Summer Math Adventure Grades 3-5

WISCONSIN
MATHEMATICS
COUNCIL, INC.

Introduction and Welcome

Welcome to your summer math adventure! You can access the program at the following site:

bit.ly/WMCSummer

Use the grid of activites to explore math this summer. Complete all of the activities in a row, column, or diagonal to earn a prize. Complete all 25 activities for a bonus prize!

Click on the links in the grid to explore different activities. Click on the link in the lower right corner of each activity to return to the grid. Have fun!

MATH Explorer

Visit https://forms.gle/YePghR3rNj6JYYuJ7 or scan this QR code with your mobile device to help us make this program better

Summer Math Adventure

Around the Home	Outdoors	The Arts	Books	Games & Puzzles
How Many?	Sidewalk Math	Spiral Math Art	Classified: The Secret Career of Mary Golda Ross, Cherokee Aerospace Engineers	Target 1000
Snack Time	How Tall is that Tree?	Flexagons	Maryam's Magic	Panda Squares
Crazy Train	Fraction Target Game	Math Poetry	Secret Coders	Nim Games
Make Lemonade	Exercise by the Numbers	Seamless Patterns	Unusual Chickens	How Close to 100?
Keeping Track	Shape Frames	Kandinsky Math Art	A Hundred Billion Stars	Ultimate Tic-Tac-Toe

WISCONSIN MATHEMATICS COUNCIL, INC.

How Many?

Find (or fill) a container with many small objects. Instead of counting, estimate how many objects are in the container.

How do you know your estimate is reasonable?

What other information would help you make a more accurate estimate?

How could you count the objects in an organized way to find the exact number?

What else can you estimate?

- the number of objects needed to fill a space or container
- the cost of groceries for a meal
- the weight of something
- the height of a building
- how long it takes to travel somewhere or complete a task

Return to Activity Grid

Snack Time

Trail mix makes a great summer snack. Here is a recipe you can try

Trail Mix Recipe

1 ¼ cup dry cereal (like Chex or Cheerios)
1 ⅓ cup pretzels
⅔ cup raisins
¾ cup chocolate chips or M&Ms
½ cup peanuts

How much trail mix does one recipe make?

If one serving is ½ cup of trail mix, how many friends could you share with?

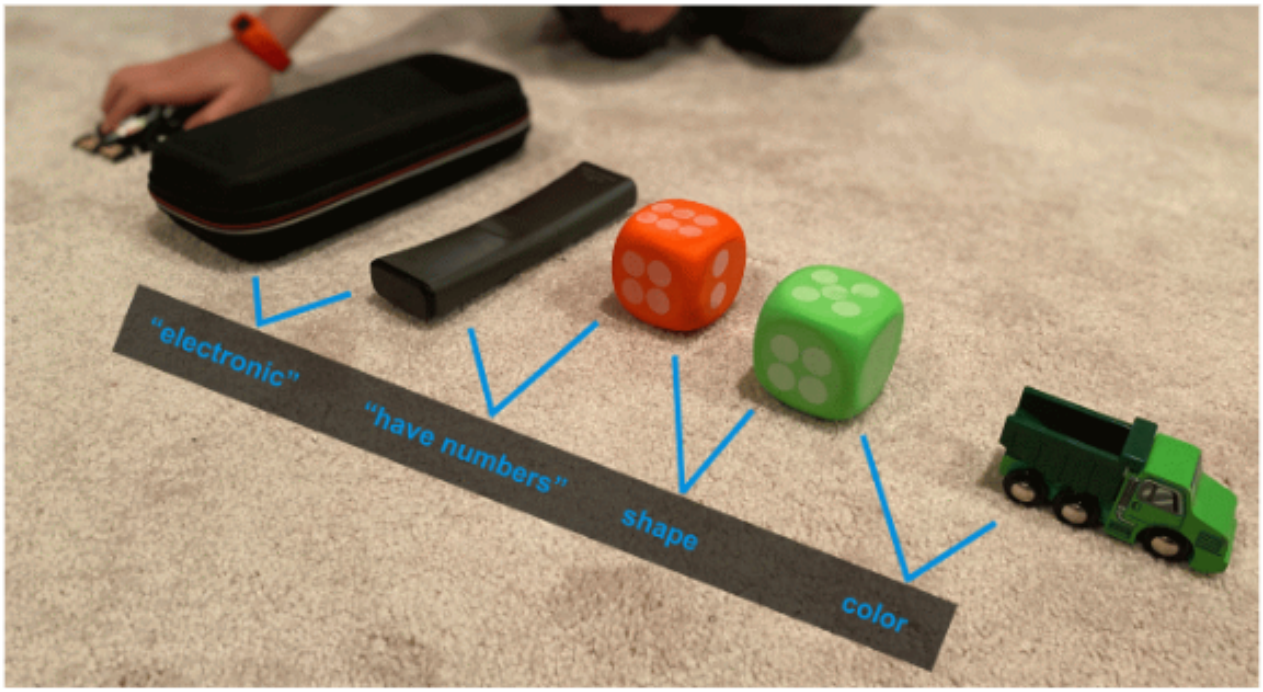
If you are missing one of the ingredients, how could you change the recipe and still have the same amount of trail mix in the end?

If a bag had 100 pieces of trail mix in it, how many pieces of each ingredient would you expect there to be?

Return to Activity Grid

Crazy Train

Gather object from around your home and lay them out on the table or floor. Choose one object to be the locomotive of your train. The next car in the train must have something in common with the one before it.



Once all of your objects are "train-ed", can you go back to the locomotive and name all of the relationships that link everything, all the way to the caboose?

Adapted from
https://earlymath.erikson.edu/games-to-play-at-home-using-attributes-for-math-thinking/

Return to Activity Grid

Make Lemonade

Each summer Brandy sets up a lemonade stand. Last summer, Brandy sold over 100 servings of lemonade. She's getting ready to set up her stand for this summer.

She will use the recipe below. This recipe will make 6 servings of lemonade.

Lemonade Recipe

Ingredient	Amount
Granulated sugar	$\frac{3}{4}$ cup
Water (for simple syrup)	$\frac{3}{4}$ cup
Lemon juice	$\frac{3}{4}$ cup
Cold water (to dilute)	2 cups

What do you notice? What do you wonder?

What mathematical questions can you ask about this situation? Answer all the questions you can!

Challenge

Try to find a recipe on a box, in a cookbook, in a magazine, or online. Think of questions that you could ask and answer about this recipe.

How do the measurements change if you duplicate the recipe?

Adapted from
https://mathathome.mathlearningcenter.org/activity/1973

Return to Activity Grid

Keeping Track

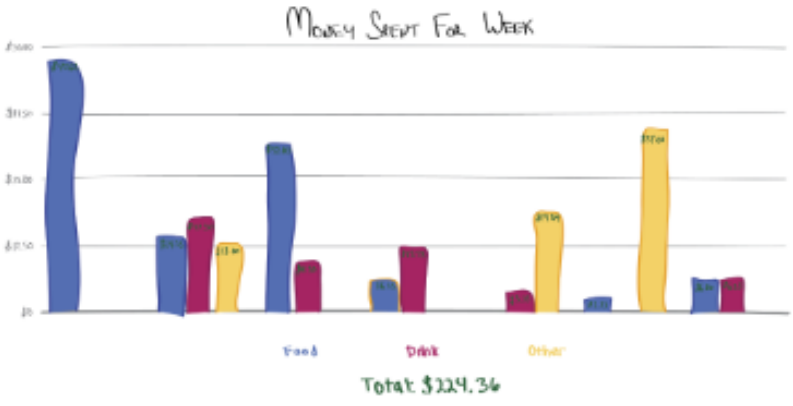
Mathematicians use data to look for patterns and make predictions.

Collect data on something that interests you.

Here are a few ideas:

- Scores for your favorite sport team or stats for your favorite player
- The time the sun rises and sets
- Weather patterns: high and low temperature, amount of rain each day
- The amount of time you spend doing different types of activities each day
- The types of animals observed in your yard

What patterns do you notice? What predictions can you make?



April Weather		
Weather	**Tally**	**Number**
Sunny	𝍸 𝍸 |||	13
Rainy	𝍸 𝍸 𝍸	15
Windy	||	2

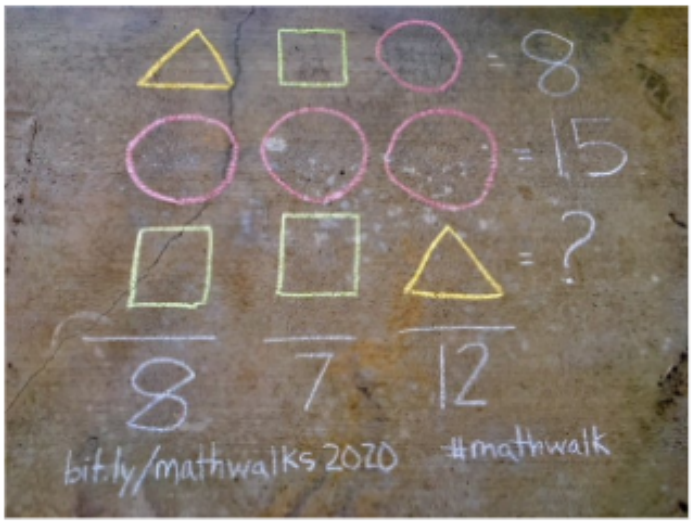
Return to Activity Grid

Sidewalk Math

Grab some sidewalk chalk and create some math outdoors. Here are a few ideas.

Hopscotch

Math Puzzle or Game



Chalk Art

For more inspiration visit
https://sites.google.com/powayusd.com/math-walks/math-walks-2020/oct-2020?authuser=0

Return to Activity Grid

How Tall is That Tree?

Image credit: 82961091 © creativecommonsstockphotos | Dreamstime.com

How many times have you come across a tree and thought that tree is humongous? What do you measure with? Considering I usually don't carry measuring tools on a walk or hike I'm often puzzled by how I could get the most accurate measurement of the tree especially since the tree would be way too hard to measure. I start wondering what I know the height of and if I could use that to get a good estimate of the tree's height.

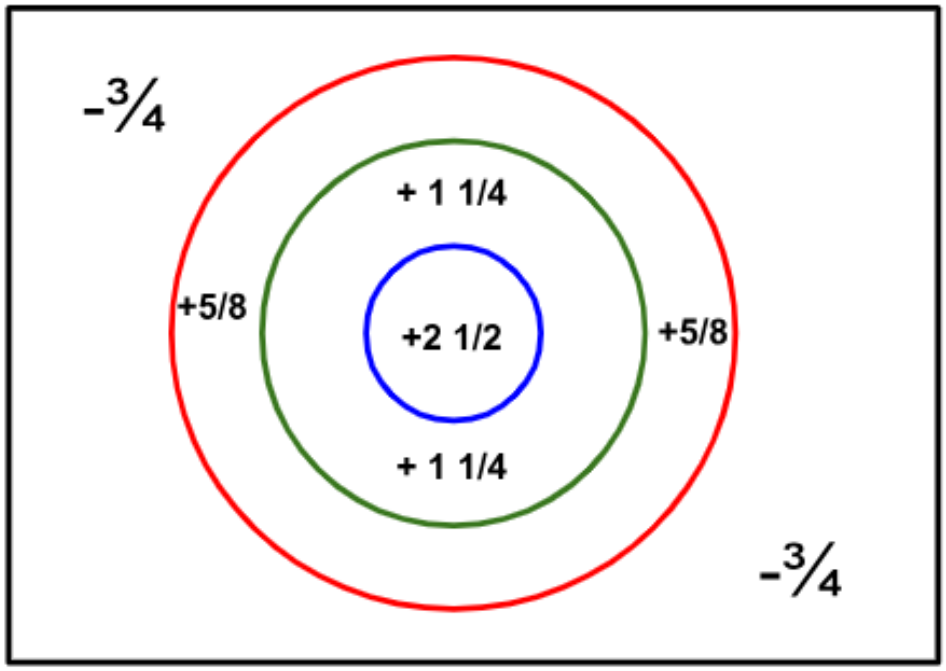
Try it when you're outside with family and friends. Challenge each other to come up with multiple strategies or being as accurate as possible to determine the height of the trees you're curious about.

