b> GAME CHANGERS	<b>LESSON 3</b> A MATERIAL WORLD	<b>LESSON 4</b> WHAT'S YOUR STORY?	<b>LESSON 5</b> NOW YOU CREATE AND PLAY MODS
<b>THEME</b>	<b>Vocabulary</b>	<b>Game Design Principles</b>	<b>Game Design Principles</b>	<b>Game Design Principles</b>	<b>Student Mods</b>
<b>OBJECTIVE</b>	Students evaluate prior knowledge and learn Game Design Principles.	Students learn about Mechanics and Goals through game mods.	Students learn about Materials and Interactivity through game mods.	Students learn about Instructions, Content and Aesthetic Appeal through game mods.	Students create mods and analyze effectiveness and/or success.
	<b>LESSON 6</b> GOALS OF THE GAME	<b>LESSON 7</b> THE FIELD OF BATTLE	<b>LESSON 8</b> PICKING UP THE PIECES	<b>LESSON 9</b> THE RIGHT WAY TO PLAY	<b>LESSON 10</b> BETA TESTING
<b>THEME</b>	<b>Goal</b>	<b>Board Building</b>	<b>Materials</b>	<b>Instructions</b>	<b>Play Test</b>
<b>OBJECTIVE</b>	Students determine goals, obstacles, and advantages for gameplay.	Students design their game board.	Students design and build content oriented characters, pieces, and other materials.	Students write a complete set of instructions for their games.	Student groups playtest each others' games.
	<b>LESSON 11</b> CRUNCH TIME				
<b>THEME</b>	<b>Modify/Build/Play Day</b>				
<b>OBJECTIVE</b>	Based on playtest results, students revise and finalize their games.				

# 5, 10 OR 15 DAY UNIT PLANNING CHART

**IF YOU ARE GOING TO TEACH THE UNIT OVER THE COURSE OF 5 DAYS, USE THE FOLLOWING LESSONS:**

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
<b>BLEND LESSONS 1 &amp; 2</b> Game Design Vocabulary and Modifications	<b>LESSON 6</b> Goal	<b>BLEND LESSONS 7 &amp; 8</b> Board Building and Materials	<b>LESSON 9</b> Instructions	<b>LESSON 11</b> Modify/Build/ Play Day

**IF YOU ARE GOING TO TEACH THE UNIT OVER THE COURSE OF 10 DAYS, USE THE FOLLOWING LESSONS:**

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
<b>LESSON 1</b> Game Design Vocabulary	<b>LESSON 2</b> Play and Analyze Mods	<b>LESSON 3</b> Play and Analyze Mods	<b>LESSON 4</b> Play and Analyze Mods	<b>LESSON 5</b> Student Modifications
DAY 6	DAY 7	DAY 8	DAY 9	DAY 10
<b>LESSON 6</b> Goal	<b>BLEND LESSONS 7 &amp; 8</b> Board Building and Materials	<b>LESSON 9</b> Instructions	<b>LESSON 10</b> Playtesting	<b>LESSON 11</b> Modify/Build/ Play Day

**IF YOU ARE GOING TO TEACH THE UNIT OVER THE COURSE OF 15 DAYS, USE THE FOLLOWING LESSONS:**

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
<b>LESSON 1</b> Game Design Vocabulary	<b>LESSON 2</b> Play and Analyze Mods	<b>LESSON 3</b> Play and Analyze Mods	<b>LESSON 4</b> Play and Analyze Mods	<b>LESSON 5</b> Student Modifications
DAY 6	DAY 7	DAY 8	DAY 9	DAY 10
<b>LESSON 6</b> Goal	<b>LESSONS 7</b> Board Building	<b>LESSON 9</b> Materials	<b>LESSON 9</b> Instructions	<b>LESSON 10</b> Playtesting
DAY 11	DAY 12	DAY 13	DAY 14	DAY 15
<b>LESSON 10 or 11</b> Playtesting or Studio Day	<b>LESSONS 10 or 11</b> Playtesting or Studio Day	<b>LESSON 11</b> Studio Day	<b>LESSON 11</b> Studio Day	<b>GAME PLAY</b> Celebration!



# ROLL AND MOVE UNIT



# ROLL AND MOVE

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# LESSON 1

## ROLL & MOVE



# GAME ON!

### OBJECTIVES:

Students will evaluate background knowledge regarding games and game design. Students will learn the Game Design Principles.

### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

### MATERIALS:

Game Design Pre-assessment, Pre/Post Student Survey, Game Design (GD) Principles Puzzle, pencils, white board or chart paper, sticky notes, markers

**TIME: 50 minutes**

## PROCEDURE

### 0-15 minutes:

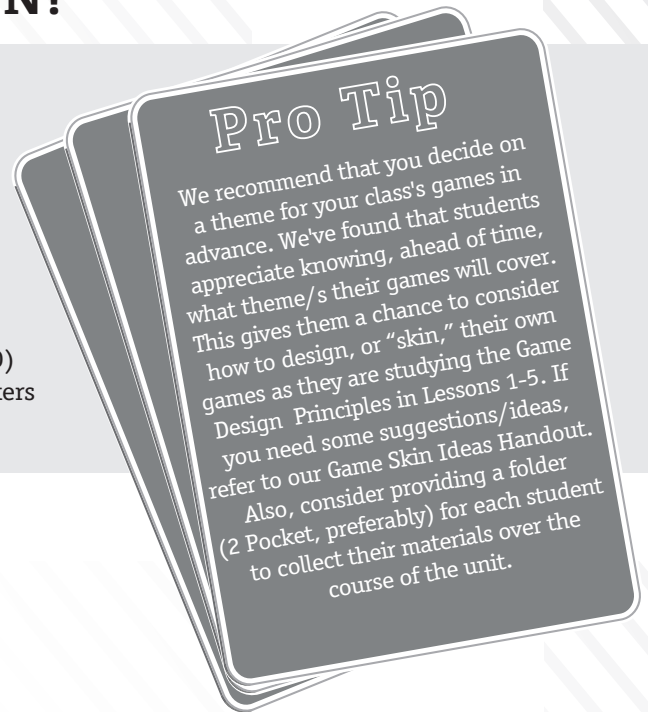
1. Begin in a whole group setting by briefly explaining to students that they will have the chance to build a game of their own to demonstrate their understanding of a theme that you have chosen. For the purposes of this unit, we suggest sticking to the creation of board games.
2. Continue by asking students about their favorite games. List responses on the board or chart paper. Consider building a table or graph that separates the responses into game type: Card, Board, Video, Dice, and/or Party. The graph can also be built by students writing their favorite game on a sticky note, then stack these on the graph, separated into the above categories. Discuss the results. What do students notice? Are there games that could fit in multiple categories? Is there one game type that seems to come up the most? Why?
3. If time permits, ask students to consider why they chose the game/s they did, and what makes these games special. What do games teach us? Why do we enjoy playing them? What benefits do they have now and throughout history?

### 15-30 minutes:

4. Administer the pre-assessments to students: Student Pre-assessment and Student Survey. Discovering these baselines will give valuable insight as to what your students will need most during the unit. It will also reveal just how much they've grown during the study, as well.

### 30-50 minutes:

5. Distribute the GD Principles Puzzle Handout. In small groups or individually, have the students work to solve the puzzle, matching each term, definition, and example. After completion, have the whole class come up with examples that match each principle. For example:



- a. After discussing Mechanics, students could write: "Life. Spin, move, buy/action," or "Uno. Complete action, play a card or draw until able to play."
- b. After discussing Interactivity, students could write: "Life. Very competitive," or "Monopoly. Competitive, but trading cards and money allowed."

## EXTENSIONS

- Bring in one or more commercial games to use as models for the class. Have students look through the game's box and instructions and identify examples of each of the GD Principles. If you're unable to bring in a physical game, consider bringing in printouts of instructions and/or images of game materials for students.
- Have students evaluate some of their favorite games individually or in groups.
- Use the GD Principles to compare different game types and discuss differences between certain games. What do students notice about how GD Principles show up in different games? Why?





# LESSON 2

## ROLL & MOVE



# GAME CHANGERS

### OBJECTIVES:

Using the Game Design Principles, students will critically evaluate modifications to a game.

### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal

### MATERIALS:

Tic Tac Toe handout, Mechanics and Goal Mod Handouts (Copied back to back), pencils, blank paper, white board or chart paper, markers, six-sided dice, tokens

**TIME: 50 minutes**

## PROCEDURE

### 0-10 minutes:

1. Begin in a whole group setting. Ask students what they remember about the GD Principles they learned the previous lesson. List their responses on the board, prompting when necessary so all seven are listed: **Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal**

2. Follow this up by introducing three new Game Design terms that will be used throughout the rest of the project:

- Modification (mod):** a change in something, such as a system or style.
- Advantage:** something that makes it easier to achieve the goal of the game, such as an achievement, resource, or event.
- Obstacle:** something that makes it harder for a player to achieve the goal of the game, such as a barrier, event, or choice.

### 10-50 minutes:

3. Distribute the Tic Tac Toe Handout. In pairs, have students play Tic Tac Toe for a few minutes. During their gameplay today, students are welcome to use blank paper if they run out of room on this handout. Afterward, briefly review how this basic game successfully or unsuccessfully demonstrates the 7 GD Principles.

4. Next, distribute the Mechanics and Goal Modification Handouts (copied back to back) to students. One side of the handout is geared towards affecting the way that the game's Mechanics (GD Principle #1) work. The other side's mods affect the Goal (GD Principle #2) of the game.



5. Ask the students to play each side for about 10 minutes, then reflect on the mod's effects on the game afterward. Encourage them to play enough iterations of each modification to get a sense of what impact each has on the typical Tic Tac Toe gameplay.

6. After 20 minutes of gameplay and evaluation, lead a whole group discussion about how the students noticed changes to the Mechanics and Goal of the game. If they haven't yet, ask them to record these observations on the Mechanics and Goal Mods handout. Be sure to save this for later, as students will continue to take notes on other mods throughout the course of their study.

## EXTENSIONS

- Provide students the chance to modify games with the intentions of affecting Mechanics and/or Goal. Evaluate whether or not each mod was successful.
- Discuss students' favorite games and how each reflects different Mechanics and Goals. What similarities and differences do they notice? What would their favorite game look like with different Mechanics and Goal?



# LESSON 3

## ROLL & MOVE



# A MATERIAL WORLD

### OBJECTIVES:

Using the Game Design Principles, students will critically evaluate modifications to a game.

### GAME DESIGN PRINCIPLES ADDRESSED:

Materials, Interactivity

### MATERIALS:

Materials and Interactivity Mod Handouts (copied back to back), copies of all 6 pages of Lined Basic Game Board (enough for each group), pencils, white board or chart paper, markers, tape, six-sided dice, game materials (counters, beans, cubes etc.)

**TIME: 50 minutes**

## PROCEDURE

### 0-5 minutes:

1. Explain to students that today's game mods are going to focus on Materials and Interactivity (GD Principles #3 and #4). Ask students to share any materials they've brought, describing how they are used in gameplay. If you've brought your own game materials, do the same.

### 5-30 minutes:

2. Distribute the individual (or pre-taped) copies of the Lined Basic Board game to build the shape you want students to play with. If necessary, have students tape the game board together. If students are able, we highly recommend they assemble their own boards, as it will support their creation process later on.

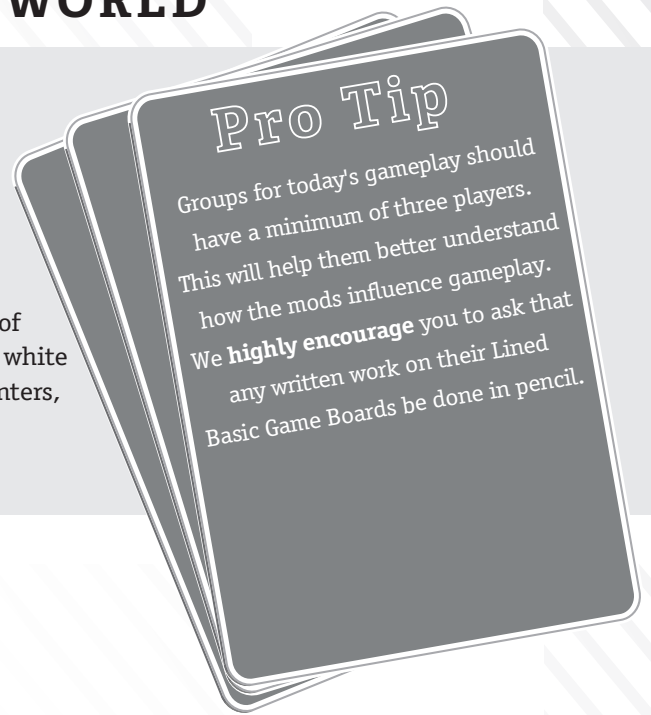
3. Hand out the Materials and Interactivity Modification Handouts (copied back to back), and have the students take 10-15 minutes to proceed through the first side, assessing the effect of each Materials mods.

4. After 15 minutes of gameplay and evaluation, lead a whole group discussion about how the mods changed Materials and general gameplay. Encourage students to take notes from the conversation on the Materials Mod Handout. Be sure to save this for later, as students may refer to this handout during their subsequent study and creation.

### 30-50 minutes:

5. Repeat the above process with the Interactivity Mod Handout.

6. After the closing conversation, ask the students to fold up/store their game board for use during future lessons.



## EXTENSIONS

- Are students familiar with games (board, video, card, etc.) that have a high degree of interactivity? Often, "multiplayer" games involve constant and equal participation from each player. What might some examples of these be? How do game designers encourage constant and equal participation? What are different ways in which players can participate in a game, both directly and indirectly?
- What games do the students know about that have interesting materials? How are these materials used? Create a chart of materials and how they can be used in each game.



# LESSON 4

## ROLL & MOVE



### WHAT'S YOUR STORY?

#### OBJECTIVES:

Using the Game Design Principles, students will critically evaluate modifications to a game.

#### GAME DESIGN PRINCIPLES ADDRESSED:

Instructions, Content, Aesthetic Appeal

#### MATERIALS:

Instructions, Content, and Aesthetic Appeal Mod Handouts (copied back to back), copies of the 3 Beat The Virus handouts: Game Board, Materials, and Instructions, pencils, white board or chart paper, markers, tape, six-sided dice, game materials (counters, beans, cubes etc.), students' game boards from previous day

**TIME: 50 minutes**

#### PROCEDURE

##### 0-5 minutes:

1. Explain that, today, the focus will be game mods for Instructions, Content, and Aesthetic Appeal (GD Principles #5, #6, & #7). Ask students what they remember about these three GD Principles. Why are they important? How are they used in games?

##### 5-30 minutes:

2. Distribute the Instructions, Content, and Aesthetic Appeal Modification Handouts (copied back to back). DO NOT hand out the Beat the Virus Game Board yet!

3. The Instructions Mod is geared towards affecting the way that the game's Instructions work to support, or confuse, the gameplay. Note that one set of instructions is intended to be a poor representation of instructions. This can be referred to as a modification that "breaks the game," or makes the game impossible to play and/or win. The second is a quality example of instructions. Both are intended to demonstrate the range of potential instructions.

4. Encourage students to play as many iterations of the Instructions Mods as possible in the time provided to get a sense of the effect each has on gameplay they studied previously.

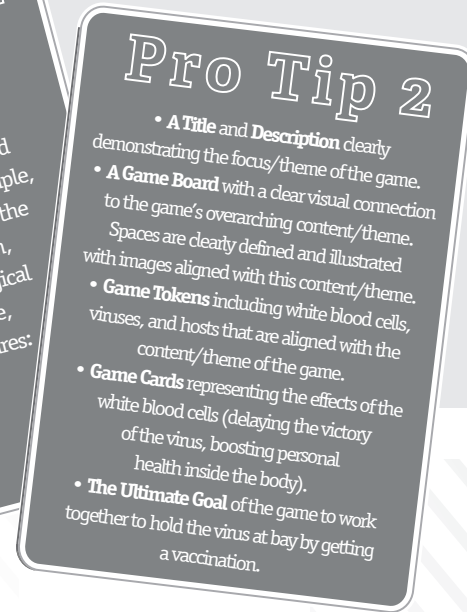
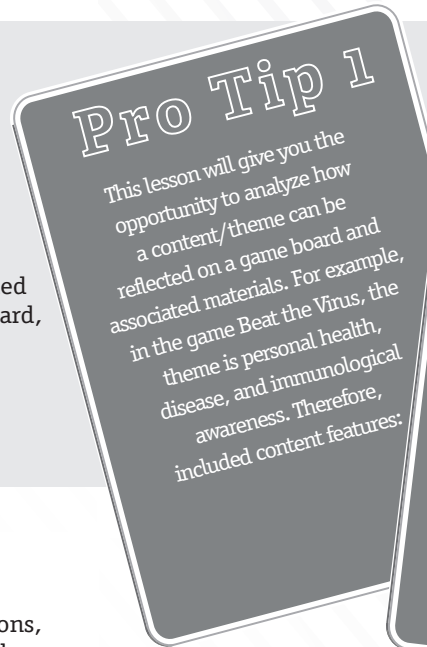
**Note:** They should be comparing these "modded" games to the unmodified, plain Roll & Move game played initially.

5. After 15 minutes of gameplay and evaluation, lead a whole group discussion about how the students noticed changes resulting from the differing instructions. Again, request students take additional notes during the conversation to document observations.

##### 30-50 minutes:

6. Repeat the above process, and NOW hand out the Beat the Virus Game Board and Beat the Virus Instructions. This Mod is intended to affect how Content and Aesthetic Appeal affect the gameplay experience, and the game board, materials, and instructions are all designed to further support that point.

7. Note that the Mods to this game are intended to provide thematic and artistic elements that align with the game's subject



matter and draw players into the gameplay. Providing both a content-oriented skin/story and aesthetic design onto a game increases its hook, relevance, and enjoyment for players. Encourage students to analyze how the Content (text, images, figures, game board) and Aesthetic Appeal of the game's materials, instructions, and design impacts their gameplay and aligns with the game's overall subject matter.

8. During the subsequent conversation, have students record/take notes. If necessary, create a chart on the board that allows students to map out how the Content and Aesthetic Appeal of a game align with and support subject matter, as well as improvements students might make to the design, art, and/or materials. For example, could beneficial and/or penalty cards be created that reinforce concepts of hygiene, nutrition, etc.? What might be added to the game board to increase its Aesthetic Appeal?

#### EXTENSIONS

- Students know about all sorts of games that have great stories/themes associated with them. Host a discussion about the Content that comes up in the games students play, and how that content impacts their overall experience with these games.

- Which games do the students think have the greatest/most effective Aesthetic Appeal? Remember, these games could include card, video, board, and/or party games.

- Provide copies of game instructions from common games your students might be familiar with. These can be downloaded from the internet or copied. Compare and contrast the instructions. How wordy are they? How effective, concise and clear are they? How do they incorporate content and aesthetic appeal into their design, and why?



# LESSON 5

## ROLL & MOVE



### NOW YOU CREATE AND PLAY MODS!

#### OBJECTIVES:

Using their understanding of the effects of game modifications from the previous lessons, students will experiment with game modifications and analyze their consequences.

#### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

#### MATERIALS:

Copies of Mod Possibilities Handout, copies of Mod Evaluation Handout (copied back to back), pencils, white board or chart paper, markers, assortment of dice, counters, chips, cubes, and other materials that students can use for gameplay

**TIME: 50 minutes**

#### PROCEDURE

##### 0-5 minutes:

1. Begin in a whole group setting, and review what they have learned from their experiments with game Mods and/or the definition of "Modification" from Lesson 2. For reference:

- Modification:** a change in something, such as a system or style
- Advantage:** something that makes it easier to achieve the goal of the game, such as an achievement, resource or event
- Obstacle:** something that makes it harder for a player to achieve the goal of the game, such as a barrier, event, or choice

##### 5-30 minutes:

2. Over the past lessons, students have studied the effects of game mods on the gameplay experience. Today, the students are expected to use their creativity and experience with mods to change a Roll & Move game in ways that they decide.

3. Using the Lined Basic Game Board or Beat the Virus as their foundation, invite students to come up with a Mod, or series of Mods, that changes the gameplay experience in some way. Encourage them to create mods that manipulate the Game Design Principles. Also, students are encouraged to play with and alter the options on the Mod Possibilities Handout.

4. After groups have decided upon a particular mod, have them write it out on their Mod Evaluation Handout. Have the group playtest the game for 15-20 minutes to determine the effect/s of their mod/s.

5. Stop the playtesting process after a time. Using a whip-around, check in with each group to determine how well (or not) their modifications worked. What were the expected consequences? What happened that they did not expect? What Principles were affected by gameplay?



##### 30-50 minutes:

6. Have student groups come up with a second mod, or series of mods, record them, and then playtest for another 15 minutes. Try to encourage groups to focus this iteration on a different GD Principle from their first mod in order to provide some different gameplay consequences.

7. Discuss: How did this new mod, or mods, change things?

#### EXTENSIONS

• Let the students know that in the following lessons, they will get to use what they have learned to create a game of their own. As their teacher, it's up to you to determine what the theme of the game will be. We encourage you to make it general and applicable to what you are studying in class. Refer to the Game Skin Ideas Handout.

• Provide students with popular games to play through and/or analyze. Give them the chance to modify the game in a manner of their choosing, then analyze the effects of this mod on the gameplay.





# LESSON 6

## ROLL & MOVE



### GOALS OF THE GAME

#### OBJECTIVES:

Within a theme, students will begin the game design process by determining a Goal for their game. Students will begin writing the Instructions for their games.

#### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

#### MATERIALS:

Goals of the Game Handout, pencils, white board or chart paper, markers

#### TIME: 50 minutes

#### PROCEDURE

##### 0-15 minutes:

1. Begin the lesson by telling the students that today they will begin creating their own games. In order to do this, they will come up with a Goal for their game based on a theme of your (the teacher's) choosing. To better understand what various goals can look like, start by facilitating a whole group conversation to fill out a Goal of the Game handout together. This can be done on the white board, document camera, projector, or chart paper. Remember, game types can include Card, Board, Video, Dice, and/or Party.

2. The following is an example of how the handout would be completed for Beat the Virus.

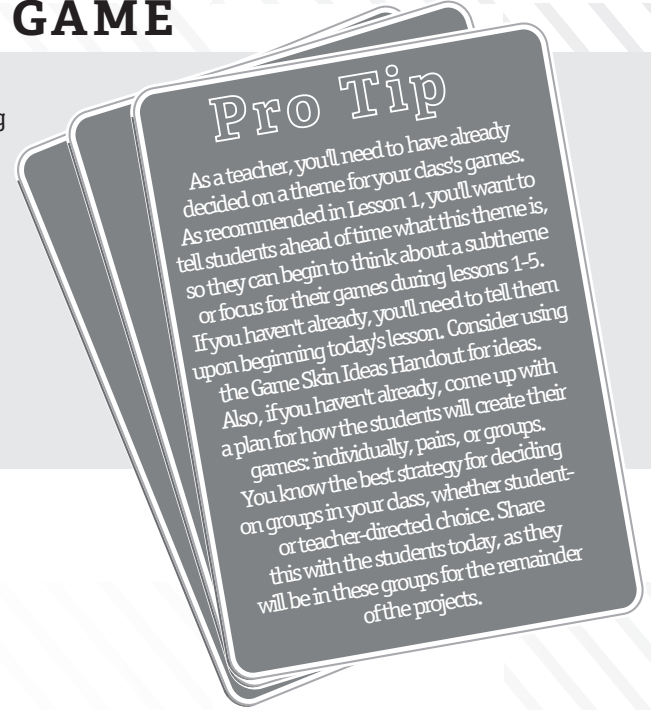
- **Content/Theme:** Immune System, healthy lifestyle and habits, infectious diseases
- **Goal:** Get a vaccine before an outbreak of the flu virus

Advantages	Obstacles
<ul style="list-style-type: none"> <li>• White blood cells (slow infection)</li> <li>• Washing hand (prevents spread of disease)</li> <li>• Getting good sleep (maintains good health)</li> <li>• Eating/Drinking right (gives strength)</li> </ul>	<ul style="list-style-type: none"> <li>• Viruses (spread quickly)</li> <li>• Airborne transmission (infect those nearby)</li> <li>• Stress (deteriorates health)</li> <li>• Unknown contact with infected objects, (spreads Infection)</li> </ul>

##### 15-40 Minutes:

3. In the next part of the lesson, remind the students what their theme is. In order to come up with their own goal, students will use the Goals of the Game Handout. This handout is expected to help the students generate the following based on a theme you provide:

- (a) **Content/Theme:** a basic description of the game aligned with the game's content/theme.
- (b) **Goal:** how players win the game.
- (c) **Advantage:** something that makes it easier to achieve the goal of the game, such as an achievement, resource or event.
- (d) **Obstacle:** something that makes it harder for a player to achieve the goal of the game, such as a barrier, event, or choice.



4. During this part of the lesson, circulate among the room to support students as needed. Based on the needs of the class or an individual student/group, stop the process and have students briefly share what they've come up with, or encourage students having difficulty to visit other groups to see what others have come up with. This could serve as inspiration for their work. If you do take time to share during the process, there is less of a need to do that at the end of the lesson.

##### 40-50 minutes:

5. If you haven't yet had students share what they were able to accomplish today, give groups/individuals time to talk about what they were able to come up with. This will serve as both a celebration and gentle motivator/inspiration for students who were not able to complete the activity in time.

6. Have students put their work in their folders for tomorrow. Let students know that tomorrow they will begin to design their game boards to support the Goals, Obstacles, and Advantages of their game.

#### EXTENSIONS

- Provide students with popular games to play through and/or analyze for Goals, Obstacles, and Advantages as they relate to overall game themes. Discuss how these thematic elements work together to create a better/worse experience for the player, and a better/worse overall game.

# THE FIELD OF BATTLE

### OBJECTIVES:

Students will create a game board to support the theme, goal, advantages, and obstacles of their game.

### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

### MATERIALS:

Board Design Handout (copied back to back), Sample Game Board Handout, pencils, pens, markers, crayons, colored pencils, white board or chart paper, markers, computers with internet connection (used for printing images to be used on game board)

**TIME: 50 minutes**

## PROCEDURE

### 0-10 minutes:

1. Begin by telling the students that today they will be designing their game boards.

2. Guide a conversation about game boards and what they can look like by having students consider the following questions: What kind of board would connect to the theme of the game you are building? What images and symbols might be associated with this theme? How can you generate a board that shows your learning or understanding about the content and/or theme? If desired, provide the students with copies of the Sample Game Board Handout to ignite their imaginations.

3. The goal here is to have them consider what kind of board would best represent the theme, goal, obstacles, and advantages they came up with in the previous lesson. If necessary, draw (or have students come up and draw) examples on the board.

### 10-40 minutes:

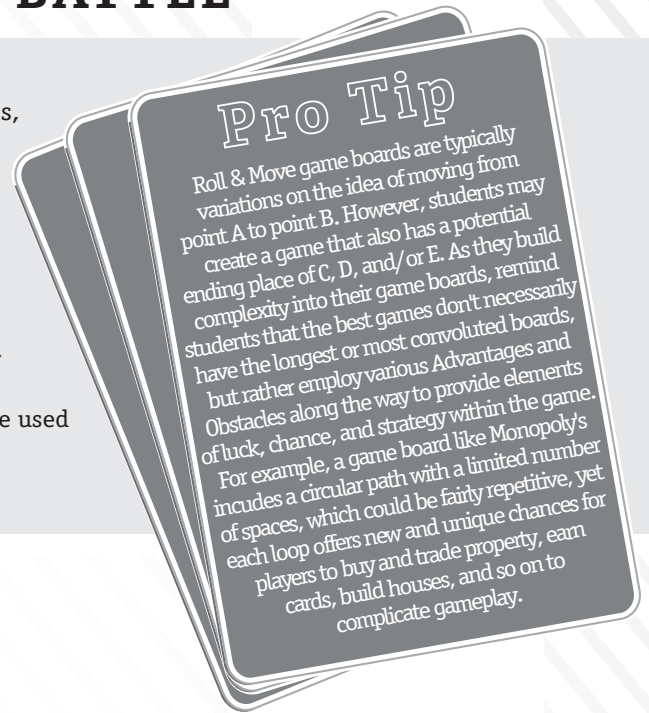
4. Distribute the Board Design Handout (copied back to back), and give the students time to work through the process of coming up with their game boards. Circulate throughout the room, asking guiding questions, redirecting, and offering input where needed.

5. Once students have completed their planning, provide them with necessary time and materials to build their game boards.

### 40-50 minutes:

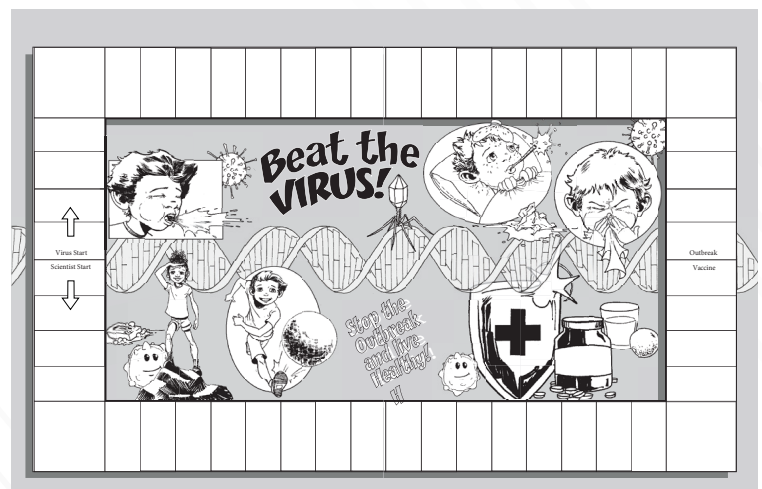
6. After the students have worked on their game boards, give those that are interested a time to share what they have come up with. If interested, allow other students the opportunity to provide supportive feedback.

7. Clean up and place all materials into folders for tomorrow.



## EXTENSIONS

- Bring in examples, copies, print-outs, and/or photos of game boards for students to compare, analyze, and experiment with.
- Compare similarly designed game boards that employ different Themes, Obstacles, and Advantages. How is the path in Monopoly different from that in Sorry!? How do Pandemic's and Risk's use of islands/countries compare?





# LESSON 8

## ROLL & MOVE



# PICKING UP THE PIECES

### OBJECTIVES:

Students will create game materials to support the theme, goal, advantages, and obstacles of their game.

### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

### MATERIALS:

Game Materials Handout, Sample Game Materials Handout, pencils, white board or chart paper, markers, assortment of materials that students can use for gameplay (listed in Pro Tip), baggies/containers to collect student gameplay materials

**TIME: 50 minutes**

### PROCEDURE

#### 0-10 minutes:

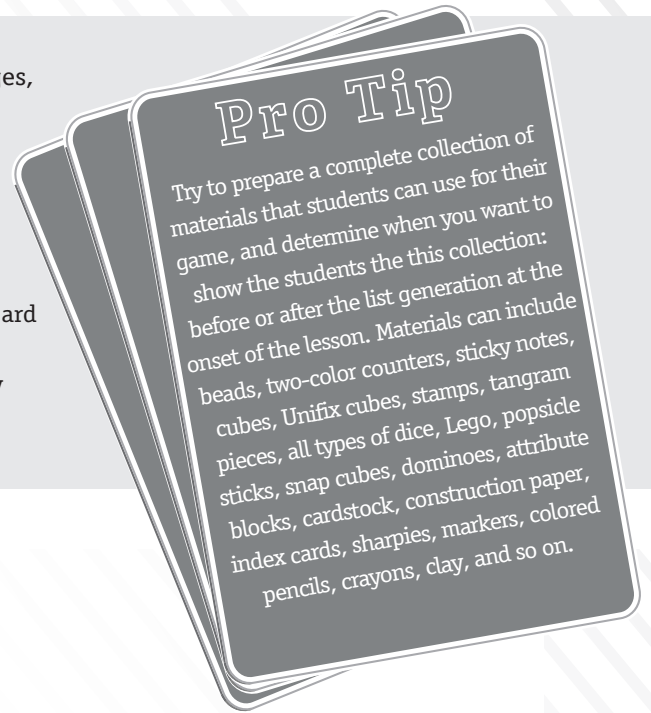
1. Begin lesson by generating a list of potential game materials. If you've chosen to show students the collection of materials, consider asking them: "How could each of these be used in the game?" If needed, have students group the materials together in the categories included below, either on the board or using the collection for examples. If you haven't shared the materials, see what the students can come up with on their own.

