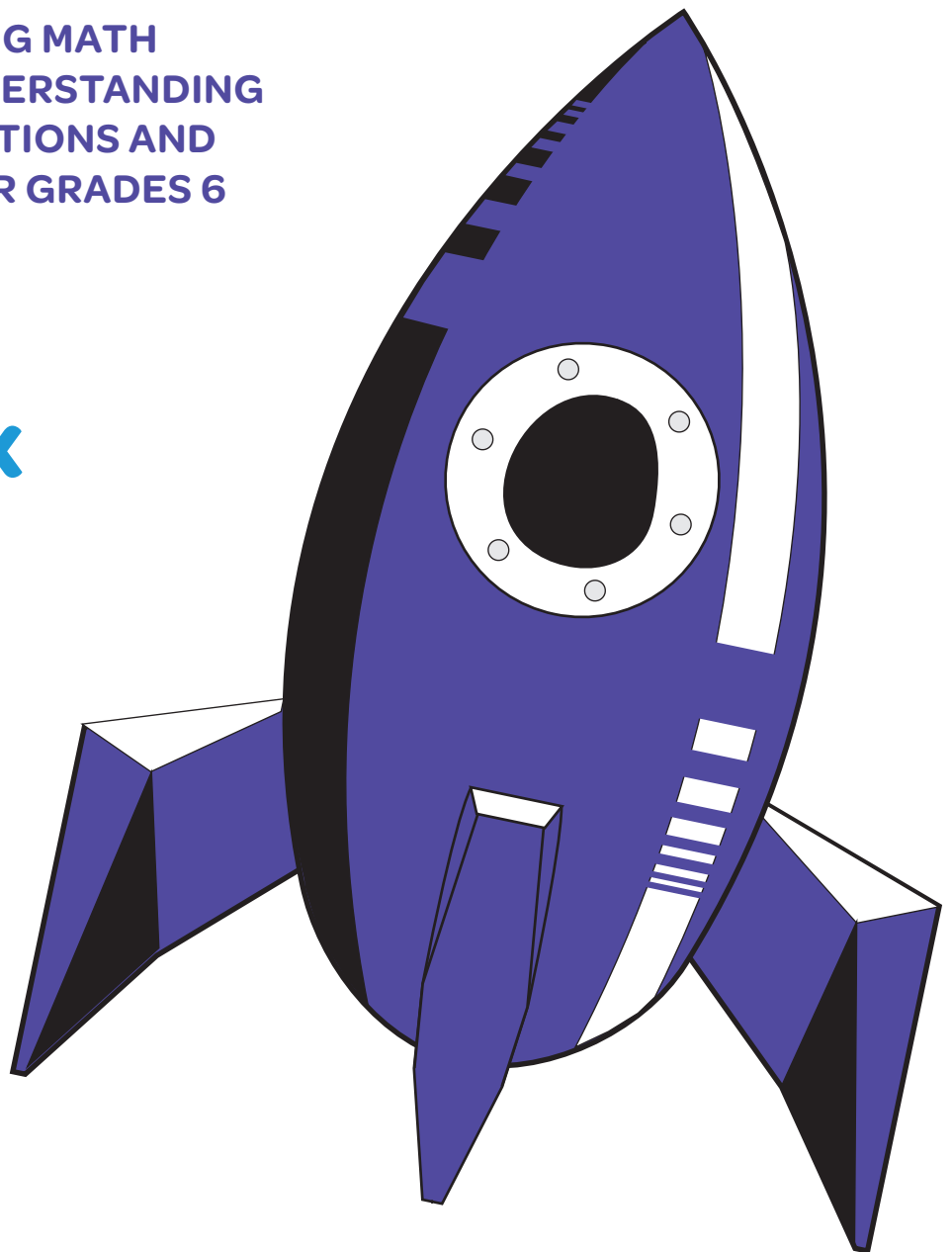



Absolute Blast!

A ROCKET-LAUNCHING MATH
GAME TO BOOST UNDERSTANDING
OF INTEGERS, OPERATIONS AND
ABSOLUTE VALUE FOR GRADES 6
THROUGH 8

Print+Play
GAME PACK





Games are powerful learning tools.
At Institute of Play, we've seen games engage students in exciting and empowering ways.

Since 2009, we've designed more than 80 classroom games, which have been prototyped and used by teachers at Quest schools (Quest to Learn in New York City and CICS ChicagoQuest in Chicago). And now, we can't wait to share our library of teacher-tested, student-approved games with you!

Game design is a continuous and collaborative process. We would love to get your feedback about our games after you play them with your students. Join our Institute of Play Google+ community to share your thoughts with us and other educators.

And visit www.instituteofplay.org for more ideas and resources about how to integrate games and learning in your classroom.

GAME CONTENTS

WHAT IS IN THIS PACK?

In collaboration with Quest teachers, Institute of Play developed this set of game materials and supporting resources for Absolute Blast. We invite you to explore this game pack to help you learn about the game in order to play it with your students.

PAGE

4	GAME BASICS
7	GAME PLAY
11	TEACHER RESOURCES
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GAME BASICS

WHAT IS IT?

Absolute Blast is a multiplayer game in which players try to launch their own or others' rockets by adding and subtracting integers and using absolute value. Quest math teachers, like Kris Mueller, have used it to provide a space for students to practice and master specific math concepts and skills.

Quest math teachers who teach 6th-9th grades have adapted this game by changing the range of numbers and types of cards involved in game play. This game is full of possibilities for your classroom, and we encourage you to use and adapt it based on your students' needs and abilities.

Play and enjoy!

"One of the things I really like about Absolute Blast is that it is just a fun game. Even after you've mastered the content, it still has great replay value. Students asked to play it after class was over. I even played it with other teachers and we had a great time."
– Kris Mueller, 8th grade Math teacher, Quest to Learn, New York City



Kris Mueller

8th Grade Math Teacher
Teacher-Designer, Quest to Learn,
New York City

Kris loves thinking about middle school mathematics as a system of codes to be cracked. He knows that math is so much more than skills to be practiced, it is a way of understanding the world, and an efficient way of learning how to think. After earning an undergraduate degree in political science and a graduate degree in mathematics education from University of Maine, Kris taught middle school math in Maine and Vermont before coming to Quest to Learn in New York City. Outside the classroom walls, he cooks, hikes, kayaks, and plays European strategy board games.

GAME BASICS

THE GOALS



Learning Goal

Students will be able to practice their calculation skills and hone their understanding of operations with integers and absolute value.

Game Goal

Launch your rockets with the highest absolute value. In other words, try to get each individual rocket as far from zero as possible, either in the positive or negative direction. The game ends when one player launches all of his or her rockets. The player who has the highest score from his or her launched rockets is the winner.

GAME BASICS

COMMON CORE STANDARDS ALIGNMENT

AND OTHER COMPETENCIES

CCSS.Math.Content.6.NS.C.6a

Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.

CCSS.Math.Content.6.NS.C.7c

Understand the absolute value of a rational number as its distance from 0 on the number line.

CCSS.Math.Content.7.NS.A.1b

Understand $p + q$ as the number located a distance $|q|$ from p , in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses).

CCSS.Math.Content.7.NS.A.2a

Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers.

CCSS.Math.Practice.MP7

Mathematically proficient students look closely to discern a pattern or structure

Communication

Use of oral, written, performative, and visual forms of language to formulate, exchange, present, and reflect on ideas: shared understanding is the aim of communication.

Teamwork

Students plan and coordinate work towards a mutual goal; understand and regulate themselves as a team member; demonstrate leadership skills, including the ability to persuade and guide others; and resolve conflicts cooperatively.

GAME PLAY

HOW TO PLAY

On this page, you'll find a set of general rules for Absolute Blast. For more information about specific cards in the game, see pages 8 and 9.

1

Shuffle the cards and place them face-down in the middle.

2

Next to this stack is the discard pile.