Adapted from
https://www.youcubed.org/resources/how-tall-is-that-tree-2-12-video/

Return to Activity Grid

Fraction Target Game

Pedro and his friends made up a fraction beanbag toss game. Each player gets three bean bags to toss each turn. After each toss, they add or subtract points based on where the beanbag lands. High score wins. There are no negative scores in this game, so if you toss a beanbag that would give you a negative score, your score stays at 0 points.



What do you notice? What do you wonder?

What mathematical questions can you ask about this situation? Answer all the questions you can!

Challenge

Make your own fraction target game, or change the rules for this target game. You could make a game that asks players to get as close as possible to a target number. Show the results of one round and the points scored. What was your total score?

Adapted from
https://mathathome.mathlearningcenter.org/activity/1251

Return to Activity Grid

Exercise by the Numbers

12 Jumping Jacks

8 Lunges

6 Squats

14 Knee Highs

7 Sit Ups

15 Burpees

Olivia plans to start her day with these six exercises. At first she'll do the set of exercises once. She'll do 12 jumping jacks, 8 lunges, and so on, until she's completed all six exercises. She thinks this will take about 20 minutes. She wants to work up to going through the full set of exercises three times.

What do you notice? What do you wonder?

What mathematical questions can you ask about this situation? Answer all the questions you can!

Challenge

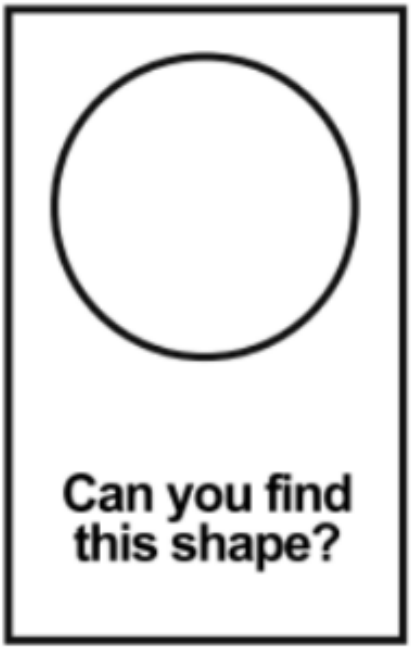
Create your own exercise plan. Make a list of the exercises you will do. How many will you do of each one? How many times will you repeat the set of exercises? Share your notes with a friend or family member and ask them to exercise with you.

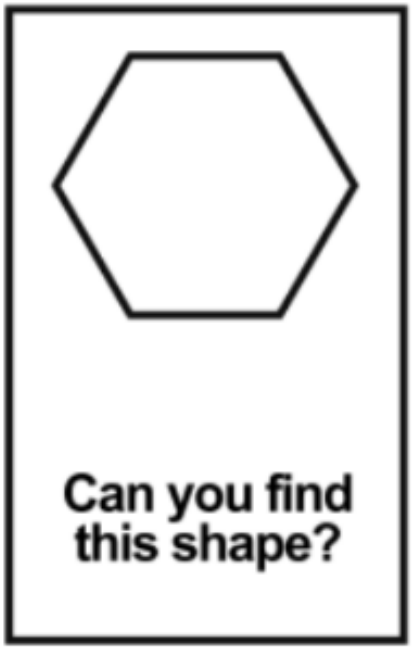
Adapted from
https://mathathome.mathlearningcenter.org/activity/1790

Return to Activity Grid

Shape Frames

Print and cut out these Shape Frames and use them to go on a shape hunt around your neighborhood.





Return to Activity Grid

FIND THE SHAPE

FIND THE SHAPE

FIND THE SHAPE

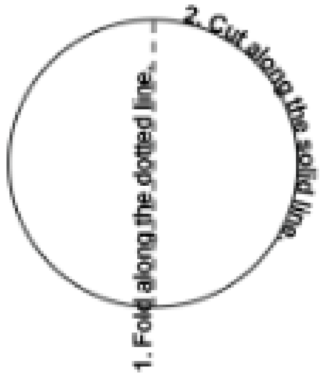
FIND THE SHAPE

FIND THE SHAPE

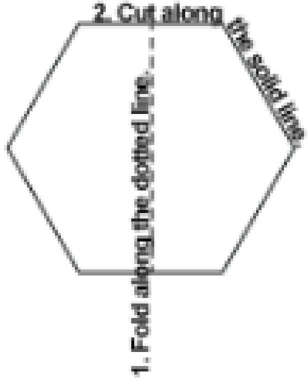
FIND THE SHAPE

FIND THE SHAPE

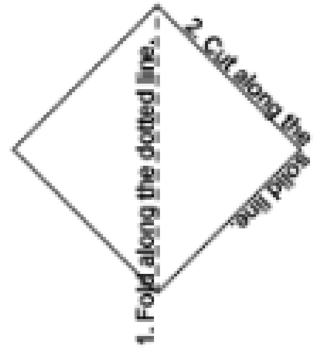
FIND THE SHAPE



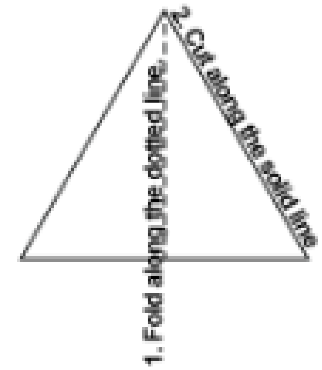
Can you find this shape?



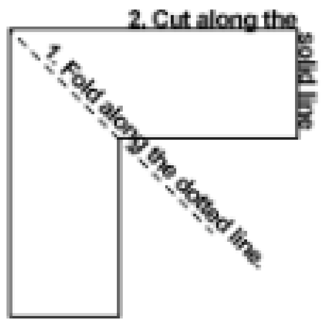
Can you find this shape?



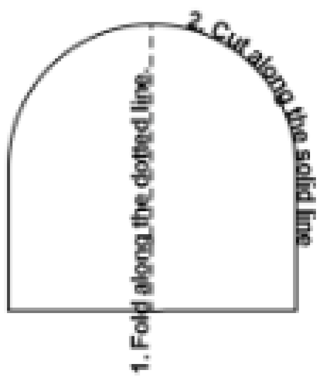
Can you find this shape?



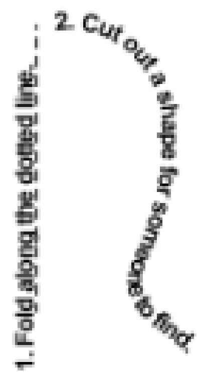
Can you find this shape?



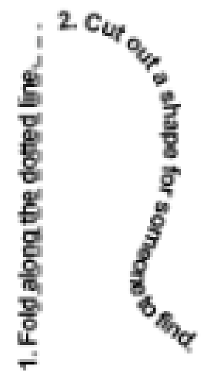
Can you find this shape?



Can you find this shape?



Can you find this shape?



Can you find this shape?

@womiworldwide

Spiral Math Art

We are going to use multiplication to create some spiral art, or a spirolateral.

Choose a number and write its multiples. Here's 5 as an example.

5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55

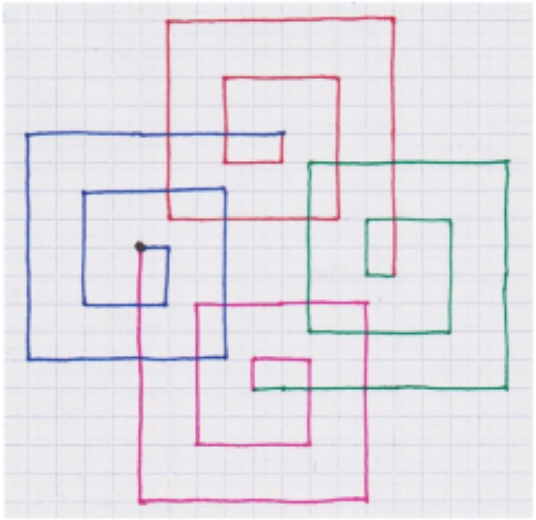
Now, turn it into a sequence of single digits by adding the two digits of each number together. For example 10 becomes 1+0=1, 1+5=6 and so forth.

5, 1, 6, 2, 7, 3, 8, 4, 9, 5, 1

Once you see the pattern start to repeat you can stop. So we would be left with 5, 1, 6, 2, 7, 3, 8, 4, 9 as our final sequence.

Now you are ready to draw!

Get your graph paper.
Draw a line 5 squares long.
Make a 90 degree turn to the right.
Draw a line 1 square long.
Make a 90 degree turn to the right.
Draw a line 6 squares long.
See the pattern?



When you complete the final line in your sequence, start over with the first number. Repeat until the spirals connect back to the very first line.

EXTENSIONS:

Compare the patterns of different sequences. Do some of them look similar?

Color in your spirolateral to make it snazzy.

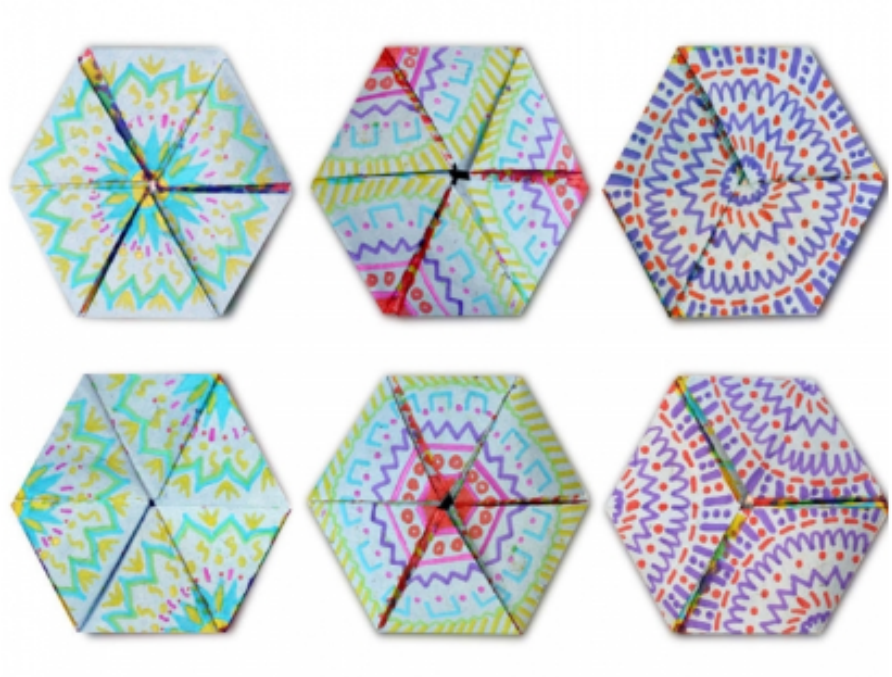
Return to Activity Grid

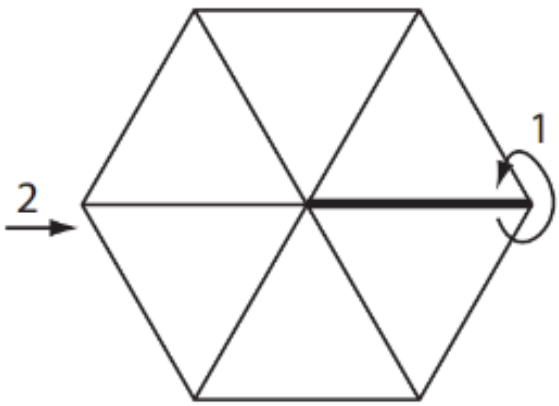
Adapted from:
https://www.whatdowedoallday.com/simple-spirolateral-math-art-for-kids

Flexagons

Flexagons are folded paper polygons that have the neat feature of changing faces as they are flexed. There are many types of flexagons. The names of flexagons tell the type of polygon and the number of faces. In this project we make a tri-hexaflexagon—a six-sided polygon (hexagon) with three faces (tri).