- a. **Avatars** representing particular people, objects, animals, symbols, and/or characters
- b. **Cards** that players draw or play during the game
- c. **Movement pieces** including
  - i. **Dice** for movement, combat, and earning points
  - ii. **Spinners** for movement and decision-making in the game
- d. **Tokens** (chips, cubes, glass gems, coins, sticks) representing currency, life, and/or points during a game
- e. **Other Materials** as related to the overall theme and gameplay

#### 10-50 minutes:

2. Provide students time to generate ideas with the Game Materials handout. The ultimate goal of this exercise is to get students thinking about how they can connect to their materials to the theme, goal, advantages, and obstacles of their games. Supporting questions not on the handout include:

- a. **Avatars**
  - i. What are players going to use as their avatars during the game?
  - ii. Do your avatars fit in with the theme of the game?
  - iii. How many players can enjoyably play your game? Does each need an avatar, and how will these be assigned (if not randomly)?
  - iv. How can you make your avatar fun to play with and aesthetically appealing?



#### b. Obstacles and Advantages

- i. How can you use some of the materials available to you as in-game Obstacles and/or Advantages? Try to think past just writing "Lose a Turn" or "Move ahead one space" on the space or cards. Some ideas include:
  - Create cards that have various obstacles and advantages on them, increasing the surprises during gameplay
  - Create chips or tokens that can be earned to punish other players, buy extra turns, or utilize some special ability/ element in the game
  - Create a spinner to determine which way a player moves at an intersection, whether they earn/lose a chip or token, and/or a special space on the board a player moves to next
  - Earn chips that are then placed/removed to build/destroy islands over water, complete math equations, unite bonds between electrons, or complete a novel's story arc
  - Build other physical items that change gameplay, such as a popsicle-stick "roads" that needs to be built between forts, Styrofoam balls used with a board to create a "universe" students can travel around, or a plaster tree at the center of the board students need to reach to complete the water cycle



### PICKING UP THE PIECES

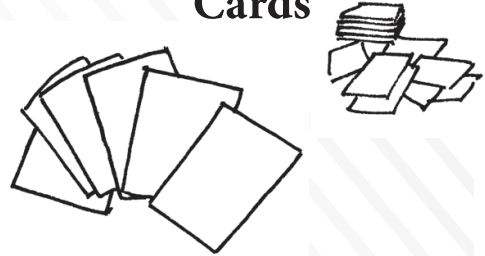
3. Once students have completed their plans for construction on the Game Materials handout, allow them to work on collecting and building these materials.

4. For the **last five minutes**, have students clean up their work and make sure to label each of their bags/boxes for future use.

#### EXTENSIONS

- Bring in examples, print-outs, and/or photos of game materials for students to compare, analyze, and experiment with.
- Have students brainstorm/create their own “theoretical” additions to a popular game. What materials would they add to Monopoly to make it better while aligning with the theme? How about Risk? Candyland? How might they add to, or tweak, the materials that already exist to make the game better? Encourage students to focus first on advantages and obstacles they might add to the game, and then consider the materials they would use to make these a reality. This will help students remain focused on the thematic elements, rather than the specifics of gameplay for each material.

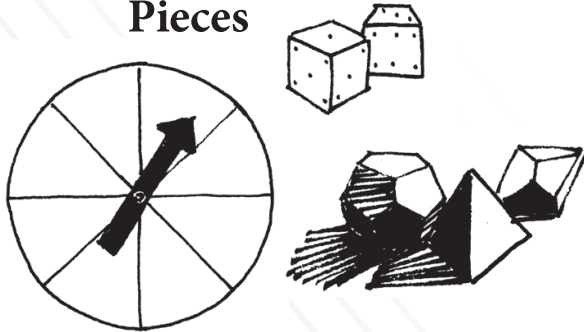
#### Cards



#### Avatars



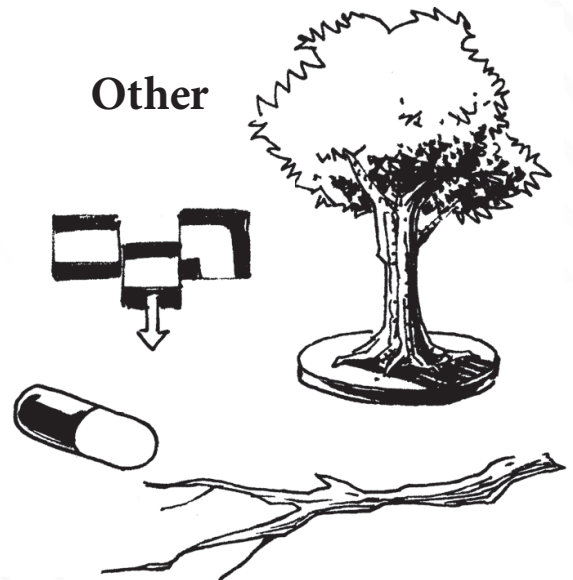
#### Movement Pieces



#### Tokens



#### Other







# LESSON 9

## ROLL & MOVE



## THE RIGHT WAY TO PLAY

### OBJECTIVES:

Students will write a complete set of Instructions for their game.

### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

### MATERIALS:

Game Instructions Handout (copied back to back), Beat the Virus Instructions, pencils, white board or chart paper, markers, computer with internet connection and projection capability (not necessary, but helpful), other gameplay materials as needed

**TIME: 50 minutes**

## PROCEDURE

### 0-15 minutes:

1. Begin by telling the students that today they will be writing the instructions for their games. The great news is that they have already done most of the work for this part of the project.

2. Lead a short conversation that reviews the main categories of Game Instructions. These are on today's handout and include:

- |                               |                       |
|-------------------------------|-----------------------|
| a. Game Name                  | g. Goal               |
| b. # of Players               | h. Contents           |
| c. Age Range                  | i. Setup              |
| d. Play Time                  | j. Gameplay           |
| e. Designers                  | i. Turns              |
| f. Introduction/<br>Backstory | ii. Examples          |
|                               | k. Special Situations |

3. In a whole or small group setting, fill in these categories with a simple and commonly known game such as Tic Tac Toe, Uno, Checkers, Sorry, or Clue. Or, you can use our provided example instructions for Beat the Virus. This can serve as a powerful modeling tool. If possible, do this via document camera or on the board/chart paper.

4. Another possibility is to print online versions of these games' rules, bring in copies of your own, or ask students to bring in some of their own. Using these mentor texts, compare them to the above categories and evaluate how effectively they work.

## Pro Tip 1

• Students should focus first on creating CLEAR and CONCISE written instructions, then the design aspects (drawings, layout, colors, etc.). Encourage them to think creatively about how the instructions might look. Images (photos, illustrations, etc.) are vital to communicating game materials and gameplay elements, and students should be encouraged to add these in where appropriate.

• This lesson is a great chance for the writers in the group to shine. They can scribe for the group, while other members are thinking aloud about answer to the handout questions.

## Pro Tip 2

• After playtesting by other groups during Lesson 10, designers might want/need to change their instructions. If available, encourage students to write their instructions on a digital device. Students can even cut out and paste text onto pre-made instructions.

• This lesson expects students to return to a much more linear, step-by-step method of this kind. This will be welcomed by some students and resisted by others. Just mentioning this shift in the beginning of the lesson can help them ease into it or look forward to it – whatever the case may be.

### 15-50 minutes:

5. Distribute copies of the Game Instructions Handout to students and provide students time and support to complete these in a quality manner. Encourage students to utilize the work they've done previously. The goal of the handout is to give students the chance to thoroughly consider their games while building on the work they've done in previous handouts.

6. Once students have answered the questions on the Game Instructions Handout, have them create an original set of instructions. If students have time, ask them to decorate the instructions to accentuate the theme of the game.

## EXTENSIONS

• Have students draw a small, to-scale version of their game board as part of their instructions. The board should have each important aspect of the game labeled and briefly explained. This is a common feature in Roll & Move game instructions and examples can be found in multiple board games and online.

• A useful exercise to discuss Aesthetic Appeal, Content, and other design elements of instructions is to have students note how different games' instructions employ different layouts, themes, color schemes, fonts, images, and other details to get across information and align with a game's theme.



# LESSON 10

## ROLL & MOVE



# BETA TESTING

### OBJECTIVES:

Students will playtest games created by other students. Playtesters will provide supportive feedback for each game.

### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

### MATERIALS:

Completed games, Multiple copies of Playtest Feedback Handout (copied back to back), Game Design Rubric, pencils, open minds, penchant for fun

**TIME: 50 minutes**

## PROCEDURE

### 0-10 minutes:

1. Today will be a day for students to playtest games designed and built by classmates. Let students know that they will be playing these games with a critical eye. It's their job to determine the parts of games that work well and which parts are clunky or even flat-out broken.

2. Games, like software, are often built in stages. First is "pre-alpha," where the conceptual prep takes place. Second is "alpha," when the first parts of the game are put together. Next comes "beta." When a game goes to beta, it is ready to be tested by people that are trying to break it, see how fun it is, and discover gameplay outcomes that the designers and builders have not anticipated. Beta testing is a necessary step in gameplay, so that designers don't release a broken game.

3. A good place to jump in is by reviewing the Game Design Rubric. Remind students that the Game Design Principles for evaluation are Mechanics, Goal, Materials, Interactivity, Instructions, Content, and Aesthetic Appeal. They will be asked to pay attention to these Principles while playing their classmates' game.

### 10-50 minutes:

4. Have students write what specific type of feedback they would like on **two copies** of the Playtest Feedback Handout, ask them to leave this handout on the table near their game. They **should not** set up their game or be allowed to clarify any misconceptions from poor instructional writing.

5. Assign groups to play a game other than their own. Instruct the students to play through each game many times, just as they did during the mod evaluation lessons. This will give them a more accurate window into the game they are playing.

## Pro Tip 1

This lesson plan allows for a group of students to playtest one game in 50 minutes. However, it is up to your (the teacher's) discretion as to how many times this lesson is used in the overall unit, as students could potentially spend a number of additional days playtesting each other's games and providing feedback.

## Pro Tip 2

Remind students the difference between criticism and feedback, so they can support the game design development:

- **Criticism** is when students express disapproval the game based on perceived faults or mistakes. "This game is boring because it only has one material."
- **Feedback** is when students note their reactions to a game, then provide constructive comments on improvements that could be made. "I would have more fun if the materials used were more complicated. Maybe you could use coins to buy extra turns?"

6. After 15 minutes of playtesting, ask groups to make sure they have given feedback on each of the six sections of the feedback form. If they have not done this yet, please complete it at this point. If students seem to be struggling, consider having them look back at the Mod Handouts or at the Game Design Rubric for definitions of each Mod. Place all game materials back in the box for the next group to set up.

7. At the 30 minute mark, have groups shift to another game that is not their own. Repeat the playtesting feedback process (Steps 4-6 above) with this new game.

8. If time allows, facilitate a group discussion/whip around to celebrate some of the best things that students enjoyed as they playtested their classmates' games.

9. Be sure to allow time for cleanup. The last group that played a game should put the game away as expected. Designers should put their feedback forms in their folders.



# LESSON 11

## ROLL & MOVE



### CRUNCH TIME

#### OBJECTIVES:

Utilizing feedback from playtesters, students will modify game elements to improve their games. Students will build a quality final product and showcase their completed game.

#### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

#### MATERIALS:

Game Design Rubric, Playtest Feedback Handouts completed by playtesters, assortment of materials that students can use for gameplay (listed in detail below), pencils, open minds, penchant for fun

**TIME: 50 minutes**

#### PROCEDURE

##### 0-10 minutes:

1. Explain to students that today they will adapt/improve their games based on feedback from playtesters. Remind them that they have done great work in designing and building their games, and for the next day(s) they will be able to put all that work into action by creating their final games!
2. Before getting started, gather the students together and discuss what kind of feedback they received from their testers. Discussing this in a whole group might make some students feel too vulnerable, so focus on the students that are willing to share what they heard from playtesters and hear suggestions from classmates.
3. If that's too threatening, feel free to discuss typical game development problems and potential solutions. Try to focus the conversation on the following questions:

#### Pro Tip 1

- This lesson plan allows for students to edit and finalize their game in 50 minutes. However, it is up to the teacher's discretion as to how many times this lesson is used in the overall unit, as students could potentially spend a number of additional days building their games during class.
- Be sure to give the students adequate time to create! They won't be able to act on all the great planning work without adequate studio time.

#### Pro Tip 2

- Upon completion, **don't forget to administer the post-assessments** included in the Assessments section of this curriculum! Teachers can use these materials to measure student growth, while students can complete a self-evaluation to see their own development over the unit. Also, re-administration of the Pre/Post Survey and Game Design Rubric provides valuable insights into the effectiveness of the curriculum.

- a. What Game Design Principles are most in need of improvement in this game?
- b. Why are these Principles not working as well as they could be?
- c. What solutions/ideas could we suggest to the game designer to improve this game?

4. Below are some sample gameplay problems that we have seen show up several times. If students need help with moving from their feedback to improvements, this can also be a useful chart to put on the board or have students create on their own as a brainstorming tool:

PRINCIPLES	ISSUE	REPAIR
Mechanics, Goal, Materials	Game is boring or never ends because of board layout, constant loss/gain of spaces, health, money, non-specific number of rounds.	Increase the number of in-game advantages while decreasing the number of obstacles.
Content, Aesthetic Appeal, Materials	Game board and materials are plain or lack thematic connection.	Cut and paste thematic images from internet, magazines, etc. Add shortcuts, twists and turns to game board.
Instructions	Unclear how to play game due to poorly written instructions.	Take time to explain parts of instructions in greater detail.
Materials, Mechanics, Aesthetic Appeal	Spaces are too small and/or text on board or cards is too small/hard to read	Find a bigger piece of paper and either be more careful with handwriting or use a computer to create necessary materials.



# LESSON 11

## ROLL & MOVE



### CRUNCH TIME

#### 10-50 minutes:

5. Provide the students time and resources to make their plans a reality.

#### Helpful Hints:

- a. We've found that larger, heavier weight paper lends a certain importance and special feel to their final product. If you have any available, 12"x18" paper is a great size. It gives the students space for their imagination. They can also tape pieces together for a larger space, as necessary. A heavier weight paper also withstands more erasing, as students often (wonderfully so) want their final products to be "just right."
- b. Another strategy for some students is to trace a difficult part of the game. Artists regularly trace and copy from one another, and this technique is absolutely valid. We've found it helpful to tape the source material and drawing paper to a window, if a light box is not available.
- c. One wonderful strategy is to have students outline their game lines with a black fine point marker. This light outline gives the work a more polished feel to it. Students comment over and over again just how cool this effect is. Essentially, it helps their drawings stand out on the page a bit more.
- d. Above all, this time is supposed to be enjoyable! Students are expected to push themselves in ways that feel good. If frustration and disappointment are creeping in, support the student to scale back expectations or facilitate an easier process such as simplifying the process, making use of mentor drawings, or tracing.

6. Once materials have been cleaned up, consider asking students to leave their work on the desks. Have the class walk around and notice what their peers are doing. Celebrate, observe, and comment. We all understand the benefits of positive feedback.

7. On the final day of class, consider having a 'game night' or celebration where students are given the opportunity to play each other's games. Decorations, music, a special snack, guests, and buddy classes can all add to the sense that the students' work is being honored on a greater level.

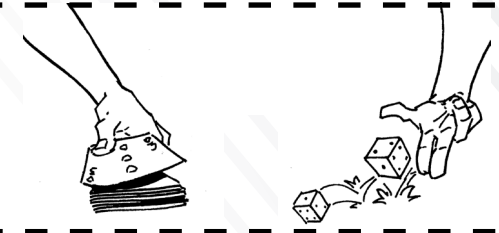
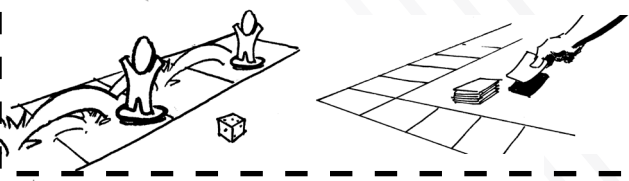
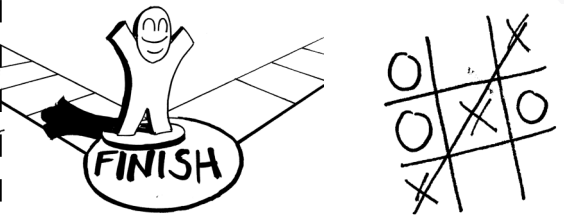
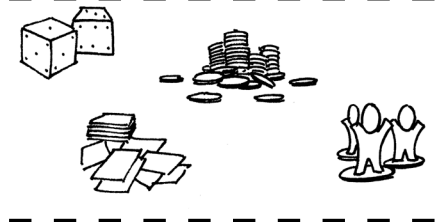


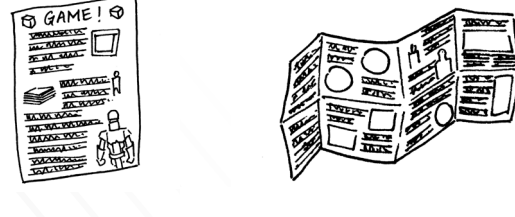


# ROLL AND MOVE HANDOUTS



# GAME DESIGN PRINCIPLES PUZZLE

Game Designer(s): \_\_\_\_\_

Principle	Description	Example
<h2>Mechanics</h2>	<p>How a game functions. This might include rolling dice, drawing cards, moving characters, etc.</p>	
<h2>Interactivity</h2>	<p>How players work together (cooperatively) or against one another (combatively) to achieve a goal.</p>	
<h2>Goal</h2>	<p>The end-goal, or way(s) of "winning" the game.</p>	
<h2>Materials</h2>	<p>The pieces used in gameplay: cards, dice, game boards, tokens, etc.</p>	
<h2>Content</h2>	<p>The story or "theme" of a game.</p>	
<h2>Aesthetic Appeal</h2>	<p>How visually enjoyable the materials are to look at.</p>	
<h2>Instructions</h2>	<p>Rules of play. Can be presented as written, illustrated, video or a combination.</p>	



# LESSON 2

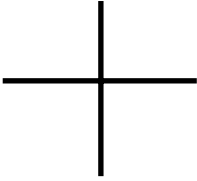
ROLL & MOVE



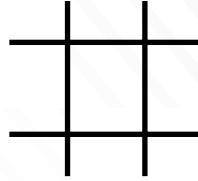
## TIC TAC TOE

Game Designer(s): \_\_\_\_\_

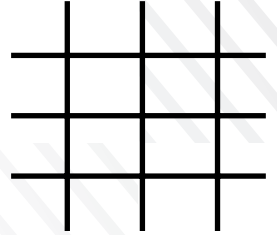
**2x2**



**3x3**



**4x4**





# LESSON 2

## ROLL & MOVE



# MECHANICS MOD

**Game Designer(s):** \_\_\_\_\_

**Mechanics:** How a game functions. This might include rolling dice, drawing cards, moving characters, etc.

### Basic Tic Tac Toe

- Two players choose who will be X and who will be O.
- Playing on a 3 by 3 game board, players take turns placing their Xs or Os in one of the spaces.
- A player wins when they place three Xs or Os in a row, either horizontally, vertically, or diagonally.
- A draw, or tie, happens when all nine spaces are filled and neither player has three in a row.

How would you describe the Mechanics of this game? \_\_\_\_\_

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### Level 1 Mod: Modify Basic Tic Tac Toe

- At the beginning of each turn, the player rolls two dice. If the roll is greater than seven, they get to place two of their symbols on the board.
- If the roll is seven or less, they get to place one symbol.

How did this modification affect the Mechanics of the game? \_\_\_\_\_

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### Level 2 Mod: Now build upon the Level 1 Mod

- Expand the board to play on a 4 by 4 grid.
- Players are still trying to place three symbols in a row.
- At the start of the game, each player gets one token.
- Each player can play a token once per game, directly after their opponent's turn, to force that opponent to erase the symbol they just played and move it to any other available space.

How did this modification affect the Mechanics of the game? \_\_\_\_\_

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Finally, did any of the mods above affect any of the other Game Design Principles? If so, how?

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# LESSON 2

## ROLL & MOVE



# GOAL MOD

**Game Designer(s):** \_\_\_\_\_

**Goal:** This is the end-goal, or way(s) of “winning” the game.

**Basic Tic Tac Toe**

- Two players choose who will be X and who will be O.
- Playing on a 3 by 3 game board, players take turns placing their Xs or Os in one of the spaces.
- A player wins when they place three Xs or Os in a row, either horizontally, vertically, or diagonally.
- A draw, or tie, happens when all nine spaces are filled and neither player has three in a row.

**Level 1 Mod: Modify Basic Tic Tac Toe**

- Playing on a 3 by 3 game board, the winner of the game is the player that forces their opponent to be the first person to get three in a row.
- If you get three in a row, you lose.

How did this mod affect the Goal of the game? \_\_\_\_\_

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**Level 2 Mod: Now build upon the Level 1 Mod**

- Using a 4 by 4 game board, the winner is the first player to get four in a row and make sure that their opponent has previously marked three in a row.

How did this modification affect the Mechanics of the game? \_\_\_\_\_

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Finally, did any of the mods above affect any of the other Game Design Principles? If so, how?

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# LESSON 3

## ROLL & MOVE



### MATERIALS MOD

**Game Designer(s):** \_\_\_\_\_

**Materials:** The pieces used in gameplay; cards, dice, game boards, tokens, etc.

**BASIC GAME BOARD:**

Follow the Basic Roll and Move Instructions for the first few games.

How would you describe the Materials you used in this game? \_\_\_\_\_

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**Level 1 Mod:** Next, build on the Basic Roll and Move Instructions by adding the following to as many spaces as you decide:

- Place sticky notes that tell player to move back or forward a certain number of spaces
- Place tokens/coins on certain spaces. Players pick up these tokens when they land on the space. Each token/coin can be redeemed for an extra turn or can be given to an opponent, at any point in the game, so they miss a turn.

How did this modification affect the Materials of the game? \_\_\_\_\_

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**Level 2 Mod:** Continue with the rules from Level 1, and add on these rules:

- Each player begins the game with three beads. Each bead can be used only once during gameplay for only 1 of the following purposes:
  - o Cancel out a "move back" obstacle for yourself
  - o Cancel out a "move forward" advantage for an opponent
  - o Gain an "Extra Turn" for yourself
  - o Cancel out an "Extra Turn" choice an opponent has made (must be done before they roll)

How did this modification affect the Materials of the game? \_\_\_\_\_

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Finally, did any of the mods above affect any of the other Game Design Principles? If so, how? \_\_\_\_\_

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# LESSON 3

## ROLL & MOVE



### INTERACTIVITY

**Game Designer(s):** \_\_\_\_\_

**Interactivity:** How players work together (cooperatively) or against one another (combatively) to achieve a goal.

**Basic Game:** Play the game according to the instructions on the Lined Basic Game Board

**Level 1 Mod:** No longer are you trying to be the first one to the Finish. The new goal of the game is to have all players arrive at the Finish on the SAME turn. Either you all win, or you all lose.

- During their turn, a player rolls as many dice as there are players. Then, as a group, you all must decide who gets to use which die.
- For example, in a 3 player game, Player A starts their turn by rolling 3 dice and gets a 2, 4, and 6. The group then decides together that Player A will move 4 spaces, Player B will move 6 spaces, and Player C will move 2 spaces.
- Play continues on with Player B rolling and the group deciding on movement, and so on until either all players arrive at the finish on the same turn, or not and win or lose.

How did this modification affect the Interactivity of the game? \_\_\_\_\_

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**Level 2 Mod:** Play with the same goal as in the Level 1 Mod – all get to the finish at the same time.

- Now, during each turn, each player rolls two dice at the same time. Each player then chooses from ONE of their dice and move that many spaces.
- Once during the game, a player can give one of their rolled die to another player. On this turn, the player giving their die must use their other die for their movement.
- For example, Player A rolls a 6 and 1. Player B rolls a 5 and 5. Player A can give Player B their 1. Player B moves 1 space and Player A moves 6 spaces.

How did this modification affect the Interactivity of the game? \_\_\_\_\_

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Finally, did any of the mods above affect any of the other Game Design Principles? If so, how?

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# LESSON 3

ROLL & MOVE



## LINED BASIC GAME BOARD

**START**

**FINISH!!!**

**Materials:**

- Avatar for each player
- 1 six-sided die

**Basic Roll and Move Instructions:**

- 1-Each player places their avatar on the Start space.
- 2-Each player rolls a six-sided die. The player with the highest number goes first.
- 3-During a turn, the player rolls a six-sided die.
- 4-Play moves to the left.
- 5-The first player to get to the Finish is the winner.

Game Designer(s):

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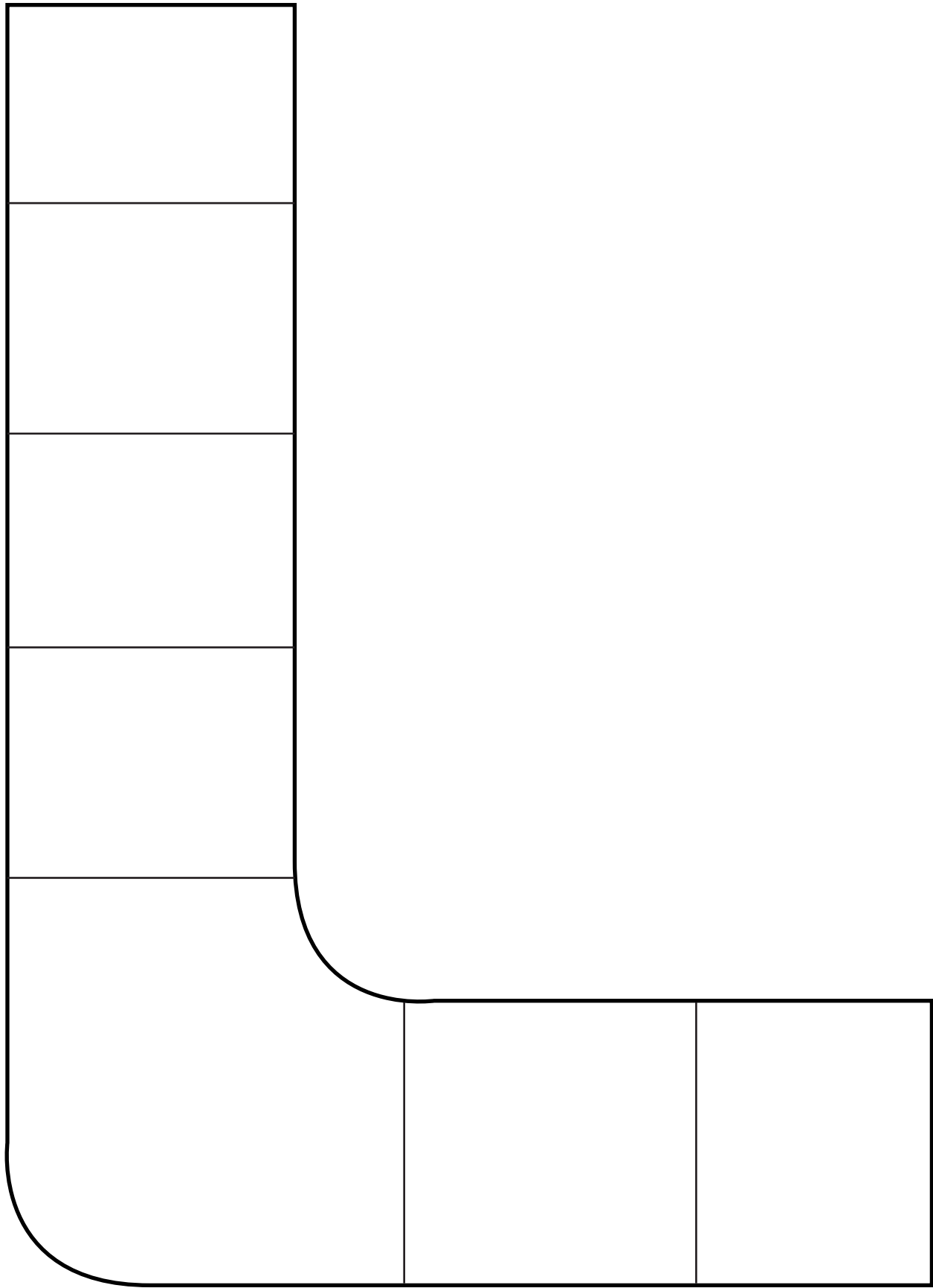


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# LESSON 4

## ROLL & MOVE



### INSTRUCTIONS MOD

Game Designer(s): \_\_\_\_\_

**Instructions:** Rules of Play. Can be written with or without images, or done by video.

**Level 1 Mod:**

- Use the old game board
- Use two dice to get to the end.
- If you land on two odd spaces, you can send an opponent back to start.

How would you describe the Instructions for this game? \_\_\_\_\_

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**Level 2 Mod: Goal: Be the first player to reach the Finish.**

1. Use your Lined Basic Game Board with the Basic Roll and Move Instructions
2. Begin by numbering all spaces in order: Start is 0, then 1, 2,3...until the Finish.
3. All players begin on the Start space. Whoever has the curliest hair goes first, and play continues to the left.
4. During a turn, a player rolls 2 six-sided dice and chooses ONE of the dice to use for their turn. The player then moves forward that many spaces.
5. If you land on an odd-numbered space, you earn a coin/token. If you earn 2 tokens/coins, you can turn them in, at any point in the game, to send ONE player back to the Start.

Level 1 and Level 2 were intended to be the same game. How did the different instructions affect the gameplay experience? \_\_\_\_\_

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Finally, did any of the mods above affect any of the other Game Design Principles? If so, how?

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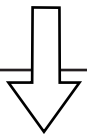


# Beat the VIRUS!

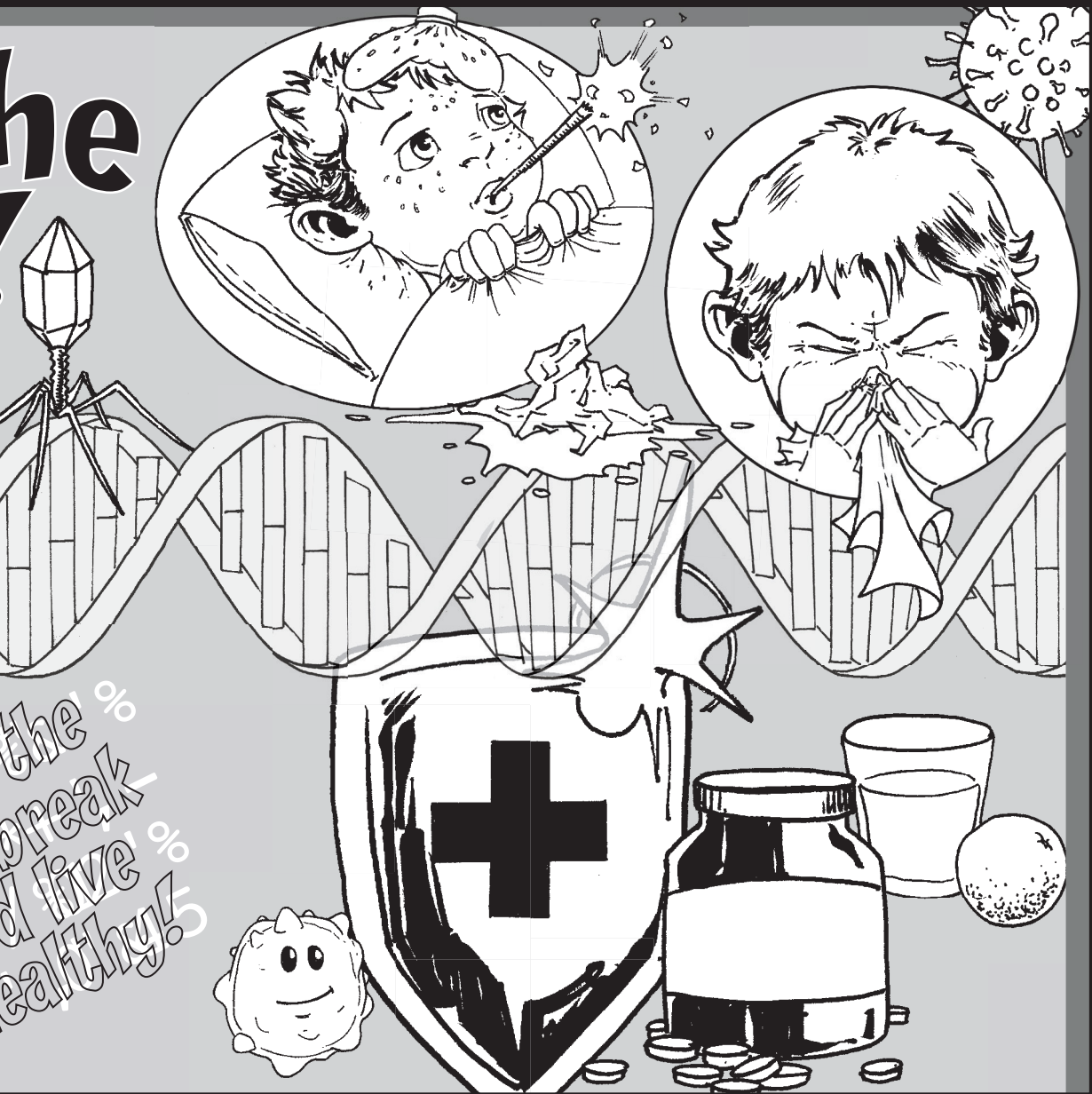


Virus Start

Scientist Start







he

the  
break  
d live  
healthy!