3

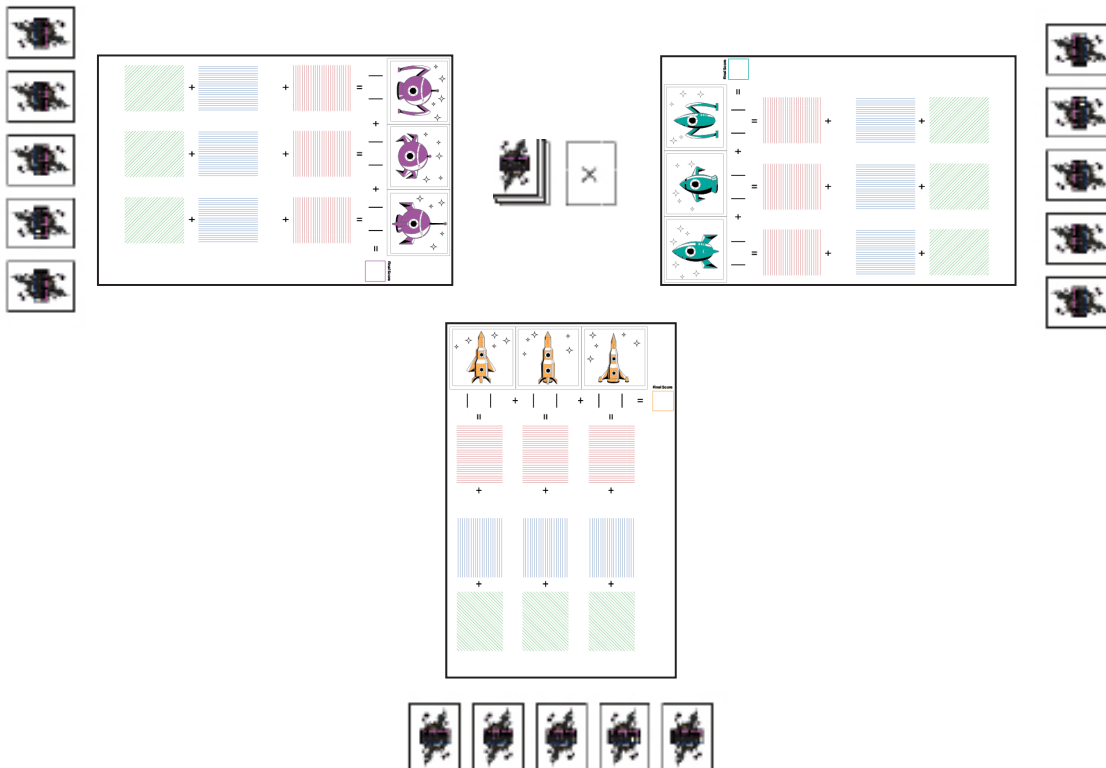
Each player takes a Rocket Tracker Score Sheet to keep track of his/her game moves.

4

Each player draws five cards.

5

Play starts with a single player and then moves to the left.



6

Play up to two cards per turn. Cards may be discarded instead of played.

7

Cards can target any rocket in the game that has not launched.

8

At the end of your turn, if a rocket has all three Booster Card colors/patterns, it launches.

9

To launch a rocket, find the sum of its Boosters, the write it in the absolute value symbol below the rocket.

10

Draw cards until you have five in your hand again, then play moves to the left.

GAME PLAY

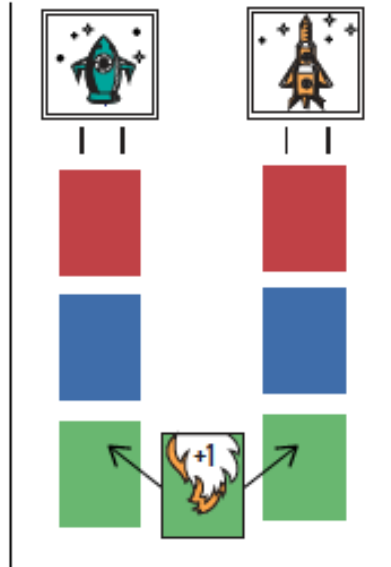
HOW TO PLAY BOOSTER CARDS

The primary cards in the game are Booster Cards which are played on your rockets or your opponents' rockets. The sum of a rocket's Booster Cards determines how many points the rocket earns. See below for more detailed instructions about how to play your Booster Cards.

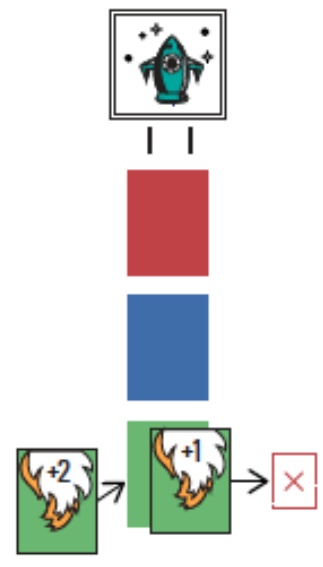
Booster Cards



A Booster is played by placing it in the appropriately colored/patterned space above a rocket.



A Booster may be played on any rocket, including on your opponents' rockets.



A Booster can replace another of the same color/pattern. The old one goes to the discard pile

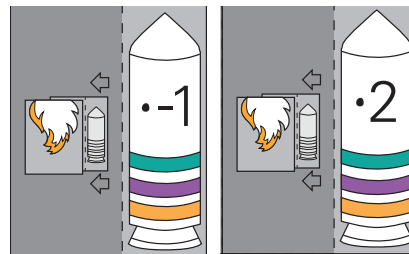
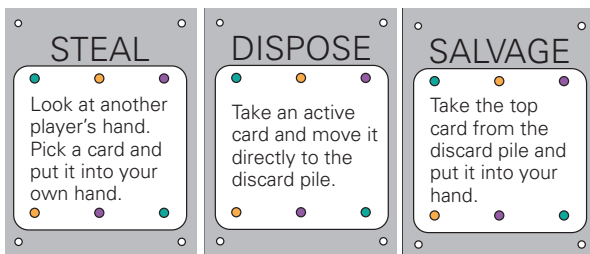


If a rocket has all three Booster colors/patterns at the end of the turn, it launches and its score is written down and locked in.

GAME PLAY

HOW TO PLAY SPECIAL & MODIFIER CARDS

In addition to Booster Cards, there are two additional types of cards: Special Cards and Modifier Cards. See below for more information about each type of card.



Special Cards rearrange cards based on certain instructions. After use, they go into the discard pile. When a special card refers to an "active" card, it means any Booster or Modifier Card attached to an unlaunched rocket.

STEAL

Choose a player, and look at his or her hand of cards. Choose one of those cards to steal and put into your own hand.

DISPOSE

Take an active card and move it directly to the discard Pile. If you dispose of a Booster with a Modifier attached, leave the Modifier behind.

SALVAGE

Take the top card from the discard pile and put it into your hand.

Modifiers are recognized by a cylindrical shape coupled with an operation and a number. Use one by placing it under the Booster of any unlaunched rocket. Slide it under so the right side of the card is still visible.

Modifiers divide or multiply the value of that Booster.

If you divide an odd number, it is acceptable to use the decimal result for scoring (ie, .5 or 3.5).

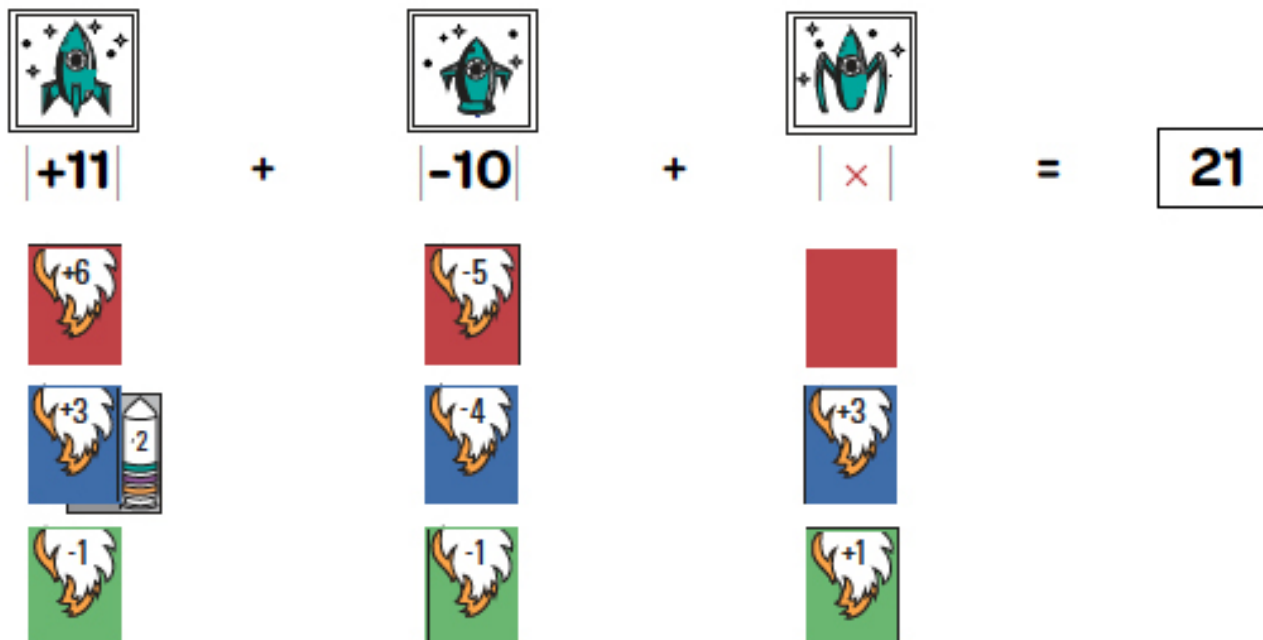
Only one Modifier can exist on a Booster. If the Booster already has a Modifier, the new one replaces the old one. The old Modifier goes into the discard pile.

GAME PLAY

HOW TO SCORE

The game ends when any one player has launched all three rockets. However, that player is not necessarily the winner. The winner is the player who has the highest combined score from all of his or her launched rockets.