Follow these instructions to fold your flexagon. Add a colorful design to each side of the assembled flexagon.

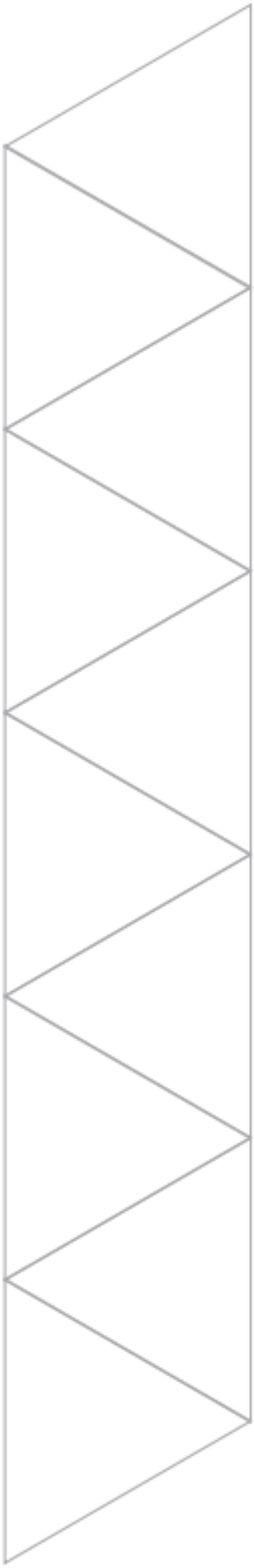




How to flex your flexagon

1. Pinch two triangles together so the fold between them points towards you.
2. 2. Push the other two triangles in from the other side,then open the flexagon out from the point nearest you. If it does not open,try a different pair of triangles.

Return to Activity Grid



SIMPLE INSTRUCTIONS FOR FOLDING A TRIHEXAFLEXAGON

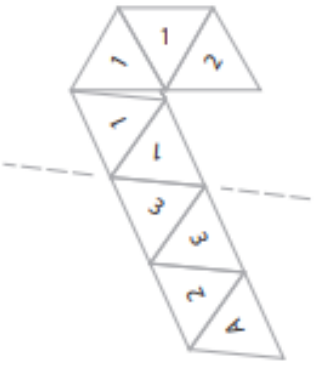
1. Cut out the blank template at the left, and crease each of the lines.
2. orient the template as shown:

3. write numbers on it, exactly as shown, with the numbers tilted where shown:

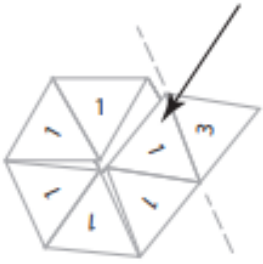
4. flip the template over from top to bottom, so the triangle at the left (with the 3 on it) stays to the left. label the second side as shown:

5. Turn the template back to the front and fold it once as shown. The left side should go **BEHIND** the right side, as shown in the illustration in step 6:

6.Fold the bottom part of the strip up and **away** from you, as shown. Be sure the numbers look like the illustration at the right. Note that the "1" face goes **in front of** the "2" face. (see arrow below). The flexagon should now look like the last illustration below. **It should now have all "1"s showing, and one tab with a "3"!!**



7. **Last step**: Fold tab 3 **away** from you. It has a letter "A" on back. Glue or tape face "A" to face "B" in back, and you have a trihexaflexagon!



Math Poetry

Math is Me
Math can inspire.
Math can inquire.
Math does not require those who know,
but those who understand.
Math is me.
--- Brooke Johnston, Notre Dame Preparatory School
2019 AMS Math Poetry Contest Winner

Many forms of poetry use numeric formulas. The formulas usually indicate a prescribed number of syllables that the define the type of poem, or poetic form used. For example:

- *haiku.* A haiku is a poem of three lines and a total of 17 syllables: five syllables on the first line, seven on the second line, and five on the last line.
- *sonnet.* A sonnet is a poem of 14 lines, with 10 syllables on each line.
- *cinquain.* A cinquain poem is a verse of five lines that do not rhyme.
- *square*. A square poem has as many lines as syllables per line
- *snowball.* A snowball is a poem built from a sequence of lines whose whose syllable-counts increase (or decrease) by one from line to line.

Write an original poem using one of these forms - it doesn't have to be about math - or - create your own mathematical poetry form.

Adapted from
https://blog.education.nationalgeographic.org/2018/04/26/how-math-and-poetry-intersect/

Return to Activity Grid

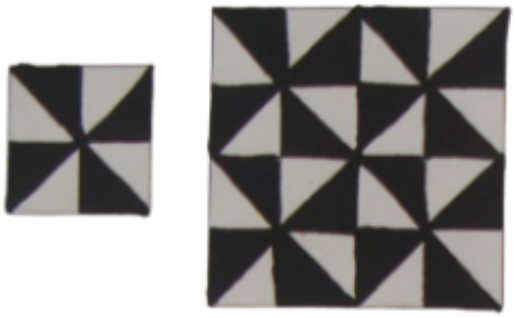
Seamless Patterns

Use graph paper to create a pattern in a 2 x 2, 3 x 3 or 4 x 4 square. Repeat your pattern across a larger grid.

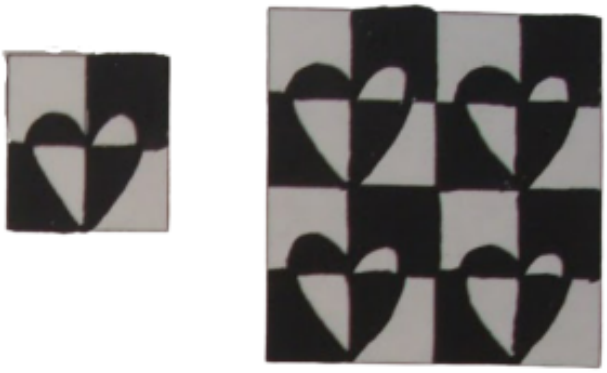
What repeats? What new patterns emerge?

Examples:

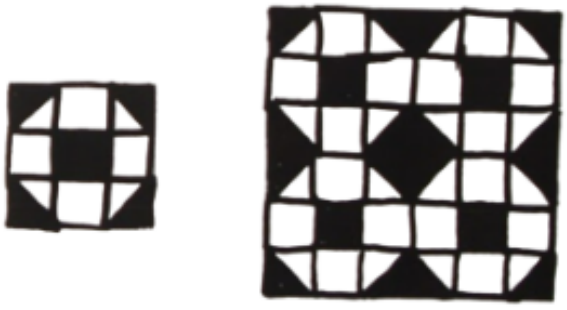
2 x 2



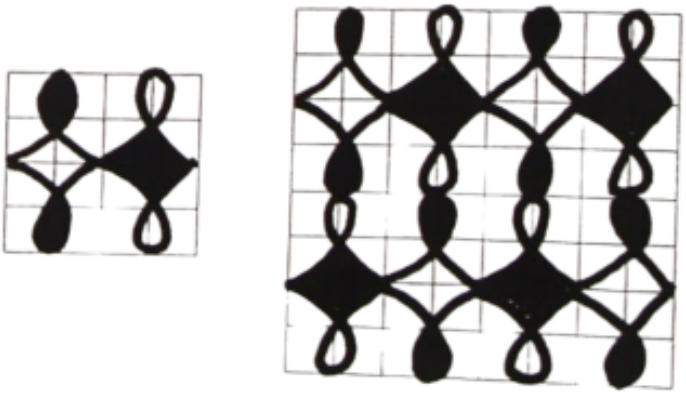
2 x 2



3 x 3



4 x 4



Where else do you notice patterns?

Adapted from:
http://mrshollyhatfield.blogspot.com/2012/07/7th-grade-op-art-lesson.html

Return to Activity Grid

Kandinsky Math Art

Vasily Kandinsky is known as a pioneer of abstract art. He often used shapes – especially circles and squares – within his works. Sometimes the shapes are organized in patterns like in the painting *Color Study: Squares with Concentric Circles.* **Concentric circles** are circles with the same center. They fit inside each other and are the same distance apart all the way around.

www.Wassily-Kandinsky.org

Materials:

- Paper or cardstock
- Pencil
- Ruler
- Paint, crayons, markers, colored pencils, oil pastels or chalk

Directions:

1. Use a pencil and ruler to divide your paper or card in squares.
2. Draw a small circle in the center of one of your square spaces.
3. Use other colors to build up your circle, adding bigger circles of color around your first circle, until you have filled your square space with colorful concentric circles.
4. Continue to fill all the squares on your paper with concentric circles of different colors.

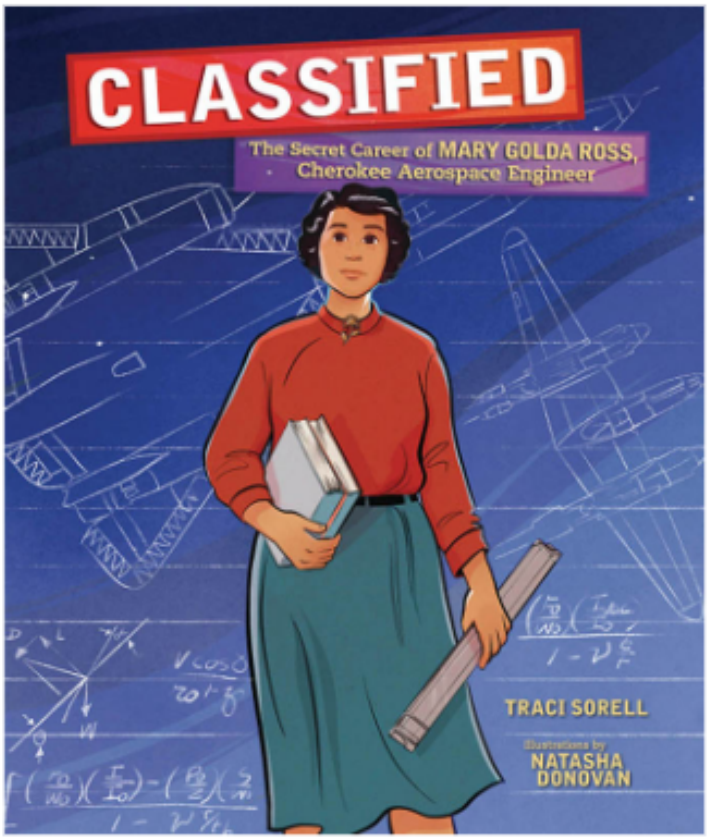
How many circles are in your finished piece?