Outbreak

Vaccine

# Beat the Virus! Instructions

**Introduction:** In a nearby town, scientists have discovered that an outbreak of a nasty flu virus is about to be unleashed. It's up to them to teach others how to prevent infection and reach the vaccine clinic before the virus infects the community!

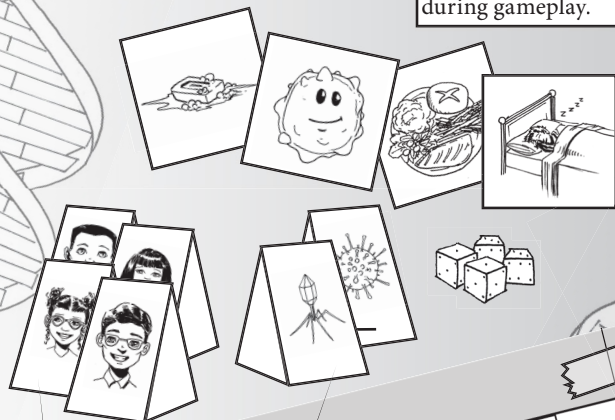
**Goal:** In this 2-4 person game, your team's goal is to get all players to the "vaccine" before the "viruses" get to the Outbreak stage. If both viruses get to the Outbreak space before all team members arrive at the vaccine space, all team members lose.

**Materials:** Two pieces of game board, four 6-sided dice, 2-4 Scientist avatars, 2 Virus avatars, 4 Prevention Cards, student modification cards.

**Setup:** Assemble the two pieces of the game board with clear tape. Players place their avatar on the "Scientist" space and virus avatars on the "Virus" space. Prevention cards are placed on the table for the team of scientists to use during gameplay.

**Gameplay:** Players will move from one end of the game board while two viruses move from the other end. Play moves to the next player until either the entire team makes it to the vaccine or both viruses make it to the Outbreak stage.

**Turns:** Using the same number of six-sided dice as there are players, a player begins their turn by rolling the dice. As a group, the players collaboratively assign dice to each other. The turn ends with each player moving their piece that many spaces. Players do not need to arrive at the vaccine at the same time. Once a player has arrived at the vaccine, they can now assign their die to another player, so that player gets to move the total of both dice. After each player's turn, players roll four dice for the viruses. Players assign two dice to each virus not yet on the Outbreak space.



AVATARS START HERE

AVATARS FINISH HERE

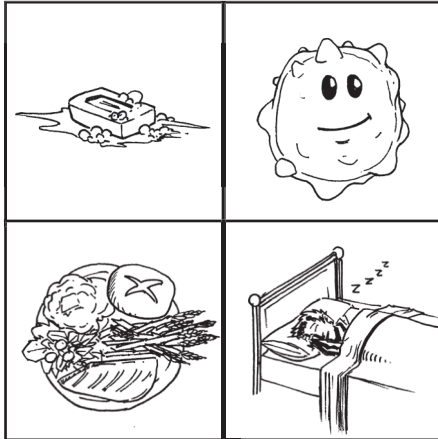
**Special Situations:** At any point in the game, one team member can use a "Prevention Card" to cause one of the viruses to lose a turn. After this card is used, it's put into a discard pile and cannot be used again during the game.



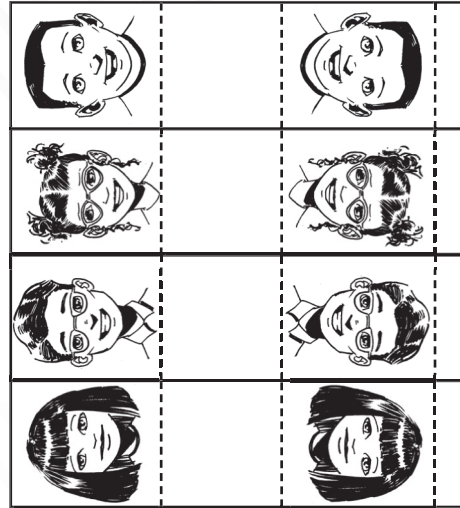
# BEAT THE VIRUS GAME MATERIALS

Cut out pieces along the solid black lines. Fold pieces on the dotted lines.

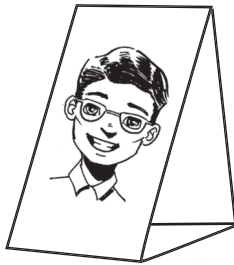
Prevention Cards



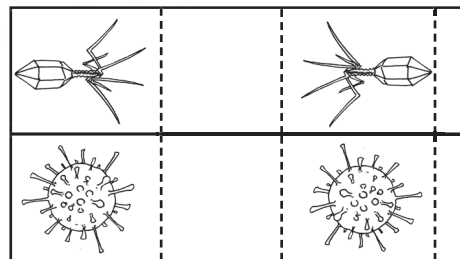
Avatars



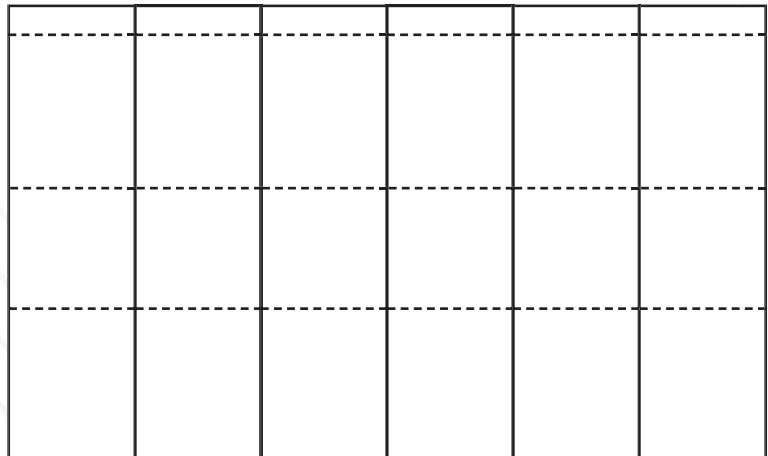
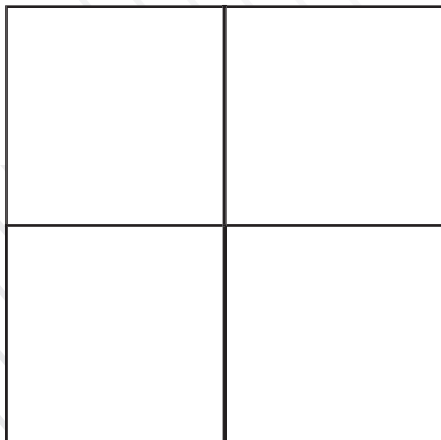
Avatar Folded for play



Viruses



Potential Student Modications







# LESSON 5

## ROLL & MOVE



# MOD POSSIBILITIES

**Game Designer(s):** \_\_\_\_\_

Here are some ideas for how you might modify your games to affect each Game Design Principle:

### **Mechanics:**

- Players label spaces on their board with special instructions for a certain dice roll.
- Players can have a maximum number of cards and must discard one after each turn.
- Holding/drawing two matching cards or rolling “doubles” with dice gives player an extra turn or special ability.
- Two or more players on the same space together must battle, with highest roll winning something of value from one or more players.

### **Goals:**

- Players must collect all of a certain color, suit, token, and/or card to win.
- Reaching the finish line is no longer the goal. Rather, the winner is the player has the most tokens, cards, or other materials when any player reaches the finish line.
- Make the goal of the game collective, where each player has a different final objective in order for an entire team to win the game.

### **Materials:**

- The game board is shrunk, extended, or rearranged into a new shape.
- Create a dice and/or spinner using symbols, rather than numbers.
- Players increase or decrease their number of coins, cards, or other gameplay materials.
- One card or roll is worth more points and/or turns than other rolls, cards, and/or tokens.
- Players can buy or trade extra turns, cards, tokens, etc.

### **Instructions:**

- Add more specificity to instructions.
- Add visuals/images to describe gameplay

### **Content/Theme:**

- Consider content-oriented events, characters, or places that can change gameplay. For example:
- A player must remain on a space until a "Common Denominator" card is drawn
- Water can become scarce because of a drought card being drawn
- A player must attain food before moving troops to the next city

### **Aesthetic Appeal:**

- Build materials (avatars, pieces, dice, spinners, etc) that support theme/content.
- Design a game board with images, sculptures, and other visuals that support theme/content.
- Create an alternate game board for a game that already exists.



# LESSON 5

## ROLL & MOVE



# MOD EVALUATION

**Game Designer(s):** \_\_\_\_\_

**Modification:** A change in gameplay that affects one or more Game Design Principles.

**Mod 1:**

Explain how Mod 1 works: \_\_\_\_\_

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How does Mod 1 change the game for better or worse? \_\_\_\_\_

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**Mod 2:**

Explain how Mod 2 works: \_\_\_\_\_

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How does Mod 2 change the game for better or worse? \_\_\_\_\_

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# LESSON 6

ROLL & MOVE



## GOALS OF THE GAME

**Game Designer(s):** \_\_\_\_\_

**Content/Theme**

Provide a basic game introduction/backstory for your game: \_\_\_\_\_

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**Goal**

Describe how players win the game: \_\_\_\_\_

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List Advantages and Obstacles in the following T Chart. Make sure they are related to your game's theme!

**Advantage:**

Something that makes it easier to achieve the goal of the game, such as an achievement, resource, or event

**Obstacle:**

Something that makes it harder for a player to achieve the goal of the game, such as a barrier, event, or choice



# LESSON 7

## ROLL & MOVE



# BOARD DESIGN

**Game Designer(s):** \_\_\_\_\_

Think about the story and/or goal of your game. Would a map, trail, road, city block, timeline, story arc, mountain, or other path make sense for your game board? Why? \_\_\_\_\_

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What kinds of symbols, shapes, colors, or images will connect the game player to your theme? Curves, sharp angles, spirals, rectangles? \_\_\_\_\_

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How will you build **advantages** into your game board? \_\_\_\_\_

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How will you build **obstacles** into your game board? \_\_\_\_\_

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# LESSON 7

## ROLL & MOVE

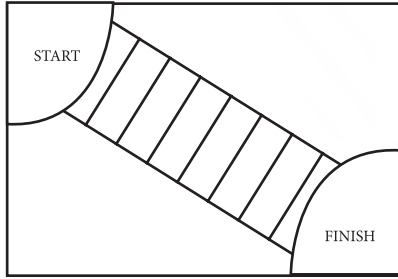


### BOARD DESIGN

Sketch your ideas in the boxes below, being sure to label the Start and Finish squares, any Advantages/Obstacles included on the board, as well as places where cards, tokens, spinners, special dice, and other materials will be placed during gameplay.

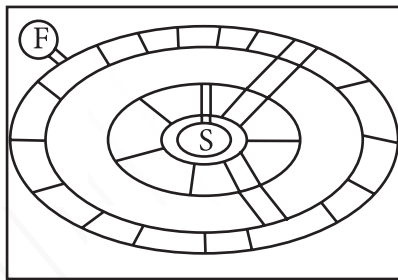
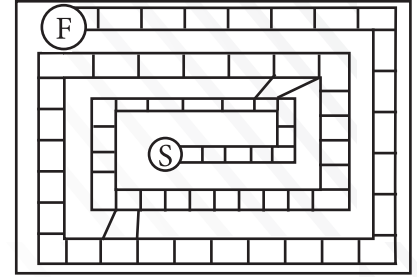
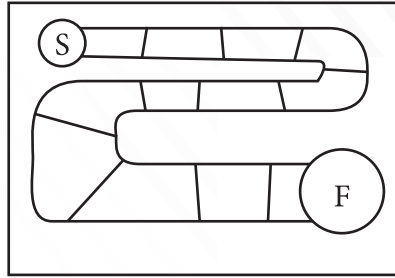
### SAMPLE GAME BOARDS

Simple



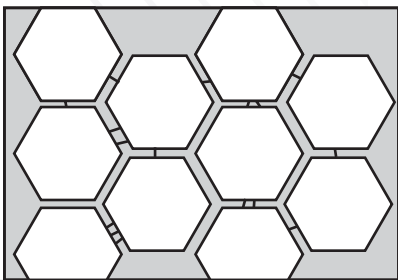
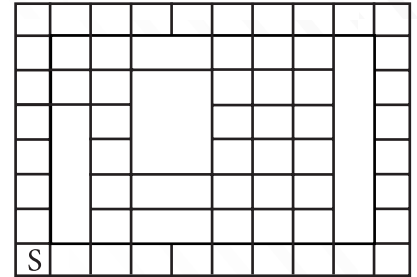
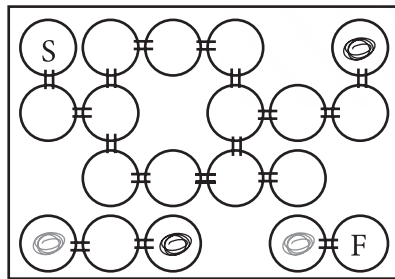
TIER 1

These game boards travel from the only Start to Finish, offering no opportunity for a change in pathway or gameplay.



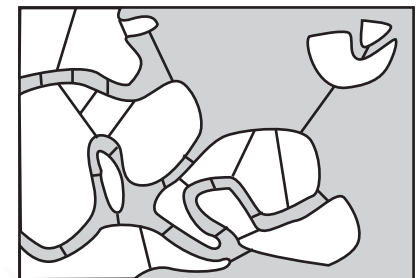
TIER 2

These game boards offer more than one possible pathway from the Start to Finish, making gameplay more complex, and potentially enjoyable.



TIER 3

These game boards do not have any specific start or finish, offering players the opportunity to choose from an incredibly varied and unpredictable experience each time they play.



Complex



# LESSON 8

## ROLL & MOVE



# GAME MATERIALS

Game Designer(s): \_\_\_\_\_

**Instructions:** Considering your game's Goal, Advantages, and Obstacles, make a list of ALL the materials you'll need to play your game. You can create Avatars, Movement Pieces, Tokens, Cards, and more!

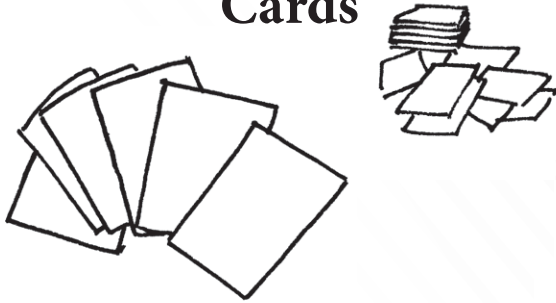
Material	How is it used in your game?	Quantity
1.	1.	

Sketch and label materials here.

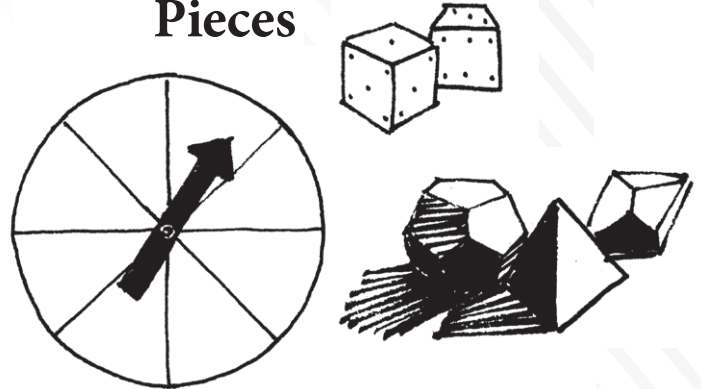


# SAMPLE GAME MATERIALS

## Cards



## Movement Pieces



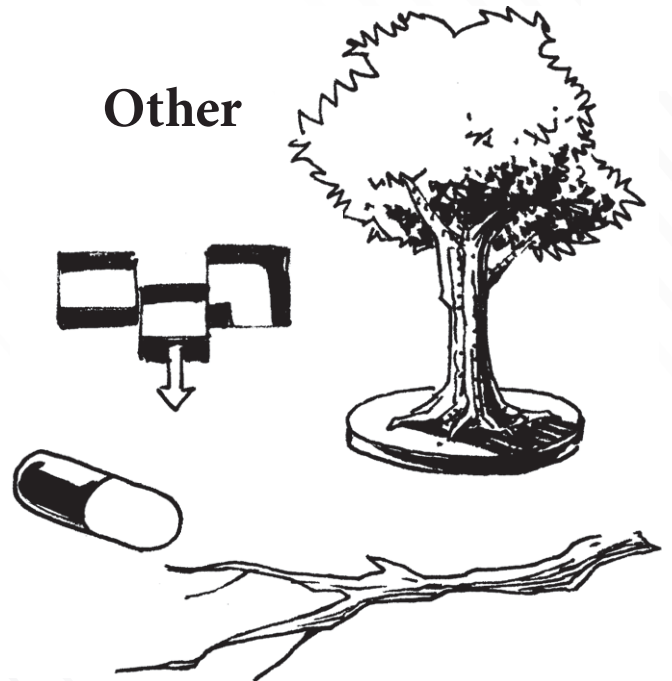
## Avatars



## Tokens



## Other





# LESSON 9

## ROLL & MOVE



# GAME INSTRUCTIONS

**Game Designer(s):** \_\_\_\_\_

**Introduction/Backstory:** A brief description of your theme or the story involved in your game. \_\_\_\_\_

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**Goal:** Up to three sentences about how a player wins or loses the game. \_\_\_\_\_

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**Materials:** What materials should players find in the game box? Be specific in your description. For example: game board, instruction sheet, 25 red "ruby" cubes, 25 green "emerald" cubes, 1 six-sided die, and a deck of 20 "market" cards.

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**Setup:** How do you setup the game to begin play? Does setup change if the number of players changes?

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# LESSON 9

## ROLL & MOVE



# GAME INSTRUCTIONS

**Game Designer(s):** \_\_\_\_\_

**Gameplay:** This is the section that describes how to play the game. How do players determine who goes first? Does play then move to the left, or something else? \_\_\_\_\_

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**Turns:** Describe what a player, or players, do during each turn. If players have a specific order of choices, be sure to describe the specific order or possible gameplay scenarios. Be sure to explain how each of the materials are used within turns. \_\_\_\_\_

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**Special Situations:** What happens on special spaces or in special situations? If you land on top of another player? If a player is "captured," "dies," or reaches a "bonus space"? \_\_\_\_\_

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# LESSON 10

## ROLL & MOVE



### PLAYTEST FEEDBACK

**Game Designer(s):** \_\_\_\_\_

What specific feedback do you want from the playtesters? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Goal:** Do you know how to win? Is the goal too hard, or too easy? Is it clearly connected to the theme?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Content/Aesthetic Appeal:** Are the game board, materials, and instructions visually engaging? Do they clearly connect to the theme? Do they make the game more fun/challenging? Why or why not?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Mechanics:** Do all players participate during each turn? Is the gameplay fun/challenging? Why or why not?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# LESSON 10

## ROLL & MOVE



# PLAYTEST FEEDBACK

**Game Designer(s):** \_\_\_\_\_

**Interactivity:** Is the game cooperative, competitive, or mixed? How many players are involved in each turn? Do players have the chance to choose one or more actions each turn? Do player choices make gameplay more fun/challenging? Why or why not? \_\_\_\_\_

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**Materials:** Are the game board, materials, and instructions visually engaging? Do they clearly connect to the theme? Do they make the game more fun/challenging? Why or why not? \_\_\_\_\_

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**Instructions:** Do the instructions clearly explain how to play? Are any parts confusing or missing?

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# RESOURCE MANAGEMENT UNIT





# RESOURCE MANAGEMENT

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# LESSON 1

## RESOURCE MANAGEMENT



# GAME ON!

### OBJECTIVES:

Students will evaluate background knowledge regarding games and game design. Students will learn the Game Design Principles.

### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

### MATERIALS:

Game Design Pre-assessment, Introduction to Resource Management Handout, Pre/Post Student Survey, Game Design (GD) Principles Puzzle, pencils, white board or chart paper, sticky notes, markers

**TIME: 50 minutes**

## PROCEDURE

### 0-15 minutes:

1. Begin in a whole group setting by briefly explaining to students that they will have the chance to build a Resource Management game of their own to demonstrate their understanding of a theme that you have chosen. For the purposes of this unit, we suggest sticking to the creation of board games.

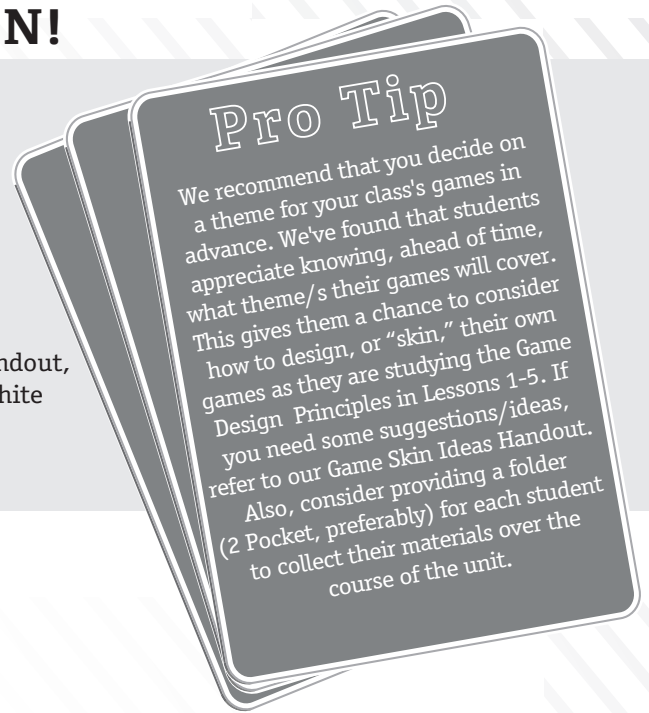
2. Continue by asking students about their favorite games. List responses on the board or chart paper. Consider building a table or graph that separates the responses into game type: Card, Board, Video, Dice, and/or Party. The graph can also be built by students writing their favorite game on a sticky note, then stack these on the graph, separated into the above categories. Discuss the results. What do students notice? Are there games that could fit in multiple categories? Is there one game type that seems to come up the most? Why?

3. If time permits, ask students to consider why they chose the game/s they did, and what makes these games special. What do games teach us? Why do we enjoy playing them? What benefits do they have now and throughout history?

### 15-30 minutes:

4. Administer the pre-assessments to students: Student Pre-assessment and Student Survey. Discovering these baselines will give valuable insight as to what your students will need most during the unit. It will also reveal just how much they've grown during the study.

5. Distribute the Introduction to Resource Management Handout and explain to students that they will be learning about Resource Management (RM) games in this unit. Ask them to read the description of RM games on the handout, then see if they can pick out games from the board that fit this description. Examples of RM games include Chess, Settlers of Catan, Monopoly, Risk, Dominion, Splendor, 7 Wonders, Forbidden Island and Pandemic, as well as video games like Sim City, World of Warcraft, and Skyrim.



### 30-50 minutes:

6. Distribute the GD Principles Handout. In small groups or individually, have the students work to solve the puzzle, matching each term, definition, and example. After completion, have the whole class come up with examples that match each principle. For example:

- After discussing Mechanics, students could write: "Chess. Move piece each turn, certain pieces can move differently across board" or "Monopoly. Roll, then player can choose to complete action (sometimes required) or end turn."
- After discussing Interactivity, students could write: "Chess. Very competitive, only 2 players, no cooperation," or "Risk. Competitive, challenging. Players can sometimes cooperate. Requires constant attention to the board."

## EXTENSIONS

- Bring in one or more commercial games (see Suggested Tabletop Games in introduction) to use as models for the class. Have students look through the game's box and instructions and identify examples of each of the GD Principles. If you're unable to bring in a physical game, consider bringing in printouts of instructions and/or images of game materials for students.
- Have students evaluate some of their favorite games individually or in groups.
- Use the GD Principles to compare different game types and discuss differences between certain games. What do students notice about how GD Principles show up in different games? Why?



## LESSON 2

### RESOURCE MANAGEMENT



# GAME CHANGERS

#### OBJECTIVES:

Using the Game Design Principles, students will critically evaluate modifications to a game.

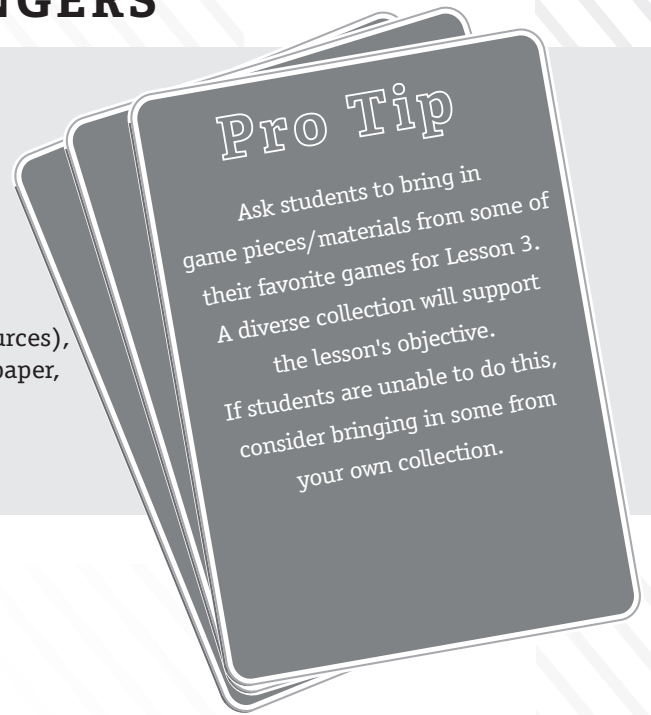
#### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal.

#### MATERIALS:

Squares! Handouts (copied back to back), Symbol Cards (Additional Resources), Mechanics and Goal Mod Handouts (copied back to back), pencils, blank paper, white board or chart paper, markers, six-sided dice, tokens

**TIME: 50 minutes**



## PROCEDURE

#### 0-10 minutes:

1. Begin in a whole group setting. Ask students what they remember about the GD Principles they learned the previous lesson. List their responses on the board, prompting when necessary so all seven are listed: **Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal**

2. Follow this up by introducing three new Game Design terms that will be used throughout the rest of the project:

- Modification (mod):** a change in something, such as a system or style.
- Resource:** a material players gather and skillfully manage to achieve specific goals throughout gameplay
- Advantage:** something that makes it easier to achieve the goal of the game, such as an achievement, resource, or event.
- Obstacle:** something that makes it harder for a player to achieve the goal of the game, such as a barrier, event, or choice.

#### 10-50 minutes:

3. Distribute the Squares! Handouts and pre-cut Symbol Cards to students. In pairs, have students play Squares! for a few minutes. Afterward, briefly review how this basic game successfully or unsuccessfully demonstrates the 7 GD Principles.

4. Next, distribute the Mechanics and Goal Modification Handouts (copied back to back) to students. One side of the handout is geared towards affecting the way that the game's Mechanics (GD Principle #1) work. The other side's mods affect the Goal (GD Principle #2) of the game.

5. Ask the students to play each side for about 10 minutes, then reflect on the mod's effects on the game afterward. Encourage them to play enough iterations of each modification to get a sense of what impact each has on the typical Squares! gameplay.

6. After 20 minutes of gameplay and evaluation, lead a whole group discussion about how the students noticed changes to the Mechanics. If they haven't yet, ask them to record these observations on the Mechanics and Goal Mods handout. Be sure to save these for later, as students will continue to take notes on other Mods throughout the course of their study.

## EXTENSIONS

- Provide students the chance to modify games with the intentions of affecting Mechanics and/or Goal. Evaluate whether or not each mod was successful.
- Discuss students' favorite games and how each reflects different Mechanics and Goals. What similarities and differences do they notice? What would their favorite game look like with different Mechanics and Goal/s?



## LESSON 3 RESOURCE MANAGEMENT



# A MATERIAL WORLD

### OBJECTIVES:

Using the Game Design Principles, students will critically evaluate modifications to a game.

### GAME DESIGN PRINCIPLES ADDRESSED:

Materials and Interactivity

### MATERIALS:

Materials and Interactivity Mod Handouts (copied back to back), copies of Basic Game Board (enough for each group), Symbol Cards, pencils, white board or chart paper, markers, tape, six-sided dice, game materials (counters, beans, cubes etc.) as needed

**TIME: 50 minutes**

## PROCEDURE

### 0-5 minutes:

1. Explain to students that today's game mods are going to focus on Materials and Interactivity (GD Principles #3 and #4). Ask students to share any materials they've brought, describing how they are used in gameplay. If you've brought your own game materials, do the same.

### 5-30 minutes:

2. Distribute the individual (or pre-taped) copies of the Basic Board Game Board to build the shape you want students to play with. Have students use pencils to draw lines on their boards. If necessary, have students tape the game board together. If students are able, we highly recommend they assemble their own boards, as it will support their creation process later on.

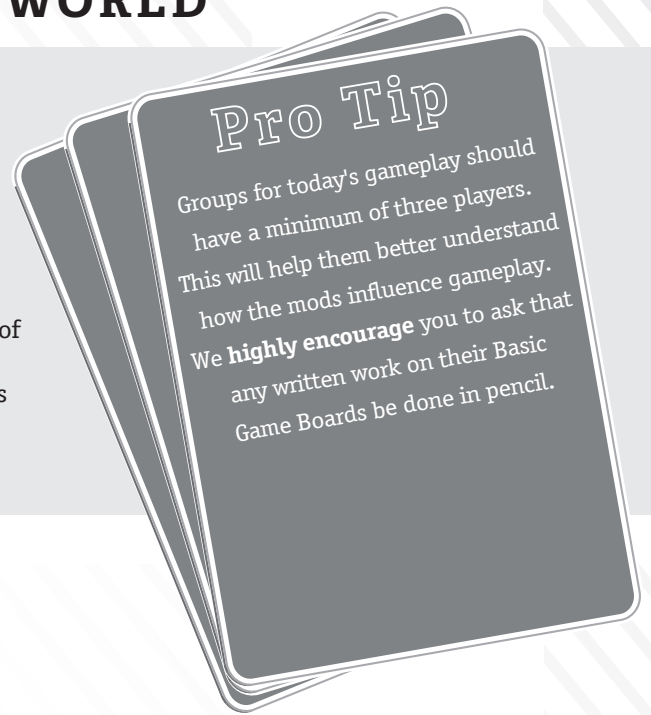
3. Hand out the Materials and Interactivity Handouts (copied back to back), and have the students take 10-15 minutes to proceed through the first side, assessing the effect of each Materials mods.

4. After 15 minutes of gameplay and evaluation, lead a whole group discussion about how the mods changed Materials and general gameplay. Encourage students to take notes from the conversation on the Materials Mod Handout. Be sure to save this for later, as students may refer to this handout during their subsequent study and creation.

### 30-50 minutes:

5. Repeat the above process with the Interactivity Mod Handout.

6. After the closing conversation, ask the students to fold up/store their game board for use during future lessons.



## EXTENSIONS

- Are students familiar with games (board, video, card, etc.) that have a high degree of interactivity? Often, "multiplayer" games involve constant and equal participation from each player. What might some examples of these be? How do game designers encourage constant and equal participation? What are different ways in which players can participate in a game, both directly and indirectly?
- What games do the students know about that have interesting materials? How are these materials used? Create a chart of materials and how they can be used in each game.





# WHAT'S YOUR STORY?

### OBJECTIVES:

Using the Game Design Principles, students will critically evaluate modifications to a game.

### GAME DESIGN PRINCIPLES ADDRESSED:

Instructions, Content, Aesthetic Appeal

### MATERIALS:

Instructions Mod Handouts (copied back to back) and the Content and Aesthetic Appeal Mod Handout, *Outbreak!* Game Board, Materials, & Instructions, pencils, white board or chart paper, markers, tape, six-sided dice, game materials (counters, beans, cubes etc.) as needed.

**TIME: 50 minutes**

## PROCEDURE

### 0-5 minutes:

1. Explain that, today, the focus will be game mods for Instructions, Content, and Aesthetic Appeal (GD Principles #5, #6, & #7). Ask students what they remember about these three GD Principles. Why are they important? How are they used in games?