A launched rocket's score is the **absolute value** of the **sum of its Boosters**. Your final score is the combined value of your **launched rockets only**. See below for an example of scoring.



By first applying the modifier to the +3 card then finding the sum of the values, this rocket earns the player 11 points.

This rocket has a negative value. However, since the absolute value is found before adding it to the score, this player gets 10 points for this rocket.

This rocket never launched, so it earns its owner no points.

The final score across this player's three rockets is 21.



TEACHER RESOURCES

EVERYTHING YOU'LL NEED

Here is a set of resources that will help you make Absolute Blast into an engaging and effective learning experience for your students.

12 ASSESSMENT GUIDE

13 FAQ

14 HOW TO ROLL OUT THIS GAME

TEACHER RESOURCES

ASSESSMENT GUIDE

Here are some of the ways that Quest teachers have assessed students during and after Absolute Blast game play. There are a number of opportunities to assess student learning during and after this game, from using more formal assessment tools like quizzes to using less formal assessment tools like reflection questions.

Circulate in the room to check for student understanding.

For instance, you could ask students why they made certain card choices, or ask them to calculate who is winning at that point in the game.

As a bigger project, ask students to create a strategy guide to help new players win the game.

Students can create a packet that describes Absolute Blast and then they can explain a number of different strategies with tips players can use to win the game.

Create a set of game play scenarios.

Make up scenarios based on players' game boards and the cards in their hands. Then ask students which cards could be played next and why. Allow for the scenarios to have multiple solutions.

Ask students to change (or modify) the game.

For example, ask students to design a game to help other students learn about calculating absolute value with positive and negative fractions, using Absolute Blast as a starting point.

TEACHER RESOURCES

FAQ

How do you differentiate this game for ELL students or students with disabilities?

Most of this game involves numbers and calculations rather than a lot of English language communication. Use modeling with game materials to help ELL students understand how to play.

For students who need more support to understand the mathematics of this game, you might provide a “cheat sheet” with a list of equations (positive+positive, positive+negative, and negative+negative) that they can refer to as needed.

What is the ideal length of time to play this game?

The length varies. The average play of Absolute Blast in Quest school classrooms is a class period of 50 minutes. As you add more Booster cards and extra cards, the game play will take longer.

What is the range of values for the Booster Cards?

The default range of values for the Boosters is -6 to +6. Each color has a range within that. The green cards have the lowest values and the red cards the highest.

What is other important card information?

The highest (and rarest) multiplier Modifier card is 3. There is only one division Modifier card that is -2.

How do you encourage 100% student participation?

- Plan to roll out the game by modeling the game and then increase the difficulty for students who are ready to learn more by adding more types of cards to game play.
- Know beforehand which students will need extra support.
- Encourage students to not only play on their own rockets, but to play on their peers' rockets.

TEACHER RESOURCES

HOW TO ROLL OUT THIS GAME

- 1 Play the game yourself first!
- 2 Prior to rolling out the game, teach arithmetic integer operations and absolute value.
- 3 Explain the rules and/or show the video tutorial to students.
- 4 Model the game play between you and two student volunteers in a fishbowl* in the middle of the room.
- 5 Group students in groups of three or four based on student needs.
- 6 Give student groups enough desk space for their game board and other materials.
- 7 Start simple by using Booster Cards and then add in Special Cards and Modifier Cards.
- 8 Distribute game materials and Rocket Trackers (see p. 15).
- 9 Play game.
- 10 Circulate in the room to check for student understanding of rules and math concepts.
- 11 Assess student learning after game play.

**Note:
A fishbowl is when a smaller group sits in a circle inside a larger circle of students. Students in the outer circle observe what is happening in the inner circle of students.*

Here is an example of how Kris Mueller, a Quest teacher, rolled out Absolute Blast.

Day 1 – Explain and model the game. Ask students to only focus on launching one rocket on their game boards. Only give students positive Booster Cards for this round (no negative Booster Cards, Modifier Cards and Special Cards).

Day 2 and 3 – For student groups who are ready to do more math in the game, add in the extra rockets and cards.

STUDENT RESOURCES

EVERYTHING YOU NEED

Here is a set of resources that your students will use during game play including the game materials, a student handout, and cards to help students remember the rules as they play. And we encourage you to modify the game to match the needs of your students.

GAME MATERIALS

PAGE

16–21	GAME BOARD
22–23	BOOSTER CARDS
22–23	SPECIAL CARDS
24–26	MODIFIER CARDS

ADDITIONAL STUDENT MATERIALS

PAGE

27	ROCKET TRACKER	SCORE SHEET
28	HINT CARDS	
29	RULE CHEAT SHEETS	

DISPOSE

Take an active card and move it directly to the discard pile.

DISPOSE

Take an active card and move it directly to the discard pile.

DISPOSE

Take an active card and move it directly to the discard pile.

STEAL

Look at another player's hand. Pick a card and put it into your own hand.