Learn more about the artist

Adapted from:
https://nurturestore.co.uk/kandinsky-circles-art-lesson-for-children

Return to Activity Grid

Classified: The Secret Career of Mary Golda Ross, Cherokee Aerospace Engineer



Mary Golda Ross designed classified airplanes and spacecraft as Lockheed Aircraft Corporation's first female engineer. Find out how her passion for math and the Cherokee values she was raised with

Reflection questions:

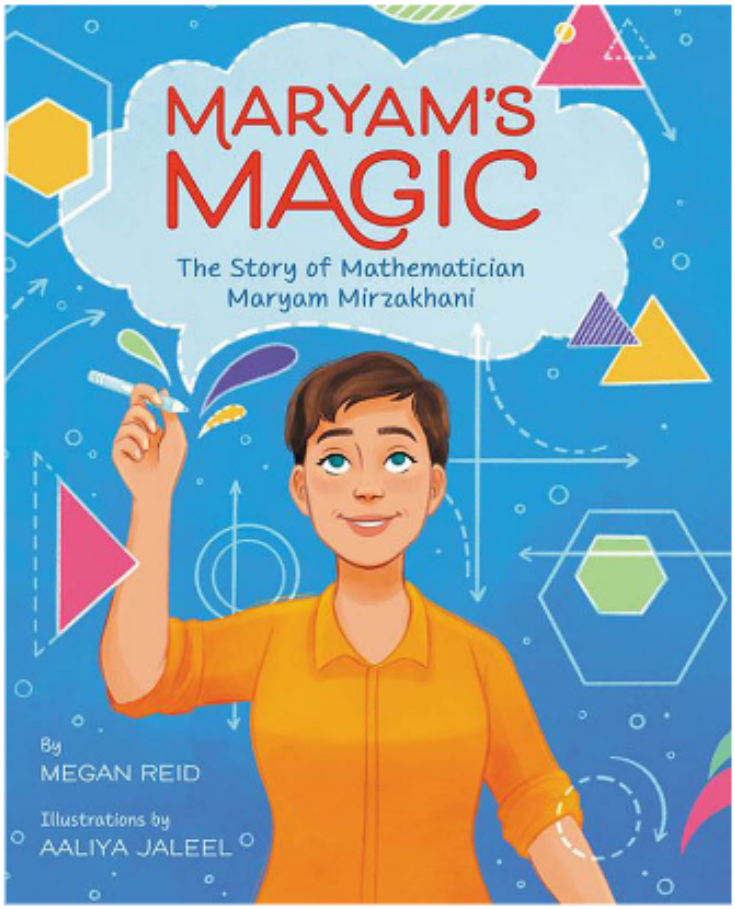
Ms. Ross spent a lot of time in schools as a student and as a teacher. What do you think drove her to want to learn so much?

The Cherokee values Ms. Ross was raised with shaped her career. What are some examples of Ms. Ross living these values? How did they support her success? Can you think of examples of living these values in your own life?

Visit: **http://bit.ly/MGRossCherokee** or scan the QR code with your mobile device to listen to Cherokee words from the story.

Return to Activity Grid

Maryam's Magic



Maryam's Magic is the true story of a girl whose creativity and love of stories helped her—and the world—to see math in a new and inspiring way.

Discussion Questions:

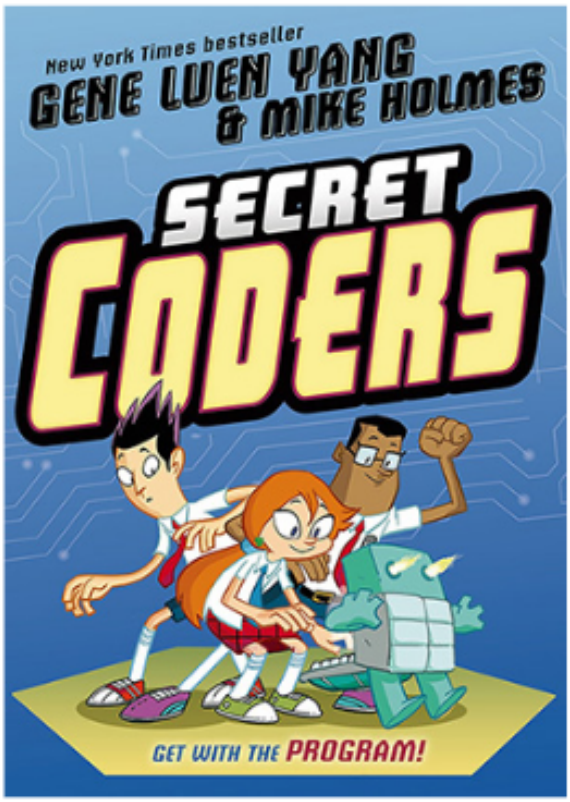
How did Maryam first feel about math? Why did her feelings change?

When confronted with a mathematical problem, Maryam said, "It's not only the question, but the way you try to solve it." What did she mean?

Why was one of Maryam's discoveries called "the magic wand theorem"? How did it help people all over the world?

Return to Activity Grid

Secret Coders



Welcome to Stately Academy, a school which is just crawling with mysteries to be solved! The founder of the school left many clues and puzzles to challenge his enterprising students. Using their wits and their growing prowess with coding, Hopper and her friend Eni are going to solve the mystery of Stately Academy no matter what it takes!

Book 1 of the Secret Coders series.

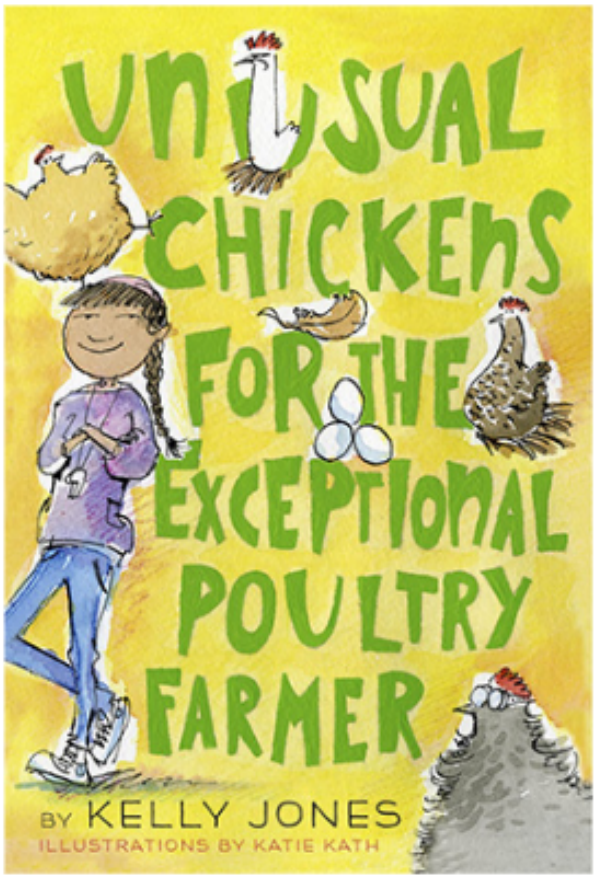
Discussion questions:

Something is very different about Stately Academy. Do you remember your first days of school? What was it like to be the new student, or go to a new school? What did you notice about the surroundings? What stuck out to you? Why?

Hopper & Eni have learned how to code the Turtle – that means give it instructions to follow. Have you ever had to follow instructions, or a pattern to get a specific result? Brainstorm the ways you follow instructions, or a pattern, to get a specific result (i.e. bake a cake, make cookies, play a sport, evening routine for going to sleep, etc.). Count how many sets of instructions you follow every day.

Return to Activity Grid

Unusual Chickens for the Exceptional Poultry Farmer



Twelve-year-old Sophie Brown feels like a fish out of water when she and her parents move from Los Angeles to the farm they've inherited from a great-uncle. Sophie, meanwhile, is learning to care for the chickens that once belonged to her Great Uncle Jim, only Uncle Jim's chickens prove to be far from ordinary. But when a respected local farmer tries to steal them, Sophie must find a way to keep them (and their superpowers) safe.

Discussion Questions:

What would you think if a jam jar floated off the ground? What would you do? Would you tell anyone?

Sophie's mom says it's a bad idea to tell people what you think while you're angry. Why do you think Sophie's mom thinks this? Do you agree?

How would you persuade your parents to let you keep a chicken: what are the pros and cons?

Return to Activity Grid

A Hundred Billion Trillion Stars

Did you know that the earth is covered in three trillion trees? And that seven billion people weigh about the same as ten quadrillion ants? Our world is full of constantly changing numbers, from a hundred billion trillion stars in space to thirty-seven billion rabbits on Earth. Can you imagine that many of anything?

Discussion Questions:

What kinds of things come in big numbers?

What is the biggest number you can think of?

Toward the close of the book, the author shares some “crazy” number facts, such as the 300 teeth in a great white shark’s mouth, or the fact that a person eats an average of 70 pounds of bugs in a lifetime! Brainstorm your own number questions, and then think of ways to find the answer.

Return to Activity Grid

Target 1000

Object of the Game

For each round, players choose 6 cards to make two 3-digit numbers that have a sum (a total when added) as close to 1,000 as possible. The score for each round is the difference between a player's sum and 1,000. The player with the lower total score after 3 rounds wins the game.

Materials

- Deck of cards containing four each of the numbers 1 to 9
  Print a set of number cards, use the 2–9 cards and aces as 1s from a deck of playing cards, or make your own cards.
- Pencil or pen
- Paper to keep track of the game as shown, or print a Target 1,000 Record Sheet

How to Play

1. Mix up the cards. Players take turns drawing cards until each has 8 cards.
2. Each player chooses 6 of their cards to make two 3-digit numbers. The goal is to make numbers that will have a sum (a total when added) as close to 1,000 (over or under) as possible.
3. Players add their numbers.
4. The difference between a player's total and 1,000 is their score for the first round.
5. After three rounds, players add their three scores. The player with the lesser total wins.

Tips for Players and Families

- Before you play, talk about numbers that add to 1,000. What are some pairs of numbers you can think of that have a sum of 1,000?
- Talk about how you're choosing your numbers. There is a lot of strategy involved!
- Students may have addition strategies not familiar to you, like making jumps on a number line, or breaking apart numbers by place value. Ask questions if you don't understand a strategy. It's always interesting to learn something new.

Change It Up

Making even small changes to a game can invite new ways of thinking about the math. Try making one of the changes below. How did it change your strategy for winning the game?

- Choose a different target number, such as 800 or 1,500.
- Change the cards you're using. For example, take out all the 4s

Adapted from:
https://www.mathlearningcenter.org/sites/default/files/pdfs/home-learning/family-games/FamilyGames_Target1000.pdf

Return to Activity Grid

1	1	1
1	2	2
2	2	3

3	3	3
4	4	4
4	5	5

5	5	6
6	6	6
7	7	7

7	8	8
8	8	9
9	9	9

Target 1,000 Record Sheet

	Name _____	Name _____
Round 1		
Total Score		
Round 2		
Total Score		
Round 3		
Total Score		
TOTAL SCORE		

Panda Squares

Print a set of Panda Square Tiles

Small (16 per page) Medium (4 per page) Large (1 per page)

Arrange all of the 16 tiles into a 4 by 4 square so that the colors match along the edges of tiles next to each other.

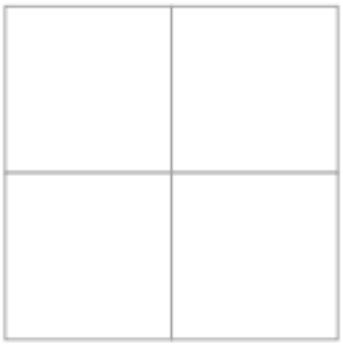
How many different arrangements can you find?