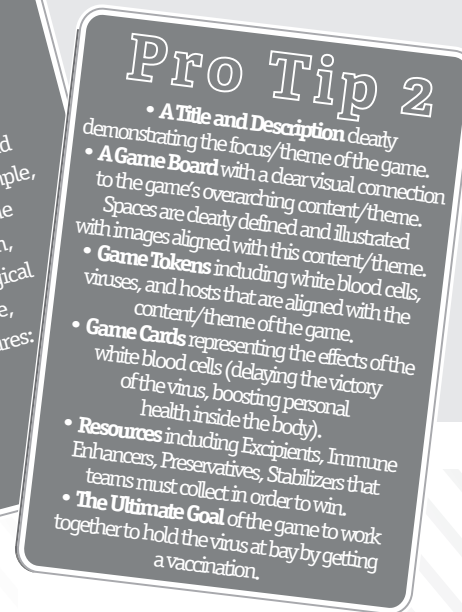
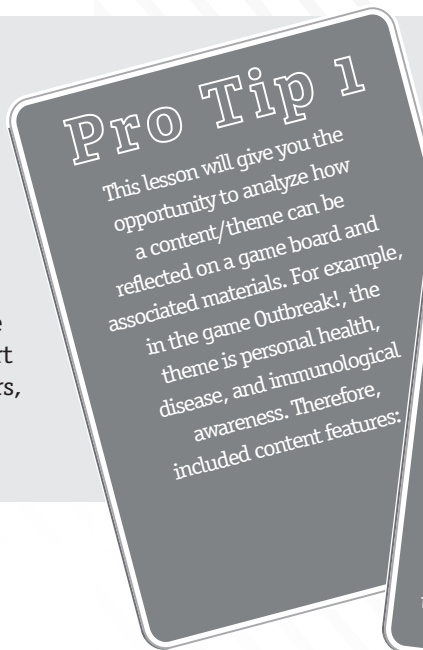
### 5-25 minutes:

2. Distribute the Instructions, Content, and Aesthetic Appeal Mod Handouts (copied back to back). Hand out the *Outbreak!* game board, but DO NOT hand out the *Outbreak!* Instructions or Materials yet! These will be distributed in the second half of the lesson.

3. The Instructions Mod is geared towards affecting the way that the game's Instructions work to support, or confuse, the gameplay. Note that one set of instructions is intended to be a poor representation of instructions. This can be referred to as a modification that "breaks the game," or makes the game impossible to play and/or win. The second is a quality example of instructions. Both are intended to demonstrate the range of potential instructions.

4. Encourage students to play as many iterations of the Instructions Mods as possible in the time provided to get a sense of the effect each has on gameplay they studied previously. Note: They should be comparing these "modded" games to the unmodified, plain Resource Management game played initially.

5. After 15 minutes of gameplay and evaluation, lead a whole group discussion about how the students noticed changes resulting from the differing instructions. Again, request students take additional notes during the conversation to document observations.



### 25-50 minutes:

6. Repeat the above process, and NOW hand out the *Outbreak!* Game Materials and Instructions. This mod is intended to affect how Content and Aesthetic Appeal affect the gameplay experience, and the materials and instructions are all designed to further support that point.

7. Students will need time to cut out *Outbreak!* materials and set up their game board. If possible consider pre-cutting these and providing them to students in plastic containers.

8. Note that the mods to this game are intended to provide thematic and artistic elements that align with the game's subject matter and draw players into the gameplay. Providing both a content-oriented skin/story and aesthetic design onto a game increases its hook, relevance, and enjoyment for players. Encourage students to analyze how the Content (text, images, figures, game board) and Aesthetic Appeal of the game's materials, instructions, and design impacts their gameplay and aligns with the game's overall subject matter.

9. During the subsequent conversation, have students record/take notes. If necessary, create a chart on the board that allows students to map out how the Content and Aesthetic Appeal of a game align with and support subject matter, as well as improvements students might make to the design, art, and/or materials. For example, could beneficial and/or penalty cards be created that reinforce concepts of hygiene, nutrition, etc.? What might be added to the game board to increase its Aesthetic Appeal?



## LESSON 4

### RESOURCE MANAGEMENT



# WHAT'S YOUR STORY?

## EXTENSIONS

- Students know about all sorts of games that have great stories/themes associated with them. Host a discussion about the Content that comes up in the games students play, and how that content impacts their overall experience with these games. How would these games look with different content and aesthetics? Monopoly with a desert island theme? Risk set in the future or on a spaceship? How would Settlers of Catan change if set at sea? Consider bringing in different versions of common games as examples.
- Which games do the students think have the greatest/most effective Aesthetic Appeal? Remember, these games could include card, video, board, and/or party games.
- Provide copies of game instructions from common games your students might be familiar with. These can be downloaded from the internet or copied. Compare and contrast the instructions. How wordy are they? How effective, concise and clear are they? How do they incorporate content and aesthetic appeal into their design, and why?
- Have students do research on a game and consider how the game's content and aesthetics (title, materials, gameplay, tokens) align with the subject matter, cultural values, social movements, fictional worlds, the game creator's personal beliefs/background, and so on.





# LESSON 5

## RESOURCE MANAGEMENT



### NOW YOU CREATE AND PLAY MODS!

#### OBJECTIVES:

Using their understanding of the effects of game modifications from the previous lessons, students will experiment with game modifications and analyze their consequences.

#### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

#### MATERIALS:

Copies of Mod Possibilities Handout, copies of Mod Evaluation Handout (copied back to back), pencils, white board or chart paper, markers, assortment of dice, counters, chips, cubes, and other materials that students can use for gameplay

**TIME: 50 minutes**



#### PROCEDURE

##### 0-5 minutes:

1. Begin in a whole group setting, and review what students have learned from their experiments with game mods and/or the definition of “Modification” from Lesson 2. For reference,

- Modification:** a change in something, such as a system or style
- Resource:** a material players gather and skillfully manage to achieve specific goals throughout gameplay
- Advantage:** something that makes it easier to achieve the goal of the game, such as an achievement, resource or event
- Obstacle:** something that makes it harder for a player to achieve the goal of the game, such as a barrier, event, or choice

##### 5-30 minutes:

2. Over the past lessons, students have studied the effects of game mods on the gameplay experience. Today, the students are expected to use their creativity and experience with Mods to change a Resource Management game in ways that they decide.

3. Using the Lined Basic Game Board or Outbreak! as their foundation, invite students to come up with a mod, or series of mods, that changes the gameplay experience in some way. Encourage them to create mods that manipulate the Game Design Principles. Also, students are encouraged to play with and alter the options on the Mod Possibilities Handout.

4. After groups have decided upon a particular mod, have them write it out on their Mod Evaluation Handout. Have the group playtest the game for 15-20 minutes to determine the effect/s of their mod/s.

5. Stop the playtesting process after a time. Using a whip-around, check in with each group to determine how well (or not) their modifications worked. What were the expected consequences? What happened that they did not expect? What Principles were affected by gameplay?

##### 30-50 minutes:

6. Have student groups come up with a second mod, or series of mods, record them, and then playtest for another 15 minutes. Try to encourage groups to focus this iteration on a different principle from their first mod in order to provide some diversity to their mod and play testing experiences.

7. Discuss: How did this new mod, or mods, change things? What successes/failures did they have? What would they do differently? How could they be made more complex, or scaled back? What did they learn about games and gameplay that they hadn't realized beforehand?

#### EXTENSIONS

- Let the students know that in the following lessons, they will get to use what they have learned to create a game of their own. As their teacher, it's up to you to determine what the theme of the game will be. We encourage you to make it general and applicable to what you are studying in class. Refer to the Game Skin Ideas Handout.
- Provide students with popular games to play through and/or analyze. Give them the chance to modify the game in a manner of their choosing, then analyze the effects of this mod on the gameplay.

# GOALS OF THE GAME

### OBJECTIVES:

Within a theme, students will begin the game design process by determining a Goal for their game. Students will begin writing the Instructions for their games.

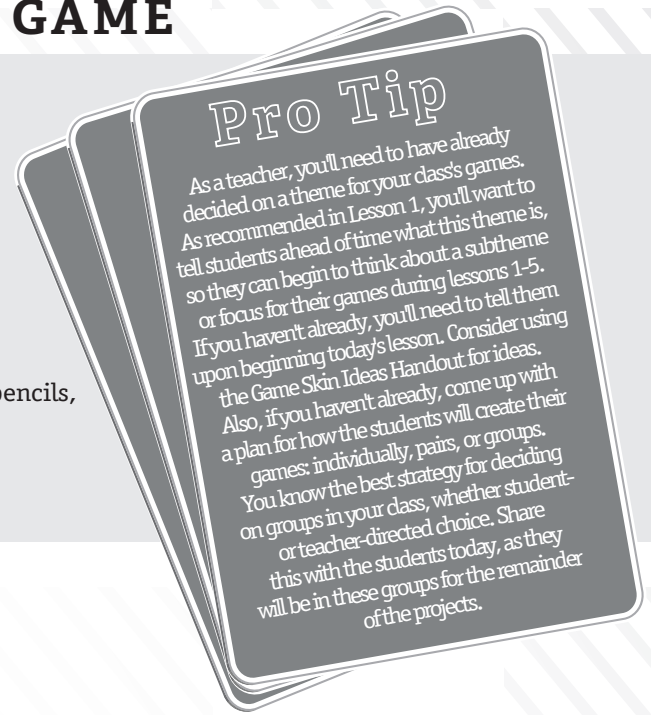
### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

### MATERIALS:

All completed handouts from previous studies, Goals of the Game Handout, pencils, white board or chart paper, markers, and game materials (counters, beans, cubes etc.) as needed

**TIME: 50 minutes**



## PROCEDURE

### 0-15 minutes:

1. Begin the lesson by telling the students that today they will begin creating their own games. In order to do this, they will come up with a Goal for their game based on a theme of your (the teacher's) choosing. To better understand what various goals can look like, start by facilitating a whole group conversation to fill out a Goals of the Game Handout together. This can be done on the white board, document camera, projector, or chart paper. Remember, game types can include Card, Board, Video, Dice, and/or Party.

2. The following is an example of how the handout would be completed for *Outbreak!*:

- **Content/Theme:** Immune System, healthy lifestyle and habits, infectious diseases
- **Goal:** Get a vaccine before an outbreak of the flu virus

Advantages	Obstacles
<ul style="list-style-type: none"> <li>• White blood cells (slow infection)</li> <li>• Preservatives (keep vaccines free of bacteria)</li> <li>• Immune Enhancer (improve vaccine effectiveness)</li> <li>• Stabilizers (maintain vaccine during storage)</li> <li>• Excipients (vaccine ingredients)</li> <li>• Scientists (conduct research, create vaccine)</li> <li>• Patients (allow for live samples, testing)</li> <li>• Labs (safe, no sickness, where testing happens)</li> </ul>	<ul style="list-style-type: none"> <li>• Viruses (high risk of infection)</li> <li>• Sickness (slows down research)</li> <li>• Quarantine (prevents testing, slows down progress)</li> <li>• Research/Tests (can be lost, slows down progress)</li> <li>• Time (more time spent, more sickness spreads)</li> <li>• Travel (difficult to move during outbreak)</li> <li>• Random (fire, flooding, etc)</li> </ul>

### 15-40 minutes:

3. In the next part of the lesson, remind the students what their theme is. In order to come up with their own goal, students will use the Goals of the Game Handout. This handout is expected to help the students generate the following based on a theme you provide:

- Content/Theme:** a basic description of the game aligned with the game's content/theme.
- Goal:** how players win the game.
- Advantage:** something that makes it easier to achieve the goal of the game, such as an achievement, resource or event.
- Obstacle:** something that makes it harder for a player to achieve the goal of the game, such as a barrier, event, or choice.

4. During this part of the lesson, circulate among the room to support students as needed. Based on the needs of the class or an individual student/group, stop the process and have students briefly share what they've come up with or encourage students having difficulty to visit (within a timeframe) other groups to see what they have come up with. This could serve as inspiration for their work. If you do take time to share during work time, there is less of a need to do that at the end of the lesson.



## LESSON 6

### RESOURCE MANAGEMENT



# GOALS OF THE GAME

#### 40-50 minutes:

5. If you haven't yet had students share what they were able to accomplish today, give groups/individuals time to talk about what they were able to come up with. This will serve as both a celebration and gentle motivator/inspiration for students that were not able to complete the activity in time.

6. Have students put their work in their folders for tomorrow. Let students know that tomorrow they will begin to design their game boards to support the Theme, Goals, Obstacles, and Advantages of their game.

#### EXTENSIONS

- Provide students with popular games to play through and/or analyze for Goals, Obstacles, and Advantages as they relate to overall game themes. Discuss how these thematic elements work together to create a better/worse experience for the player, and a better/worse overall game.

- Have students brainstorm/create their own "theoretical" additions to a popular game. What would they add to Monopoly to make it better while aligning with the theme? How about Risk? Chess? How might they change or tweak the Goal to make the game better? Encourage students to focus first on Advantages and Obstacles they might add to the game, and then consider the materials they would use to make these a reality. This will help students remain focused on the thematic elements, rather than the specifics of gameplay.



# LESSON 7

## RESOURCE MANAGEMENT



# THE FIELD OF BATTLE

### OBJECTIVES:

Students will create a game board to support the theme, goal, advantages, and obstacles of their game.

### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

### MATERIALS:

Board Design Handout (copied back to back), Sample Game Board Handout, pencils, pens, markers, crayons, colored pencils, white board or chart paper, markers, computers with internet connection (used for printing images to be used on game board), and game materials (counters, beans, cubes etc.) as needed

**TIME: 50 minutes**

## PROCEDURE

### 0-10 minutes:

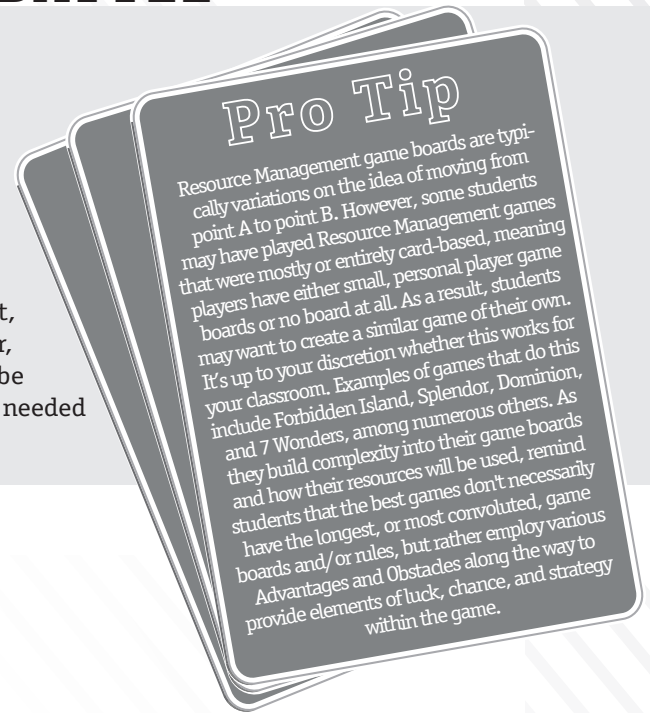
1. Begin by telling the students that today they will be designing their game boards.
2. Guide a conversation about game boards and what they can look like by having students consider the following questions: What kind of board would connect to the theme of the game you are building? What images and symbols might be associated with this theme? How can you generate a board that shows your learning or understanding about the content and/or theme? If desired, provide the students with copies of the Sample Game Board Handout to ignite their imaginations.
3. The goal here is to have them consider what kind of board would best represent the theme, goal, obstacles, and advantages they came up with in the previous lesson. If necessary, draw (or have students come up and draw) examples on the board.

### 10-40 minutes:

4. Distribute the Board Design Handout, and give the students time to work through the process of coming up with their game boards. Circulate throughout the room, asking guiding questions, redirecting, and offering input where needed.
5. Once students have completed their planning, provide them with necessary time and materials to build their game boards.
6. After the students have worked on their game boards, give those that are interested a time to share what they have come up with. If interested, allow other students the opportunity to provide supportive feedback.

### 40-50 minutes:

7. After the students have worked on their game boards, give those that are interested a time to share what they have come up with. If interested, allow other students the opportunity to provide supportive feedback.
8. Clean up and place all materials into folders for tomorrow.



## EXTENSIONS

- Bring in copies, print-outs, and/or photos of game boards for students to compare, analyze, and experiment with.
- Compare similarly designed game boards that employ different themes, obstacles, and advantages. How is the path in Monopoly different from that in Sorry!? How do Pandemic's and Risk's use of islands/countries compare?





# LESSON 8

## RESOURCE MANAGEMENT



# PICKING UP THE PIECES

### OBJECTIVES:

Students will create game materials to support the theme, goal, advantages, and obstacles of their game.

### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

### MATERIALS:

Game Materials Handout (copied back to back), pencils, white board or chart paper, markers, assortment of materials that students can use for gameplay (listed in Pro Tip), baggies/containers to collect student gameplay materials

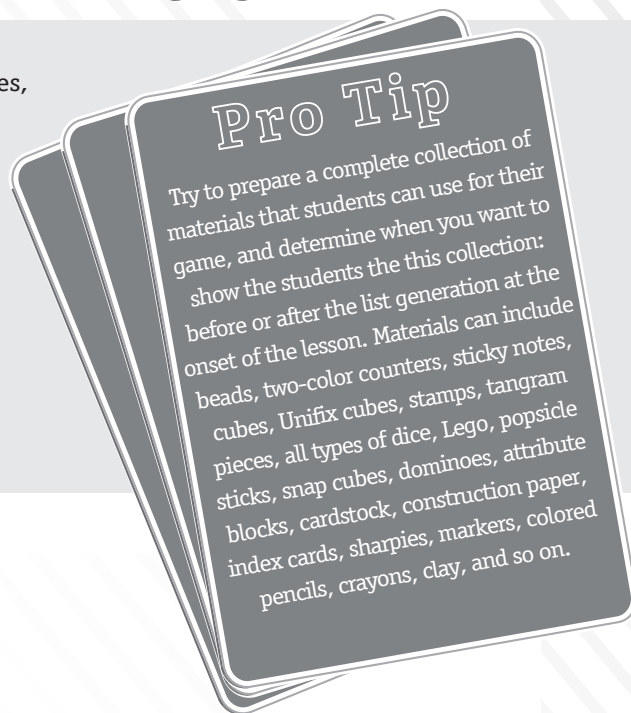
**TIME: 50 minutes**

## PROCEDURE

### 0-10 minutes:

1. Begin lesson by generating a list of potential game materials. If you've chosen to show students the collection of materials, consider asking them: "How could each of these be used in the game?" If needed, have students group the materials together in the categories included below, either on the board or using the collection for examples. If you haven't shared the materials, see what the students can come up with on their own.

- a. **Avatars** representing particular people, objects, animals, and/or characters. Avatars frequently show up in video games, such as the various characters in the World of Warcraft or Lego games, and can feature real people, fictional characters, animals, mythical creatures, magical beings, talking objects, and so on.
- b. **Cards** that players draw, play, collect, or hold onto during the game. Cards come in various shapes and sizes, and can be drawn from a pile and/or provided to each player as a pre-made "deck" at the beginning of the game
- c. **Movement pieces** including
  - i. **Dice** for movement, combat, earning rewards/points, and overcoming obstacles. Dice are most commonly 6-sided, but can have 8, 10, or 12 sides and used in multiple combinations.
  - ii. **Spinners** for movement and decision-making. Spinners include numbers, words, or symbols that influence gameplay in different ways.
- d. **Tokens** (chips, cubes, gems, coins, sticks) representing currency, special abilities, life, and/or points. Tokens are usually small items players can earn throughout the game in order to punish other players, earn rewards, show ownership, and buy resources.
- e. **Other Materials** as related to the overall theme and gameplay



### 10-50 minutes:

2. Provide students time to generate ideas with the Game Materials Handout. The ultimate goal of this exercise is to get students thinking about how they can connect to their materials to the theme, goal, advantages, and obstacles of their games. Supporting questions not on the handout include:

#### a. **Materials**

- i. What are players going to use as their avatars during the game?
- ii. Do your materials fit in with the theme of the game?
- iii. How many players can enjoyably play your game? Does each need specific materials, and how will these be assigned (if not randomly)?
- iv. How can you make your materials fun to play with and aesthetically appealing?

# PICKING UP THE PIECES

### b. Obstacles and Advantages

- i. How can you use some of the materials available to you as in-game Obstacles and/or Advantages? Try to think past just writing “Lose a Turn” or “Move ahead one space” on the space or cards. Some ideas include:
- Create cards that have various obstacles and advantages on them, increasing the surprises during gameplay
  - Create chips or tokens that can be earned to punish other players, buy extra turns, or utilize some special ability/ element in the game
  - Create a spinner to determine which way a player moves at an intersection, whether they earn/lose a chip or token, and/or a special space on the board a player moves to next
  - Earn chips that are then placed/removed to build/destroy islands over water, complete math equations, unite bonds between electrons, or complete a novel’s story arc
  - Build other physical items that change gameplay, such as a popsicle-stick “roads” that needs to be built between forts, Styrofoam balls used with a board to create a “universe” students can travel around, or a plaster tree at the center of the board students need to reach to complete the water cycle

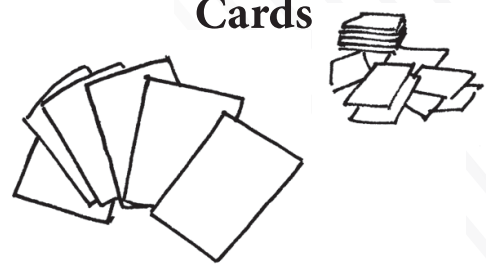
3. Once students have completed their plans for construction on the Game Materials Handout, allow them to work on collecting and building these materials. If students seem to be struggling, encourage them to look at *Outbreak!* and other real-world games for examples of how materials look and are used to align with a game’s theme, goals, obstacles, advantages.

4. For the last **five minutes**, have students clean up their work and make sure to label each of their bags/boxes for future use.

### EXTENSIONS

- Bring in copies, print-outs, and/or photos of game boards for students to compare, analyze, and experiment with.
- Compare similarly designed game boards that employ different themes, obstacles, and advantages. How is the loop in *Monopoly* different from that in *Sorry!?* How do *Pandemic’s* and *Risk’s* use of islands/countries compare?

### Cards



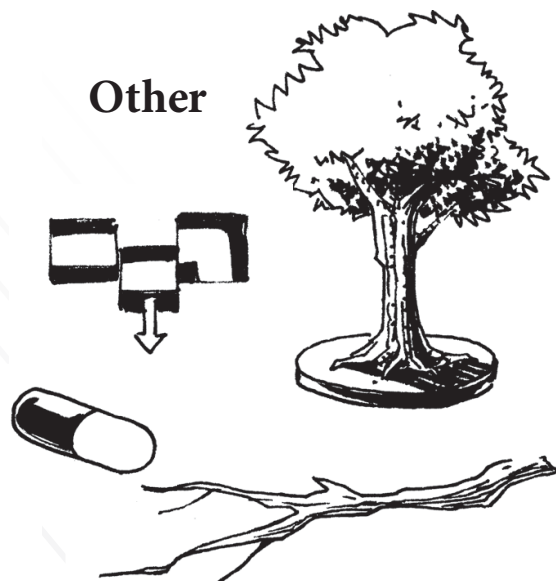
### Avatars



### Tokens



### Other







# THE RIGHT WAY TO PLAY

### OBJECTIVES:

Students will write a complete set of instructions for their game.

### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

### MATERIALS:

Game Instructions Handout (copied back to back), Resource Instructions Handout, Outbreak! Instructions, pencils, white board or chart paper, markers, computer with internet connection and projection capability (not necessary, but helpful), other gameplay materials as needed

**TIME: 50 minutes**

## PROCEDURE

### 0-15 minutes:

1. Begin by telling the students that today they will be writing the instructions for their games. The great news is that they have already done most of the work for this part of the project.

2. Lead a short conversation that reviews the main categories of Game Instructions. These are on today's handout and include:

- |                               |                       |
|-------------------------------|-----------------------|
| a. Game Name                  | g. Goal               |
| b. # of Players               | h. Contents           |
| c. Age Range                  | i. Setup              |
| d. Play Time                  | j. Gameplay           |
| e. Designers                  | i. Turns              |
| f. Introduction/<br>Backstory | ii. Examples          |
|                               | k. Special Situations |

3. In a whole or small group setting, fill in these categories with a simple and commonly known game such as Chess, Monopoly, Settlers of Catan, or Risk. Or, you can use our provided example instructions for Outbreak!. This can serve as a powerful modeling tool. If possible, do this via document camera or on the board/chart paper.

4. Another possibility is to print online versions of popular games' rules, bring in copies of your own, or ask students to bring in some of their own. Using these mentor texts, compare them to the above categories and evaluate how effectively they work.

## Pro Tip 1

• Students should focus first on creating CLEAR and CONCISE written instructions, then the design aspects (drawings, layout, colors, etc.). Encourage them to think creatively about how the instructions might look. Images (photos, illustrations, etc.) are vital to communicating game materials and gameplay elements, and students should be encouraged to add these in where appropriate.

• This lesson is a great chance for the writers in the group to shine. They can scribe for the group, while other members are thinking aloud about answer to the handout questions.

## Pro Tip 2

• After playtesting by other groups during Lesson 10, designers might want/need to change their instructions. If available, encourage students to write their instructions on a digital device. Students can even cut out and paste text onto pre-made instructions.

• This lesson expects students to return to a much more linear, step-by-step method of thin king. This will be welcomed by some students and resisted by others. Just mentioning this shift in the beginning of the lesson can help them ease into it or look forward to it – whatever the case may be.

### 15-50 minutes:

5. Distribute copies of the Game Instructions Handout (copied back to back) to students and provide students time and support to complete these in a quality manner. Encourage students to utilize the work they've done previously. The goal of the handout is to give students the chance to thoroughly consider their games while building on the work they've done in previous handouts.

6. Once students have answered the questions on the Game Instructions Handout, hand out the Resource Instructions Handout. Encourage students to critically consider which Resources will be most vital during their games and closely align these Resources with their materials, theme, goals, advantages, and obstacles. For example, in the game Outbreak!, the Resources Instructions would might look like:

- Resources:** Excipients, Immune Enhancers, Preservatives, Stabilizers
- Material:** Cards
- Uses:** Teams must collect 1 of each resource to win the game by landing on corresponding space with symbol; must pay 3 tokens to pick up card; If team cannot afford to pay for card, all players on team move back 1 space; If other team lands on symbol, must "burn" it; other team can use special card to prevent this;



## LESSON 9 RESOURCE MANAGEMENT



# THE RIGHT WAY TO PLAY

7. After students have filled out both handouts, have them create an original set of Instructions. If students have time, ask them to decorate the instructions to accentuate the theme of the game.

8. If students seem to be struggling, have them consider the instruction Mods from the previous lessons, or use the following real Resource Management game instructions as models:

a. [Risk](#):

<http://www.hasbro.com/common/instruct/monins.pdf>

b. [Monopoly](#):

<http://www.hasbro.com/common/instruct/risk.pdf>

c. [Settlers of Catan](#):

<http://www.catan.com/game/catan-junior#downloads>

d. [Settlers of Catan, Jr](#):

[http://www.boardgamecapital.com/game\\_rulessettlers-of-catanofficial.pdf](http://www.boardgamecapital.com/game_rulessettlers-of-catanofficial.pdf)

e. [Forbidden Island](#):

<http://www.gamewright.com/gamewright/pdfs/RulesForbiddenIslandTM-RULES.pdf>

### EXTENSIONS

- Have students draw a small, to-scale version of their game board as part of their instructions. The board should have each important aspect of the game labeled and briefly explained.

This is a common feature in Resource Management game instructions and examples can be found in multiple board games and online.

- A useful exercise to discuss Aesthetic Appeal, Content, and other design elements of instructions is to have students note how different games' instructions employ different layouts, themes, color schemes, fonts, images, and other details to get across information and align with a game's theme.



# LESSON 10

## RESOURCE MANAGEMENT



# BETA TESTING

### OBJECTIVES:

Students will playtest games created by other students. Playtesters will provide supportive feedback for each game.

### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

### MATERIALS:

Completed games, Multiple copies of Playtest Feedback handout (copied back to back), Game Design Rubric, pencils, open minds, penchant for fun

**TIME: 50 minutes**

## PROCEDURE

### 0-10 minutes:

1. Today will be a day for students to playtest games designed and built by classmates. Let students know that they will be playing these games with a critical eye. It's their job to determine the parts of games that work well and which parts are clunky or even flat-out broken.

2. Games, like software, are often built in stages. First is "pre-alpha," where the conceptual prep takes place. Second is "alpha," when the first parts of the game are put together. Next comes "beta." When a game goes to beta, it is ready to be tested by people that are trying to break it, see how fun it is, and discover gameplay outcomes that the designers and builders have not anticipated. Beta testing is a necessary step in gameplay, so that designers don't release a broken game.

3. A good place to jump in is by reviewing the Game Design Rubric. Remind students that the Game Design Principles for evaluation are Mechanics, Goal, Materials, Interactivity, Instructions, Content, and Aesthetic Appeal. They will be asked to pay attention to these Principles while playing their classmates' games.

### 10-50 minutes:

4. Have students write what specific type of feedback they would like on **two copies** of the Playtest Feedback Handout, ask them to leave this handout on the table near their game. They **should not** set up their game or be allowed to clarify any misconceptions from poor instructional writing.

5. Assign groups to play a game other than their own. Instruct the students to play through each game many times, just as they did during the mod evaluation lessons. This will give them a more accurate window into the game they are playing.

## Pro Tip 1

This lesson plan allows for a group of students to playtest one game in 50 minutes. However, it is up to your (the teacher's) discretion as to how many times this lesson is used in the overall unit, as students could potentially spend a number of additional days playtesting each other's games and providing feedback.

## Pro Tip 2

Remind students the difference between criticism and feedback, so they can support the game design development:

- **Criticism** is when students express disapproval the game based on perceived faults or mistakes. "This game is boring because it only has one material."
- **Feedback** is when students note their reactions to a game, then provide constructive comments on improvements that could be made. "I would have more fun if the materials used were more complicated. Maybe you could use coins to buy extra turns?"

6. After 30 minutes of playtesting, ask groups to make sure they have given feedback on each of the six sections of the feedback form. If they have not done this yet, please complete it at this point. If students seem to be struggling, consider having them look back at the Mod Handouts or at the Game Design Rubric for definitions of each Mod.

7. If time allows, facilitate a group discussion/whip around to celebrate some of the best things that students enjoyed as they playtested their classmates' games.

8. Be sure to allow time for cleanup. The group that played a game should put all game materials back in the box as expected. Designers should put their feedback forms in their Game Design folders.



# LESSON 11

## RESOURCE MANAGEMENT



### CRUNCH TIME

#### OBJECTIVES:

Utilizing feedback from playtesters, students will modify game elements to improve their games. Students will build a quality final product and showcase their completed game.

#### GAME DESIGN PRINCIPLES ADDRESSED:

Mechanics, Goal, Materials, Interactivity, Instructions, Content, Aesthetic Appeal

#### MATERIALS:

Game Design Rubric, Playtest Feedback Handouts completed by playtesters, assortment of materials that students can use for gameplay (listed in detail below), pencils, open minds, penchant for fun

**TIME: 50 minutes**

### PROCEDURE

#### 0-10 minutes:

1. Explain to students that today they will adapt/improve their games based on feedback from playtesters. Remind them that they have done great work in designing and building their games, and for the next day(s) they will be able to put all that work into action by creating their final games!
2. Before getting started, gather the students together and discuss what kind of feedback they received from their testers. Discussing this in a whole group might make some students feel too vulnerable, so focus on the students that are willing to share what they heard from playtesters and hear suggestions from classmates.
3. If that's too threatening, feel free to discuss typical game development problems and potential solutions. Try to focus the conversation on the following questions:

### Pro Tip 1

- This lesson plan allows for students to edit and finalize their game in 50 minutes. However, it is up to the teacher's discretion as to how many times this lesson is used in the overall unit, as students could potentially spend a number of additional days building their games during class.
- Be sure to give the students adequate time to create! They won't be able to act on all the great planning work without adequate studio time.

### Pro Tip 2

- Upon completion, **don't forget to administer the post-assessments** included in the Assessments section of this curriculum! Teachers can use these materials to measure student growth, while students can complete a self-evaluation to see their own development over the unit. Also, re-administration of the Pre/Post Survey and Game Design Rubric provides valuable insights into the effectiveness of the curriculum.