STEAL

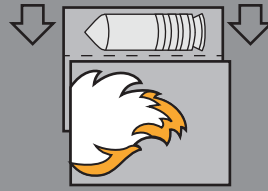
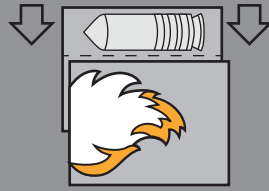
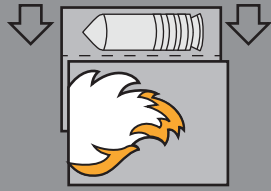
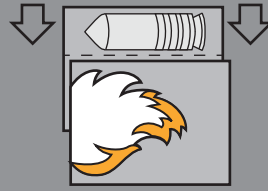
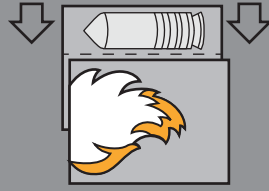
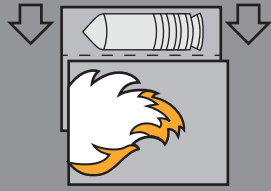
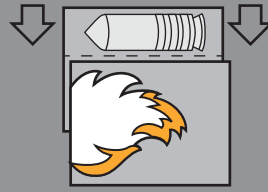
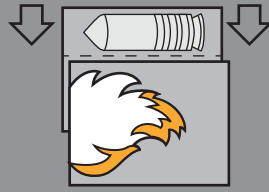
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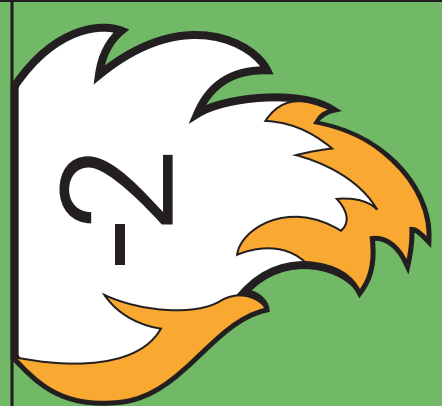
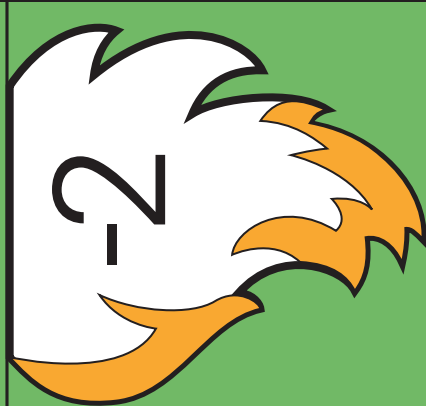
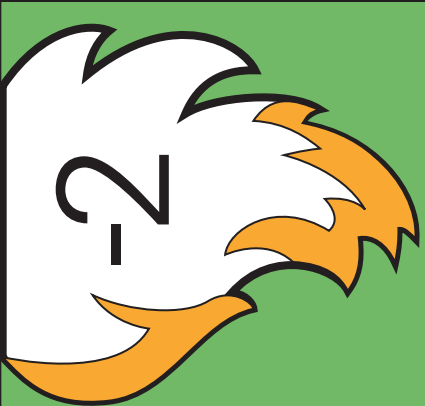
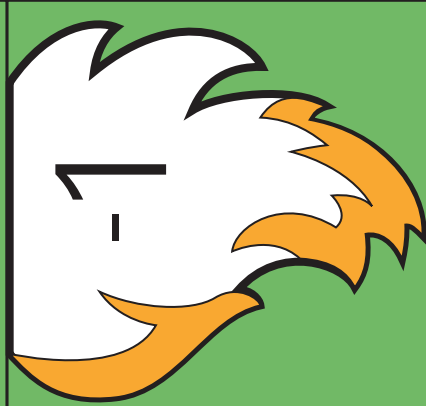
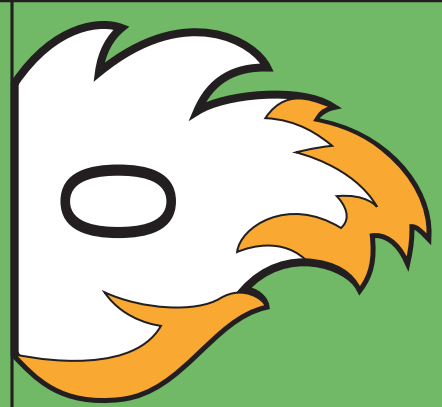
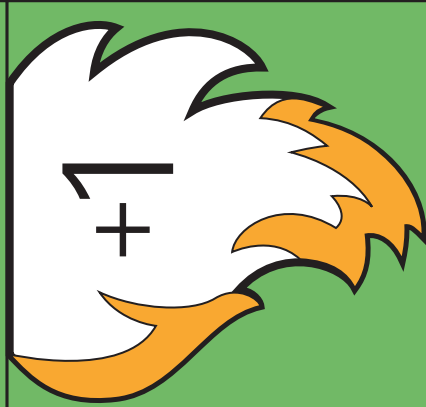
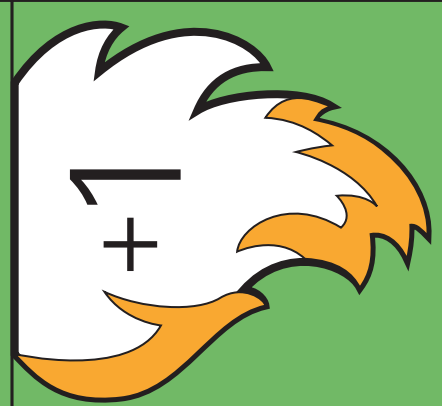
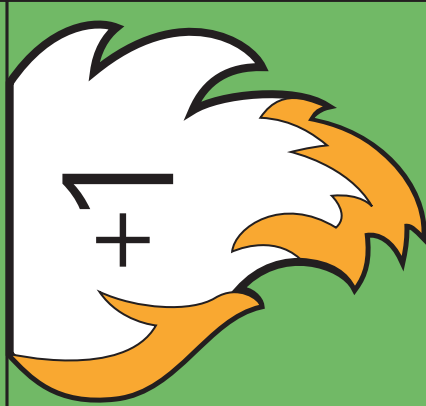
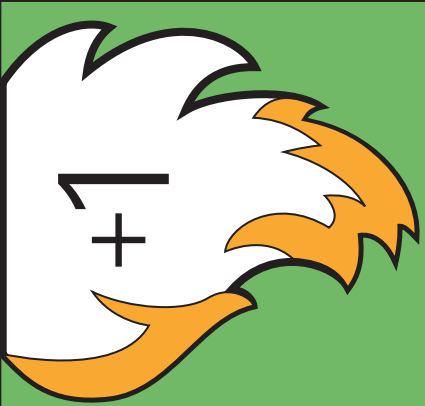
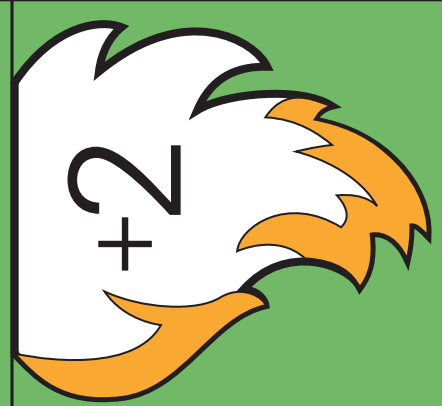
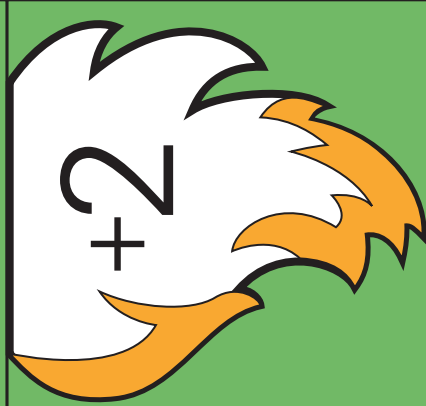
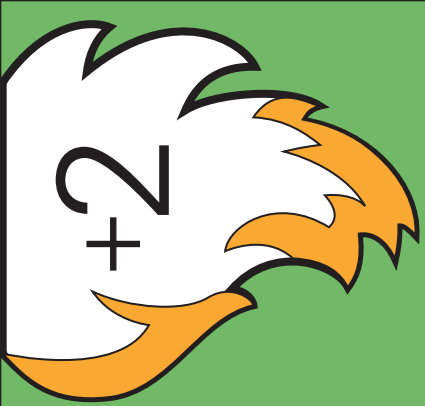
SALVAGE