Original Puzzle Source: Ivan Moscovich's Super Games

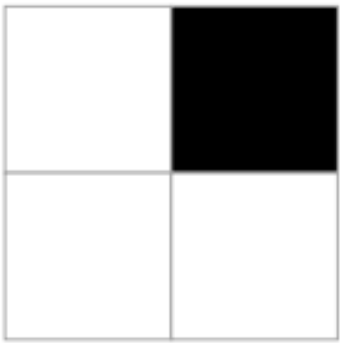
Puzzle Piece Source: David Butler, The University of Adelaide's Maths Learning Centre
https://blogs.adelaide.edu.au/maths-learning/2016/10/19/panda-squares/

Return to Activity Grid

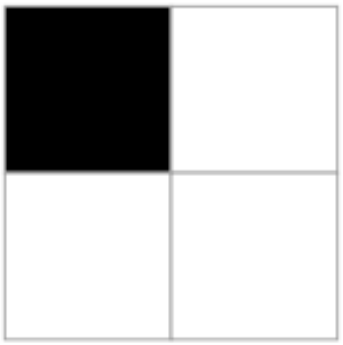
PANDA SQUARES



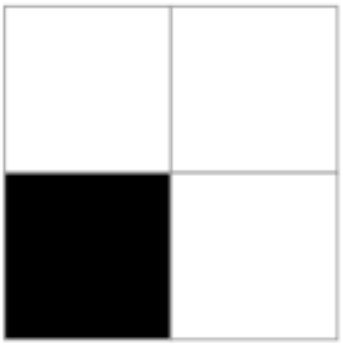
PANDA SQUARES



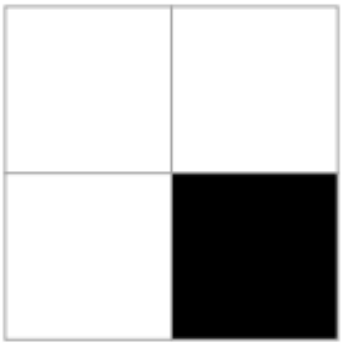
PANDA SQUARES



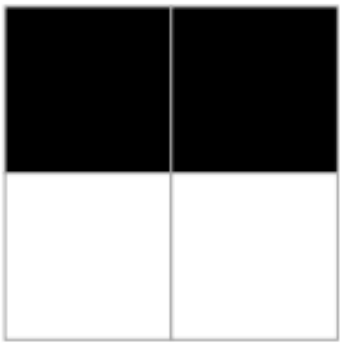
PANDA SQUARES



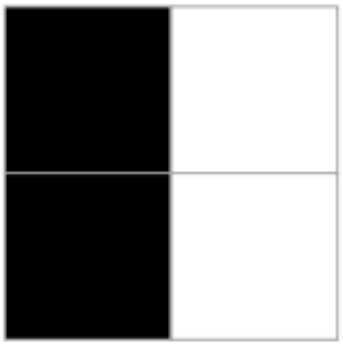
PANDA SQUARES



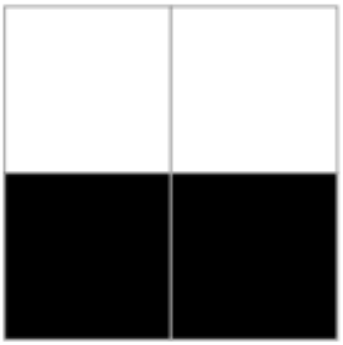
PANDA SQUARES



PANDA SQUARES

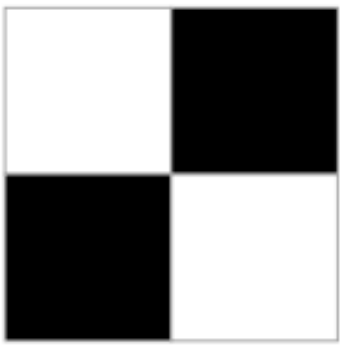


PANDA SQUARES

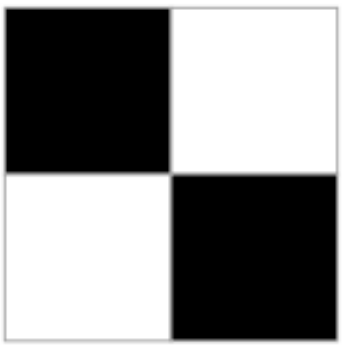


PANDA SQUARES

PANDA SQUARES

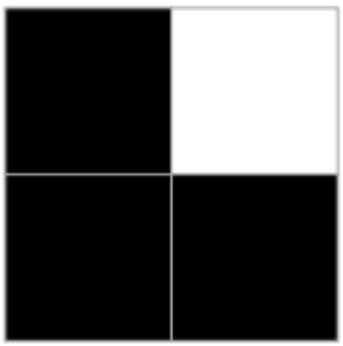


PANDA SQUARES

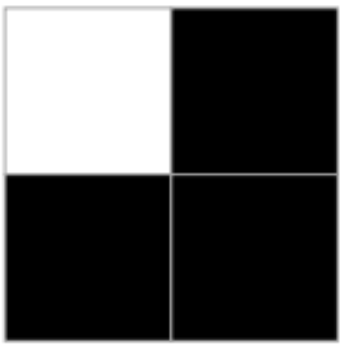


PANDA SQUARES

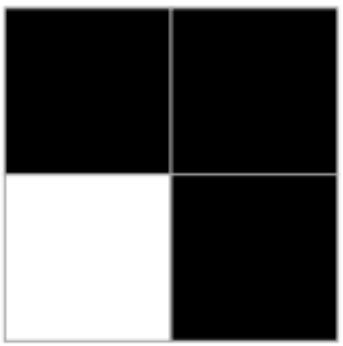
PANDA SQUARES



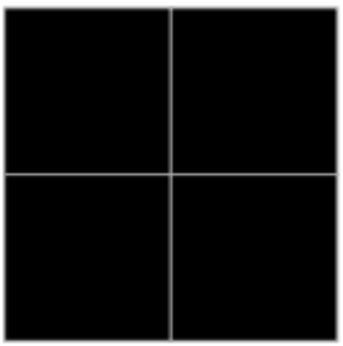
PANDA SQUARES



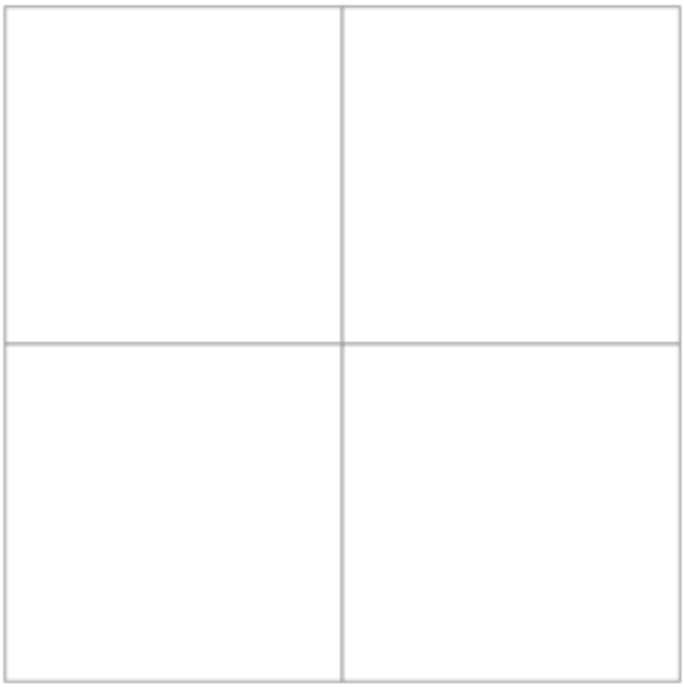
PANDA SQUARES



PANDA SQUARES

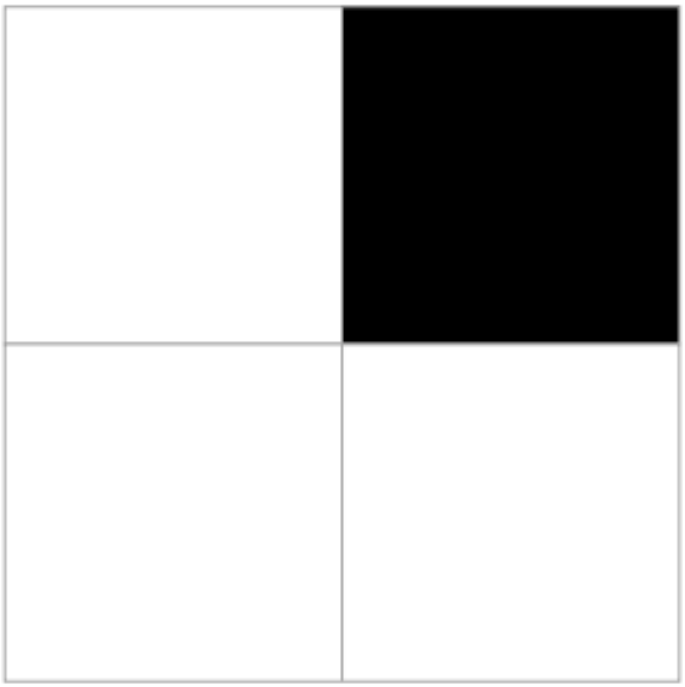


PANDA SQUARES



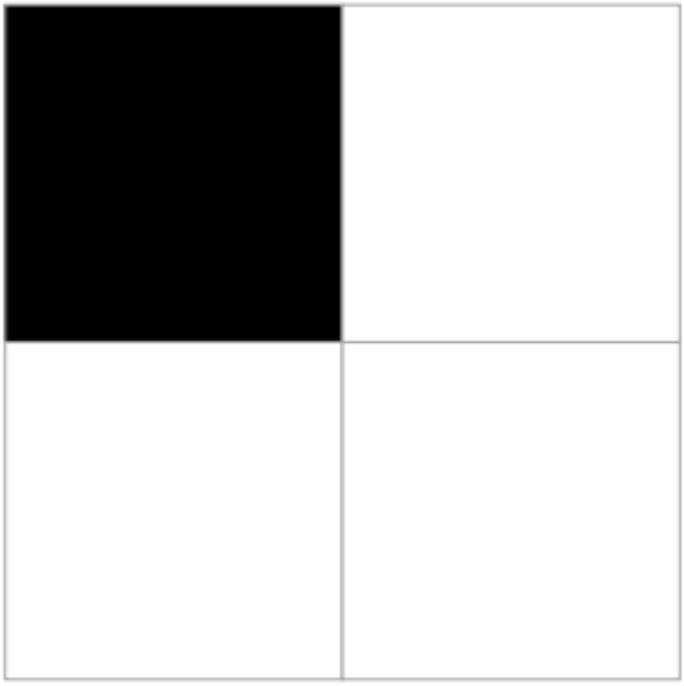
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



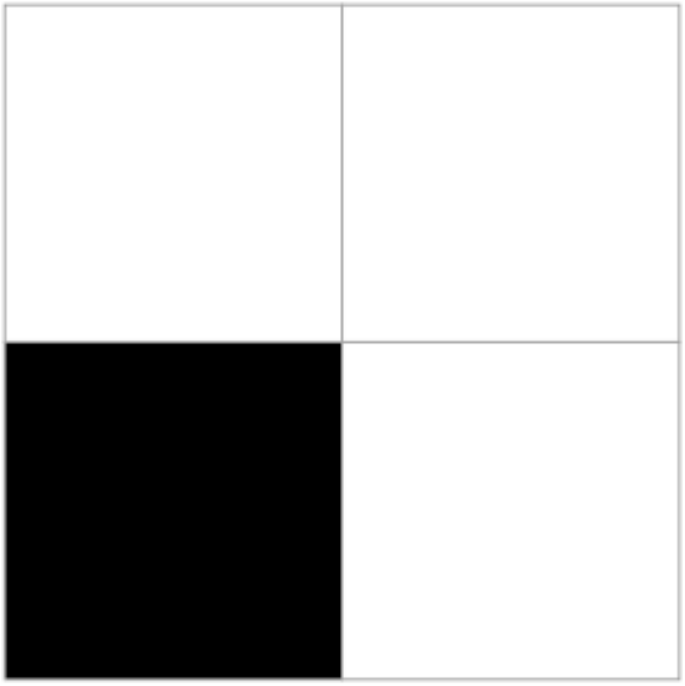
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