- a. What Game Design Principles are most in need of improvement in this game?
- b. Why are these Principles not working as well as they could be?
- c. What solutions/ideas could we suggest to the game designer to improve this game?

4. Below are some sample gameplay problems that we have seen show up several times. If students need help with moving from their feedback to improvements, this can also be a useful chart to put on the board or have students create on their own as a brainstorming tool:

PRINCIPLES	ISSUE	REPAIR
Mechanics, Goal, Materials	Game is boring or never ends because of board layout, constant loss/gain of spaces, health, money, non-specific number of rounds.	Increase the number of in-game advantages while decreasing the number of obstacles.
Content, Aesthetic Appeal, Materials	Game board and materials are plain or lack thematic connection.	Cut and paste thematic images from internet, magazines, etc. Add shortcuts, twists and turns to game board.
Instructions	Unclear how to play game due to poorly written instructions.	Take time to explain parts of instructions in greater detail.
Materials, Mechanics, Aesthetic Appeal	Spaces are too small and/or text on board or cards is too small/hard to read	Find a bigger piece of paper and either be more careful with handwriting or use a computer to create necessary materials.



# CRUNCH TIME

### 10-50 minutes:

5. Provide the students time and resources to make their plans a reality.

### 6. Helpful Hints:

a. We've found that larger, heavier weight paper lends a certain importance and special feel to their final product. If you have any available, 12"x18" paper is a great size. It gives the students space for their imagination. They can also tape pieces together for a larger space, as necessary. A heavier weight paper also withstands more erasing, as students often (wonderfully so) want their final products to be "just right."

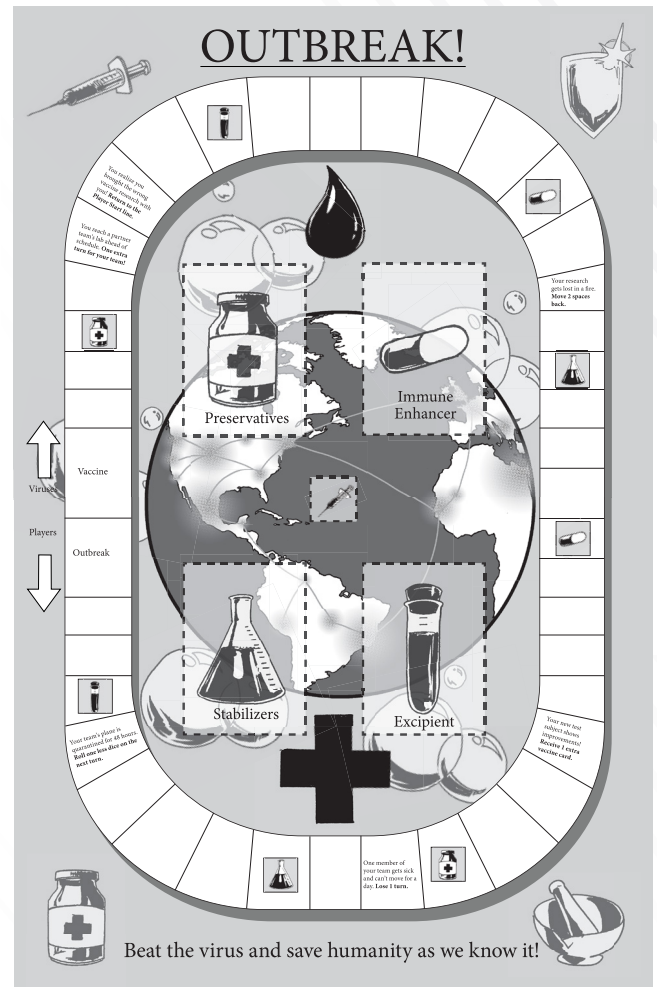
b. Another strategy for some students is to trace a difficult part of the game. Artists regularly trace and copy from one another, and this technique is absolutely valid. We've found it helpful to tape the source material and drawing paper to a window, if a light box is not available.

c. One wonderful strategy is to have students outline their game lines with a black fine point marker. This light outline gives the work a more polished feel to it. Students comment over and over again just how cool this effect is. Essentially, it helps their drawings stand out on the page a bit more.

d. Above all, this time is supposed to be enjoyable! Students are expected to push themselves in ways that feel good. If frustration and disappointment are creeping in, support the student to scale back expectations or facilitate an easier process such as simplifying the process, making use of mentor drawings, or tracing.

7. Once materials have been cleaned up, consider asking students to leave their work on the desks. Have the class walk around and notice what their peers are doing. Celebrate, observe, and comment. We all understand the benefits of positive feedback.

8. On the final day of class, consider having a 'game night' or celebration where students are given the opportunity to play each other's games. Decorations, music, a special snack, guests, and buddy classes can all add to the sense that the students' work is being honored on a greater level.





# RESOURCE MANAGEMENT HANDOUTS



# GAME DESIGN PRINCIPLES PUZZLE

Game Designer(s): \_\_\_\_\_

Principle	Description	Example
<b>Mechanics</b>	How a game functions. This might include rolling dice, drawing cards, moving characters, etc.	
<b>Interactivity</b>	How players work together (cooperatively) or against one another (combatively) to achieve a goal.	
<b>Goal</b>	The end-goal, or way(s) of "winning" the game.	
<b>Materials</b>	The pieces used in gameplay: cards, dice, game boards, tokens, etc.	
<b>Content</b>	The story or "theme" of a game.	
<b>Aesthetic Appeal</b>	How visually enjoyable the materials are to look at.	
<b>Instructions</b>	Rules of play. Can be presented as written, illustrated, video or a combination.	



## LESSON 1 RESOURCE MANAGEMENT



# INTRODUCTION TO RESOURCE MANAGEMENT

### **What is Resource Management?**

Resource Management is all about knowing what resources you have, resources you need, and when and where to use those resources in order to achieve an intended goal. In the real world, resource management involves evaluating and organizing individuals, materials, technology, information, and other resources to optimize performance.

### **What do Resource Management games look like?**

Numerous games involve resource management. Game resources can include currency, such as tokens or coins; natural resources, such as crops or stone; human resources, such as technology or roads; physical resources, such as strength or special powers; and many others. These games also include rules outlining how players can utilize their various resources. By managing these resources to the upmost efficiency, players can create a strategic advantage to win the game.

### **How are Resource Management games different from other games?**

Resource management games have been used throughout history to teach important lessons, skills, and cultural values across the world. As opposed to games of luck, like dice, or physical strength, like athletics, these games required players to primarily use their intelligence, problem-solving, and critical thinking to achieve success.

In Ancient Roman and Viking cultures, for example, rudimentary chess games were likely intended to help improve military strategy, while Arabic cultures played mancala, or "sowing," games that centered around important agricultural and cultural practices. In fact, even Monopoly (originally known as "The Landlord's Game") was originally created in order to help players better understand the positive and negatives of land ownership (weird, right?). Today, resource management games have become a mainstay of pop culture, including everything from civilization-building games like Settlers of Catan, to quest-based games like World of Warcraft, to survival-based games like Pandemic, and countless more.



# LESSON 2

## RESOURCE MANAGEMENT

# SQUARES!



**Game Designer(s):** \_\_\_\_\_

**Goal:** Complete FOUR of ANY one symbol in a row (2-4 players) on a 12-space board.

**Game Materials:** 20-30 Symbol Cards

**Instructions:**

1. Shuffle all the symbol cards into one pile.
2. The player with the next birthday goes first.
3. All players draw three cards each to start.
4. Each turn, players may take ONE action:
  - a. Draw a card, OR
  - b. Place a card
5. The first player to complete 4 in a row of any symbol wins.




**LESSON 2**  
**RESOURCE MANAGEMENT**



**SQUARES!**




# LESSON 2 RESOURCE MANAGEMENT



## MECHANICS MOD

**Game Designer(s):** \_\_\_\_\_

**Mechanics:** How a game functions. This might include rolling dice, drawing cards, moving characters, etc

**Basic Squares!**

- Play Squares! according to the basic instructions included on the handout

How would you describe the Mechanics of this game? \_\_\_\_\_

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**Level 1 Mod: Modify Squares!**

- Instead of playing Squares with a 4 by 3 grid, now play on a 4 by 4 grid. In addition, players can draw or play up to two cards per turn. Gameplay continues as normal, the goal being to achieve four of any symbol in a row.

How did this modification affect the Mechanics of the game? \_\_\_\_\_

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**Level 2 Mod: Now build upon the Level 1 Mod**

- Now, number the spaces on the grid from 1 to 16 in a top to bottom, left to right fashion.
- During each turn, roll 3 six-sided dice, and the total number is where you get to place your symbol.
- If you roll a 17 or 18, you lose a turn.
- If you roll a number that already has a symbol on it, replace that symbol with a symbol from your hand (even if it is your original card being replaced) AND play a second card in any open space.

How did this modification affect the Mechanics of the game? \_\_\_\_\_

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Finally, did any of the mods above affect any of the other Game Design Principles? If so, how? \_\_\_\_\_

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# LESSON 2 RESOURCE MANAGEMENT



## GOAL MOD

**Game Designer(s):** \_\_\_\_\_

**Goal:** This is the end-goal, or way(s) of "winning" the game.

**Level 1 Mod:**

- Using the 4 by 4 Squares! grid, play according to the instructions with one exception: Players must place four DIFFERENT symbols in a row in order to win the game.

How did this mod affect the Goal of the game? \_\_\_\_\_

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**Level 2 Mod: Modify the Level 1 Mod**

- Using a 4 by 4 grid, the winner is the one that forces or tricks their opponent into placing four of the SAME symbols in a row (horizontally, vertically, or diagonally). If you place four symbols in a row, you lose. Last player to remain in the game wins.

How did this mod affect the Goal of the game? \_\_\_\_\_

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**Level 3 Mod: Now build upon the Level 2 Mod**

- Using a 4 by 4 board, play the game according to the instructions, with one exception: Once a player places four symbols in a row, they collect this as a "stack." The winner is the one that is the first to collect 3 "stacks" of DIFFERENT symbols.

How did this mod affect the Goal of the game? \_\_\_\_\_

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Finally, did any of the mods above affect any of the other Game Design Principles? If so, how? \_\_\_\_\_

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**LESSON 3**  
**RESOURCE MANAGEMENT**



**BASIC GAME BOARD**

**Instructions:**

- 1-Shuffle all the symbol cards into one pile and place at the center of the board.
- 2-Each player rolls a six-sided die, and the player with the highest roll goes first.
- 3-Each player receives 3 cards and a game piece to start.
- 4-Place all pieces at the start space.
- 5-Each turn, players must roll one six-sided dice and move the corresponding number of spaces, then complete one or two the following actions:
  - Use 3 matching symbol cards to buy an extra turn
  - End a turn by discarding one card (if available) AND drawing a up to 3 cards from the pile. Players are allowed 3 cards (no more, no less) in their hands at all times.
- 6-First player to reach the finish line wins.

Game Designer(s):

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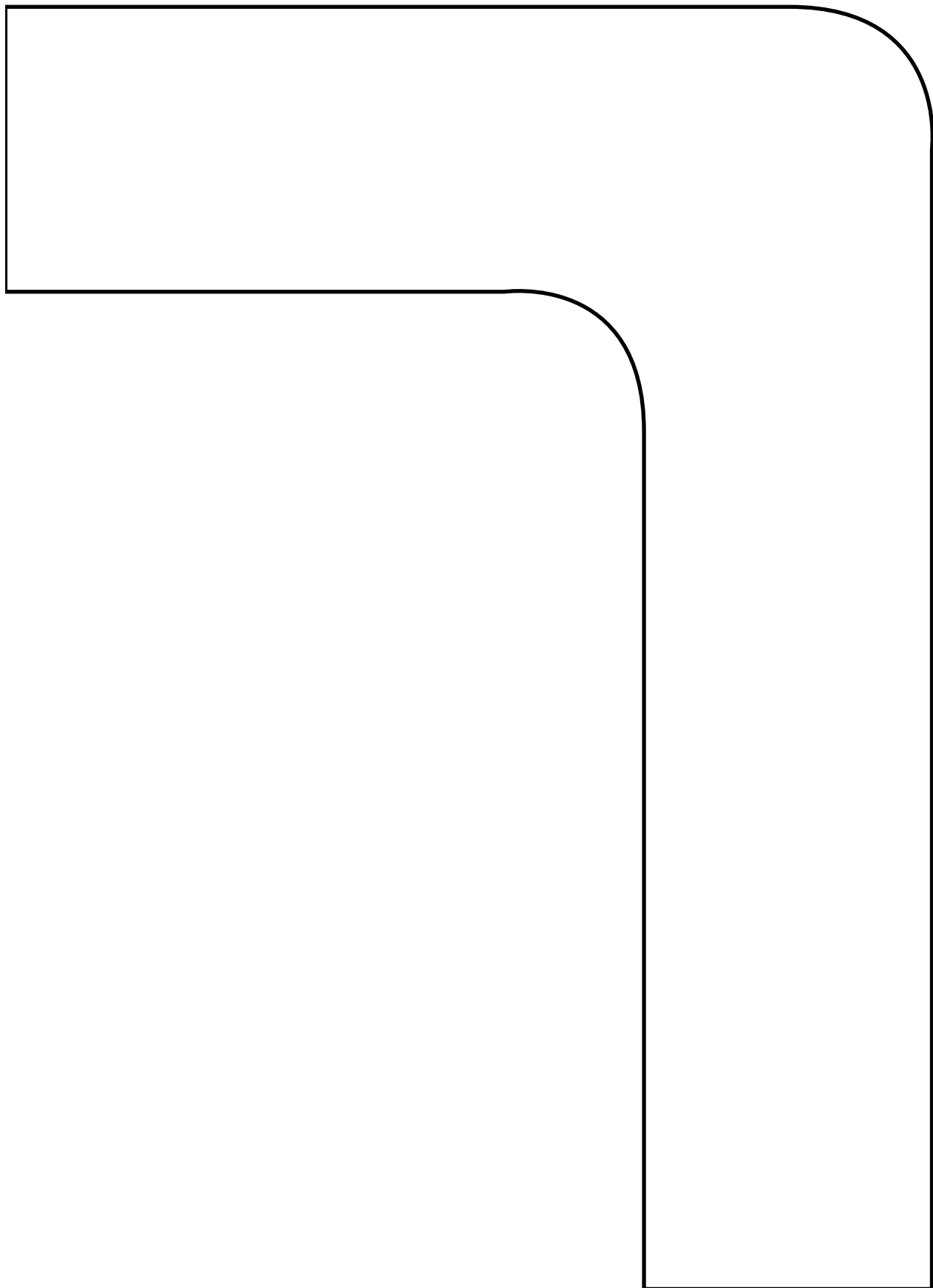
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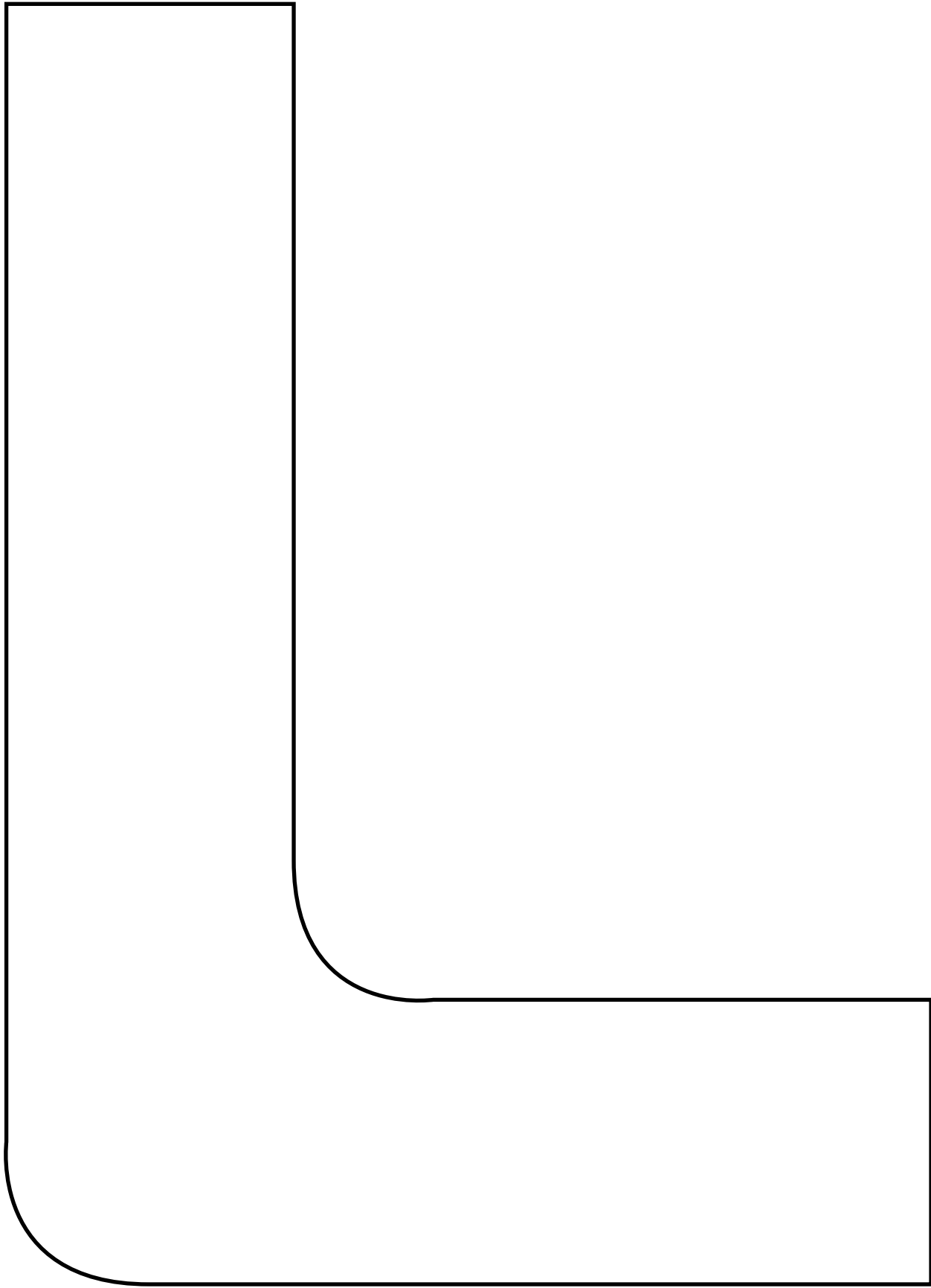


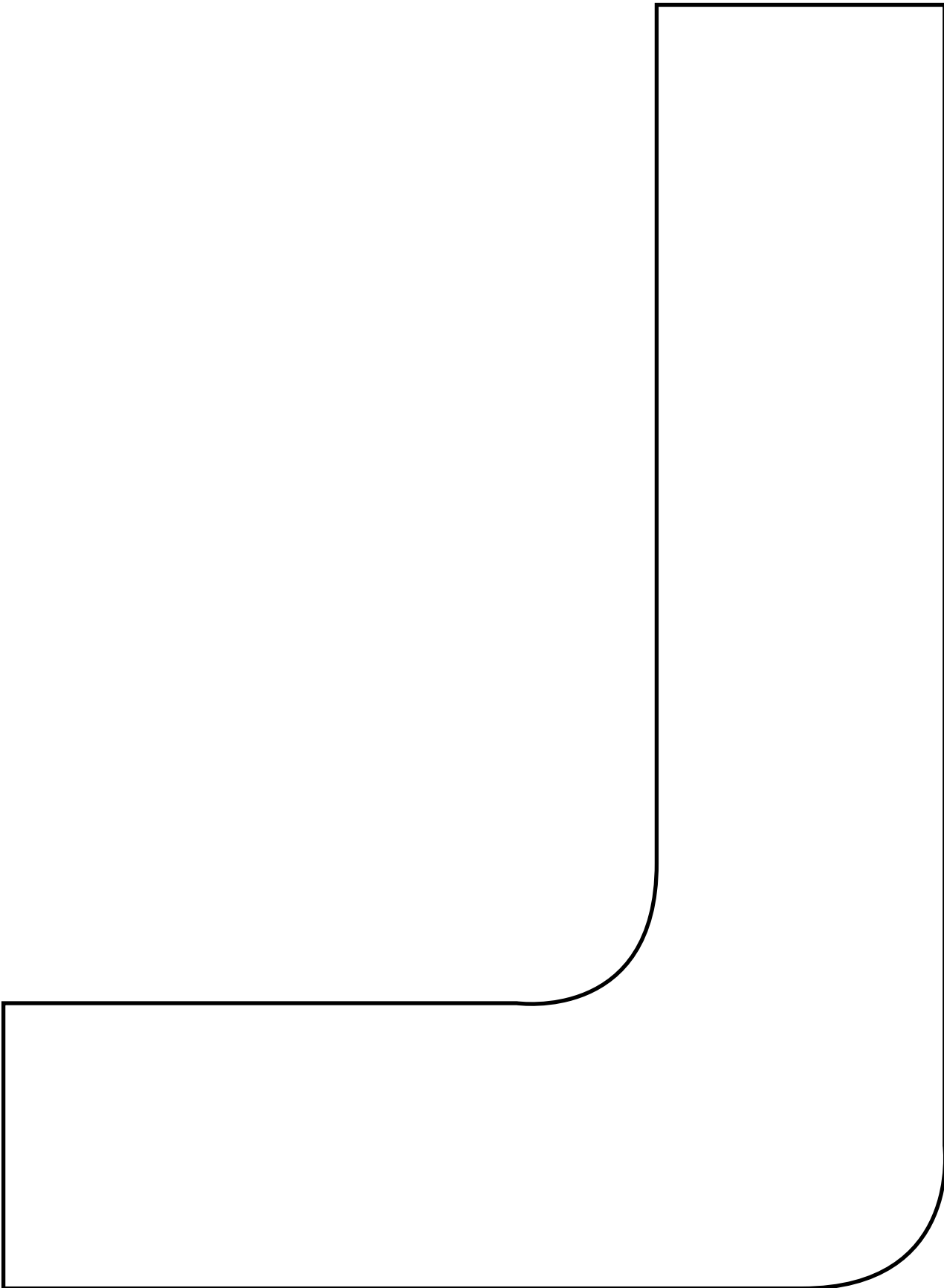
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# LESSON 3 RESOURCE MANAGEMENT



## MATERIALS MOD

**Game Designer(s):** \_\_\_\_\_

**Materials:** The pieces used in gameplay: cards, dice, game boards, tokens, etc.

**BASIC GAME BOARD:** Follow the basic Instructions for the first few games.

How would you describe the Materials you used in this game? \_\_\_\_\_

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**Level 1 Mod:** Without obstacles to overcome, this Resource Management game is very boring. So, do the following:

- Write in 3-5 phrases on spaces on your board to change gameplay. These can include phrases like "Move back 2 spaces," "Move forward 1 space," "Lose a turn," "Take one card at random from another player," "Give 1 card of your choosing to the player to your right," and other phrases as your group deems fit.
- Then, place a Symbol Card facedown on TWO additional spaces. If the player who lands on this space has one or more of that same symbol in their hand, they are rewarded or penalized in some way. Decide in your group what this reward/penalty will be. Once the card has been used, it is removed from the game.

Once you've finished, play the game through according to the basic instructions.

How did this modification affect the Materials of the game? \_\_\_\_\_

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**Level 2 Mod:** Use your same board and materials from Level 1, but make the following changes:

- Add 20 tokens to the center of the board. Give each player 3 tokens to start, and 1 token after completing each turn.
- Now, write in new phrases to your board in blank spaces, such as "Give all your tokens to the player to your right," "Give 1 token to every other player," "You earn 1 token," and so on.
- Once you've set up the board and materials, play the game through according to the basic game instructions, with the following additions:
  - o Spend 3 tokens to buy an extra turn
  - o Spend 4 tokens to prevent another player from taking a turn or extra turn (can be used by ANY player at ANY time in the game)
  - o Once tokens have been spent, they go back into the token pile at the center.

How did this modification affect the Materials of the game? \_\_\_\_\_

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Finally, did any of the mods above affect any of the other Game Design Principles? If so, how

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# LESSON 3 RESOURCE MANAGEMENT



## INTERACTIVITY

**Game Designer(s):** \_\_\_\_\_

**Interactivity:** How players work together (cooperatively) or against one another (combatively) to achieve a goal.

**Level 1 Mod:** Now, you are playing in teams, and your goal is to complete your "loop" on the game board before the opposing team completes theirs. Decide on your teams before beginning. Play according to the basic instructions, but with the following changes:

- From the Start space, 1-2 players will move one direction on the game board (clockwise), while 1-2 opponents will move the other direction (counterclockwise).
- ANY time you land on the same space as one or more opponent/s, you MUST battle immediately. To battle, each player in the space rolls the dice once, starting with the player who landed on the space most recently. Highest roll wins. The loser(s) move back 3 spaces and the winner stays put. If players roll the same number, the battle is a draw.
- Play continues until all players from one team reach the Start space again (i.e. complete the "loop"). This team is declared the winner.

How did this modification affect the Interactivity of the game? \_\_\_\_\_

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**Level 2 Mod:** In this mod, your goal is no longer to complete the loop before other players. Instead, ALL players will move one direction together to defeat an "artificial player" (AP). Play the game as you did in Level 1, but with the following changes:

- Place all players' game pieces on the Start space, facing one way (clockwise).
- Place a special marker representing 1-2 opposing "artificial players" (APs) on the starting line, facing the other way (counterclockwise). From the Start space, all players will move one direction, while the AP/s will move the opposite direction.
- Next, add 30 tokens to the center of the board. Each player (including the AP) should receive 4 tokens to start, and 1 token after completing their turn. Tokens can be used by players in the following ways:
  - o Spend 4 tokens to buy an extra turn
  - o Spend 5 tokens to prevent any other player from taking a turn or extra turn (can be used by ANY player at ANY time in the game)
  - o Once tokens have been spent, they go back into the token pile at the center







# LESSON 4 RESOURCE MANAGEMENT



## INSTRUCTIONS MOD

**Level 2 Mod:** Now, play Outbreak! according to the new Instructions below:

- Place 8 Cards with the same symbol in the center of the board.
- Place 25 tokens at the center of the board. All players should start with 1 token, and each player should receive 1 token after their turn is complete.
- Give each player one "special" card. This should be different from the symbol cards in the middle.
- In this 2-4 person game, your goal is to complete the loop before the 2 "alternate players", or APs, can complete their loop. As you move around the board, your team must also collect 4 cards. ALL resources are shared among the team.
- All players will start by moving one direction on the game board (clockwise), while two APs move the other direction (counterclockwise). Use the same number of six-sided dice as there are players.
- Randomly choose which player goes first and the order of play.
- A player begins their turn by rolling the same number of dice as there are players. As a group, the players work together to assign each dice to a specific player, and then each player moves their piece that many spaces.
- If the spaces players land on are unoccupied, the turn is over. However, if any player:
  - o Lands on a square with a phrase in it, they must perform that action immediately.
  - o Lands on a space with one of the 4 symbols on it, the team must pay 3 tokens in order to pick up 1 card from the center of the board. If the team doesn't have enough tokens, ALL players must move back one space.
  - o Lands on a space where an AP is located, the team must immediately use a "special" card. If all these cards have already been used, the player who landed there is "stopped" until the AP moves next.
  - o Lands on a square with another member of their team on it, BOTH players receive a token at the end of the turn.
- After each player's turn, they roll two dice for the APs. The team gets to choose which AP gets moved by which dice. If an AP lands on a symbol, the team must immediately discard one of the corresponding Resource Cards.
- At any point in the game, the team can use a special card to cause ONE of the APs to lose a turn.
- The game is over once the team to collects 4 cards and ALL players reach the "Vaccine" space, or when BOTH APs reach the "Outbreak!" space. Once team members reach the "Vaccine" space, they are no longer allowed to roll the dice or move, but can continue collecting/spending tokens each turn until all other teammates (or the viruses) have reached the finish line.

Level 1 and Level 2 were intended to be the same game. How did the different Instructions affect the gameplay experience?

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Finally, did any of the mods above affect any of the other Game Design Principles? If so, how? \_\_\_\_\_

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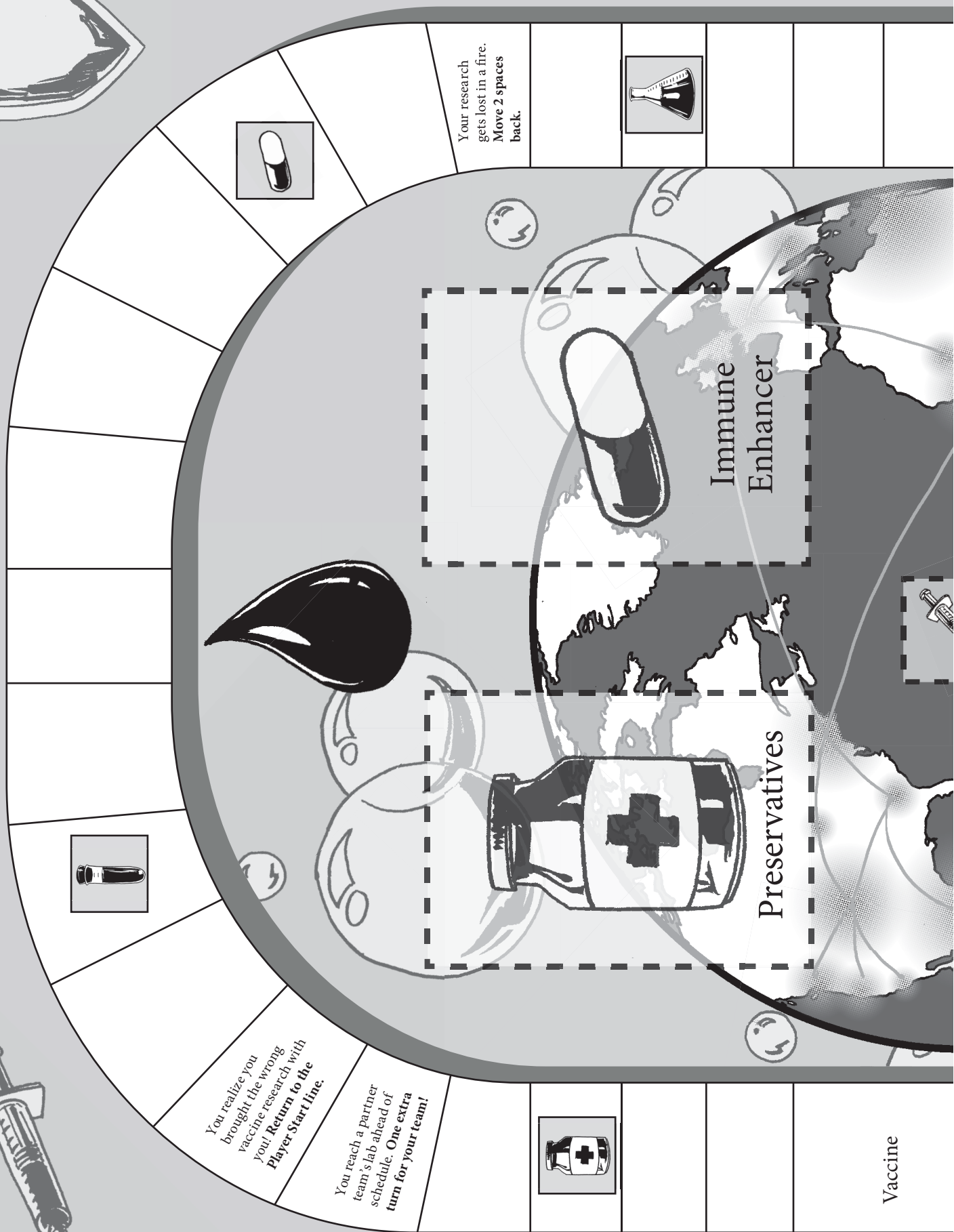


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# OUTBREAK!



Your research gets lost in a fire. Move 2 spaces back.

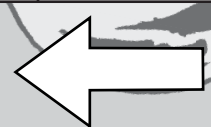
You realize you brought the wrong vaccine research with you! **Return to the Player Start line.**

You reach a partner team's lab ahead of schedule. **One extra turn for your team!**

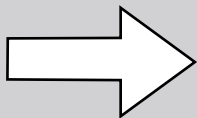
Immune Enhancer

Preservatives

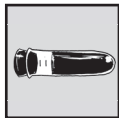
Vaccine



Players



Outbreak



Your team's plane is  
hit by an outbreak for 48 hours.  
Roll on the dice once  
each turn.