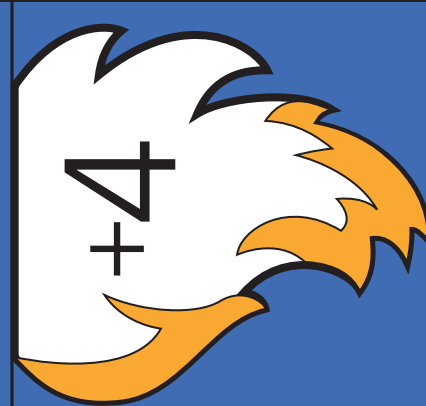
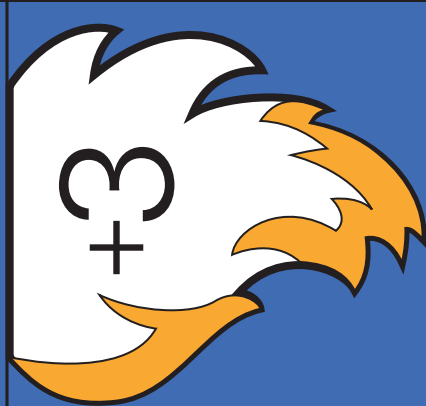
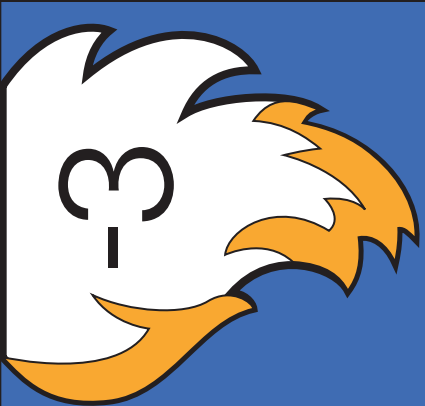
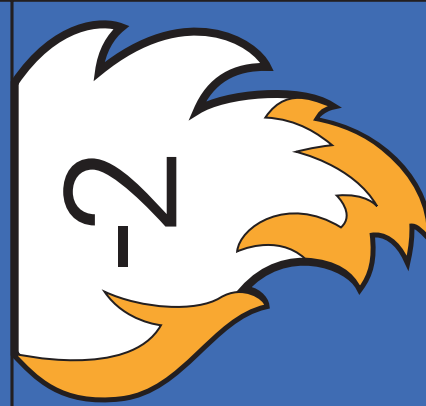
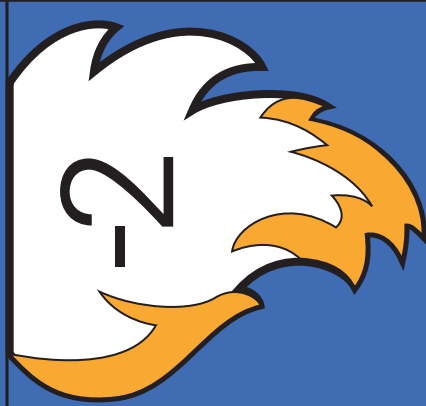
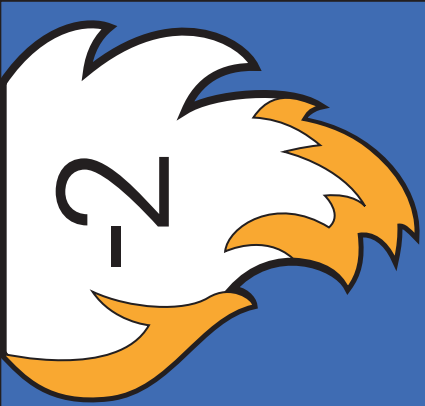
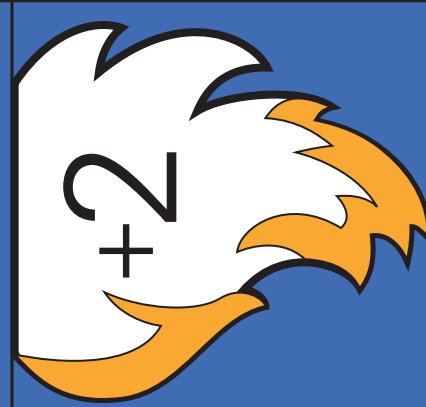
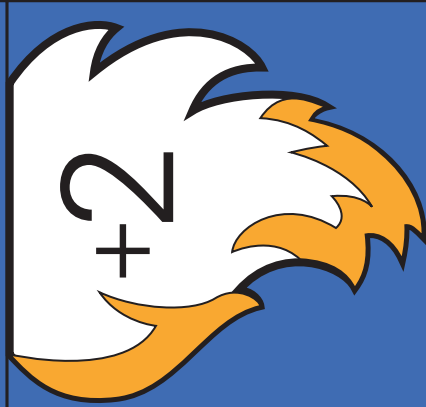
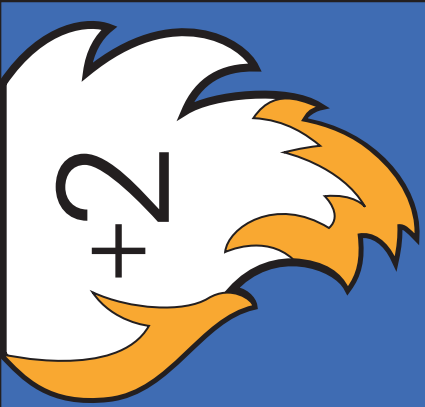
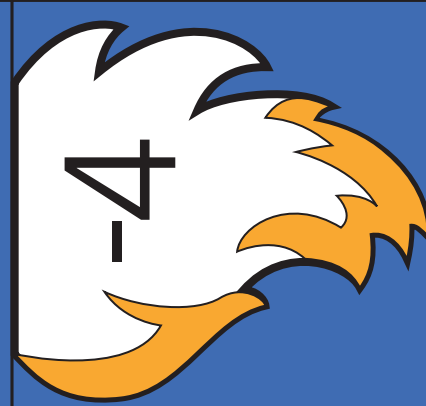
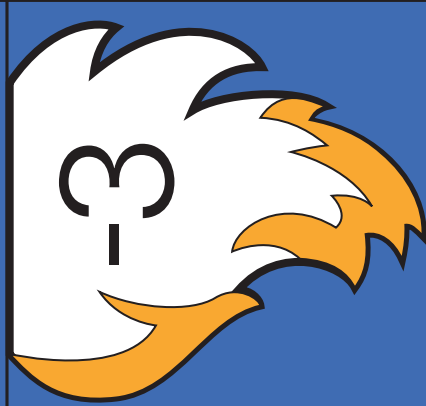
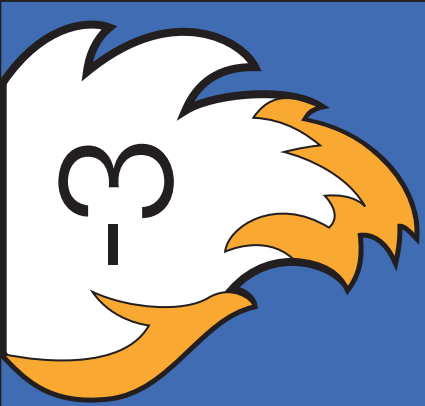
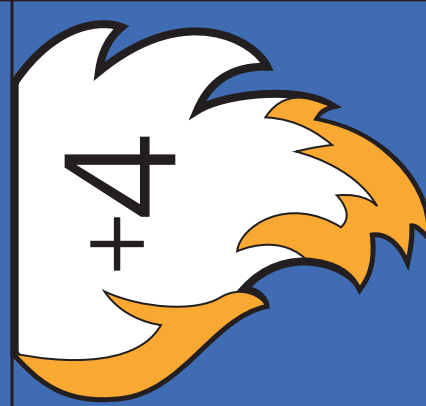
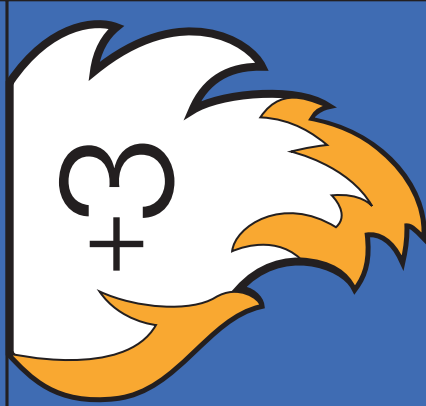
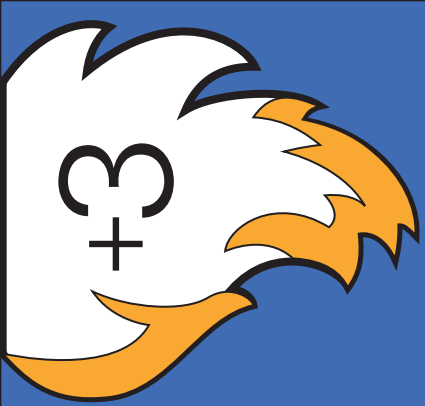
Take the top card from the discard pile and put it into your hand.

SALVAGE

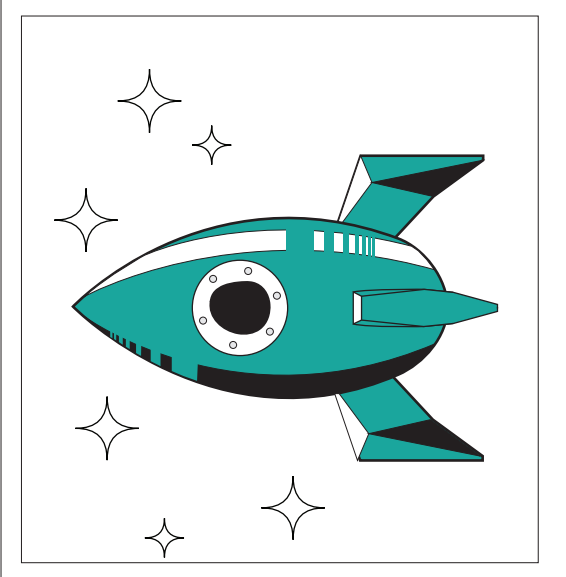
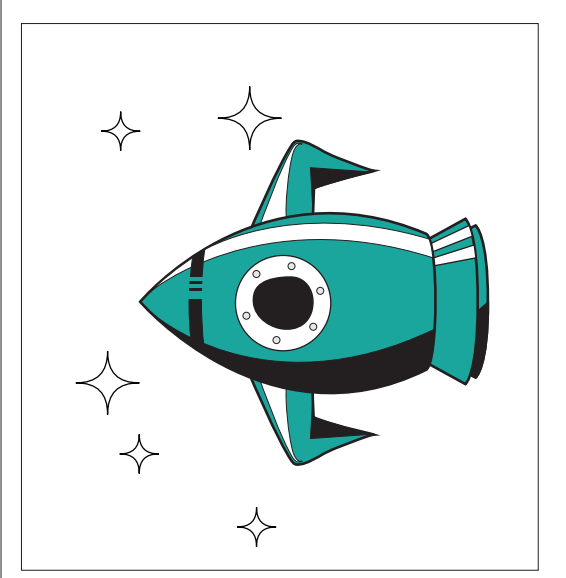
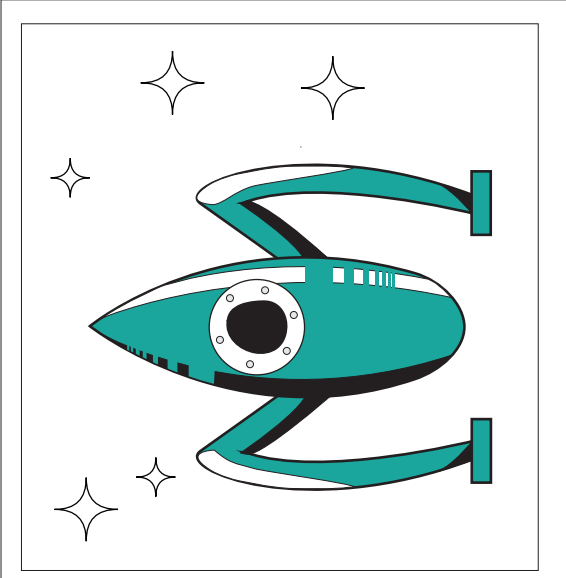
Take the top card from the discard pile and put it into your hand.