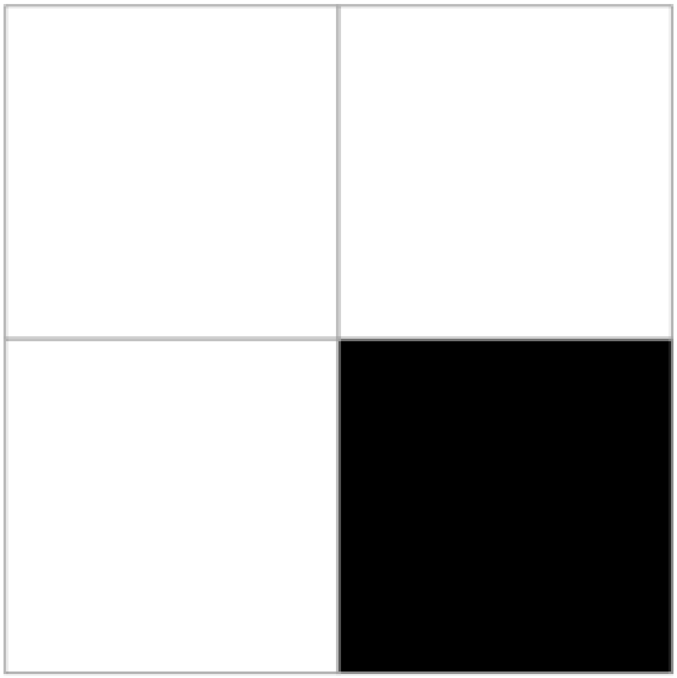
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



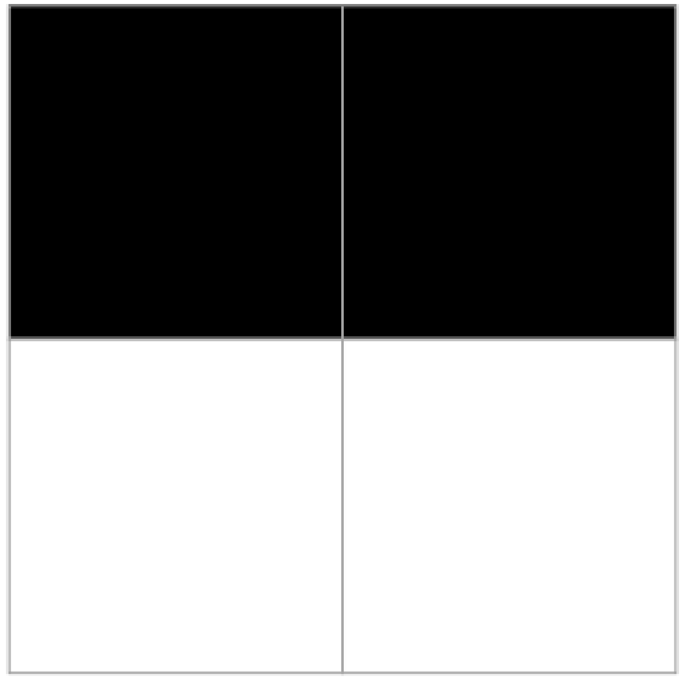
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



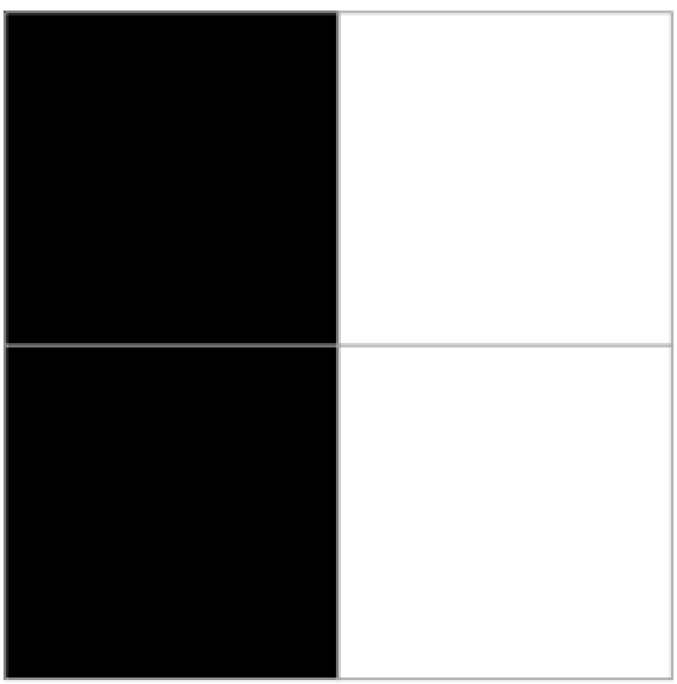
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



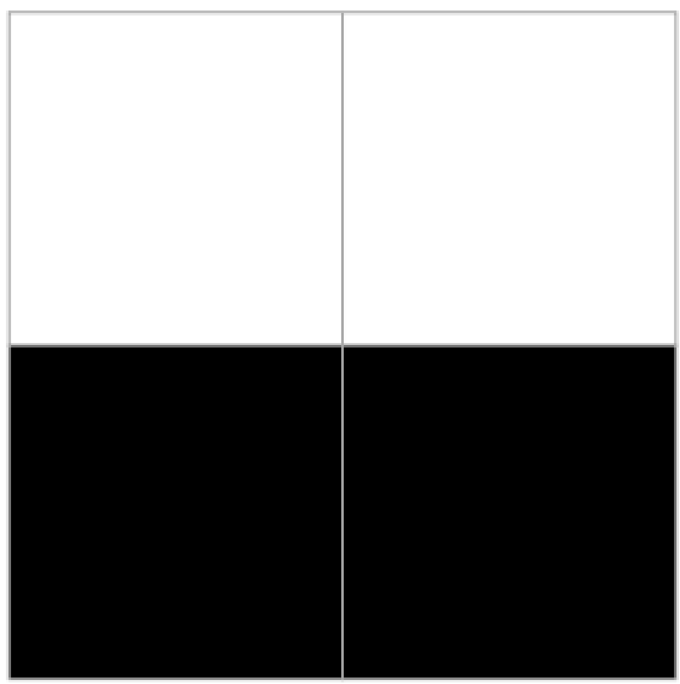
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



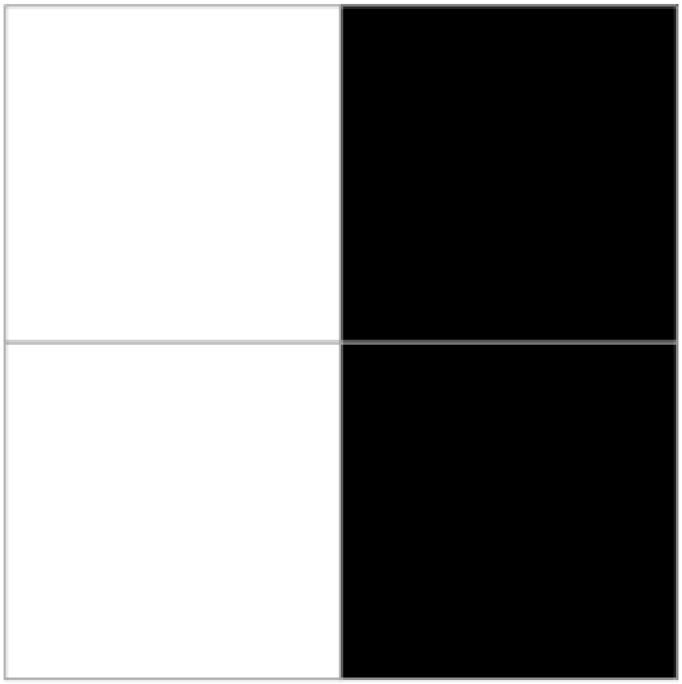
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



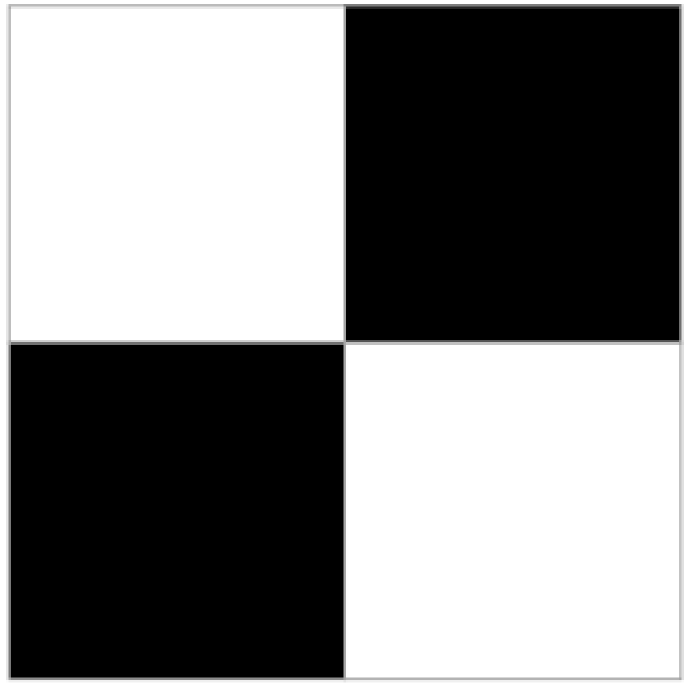
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



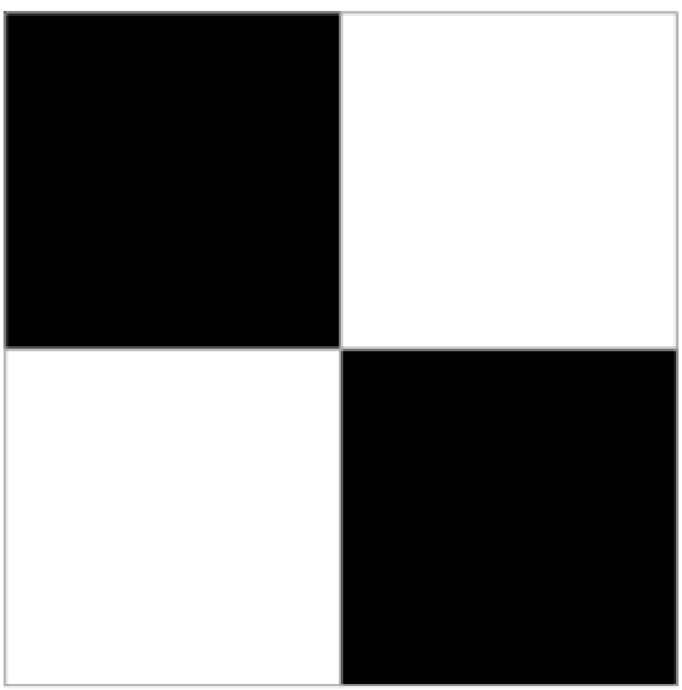
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