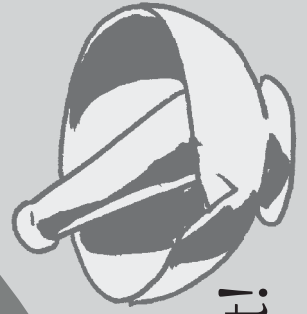
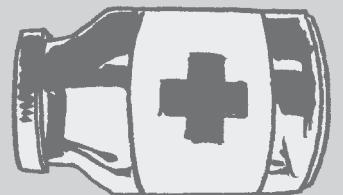
Your new test  
subject shows  
improvements!  
Receive 1 extra  
vaccine card.

Excipient

Stabilizers



One member of  
your team gets sick  
and can't move for a  
day. Lose 1 turn.



Beat the virus and save humanity as we know it!

# OUTBREAK! Game Instructions

**Introduction:** The race is on! A virus has been set loose and threatens to end all of humanity. Your team of scientists must circle the world collecting 4 crucial items to create a vaccine, then return to your lab before the virus. Good luck! The fate of the world is depending on you.

**Goal:** In this 2-4 person game, your goal is to get to the "vaccine" before the "viruses" can circle around the world and wipe out humanity. As you move around the board, your team must collect 4 different Resource Cards located in the center of the board. The game is over once the team to collects all 4 different Resource Cards and the ALL players reach the "Vaccine" space, or when BOTH viruses reach the "Outbreak!" space.



## Materials:

-Two pieces of game board

-Four 6-sided dice

-2-4 Scientist avatars

-2 Virus avatars

-8 Resource Cards

-20 Token Cards

-4 White Blood Cell Cards

**Setup:** Assemble the two pieces of the game board with clear tape.

1-Players place their avatar on the "Vaccine" space and virus avatars on the "Virus" space.

2-Resource Cards and Tokens should be placed in the center of the board for use during gameplay.

3-Each player should start with 1 token card and 1 White Blood Cell card. Discard any unused White Blood Cell cards. All resources will be shared among the team.

**Gameplay:** Randomly choose which player goes first and the order of play. All players will start by moving one direction on the game board (clockwise), while two viruses move the other direction (counterclockwise). Use the same number of six-sided dice as there are players. At any point in the game, team members can choose to play a White Blood Cell card to cause ONE of the viruses to lose a turn.

**Turns:** Each turn is broken up into 2 parts: The player's turn, and the virus's turn.

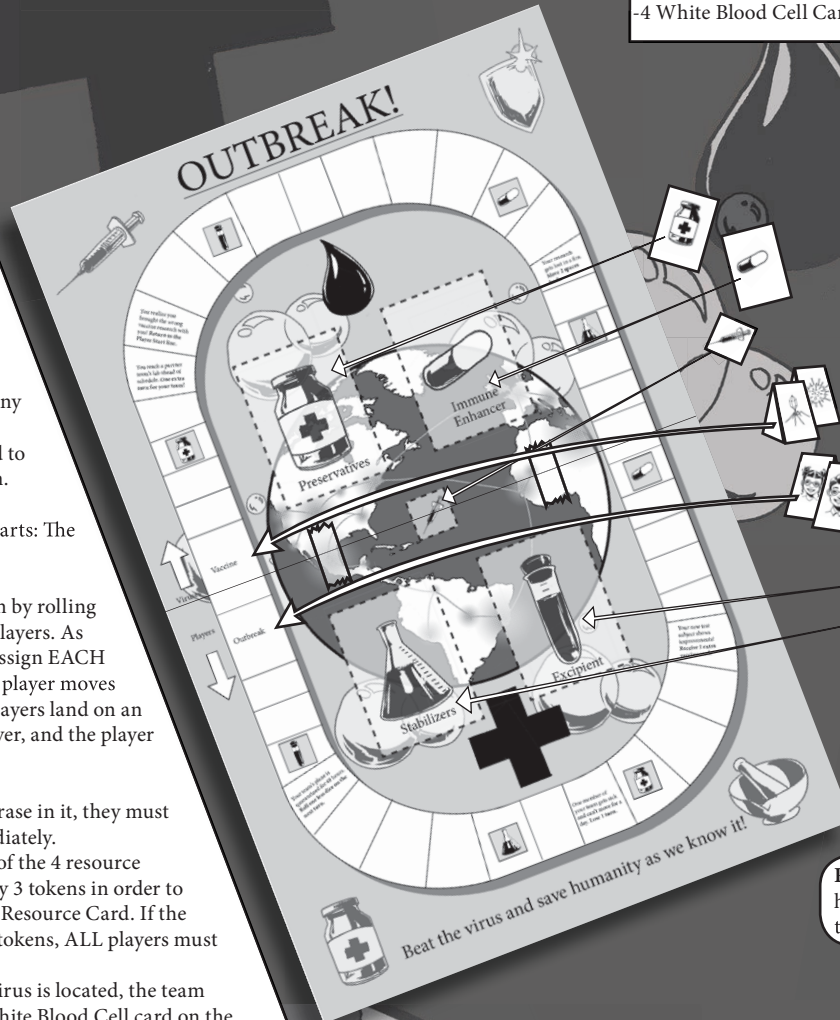
**Player Turn:** A player begins their turn by rolling the same number of dice as there are players. As a group, the players work together to assign EACH dice to a specific player, and then each player moves their piece that many spaces. If ALL players land on an unoccupied/blank space, the turn is over, and the player that rolled the dice receives 1 token.

However, if any player:

- lands on a space with a phrase in it, they must perform that action immediately.
- lands on a space with one of the 4 resource symbols, the team must pay 3 tokens in order to pick up the corresponding Resource Card. If the team doesn't have enough tokens, ALL players must move back one space.
- lands on a space where a virus is located, the team must immediately use a White Blood Cell card on the virus. If these cards have already been used, the player who lands on the virus is "sick" and unable to roll until the virus is moved.
- lands on a square with another member of their team in it, BOTH players receive a token at the end of the turn.

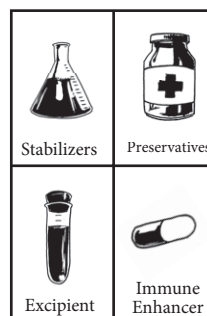
**Virus Turn:** After each player's turn, that same player should roll two dice for the viruses. All players work together to choose which virus gets moved by which dice. If a virus lands on a resource symbol, you must immediately discard one of the corresponding Resource Cards.

**Special Instructions:** Once a team member reaches the "Vaccine" space, they are no longer allowed to roll the dice and move, but can continue collecting/spending tokens each turn until all other teammates (or the viruses) have reached the finish line.







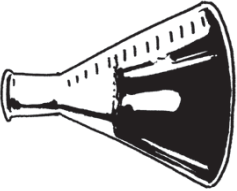
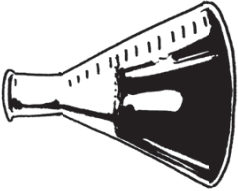


**Remember:** To win, teams must have all four resource cards when the last player reaches the finish.










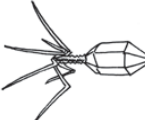


**Resources:** Each resource card represents an important part of the vaccine. Be sure to collect all four as a team.



Resource Cards

	Immune Enhancer		Immune Enhancer
	Excipient		Excipient
	Preservatives		Preservatives
	Stabilizers		Stabilizers

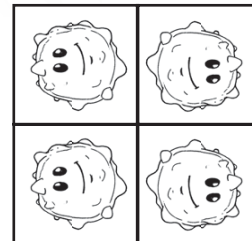
Game Pieces

Player Pieces

Viruses

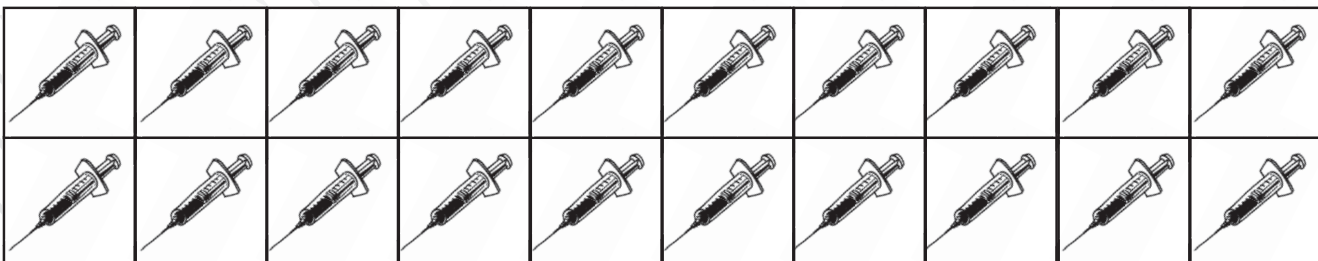
White Blood Cells



Cut out pieces along the solid black lines.

Fold pieces on the dotted lines.

Tokens







## **MOD POSSIBILITIES**

**Game Designer(s):** \_\_\_\_\_

Here are some ideas for how you might modify your games to affect each Game Design Principle:

### **Mechanics:**

- Players label spaces on their board with special instructions for a certain dice roll.
- Players can have a maximum number of cards and must discard one after each turn.
- Holding/drawing two matching cards or rolling “doubles” with dice gives player an extra turn or special ability.
- Two or more players on the same space together must battle, with highest roll winning something of value from one or more players.

### **Goals:**

- Players must collect all of a certain color, suit, token, and/or card to win.
- Reaching the finish line is no longer the goal. Rather, the winner is the player has the most tokens, cards, or other materials when any player reaches the finish line.
- Make the goal of the game collective, where each player has a different final objective in order for an entire team to win the game.

### **Materials:**

- The game board is shrunk, extended, or rearranged into a new shape.
- Create a dice and/or spinner using symbols, rather than numbers.
- Players increase or decrease their number of coins, cards, or other gameplay materials.
- One card or roll is worth more points and/or turns than other rolls, cards, and/or tokens.
- Players can buy or trade extra turns, cards, tokens, etc.

### **Instructions:**

- Add more specificity to instructions.
- Add visuals/images to describe gameplay

### **Content/Theme:**

- Consider content-oriented events, characters, or places that can change gameplay. For example:
- A player must remain on a space until a "Common Denominator" card is drawn
- Water can become scarce because of a drought card being drawn
- A player must attain food before moving troops to the next city

### **Aesthetic Appeal:**

- Build materials (avatars, pieces, dice, spinners, etc) that support theme/content.
- Design a game board with images, sculptures, and other visuals that support theme/content.
- Create an alternate game board for a game that already exists.



# LESSON 5

## RESOURCE MANAGEMENT



# MOD EVALUATION

**Game Designer(s):** \_\_\_\_\_

**Modification:** A change in gameplay that affects one or more Game Design Principles.

**Mod 1:**

Explain how Mod 1 works: \_\_\_\_\_

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How does Mod 1 change the game for better or worse? \_\_\_\_\_

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**Mod 2:**

Explain how Mod 2 works: \_\_\_\_\_

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How does Mod 2 change the game for better or worse? \_\_\_\_\_

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# LESSON 6

## RESOURCE MANAGEMENT



### GOALS OF THE GAME

**Game Designer(s):** \_\_\_\_\_

**Content/Theme**

Provide a basic game introduction/backstory for your game: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Goal**

Describe how players win the game: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

List Advantages and Obstacles in the following T Chart. Make sure they are related to your game's theme!

**Advantage:**

Something that makes it easier to achieve the goal of the game, such as an achievement, resource, or event

**Obstacle:**

Something that makes it harder for a player to achieve the goal of the game, such as a barrier, event, or choice



**LESSON 7**  
**RESOURCE MANAGEMENT**



**BOARD DESIGN**

**Game Designer(s):** \_\_\_\_\_

Think about the story and/or goal of your game. Would a map, trail, road, city block, timeline, story arc, mountain, or other path make sense for your game board? Why? \_\_\_\_\_

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What kinds of symbols, shapes, colors, or images will connect the game player to your theme? Curves, sharp angles, spirals, rectangles? \_\_\_\_\_

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How will you build **advantages** into your game board? \_\_\_\_\_

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How will you build **obstacles** into your game board? \_\_\_\_\_

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# LESSON 7

## RESOURCE MANAGEMENT



# BOARD DESIGN

Sketch your ideas in the boxes below, being sure to label the Start and Finish squares, any Advantages/Obstacles included on the board, as well as places where cards, tokens, spinners, special dice, and other materials will be placed during gameplay.



# LESSON 8

## RESOURCE MANAGEMENT



# GAME MATERIALS

**Game Designer(s):** \_\_\_\_\_

**Game Theme:** \_\_\_\_\_

**Goal of Game:** \_\_\_\_\_

**Instructions:** Considering your game's Goal, Advantages, and Obstacles, make a list of ALL the materials you'll need to play your game in each category below, then explain how they'll be used and sketch what they'll look like.

Categories include:

1. **Avatars** representing particular people, objects, animals, and/or characters
2. **Cards** that players draw, play, collect, or hold onto during the game
3. **Movement Pieces** including:
  - a. Dice for movement, combat, earning rewards/points, and overcoming obstacles
  - b. Spinners for movement and decision-making
4. **Tokens** (chips, cubes, gems, coins, sticks) representing currency, special abilities, life, and/or points
5. **Other materials** as related to the overall theme and gameplay

Material	How are they used in your game?	Quantity
<b>Avatars</b> (list below)	<b>1.</b>	<b>1.</b>
<b>Cards</b>		



# LESSON 8

## RESOURCE MANAGEMENT



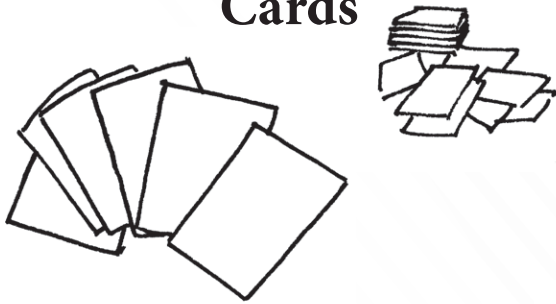
### GAME MATERIALS

Material	How are they used in your game?	Quantity
Movement Pieces		
Tokens		
Other materials		

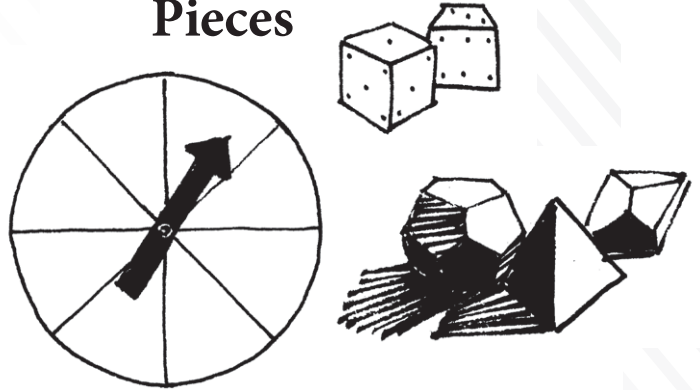
Sketch and label materials here.

# SAMPLE GAME MATERIALS

**Cards**



**Movement Pieces**



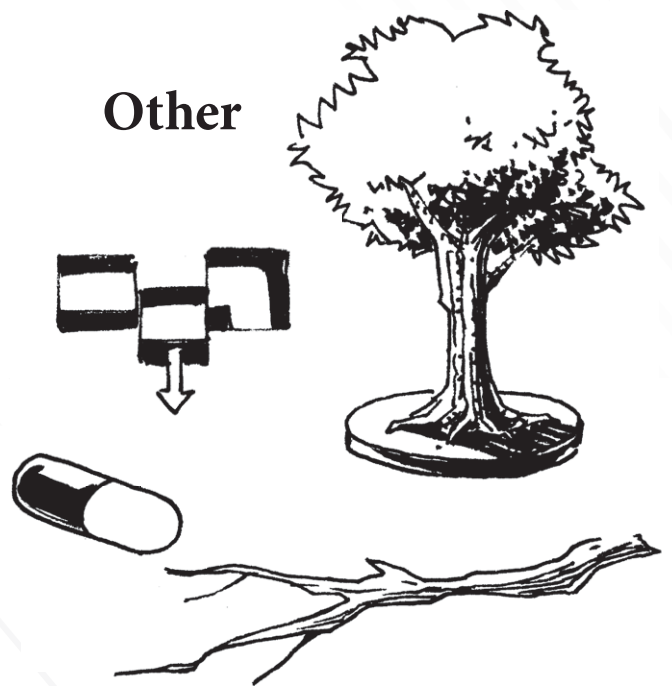
**Avatars**



**Tokens**



**Other**







# GAME INSTRUCTIONS

**Game Designer(s):** \_\_\_\_\_

**Introduction/Backstory:** A brief description of your theme or the story involved in your game. \_\_\_\_\_

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**Goal:** Up to three sentences about how a player wins or loses the game. \_\_\_\_\_

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**Materials:** What materials should players find in the game box? Be specific in your description. For example: game board, instruction sheet, 25 red "ruby" cubes, 25 green "emerald" cubes, 1 six-sided die, and a deck of 20 "market" cards.

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**Setup:** How do you setup the game to begin play? Does setup change if the number of players changes?

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# GAME INSTRUCTIONS

**Game Designer(s):** \_\_\_\_\_

**Gameplay:** This is the section that describes how to play the game. How do players determine who goes first? Does play then move to the left, or something else? \_\_\_\_\_

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**Turns:** Describe what a player, or players, do during each turn. If players have a specific order of choices, be sure to describe the specific order or possible gameplay scenarios. Be sure to explain how each of the materials are used within turns. \_\_\_\_\_

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**Special Situations:** What happens on special spaces or in special situations? If you land on top of another player? If a player is "captured," "dies," or reaches a "bonus space"? \_\_\_\_\_

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# LESSON 9

## RESOURCE MANAGEMENT



# RESOURCE INSTRUCTIONS

**Game Designer(s):** \_\_\_\_\_

**Resource:** A material players gather and skillfully manage to achieve specific goals throughout gameplay.

Use the chart below to describe how Resources will be used in your game and which material(s) you will need to add these Resources into gameplay. Then, sketch how these Resources will look to players during the game – whether a symbol drawn on cards/tokens, clay coins, cardboard cut-outs, or something else entirely!

<b>Resource:</b> _____
<b>Uses:</b> _____ _____
<b>Sketch:</b>

<b>Resource:</b> _____
<b>Uses:</b> _____ _____
<b>Sketch:</b>

<b>Resource:</b> _____
<b>Uses:</b> _____ _____
<b>Sketch:</b>

<b>Resource:</b> _____
<b>Uses:</b> _____ _____
<b>Sketch:</b>



## PLAYTEST FEEDBACK

**Game Designer(s):** \_\_\_\_\_

What specific feedback do you want from the playtesters? \_\_\_\_\_

**Goal:** Do you know how to win? Is the goal too hard, or too easy? Is it clearly connected to the theme?

**Content/Aesthetic Appeal:** Are the game board, materials, and instructions visually engaging? Do they clearly connect to the theme? Do they make the game more fun/challenging? Why or why not?

**Mechanics:** Do all players participate during each turn? Is the gameplay fun/challenging? Why or why not?



LESSON 10  
RESOURCE MANAGEMENT



PLAYTEST FEEDBACK

Game Designer(s): \_\_\_\_\_

**Interactivity:** Is the game cooperative, competitive, or mixed? How many players are involved in each turn? Do players have the chance to choose one or more actions each turn? Do player choices make gameplay more fun/challenging? Why or why not? \_\_\_\_\_

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**Materials:** Are the game board, materials, and instructions visually engaging? Do they clearly connect to the theme? Do they make the game more fun/challenging? Why or why not? \_\_\_\_\_

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**Instructions:** Do the instructions clearly explain how to play? Are any parts confusing or missing?