Final Score



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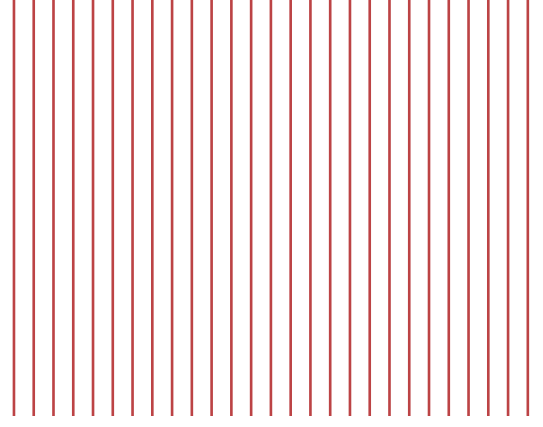
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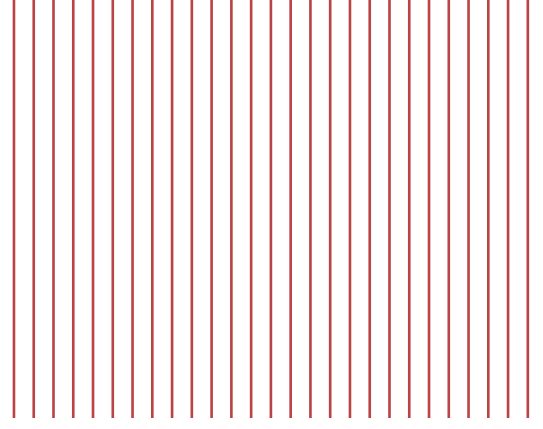
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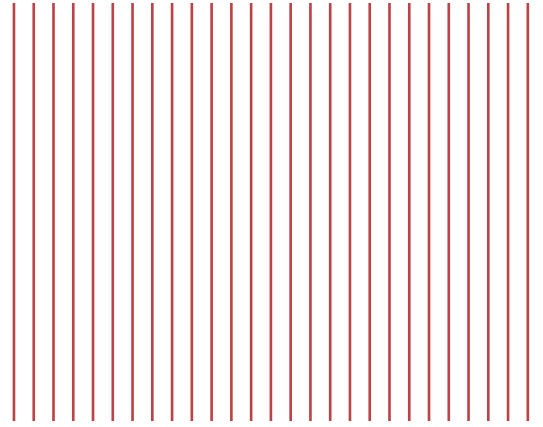
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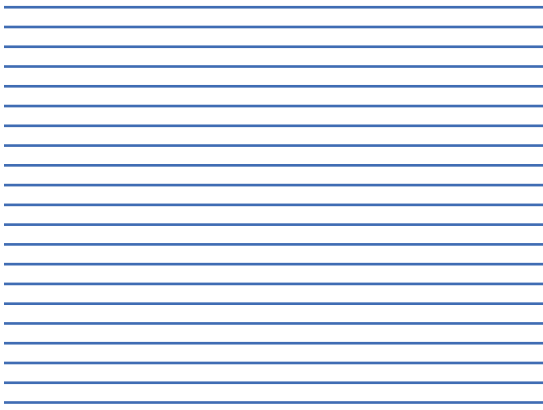