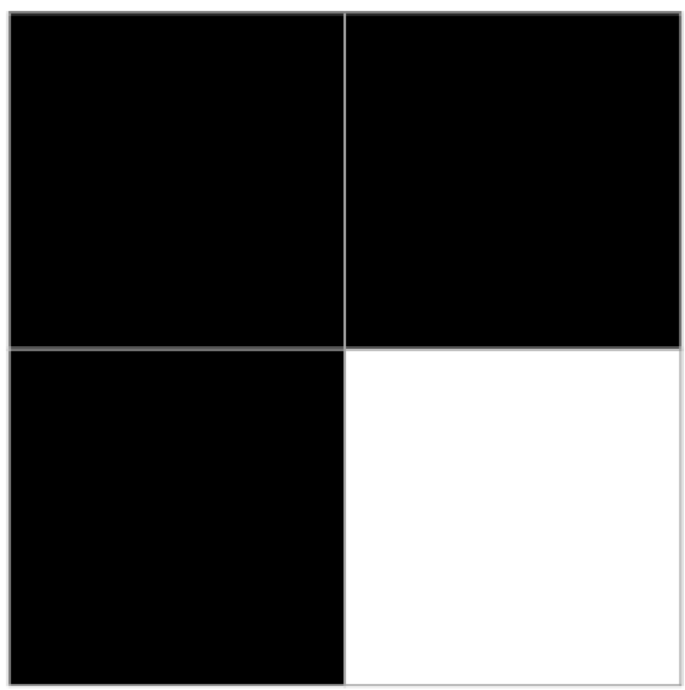
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



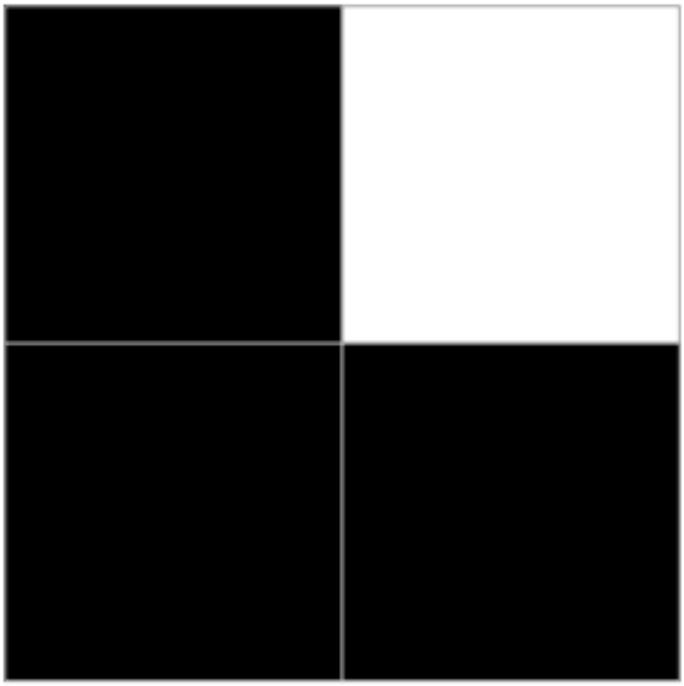
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



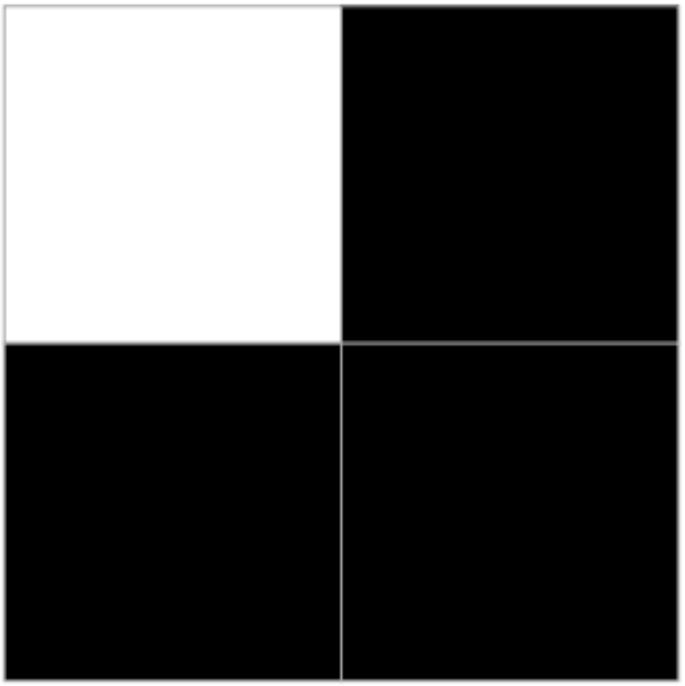
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



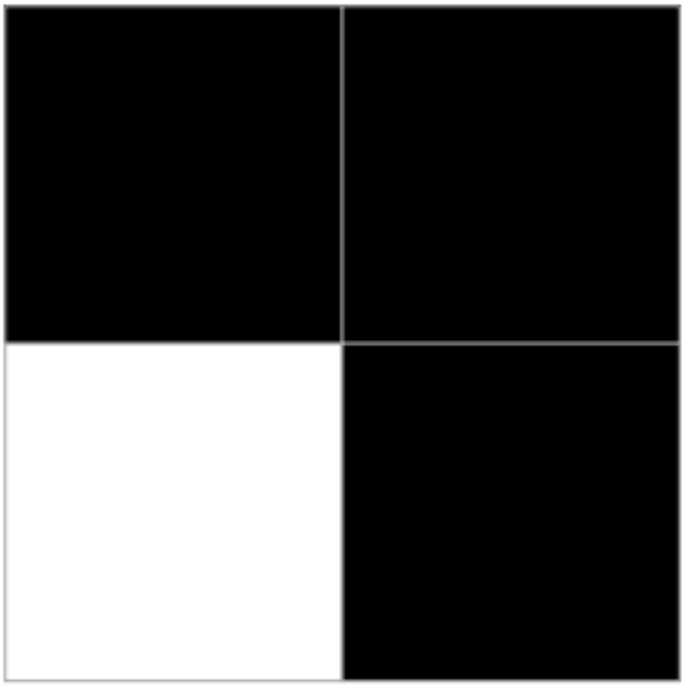
Based on "Bits" from Ivan Moscovich's *Super Games* (Hutchinson, 1984)

PANDA SQUARES



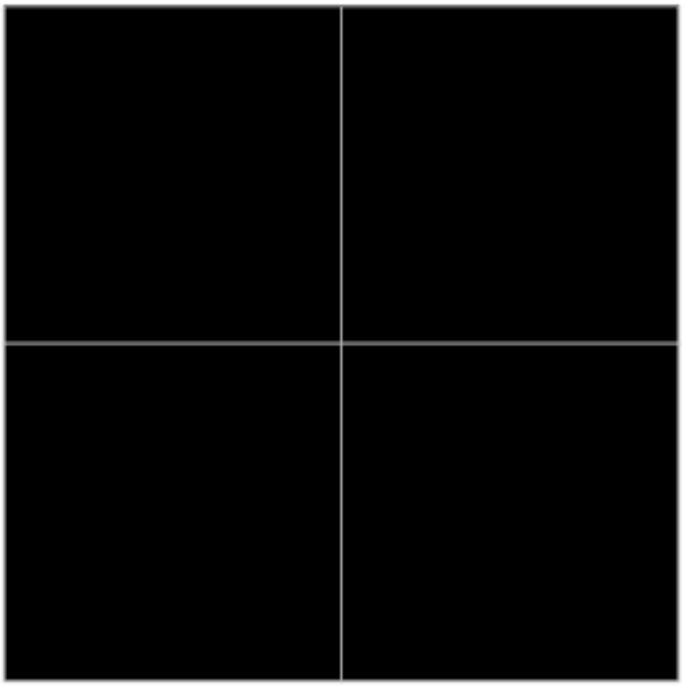
Based on "Bits" from Ivan Moscovich's *Super Games* (Hutchinson, 1984)

PANDA SQUARES



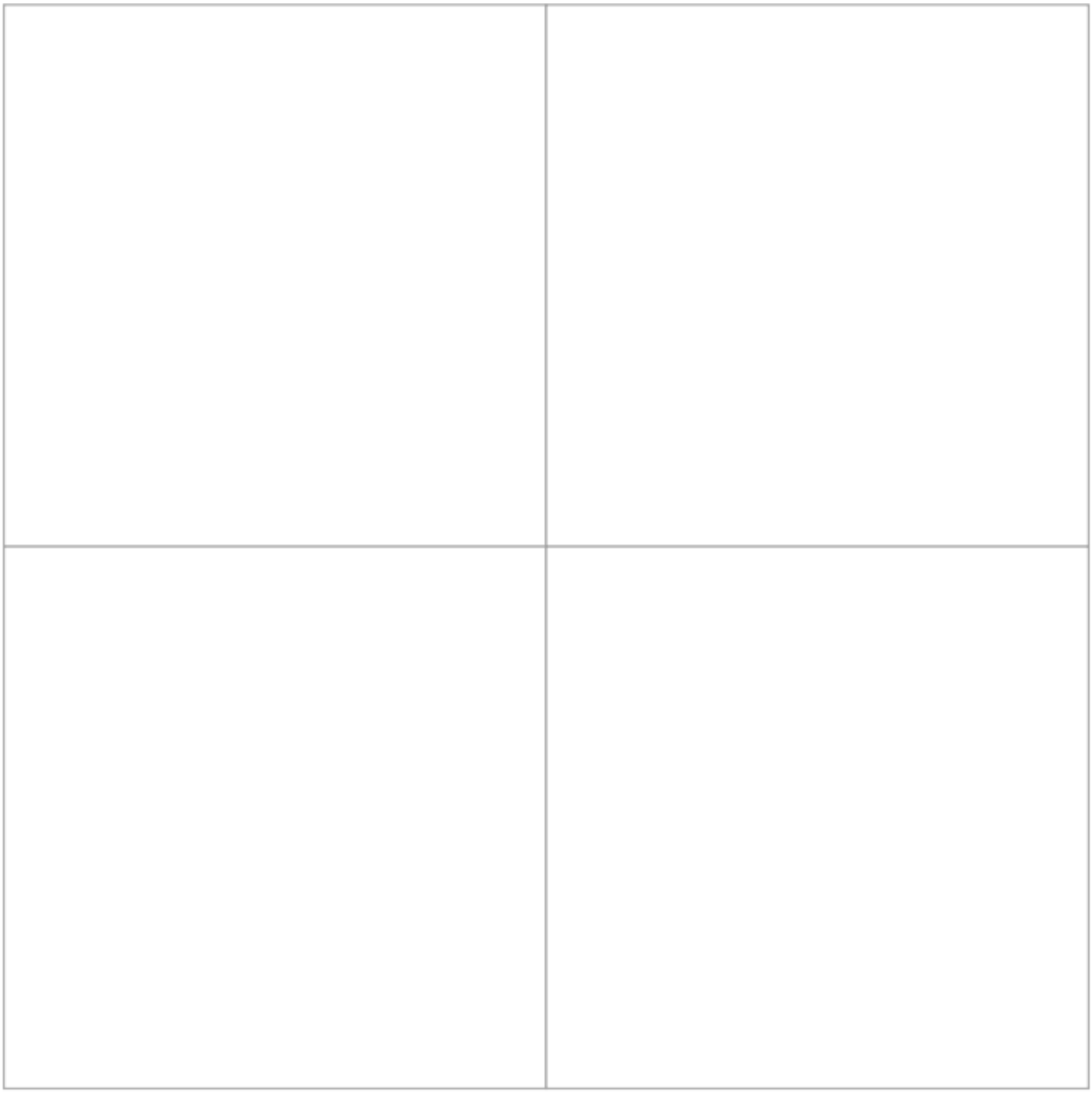
Based on "Bits" from Ivan Moscovich's *Super Games* (Hutchinson, 1984)