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# ADDITIONAL RESOURCES

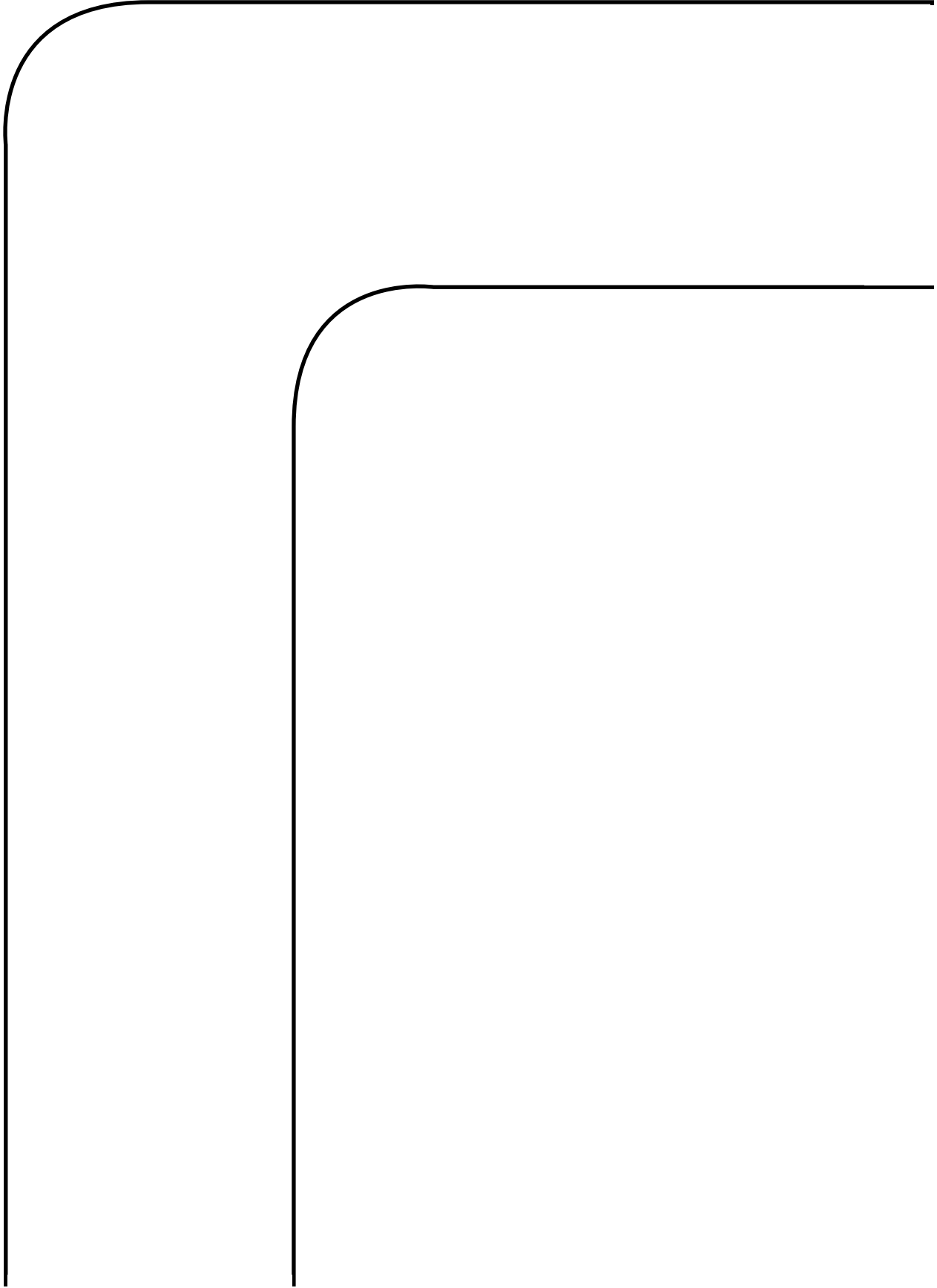


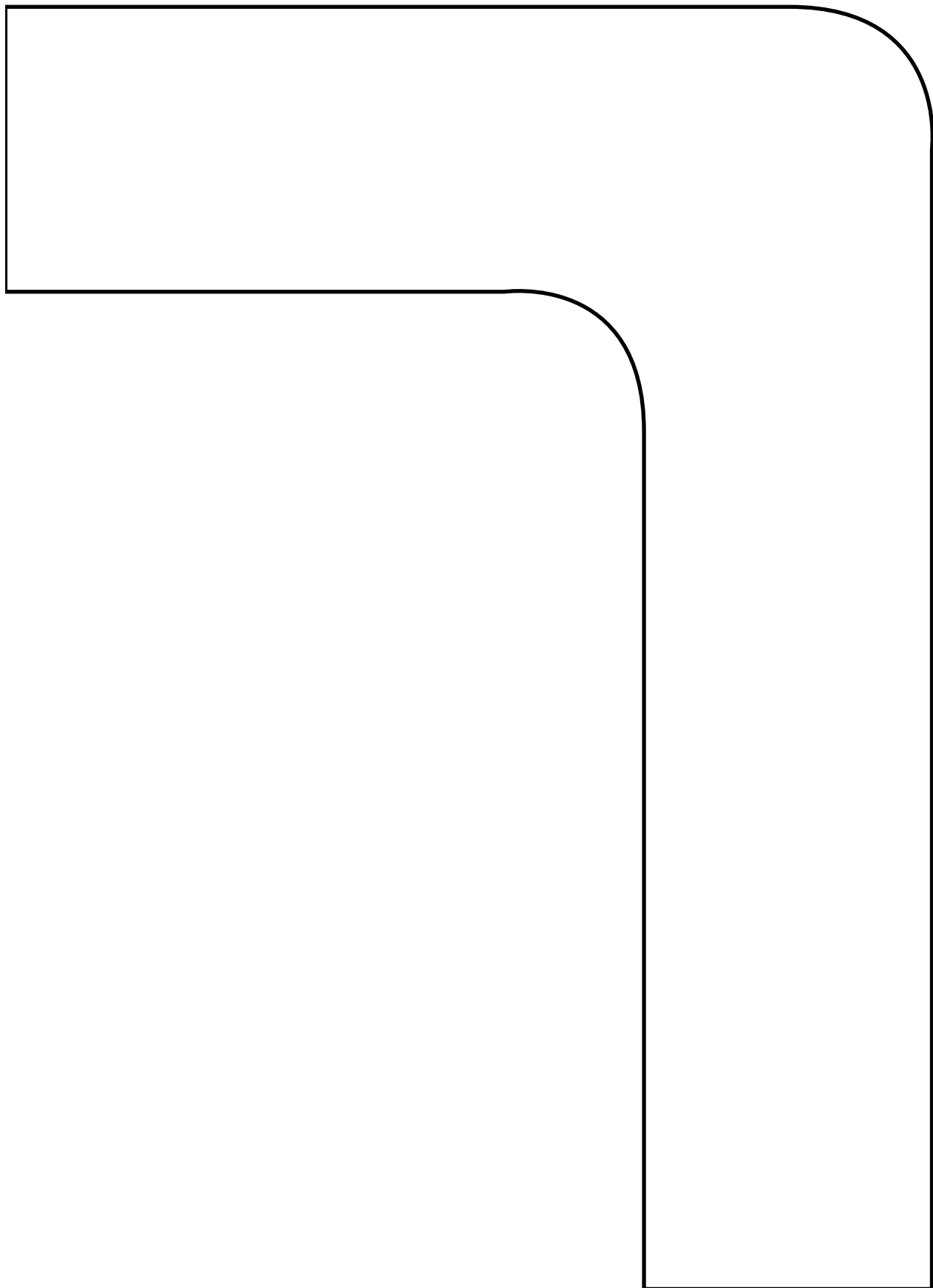


ADDITIONAL RESOURCES



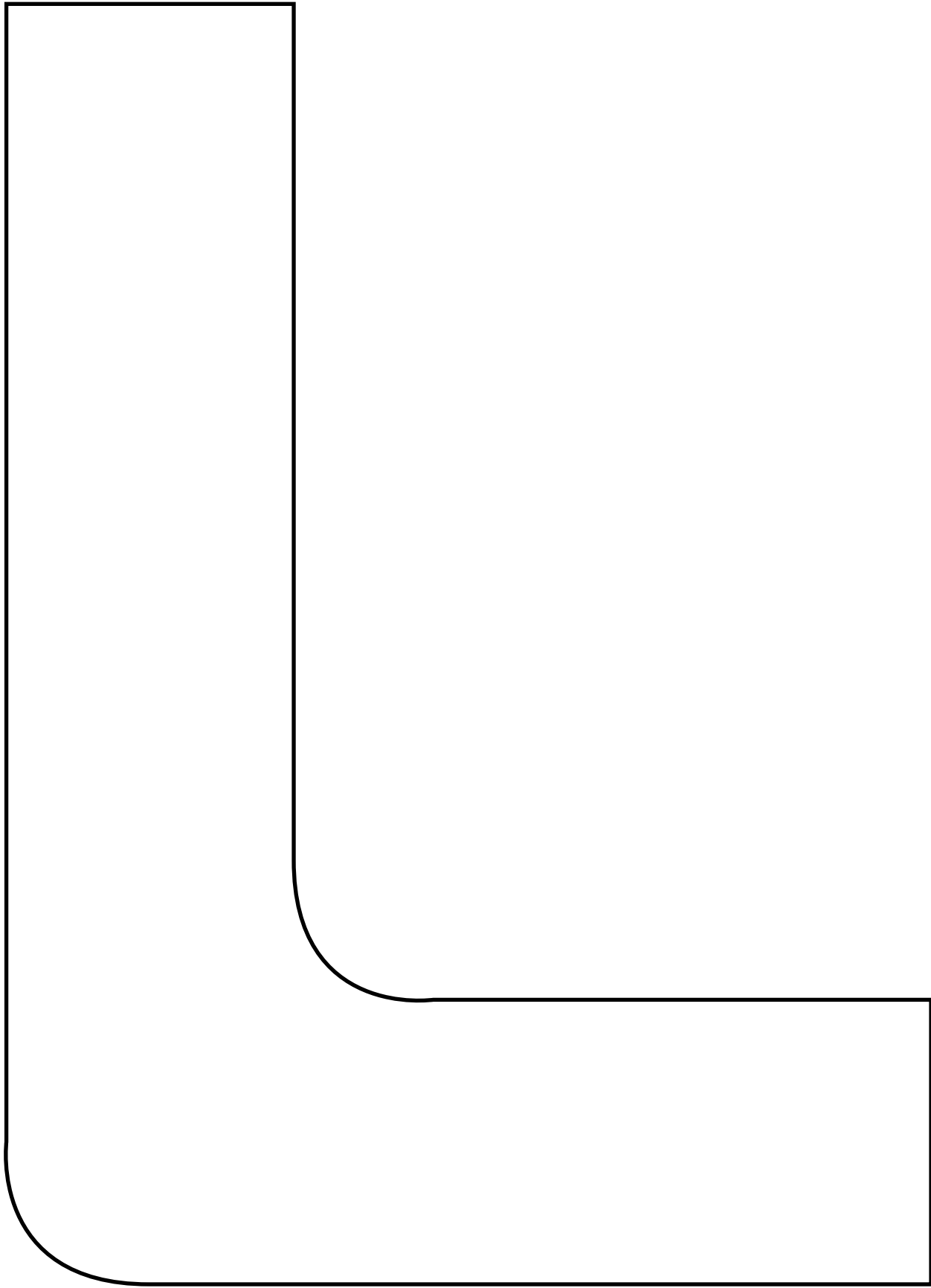
# SAMPLE GAME BOARD

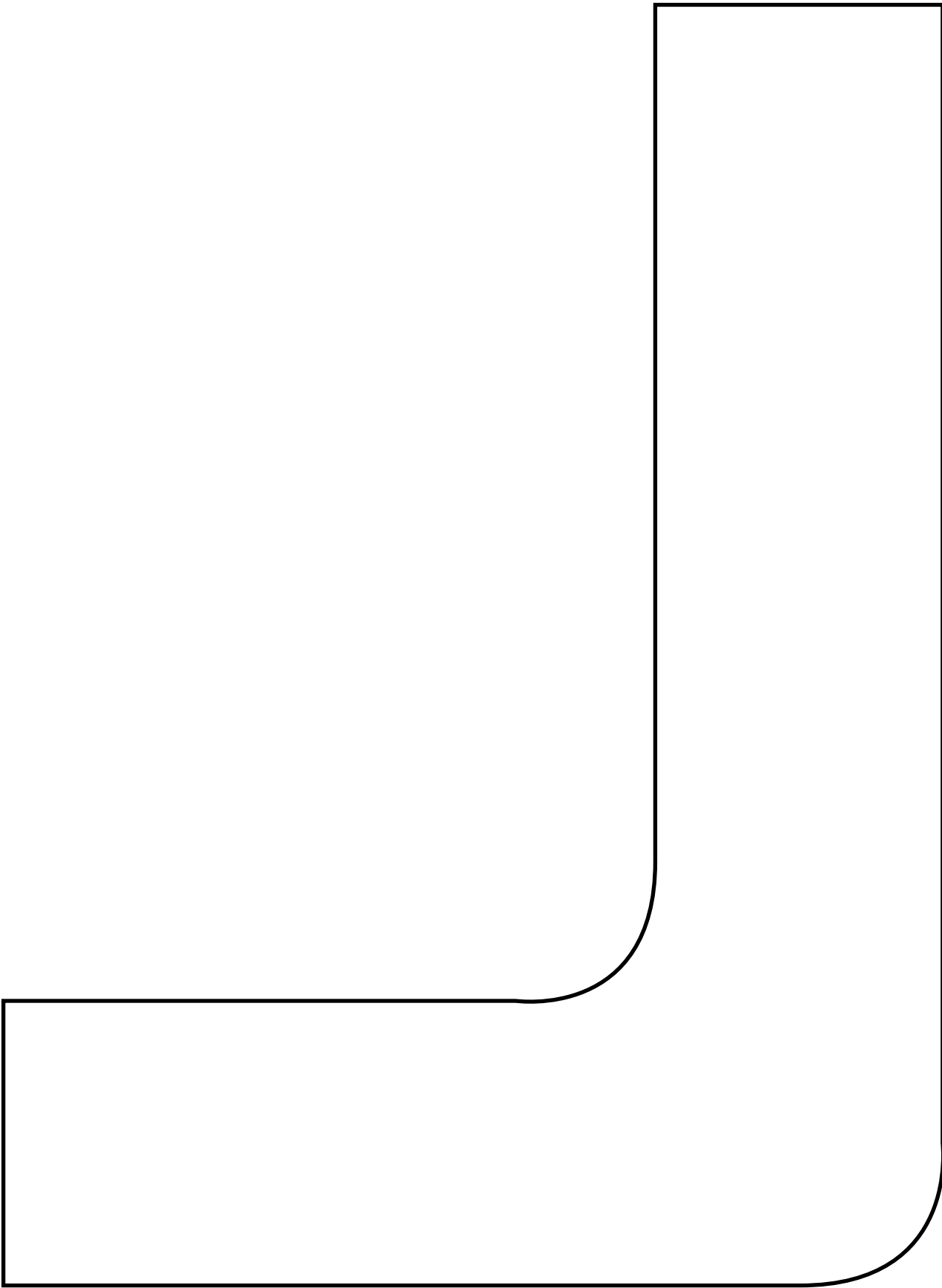






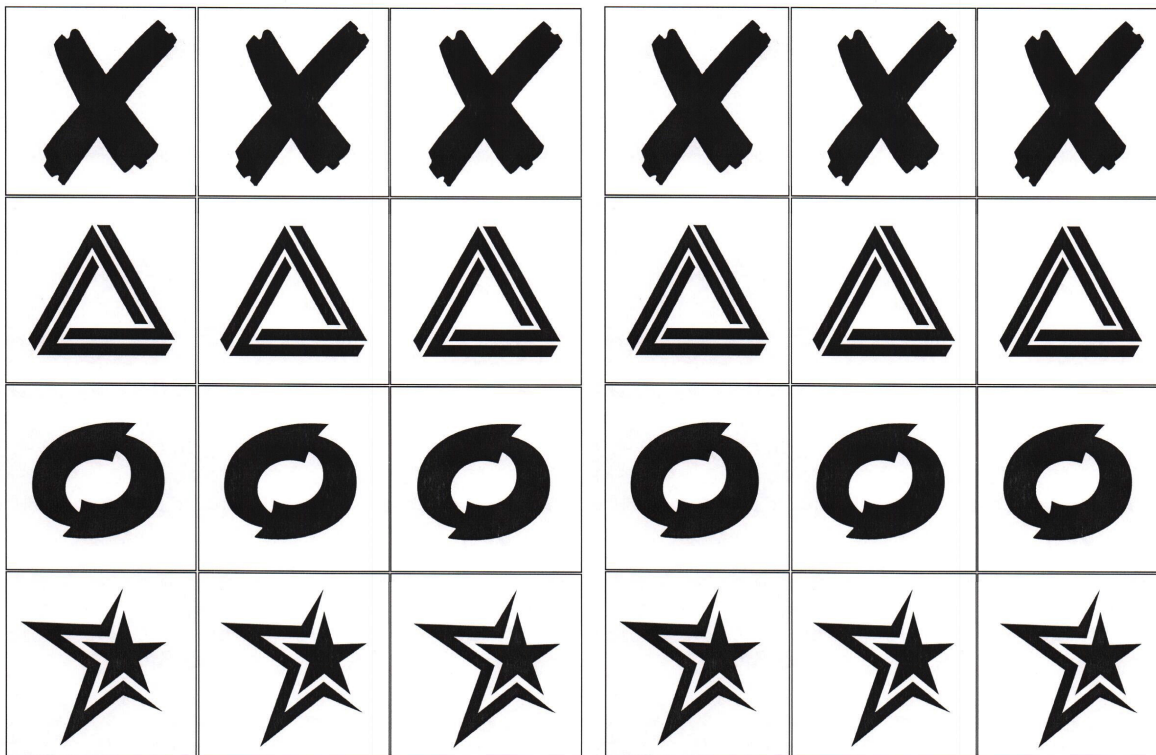
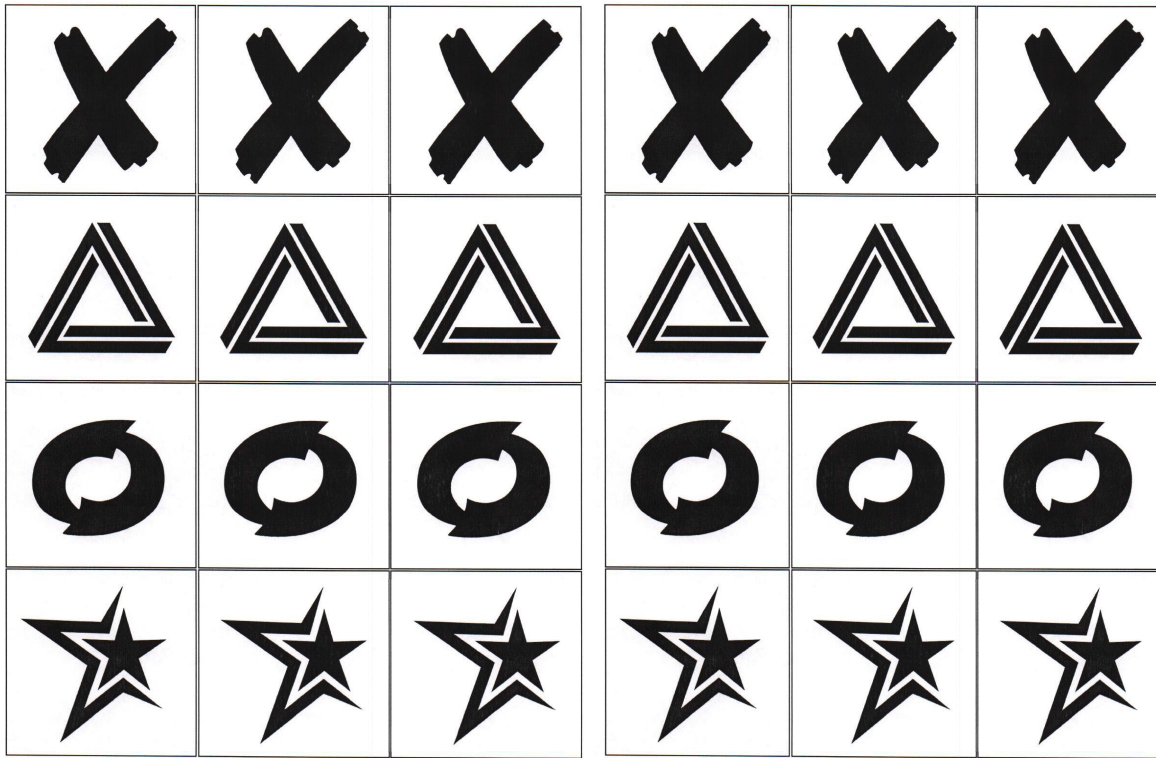




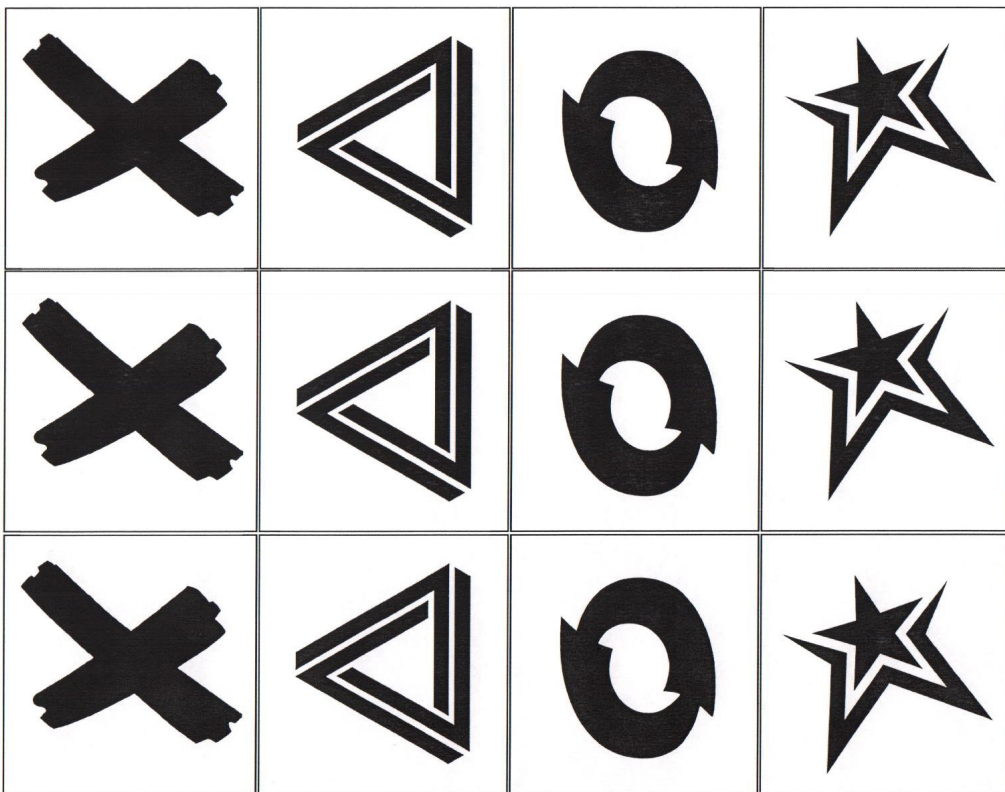
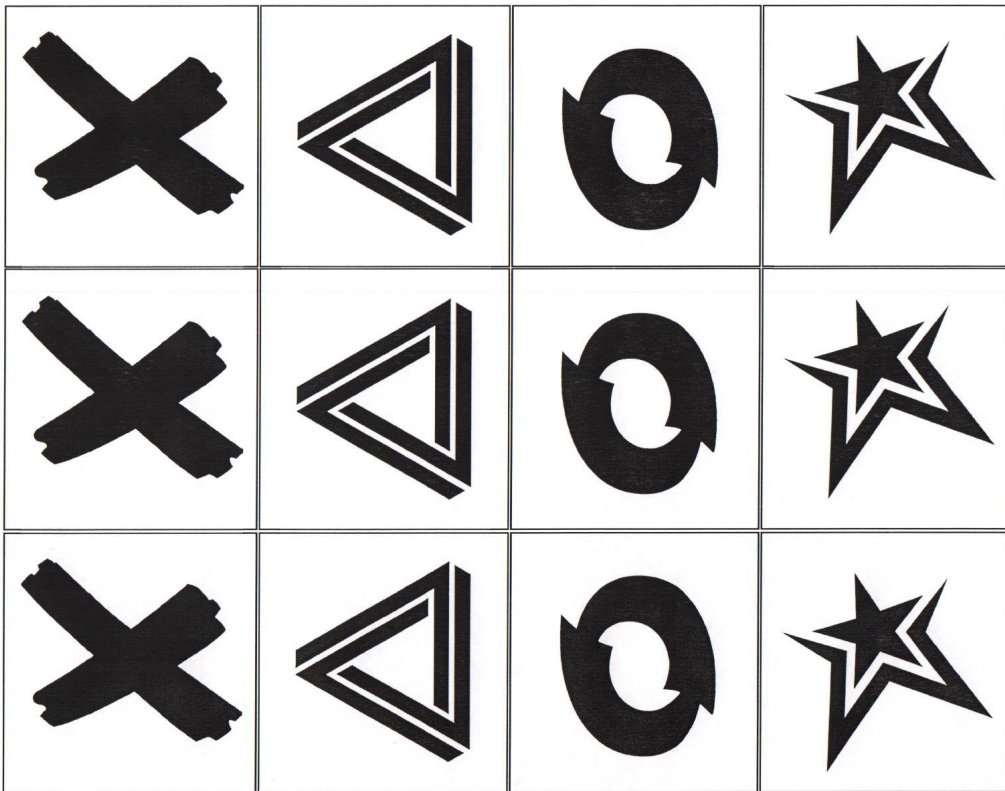




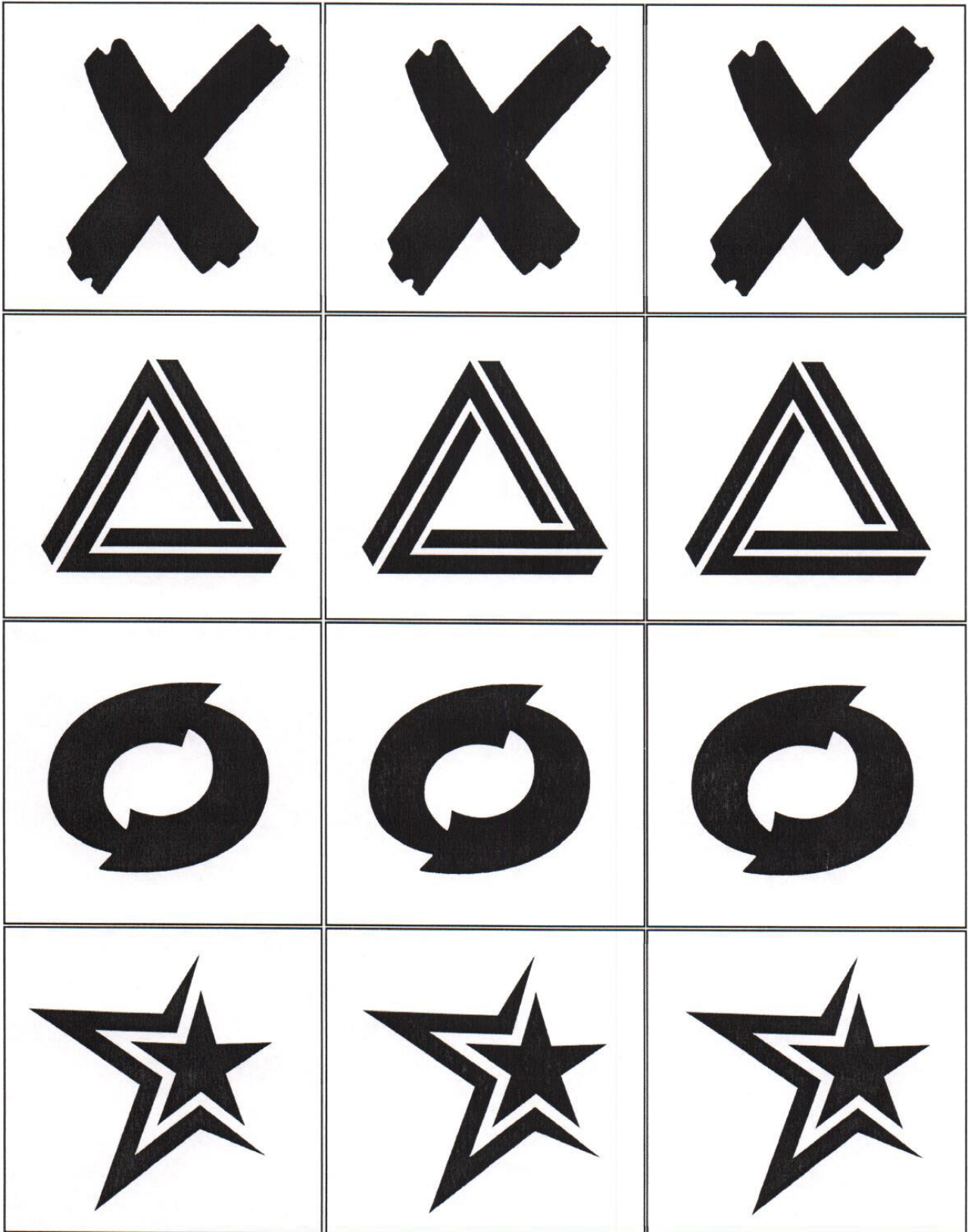
**SYMBOL CARDS - SMALL**



**SYMBOL CARDS - LARGE**

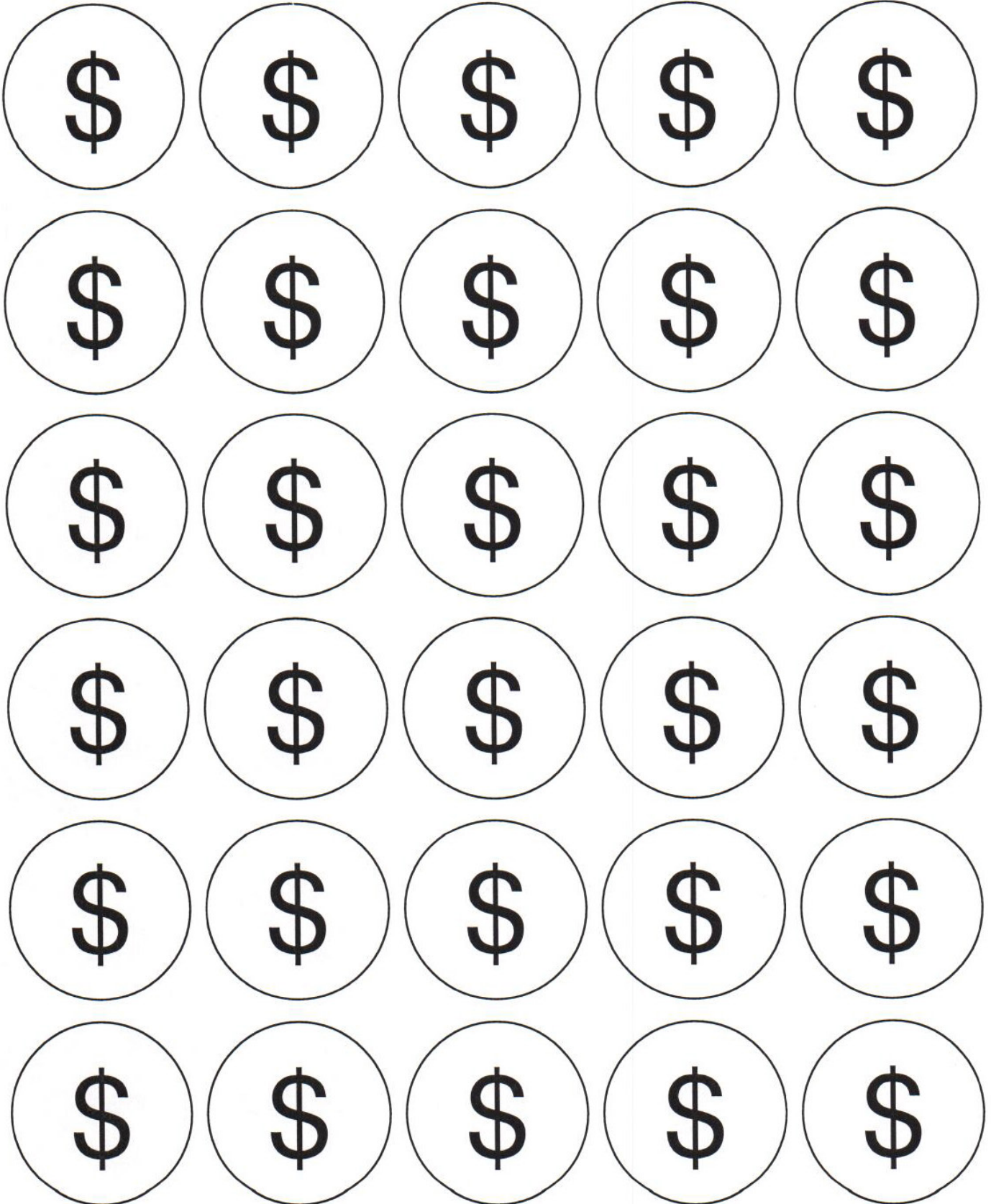


SAMPLE GAME PIECES





SAMPLE GAME PIECES

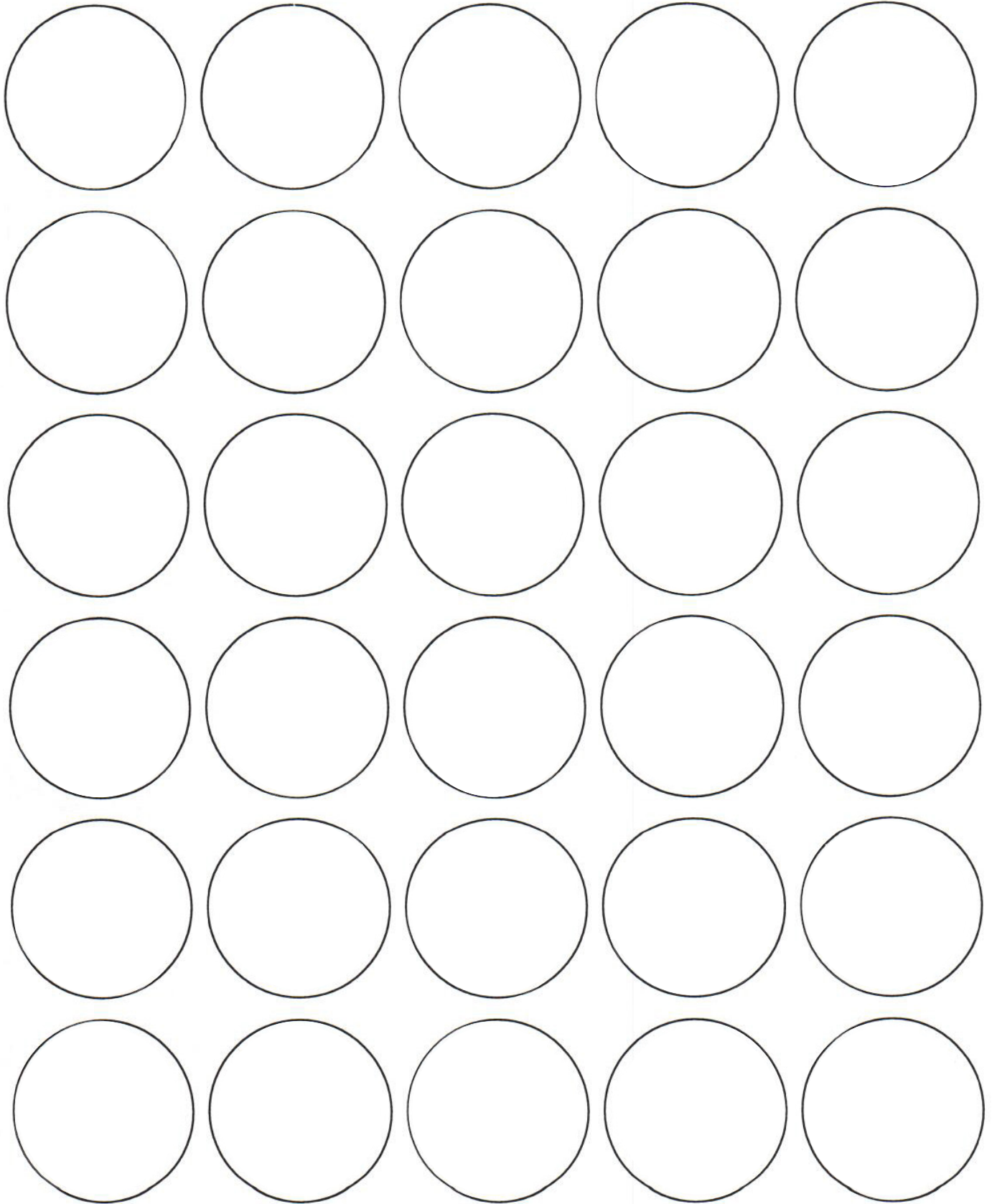




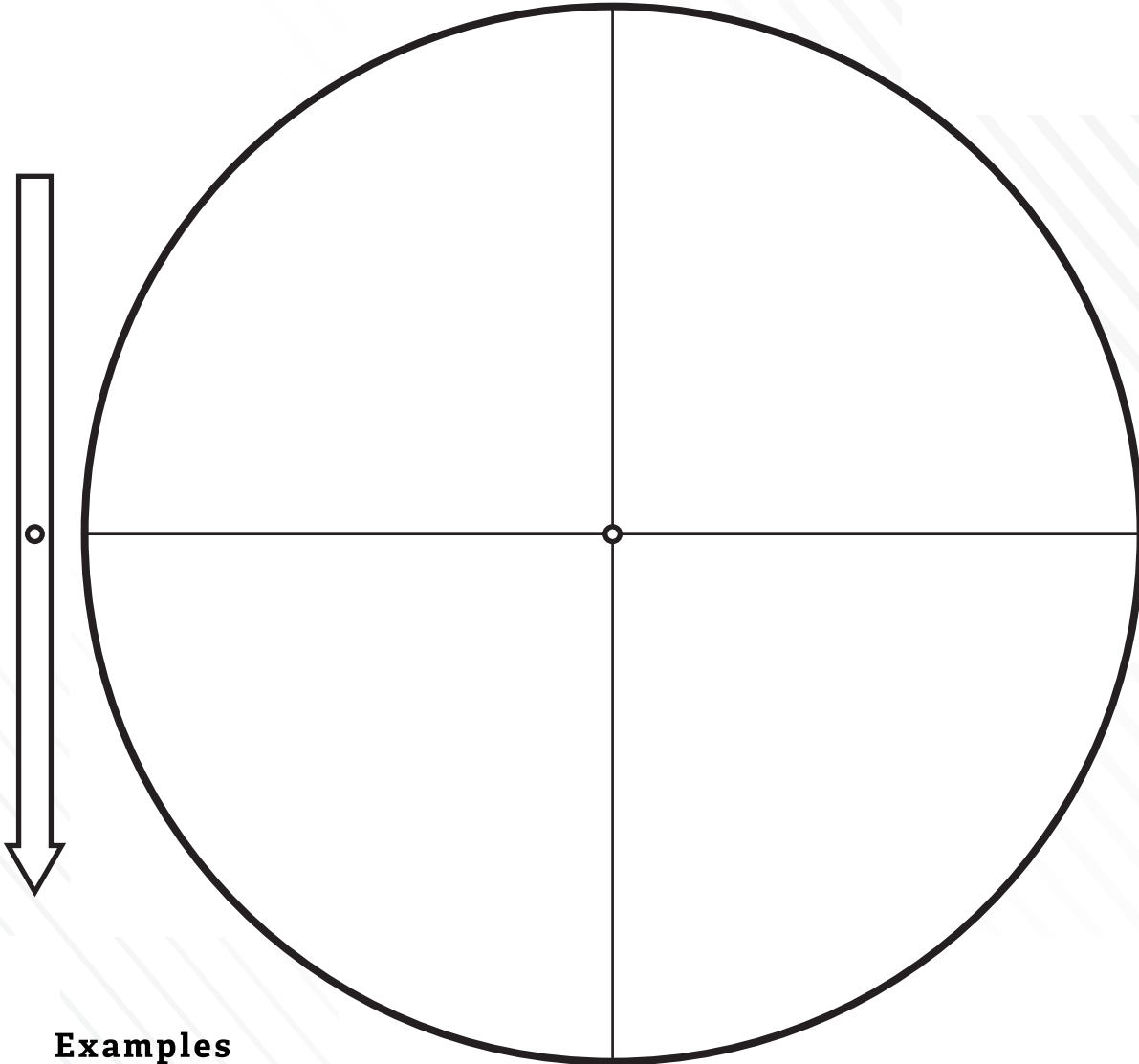
**BLANK GAME PIECES**



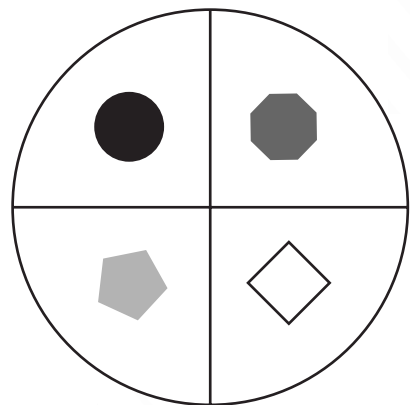
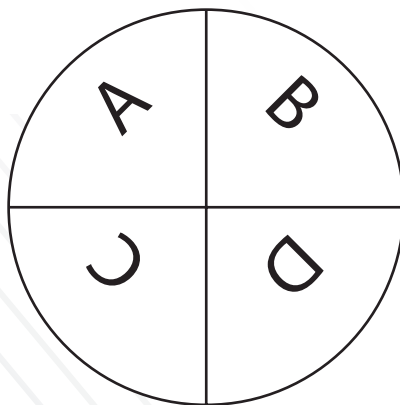
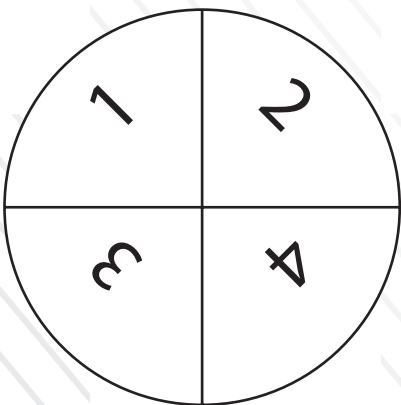

**BLANK GAME PIECES**



# SPINNER TEMPLATE 4 SECTION SPINNER

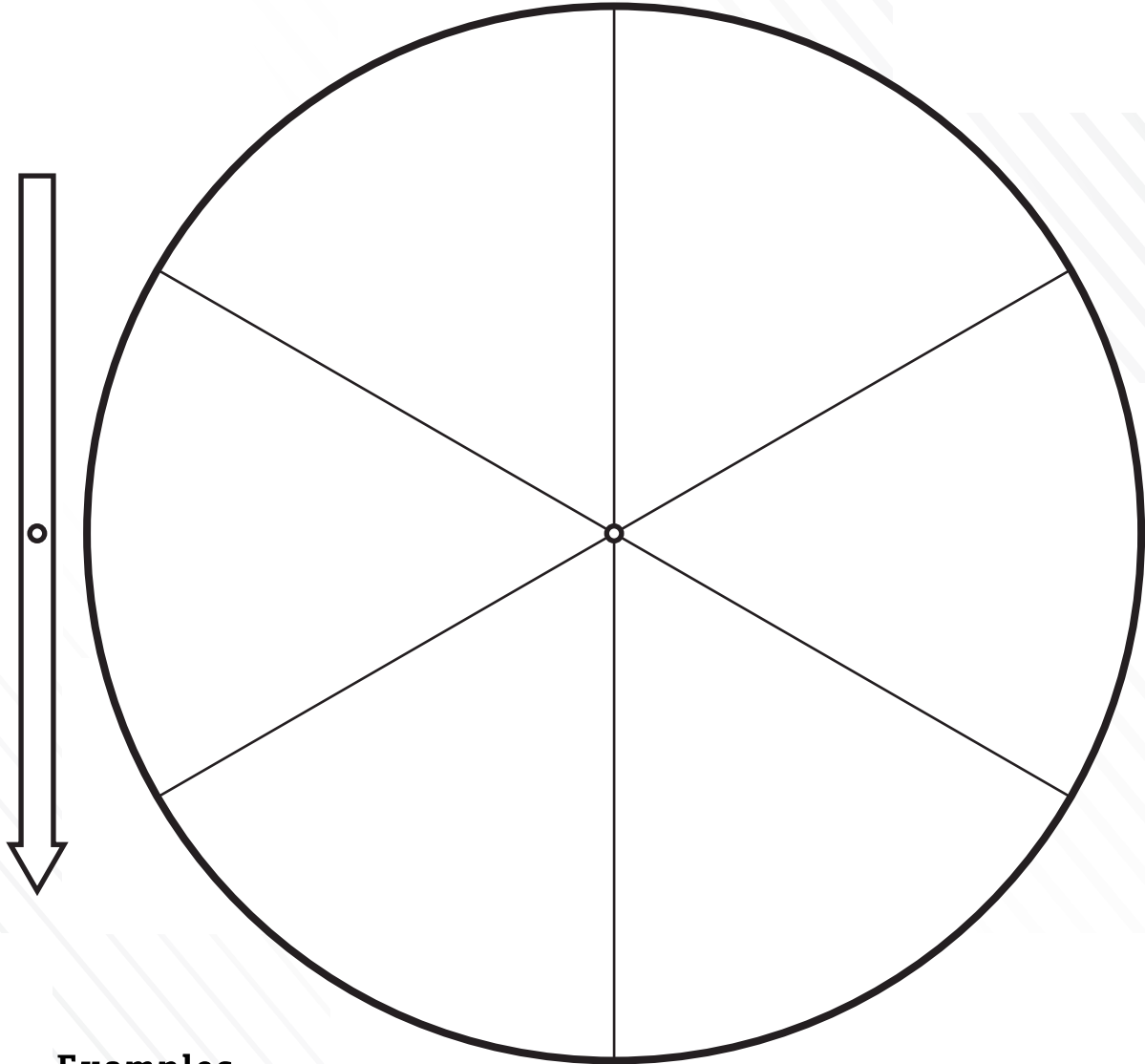


## Examples

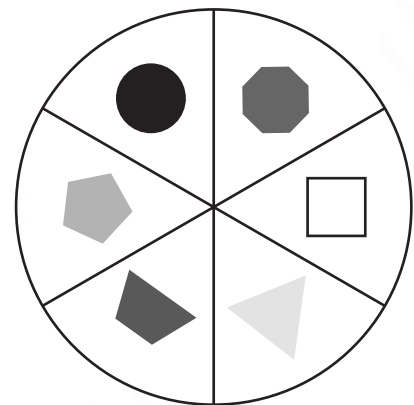
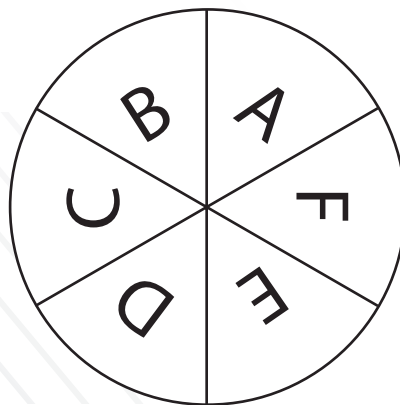
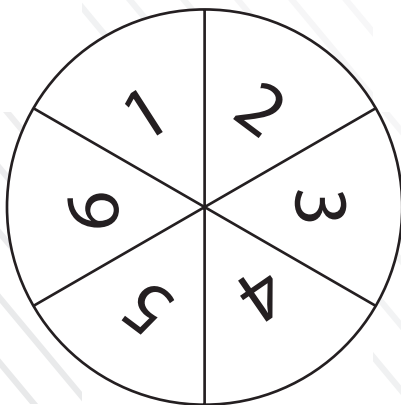