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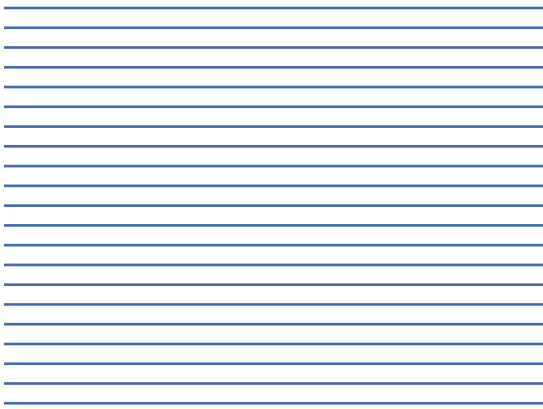
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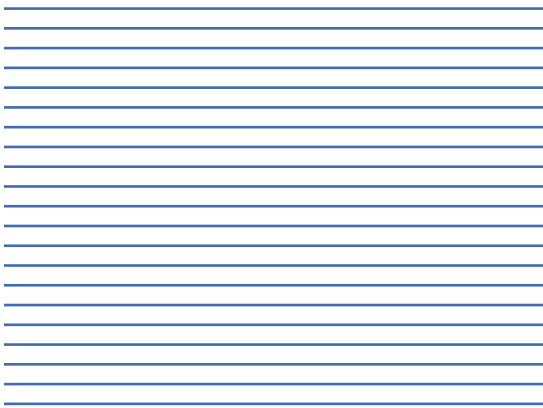
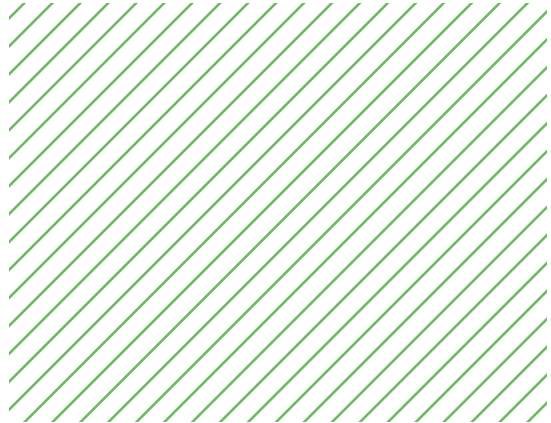
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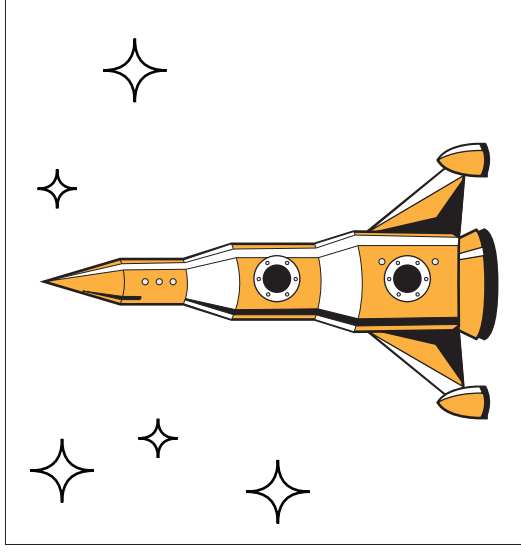
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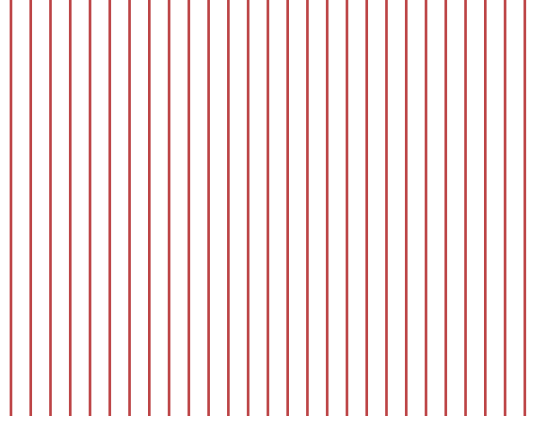
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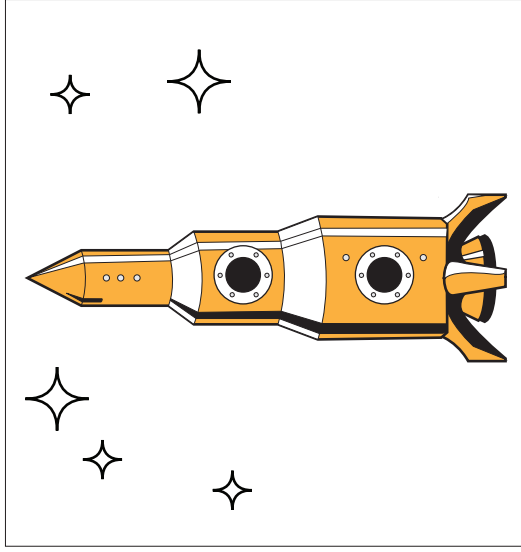
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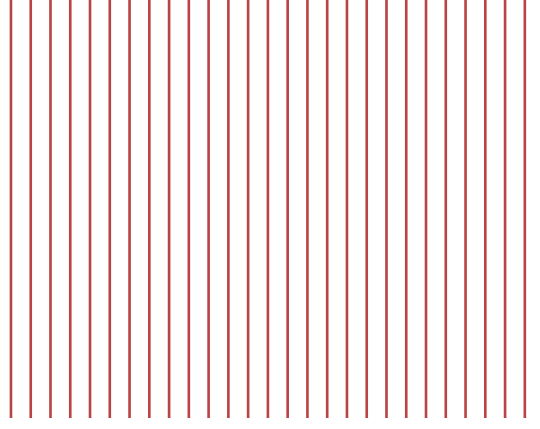
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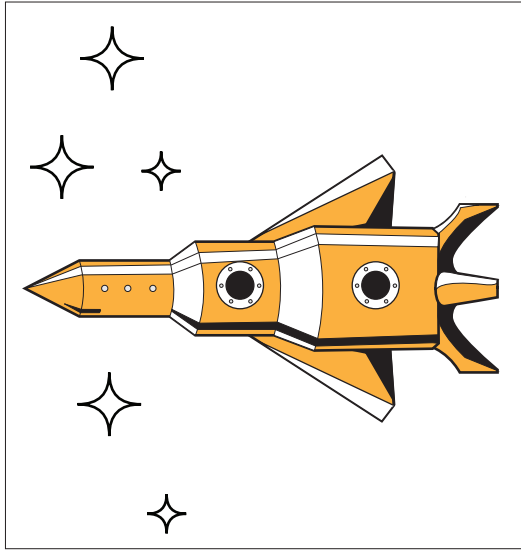
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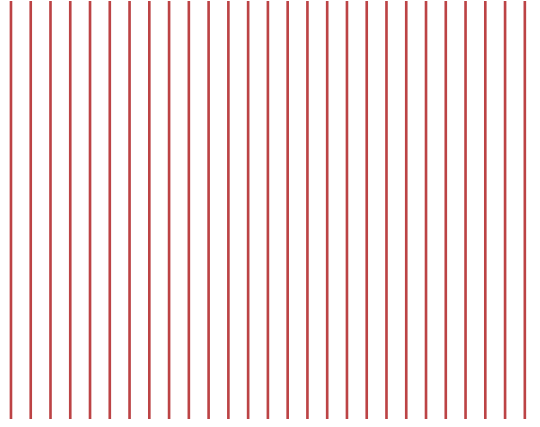
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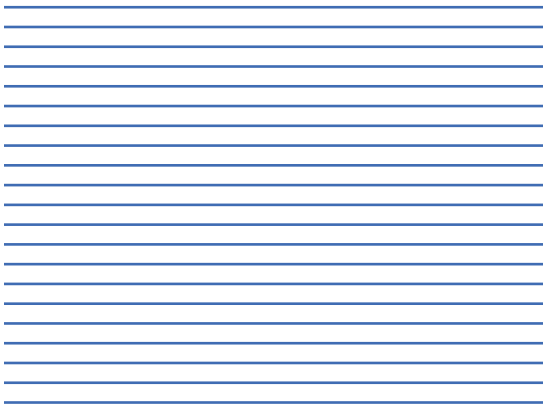
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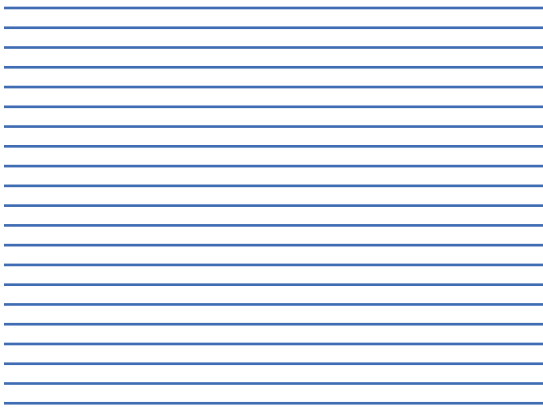
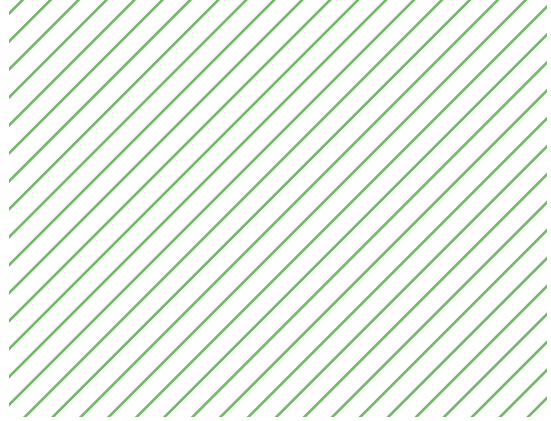
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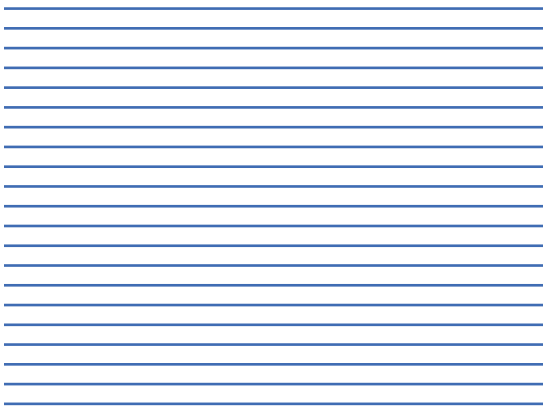
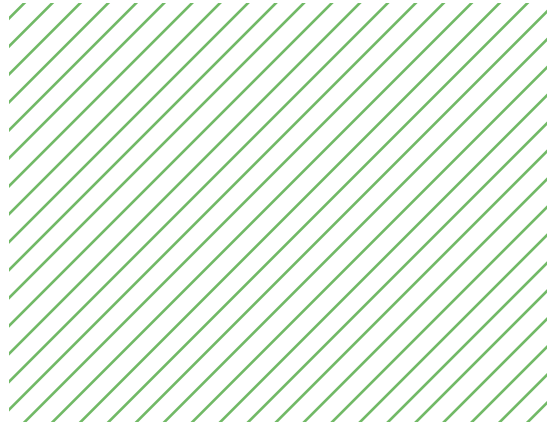
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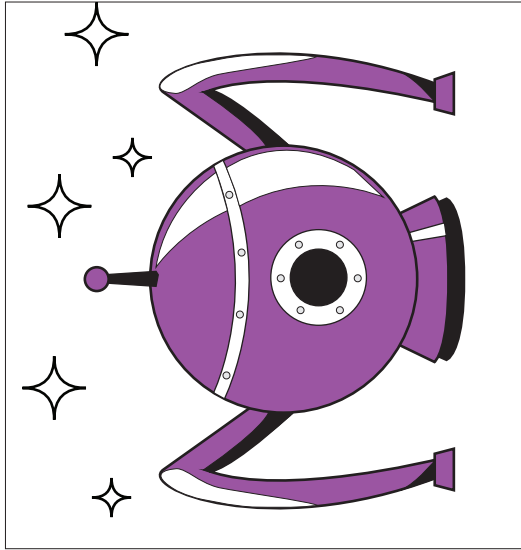
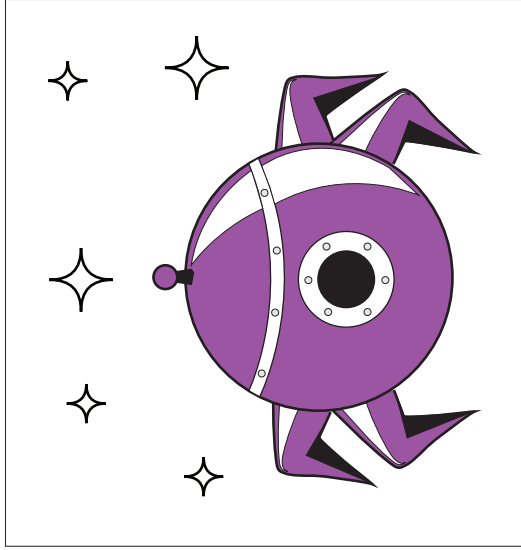
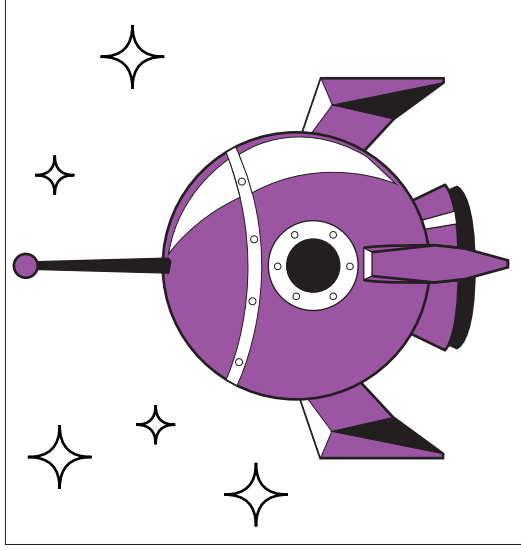
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Final Score



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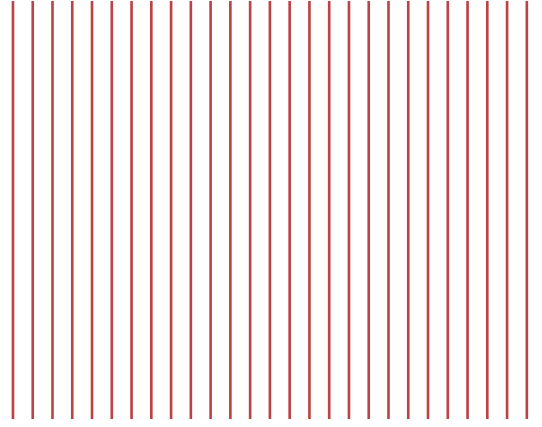
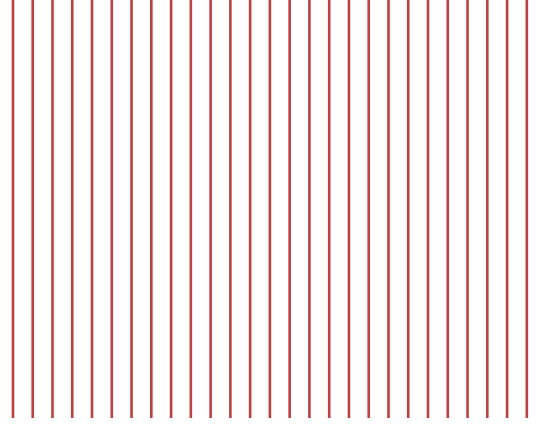
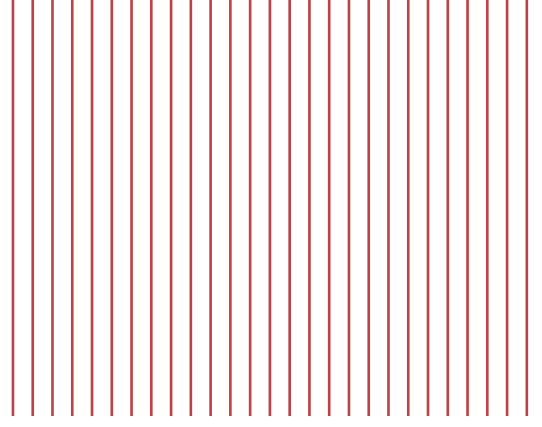
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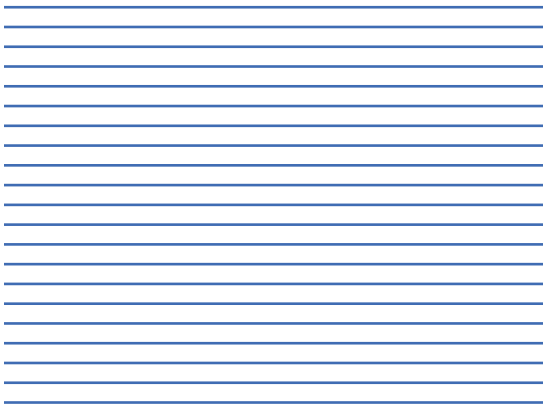
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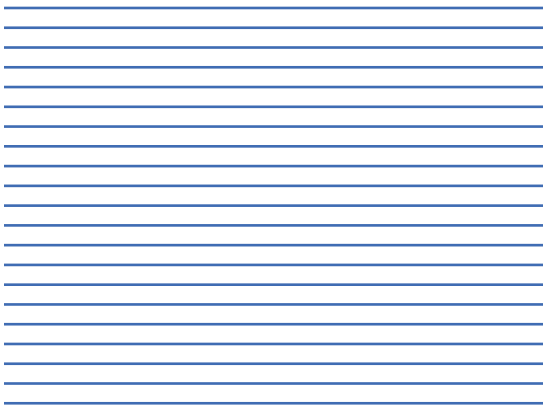
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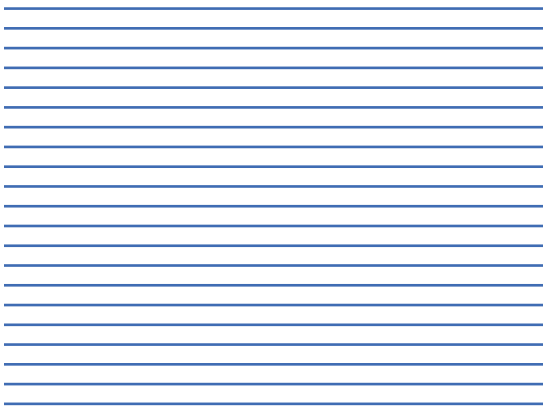
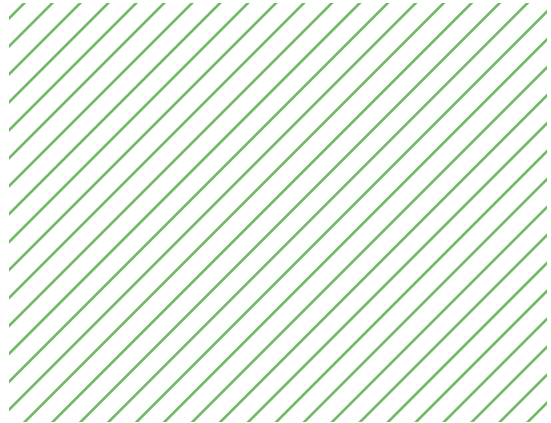
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ROCKET TRACKER

Name:

Date:

Copy your rocket scores and total score from your score sheet. Circle WINNER if you win the round.

EXAMPLE

$$|-6| + |8| + |4| = 18$$

WINNER

ROUND 1

$$| \quad | + | \quad | + | \quad | =$$

WINNER

ROUND 2

$$| \quad | + | \quad | + | \quad | =$$

WINNER

ROUND 3

$$| \quad | + | \quad | + | \quad | =$$

WINNER

ROUND 4

$$| \quad | + | \quad | + | \quad | =$$

WINNER

ROUND 5

$$| \quad | + | \quad | + | \quad | =$$

WINNER

ROUND 6

$$| \quad | + | \quad | + | \quad | =$$

WINNER

ROUND 7

$$| \quad | + | \quad | + | \quad | =$$

WINNER

HINT CARD

A negative value on a rocket isn't necessarily bad.

A -10 rocket gives as many points as a +10 rocket.

You don't have to launch ALL your rockets in the same direction. Each one can go either positive or negative on an individual basis.

Try to disrupt your opponents by putting Boosters on their rockets that are the opposite sign of what they're going for. For example, if their rocket is worth +10, play a negative card on it to bring its value closer to zero.

You can launch an opponent's rocket the same way you launch your own, by placing the last Booster Card color/pattern on it. Use this to your advantage.

Every card has its uses, so if you think you might want to discard a card, first consider how you could use it to boost yourself or disrupt your opponents.

The *-1 multiplier is very useful for flipping a card's value to disrupt your opponent or counter a disruption on your own rocket.

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CHEAT SHEET

GOAL

Launch your rockets with the highest absolute value possible.

PLAY

- 1 Play up to two cards per turn. Cards may be discarded instead of played.
- 2 Cards can target any rocket in the game that has not launched.
- 3 If a rocket has all three Booster Card colors/patterns, it launches.
- 4 To get a rocket's score, find the sum of its Booster Cards (plus any Modifier Cards), then write it in the absolute value symbol below the rocket.
- 5 Draw cards until you have five in your hand again, then play moves to the left.

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Continued Learning

After playing this game, we hope you are inspired to learn more about games and learning.

Below is additional information to support you in continuing to build and share your own learning.

We want to hear from you

We want to hear from you about your experience with this game and game pack.

[What worked well?](#)

[What would you do differently next time you play the game?](#)

We welcome stories about how you uses this game in your classroom.

We want you to learn more

If you are interested in learning more, please visit these following websites:

Institute of Play

www.instituteofplay.org

Quest to Learn, NYC

www.q2l.org

CICS ChicagoQuest

www.chicagoquest.org

We also offer other educator resources

Q School Design Pack [↗](#)

This pack highlights ten innovative components of the Quest school model.

Q Curriculum Design Pack [↗](#)

This pack provides tools and methods for you to use to design game-like curriculum.

Q Games and Learning Design Pack [↗](#)

This pack provides tools and methods for you to use to modify and design games for your classroom.

We want you to share these resources

This resource is free and we want you to share it with others. When you do use and share it, please know this resource is licensed under a Creative Commons license.

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We want to thank our partners

This game pack is a result of collaborative work done over the past years between Institute of Play, Quest to Learn, and CICS ChicagoQuest.

About Institute of Play

We design experiences that make learning irresistible.

The Institute pioneers new models of learning and engagement. We are a not-for-profit design studio, founded in 2007 by a group of game designers in New York City. We are now home to an interdisciplinary team of designers, strategists and learning practitioners. Our first project was the design and implementation of an innovative New York City public school, called Quest to Learn.

At the core of the experiences we design are games, play and the principles that underlie them.

Using these principles, we have created institutions, games, programs, events, digital platforms and products. Our work unlocks the transformative power of people as seekers and solvers of complex problems, risk takers, inventors and visionaries. We work wherever people are: in communities, businesses, schools, cultural and civic institutions.

We empower people to thrive as active citizens in a connected world.

We are not preparing for a distant future. We are about meeting people where they are and igniting their potential now. We work with a diverse set of partners to make it happen, such as Electronic Arts, Intel, Educational Testing Service, the Mozilla Foundation, the Smithsonian, Parsons the New School for Design, Chicago International Charter Schools, DePaul University, E-Line Media and others.

A selection of our work

GlassLab

An unprecedented collaboration between leaders in the commercial games industry and experts in learning and assessment, GlassLab aims to leverage digital games as powerful, data-rich learning environments that improve the process of learning with formative assessments teachers can trust.

TeacherQuest

A fresh approach to professional development, TeacherQuest is a unique blended learning program designed to empower teachers as designers, increase student engagement and re-imagine what teaching can be through games and game-like learning.

Play@ Your Org

With a hands-on exploration of games and design, Play@ Your Org workshops are designed to help businesses, cultural institutions and other organizations integrate the power of play-based learning in their work to maximize participation and engagement.

For more information, please visit www.instituteofplay.org