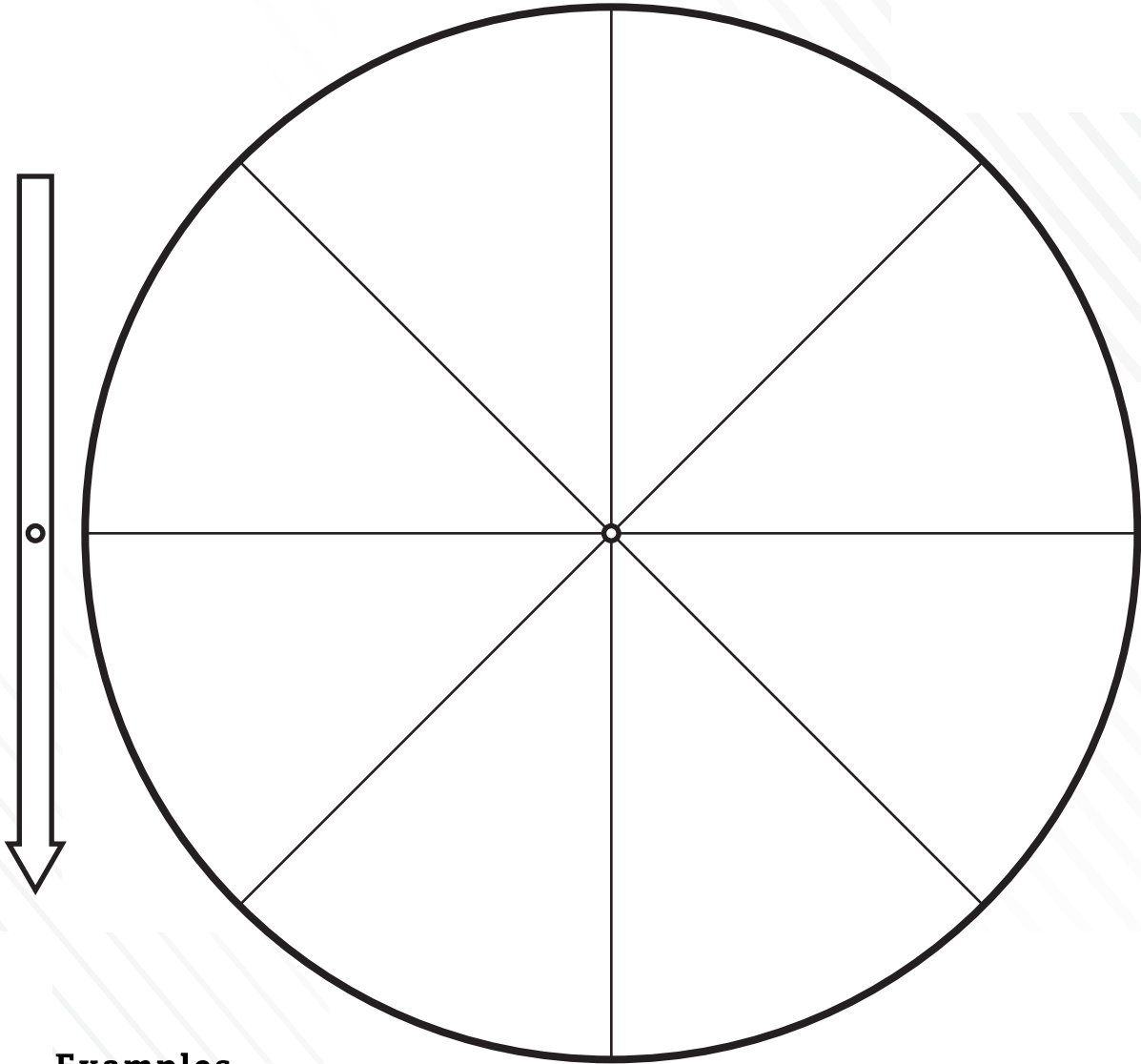
# SPINNER TEMPLATE 6 SECTION SPINNER



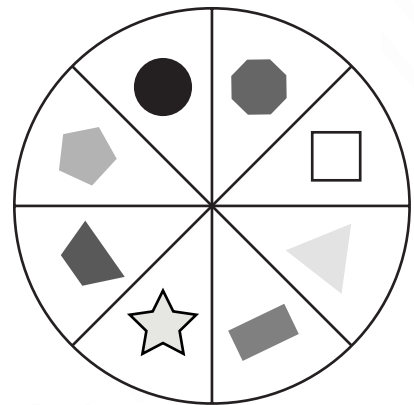
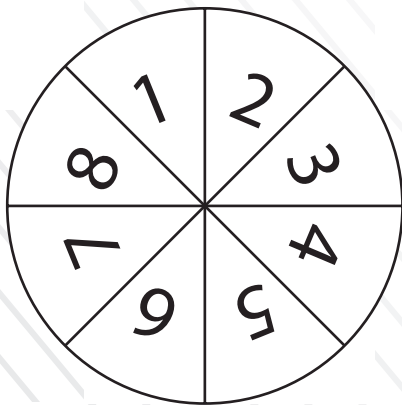
## Examples



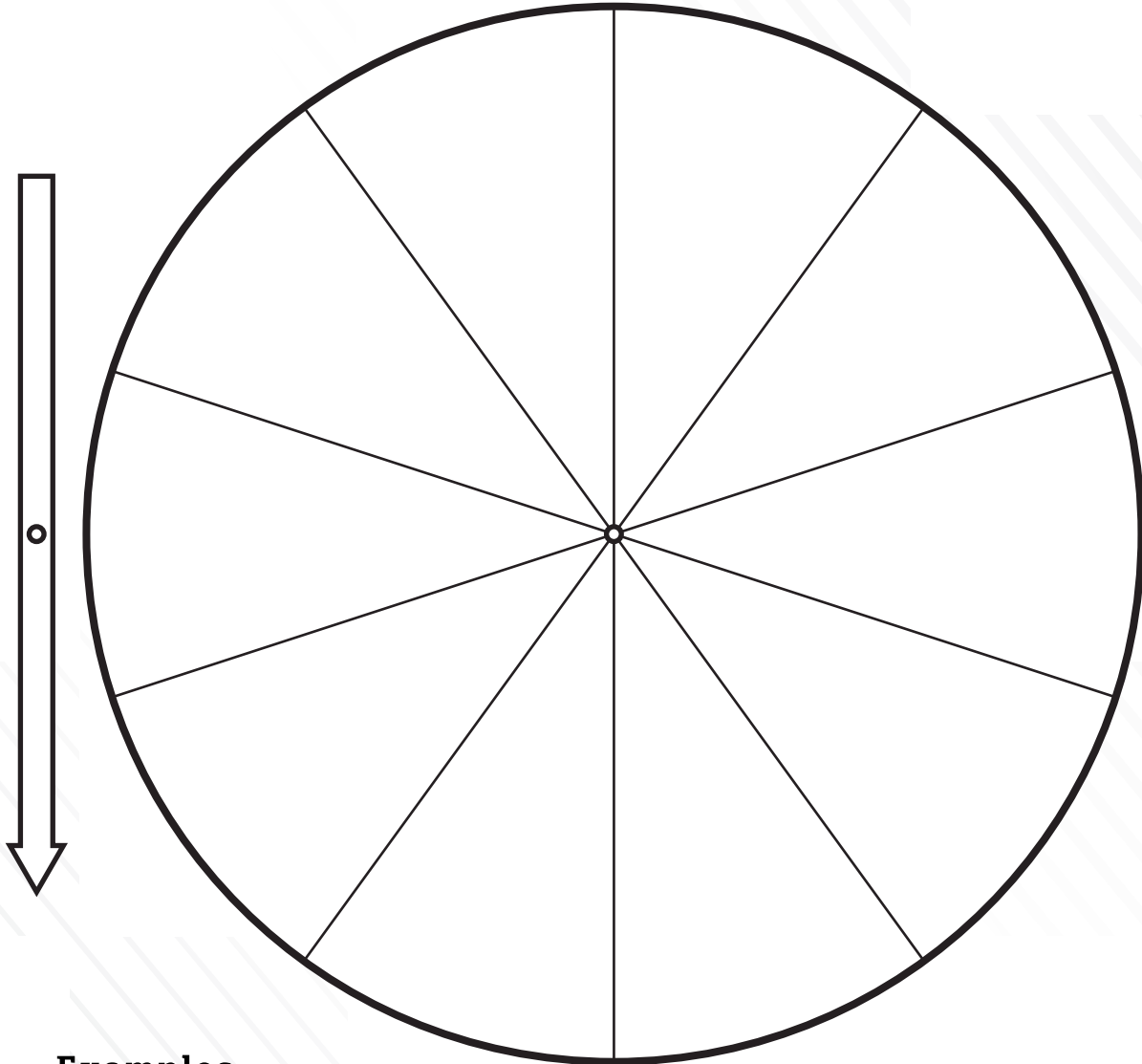
# SPINNER TEMPLATE 8 SECTION SPINNER



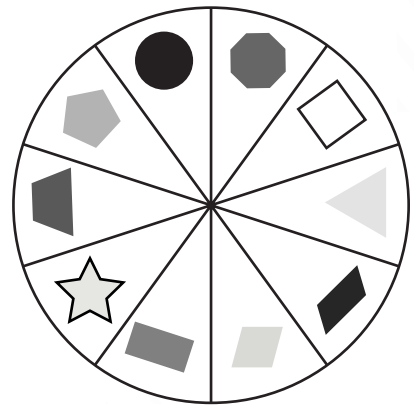
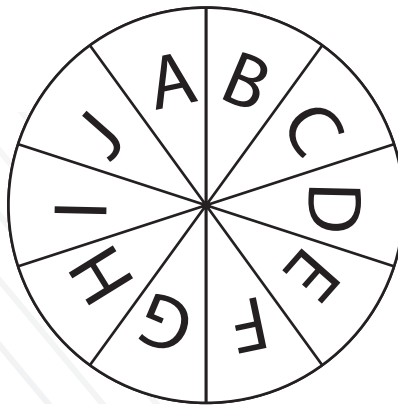
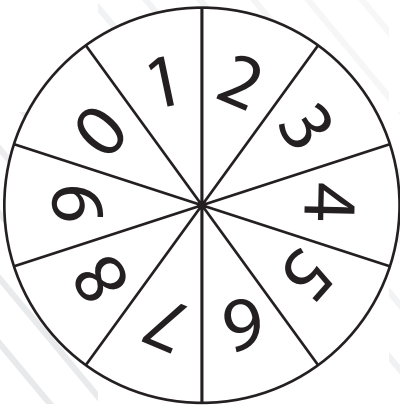
## Examples



# SPINNER TEMPLATE 10 SECTION SPINNER

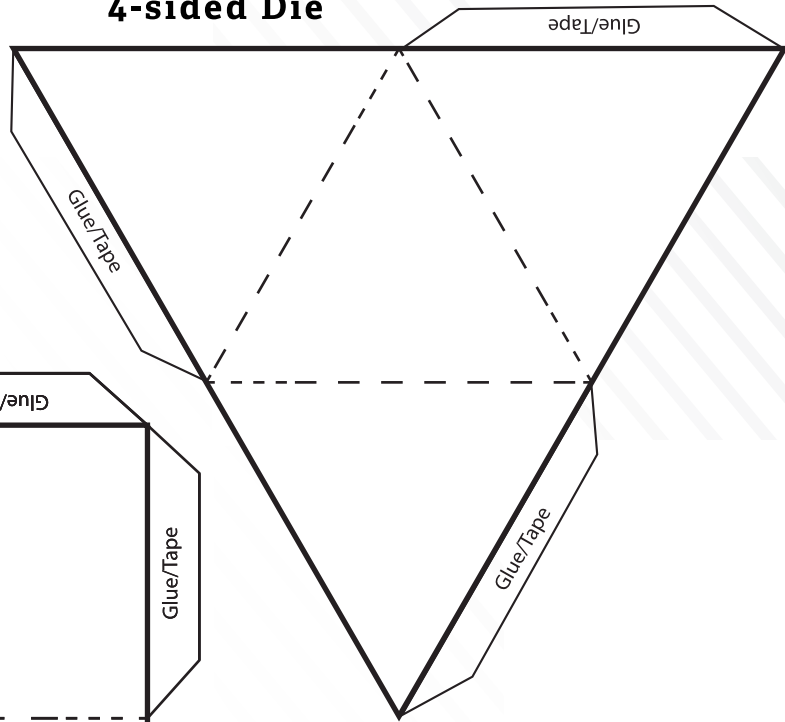


## Examples

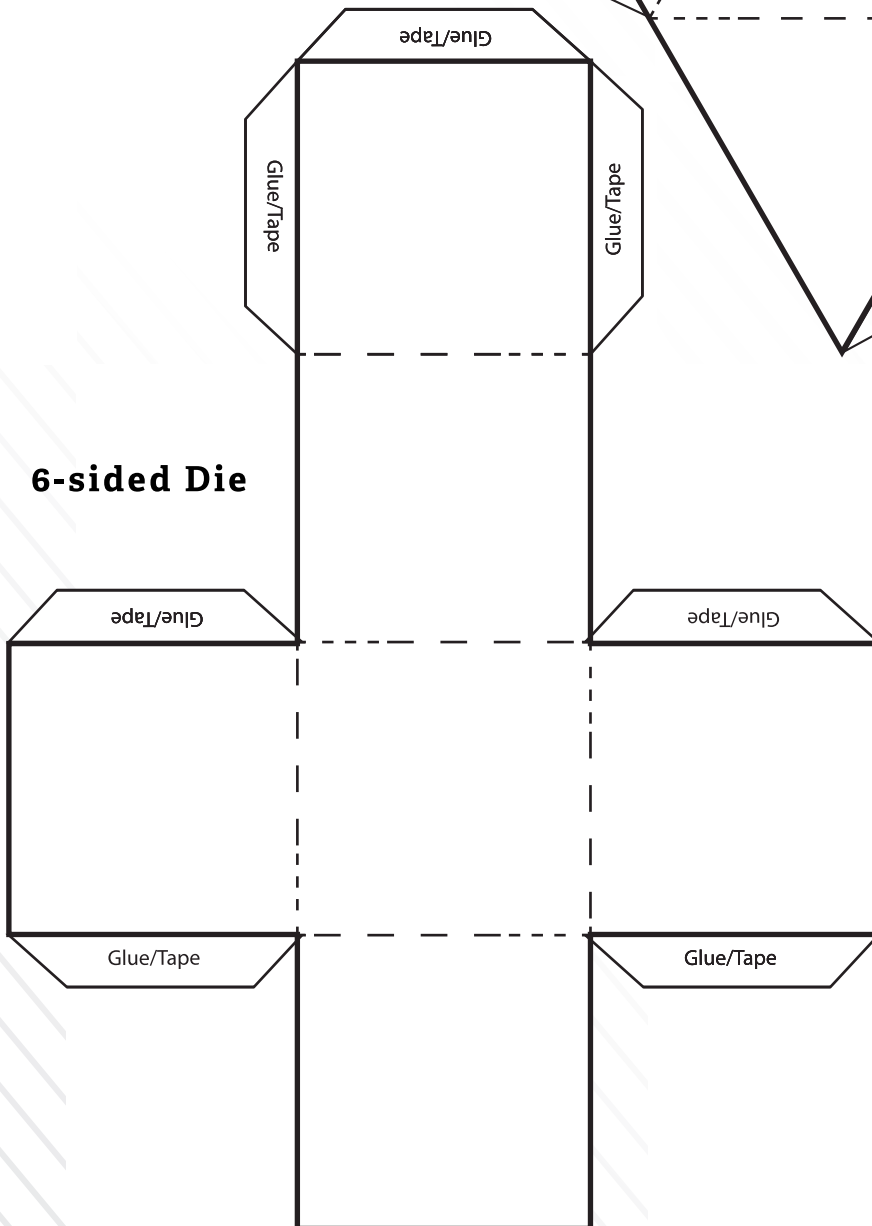


## 4 & 6 SIDED DIE

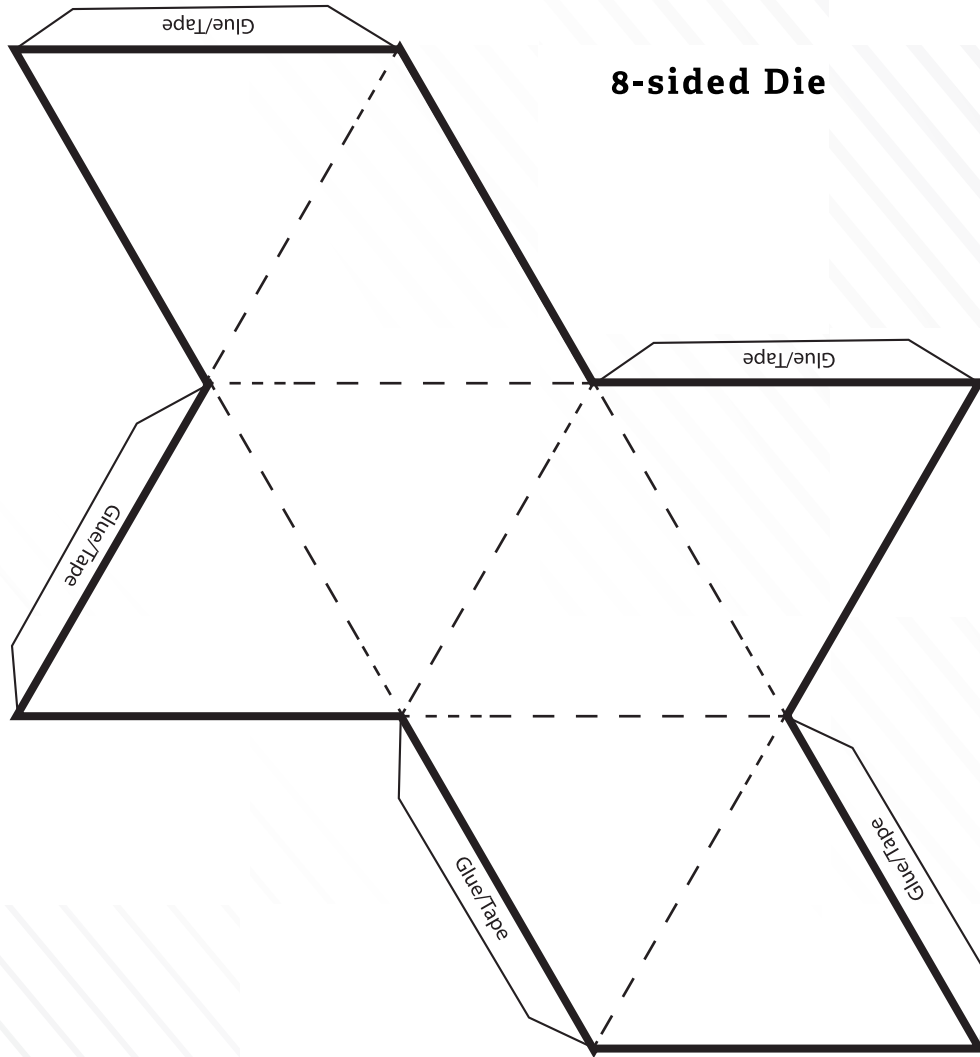
4-sided Die



6-sided Die

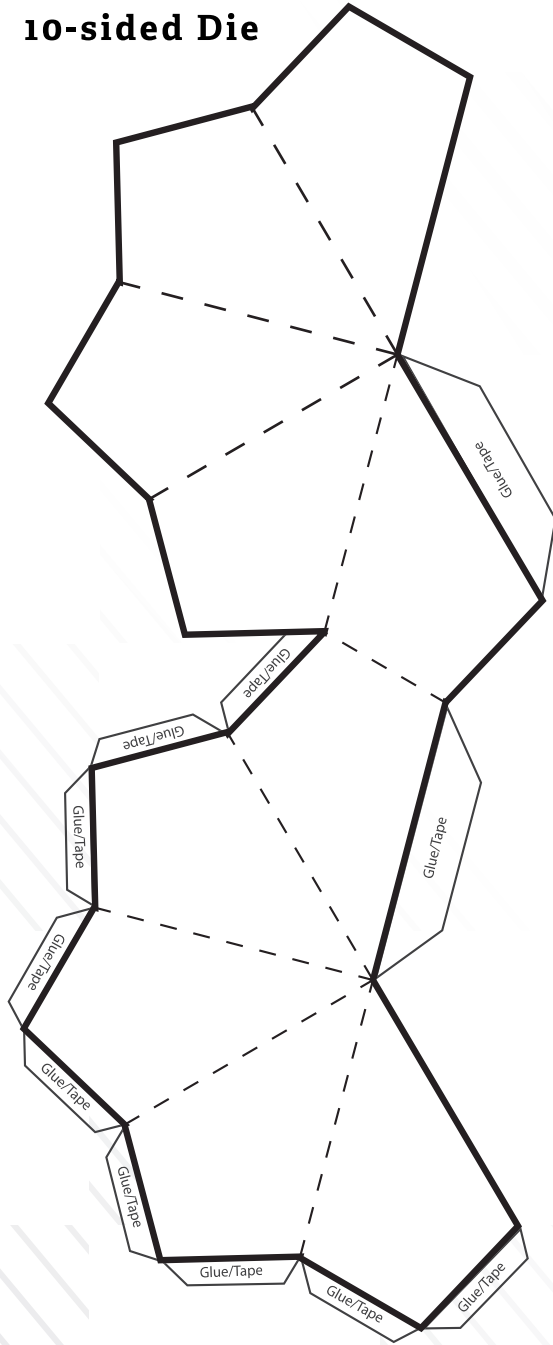


# 8 SIDED DIE

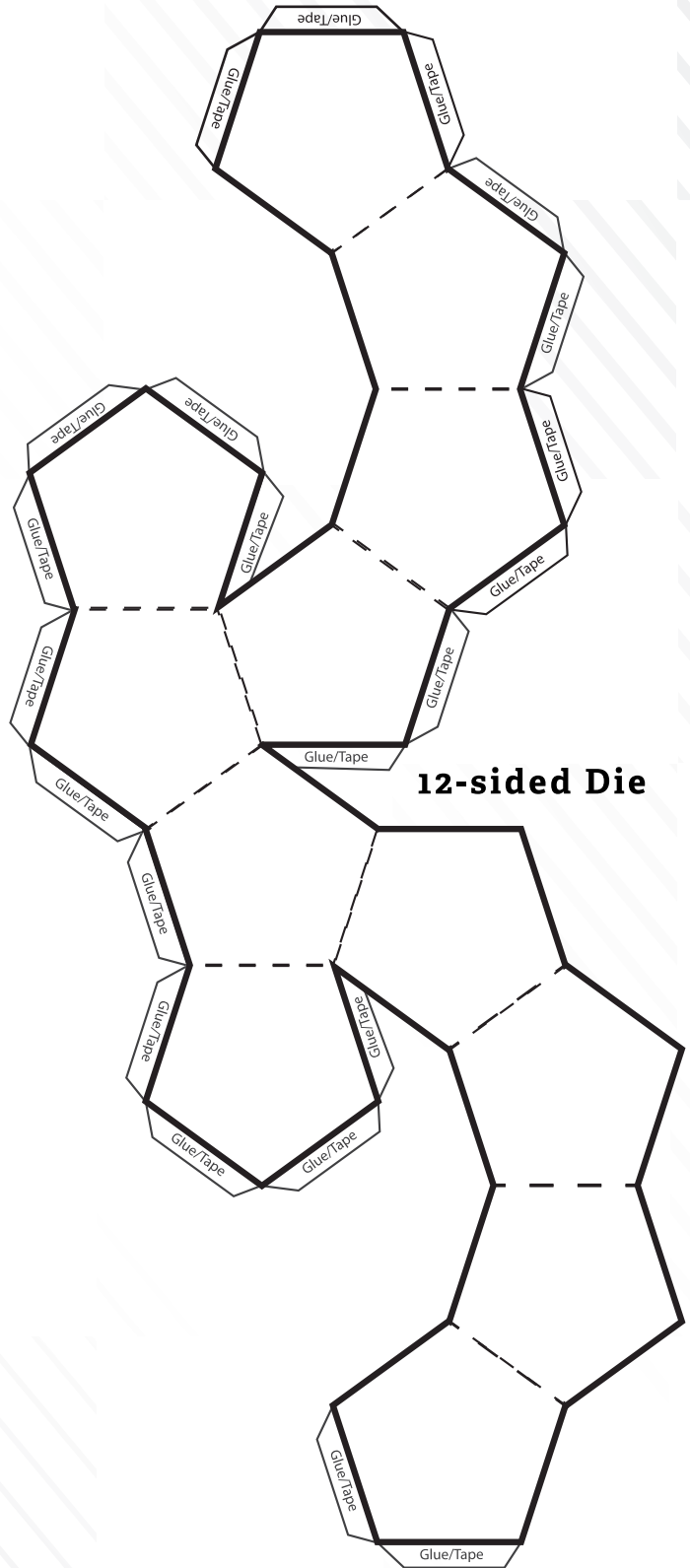


# 10 & 12 SIDED DIE

10-sided Die



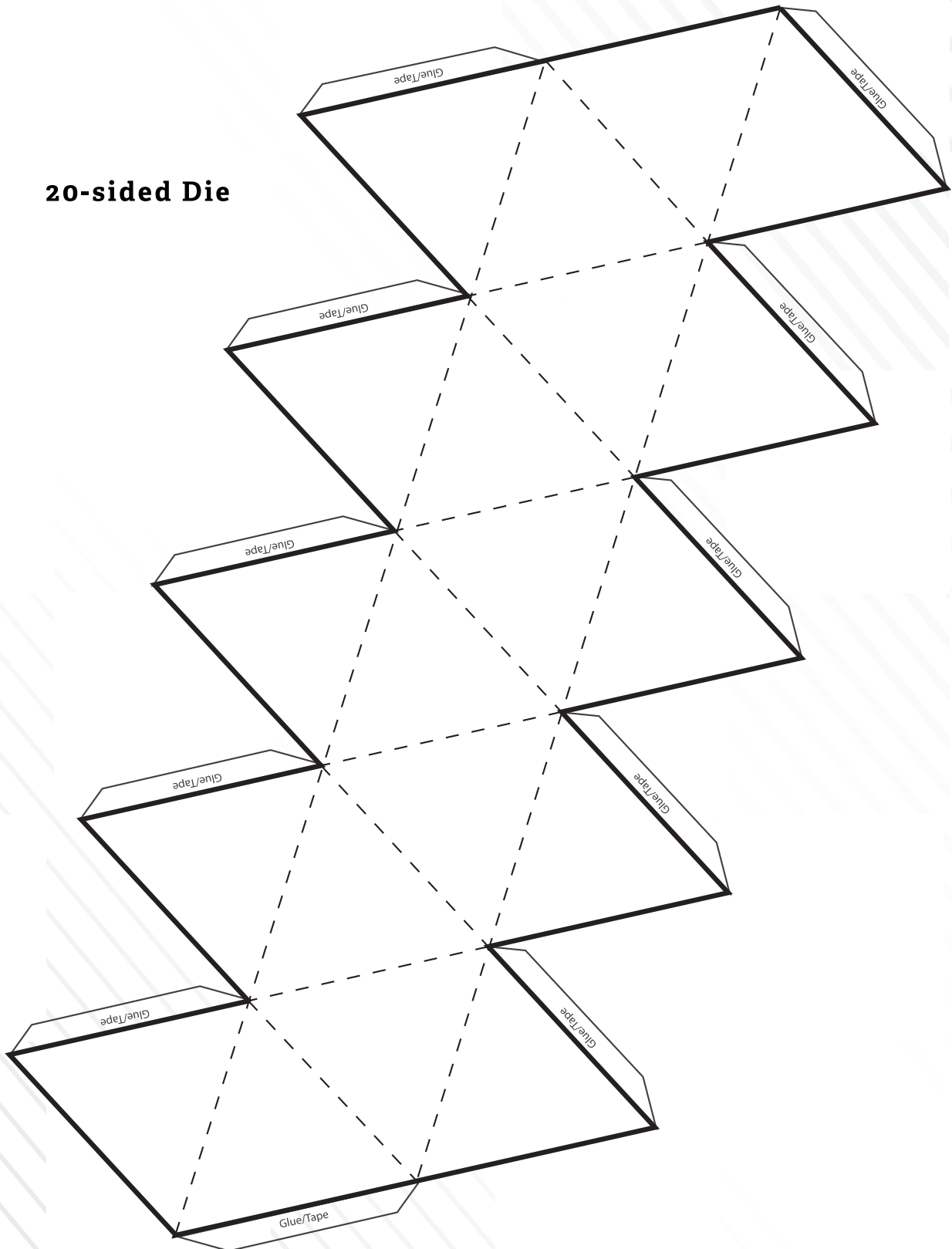
12-sided Die





## 20 SIDED DIE

20-sided Die





# ACKNOWLEDGEMENTS

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# ABOUT POP CULTURE CLASSROOM

Our “Classroom” program delivers high quality, all-inclusive educational resources to school districts, teachers, and community organizations using comics, graphic novels and related pop culture media. We strive to create educational engagement with students and provide them the creative and critical thinking skills that put them on the path to lifelong learning.

For educators, PCC’s Classroom program provides resources and professional development training to help increase students’ academic, literacy and art skills, as well as enhance their personal awareness in the classroom. Administrators will benefit from better-engaged students, which can increase attendance and improve test scores.

Students will also enjoy our exciting and diverse programming, which harnesses their existing interests in comics, movies, television, video games, and other pop culture topics in order to create one-of-a-kind learning experiences. Parents are also provided the opportunity to actively participate in their child’s education.

To maintain the quality and effectiveness of our educational tools, we regularly collaborate with award-winning comic book artists, publishers, and accomplished educators from various fields.

In addition, we engage entire communities through our signature event: Denver Comic Con. The proceeds from this annual, education-centered, family-friendly, pop culture fan event benefits PCC’s overall educational endeavors.

Through our work in The Classroom and Denver Comic Con, we envision individuals transformed by the educational power of popular culture who create diverse, inclusive and engaged communities.

Come visit us at [www.popcultureclassroom.org](http://www.popcultureclassroom.org)



**Igniting Imaginations.**