PANDA SQUARES



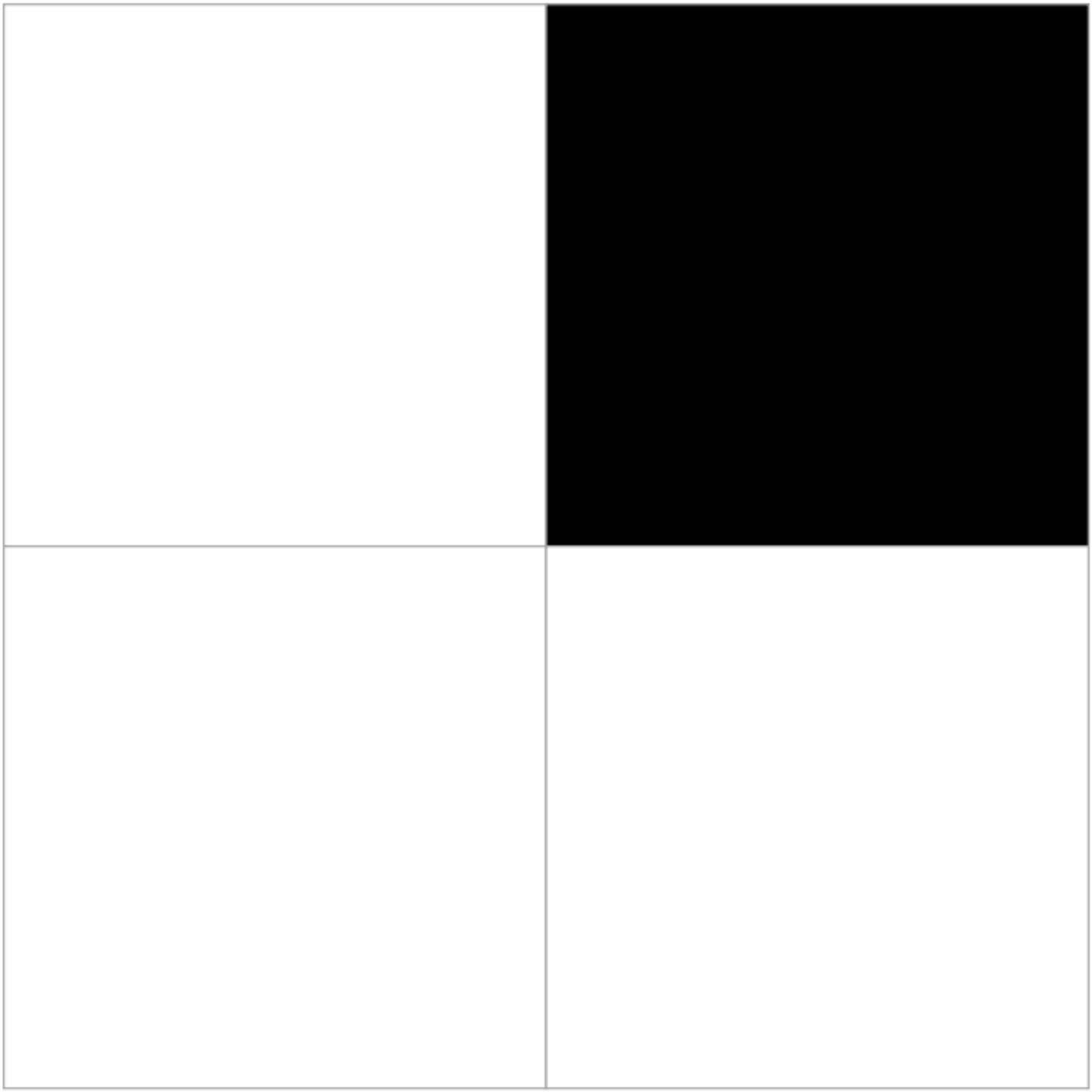
Based on "Bits" from Ivan Moscovich's *Super Games* (Hutchinson, 1984)

PANDA SQUARES



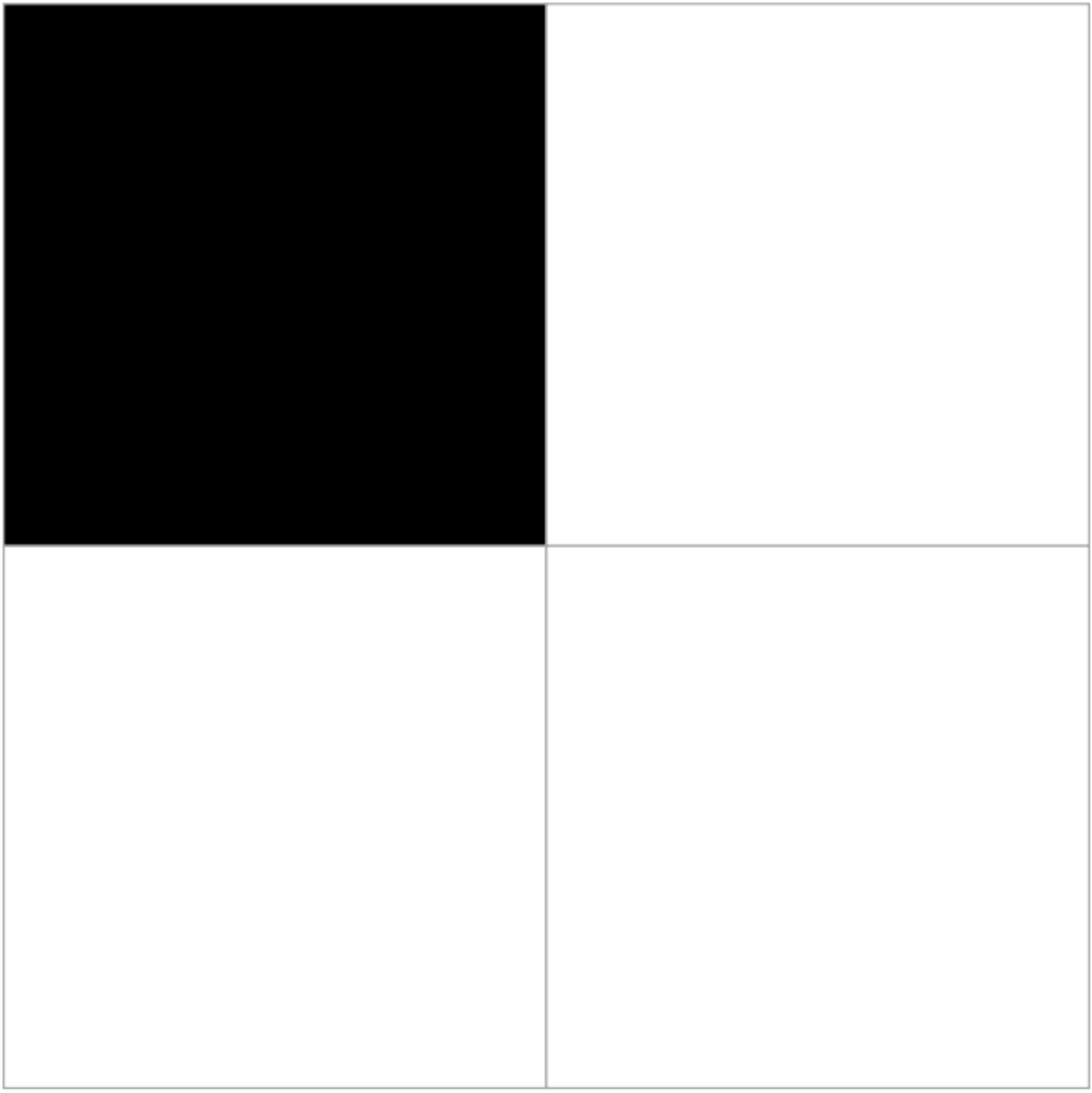
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



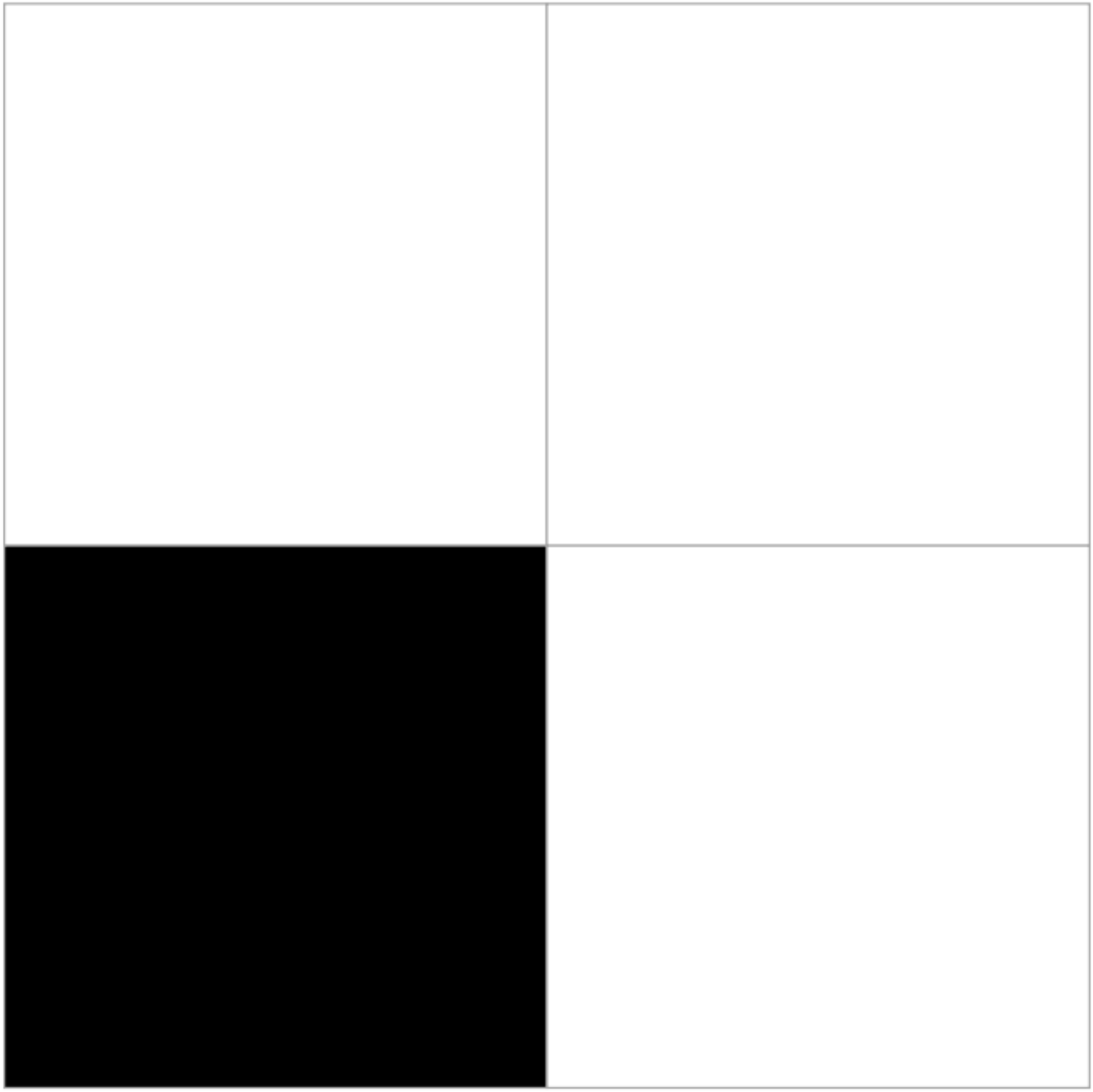
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



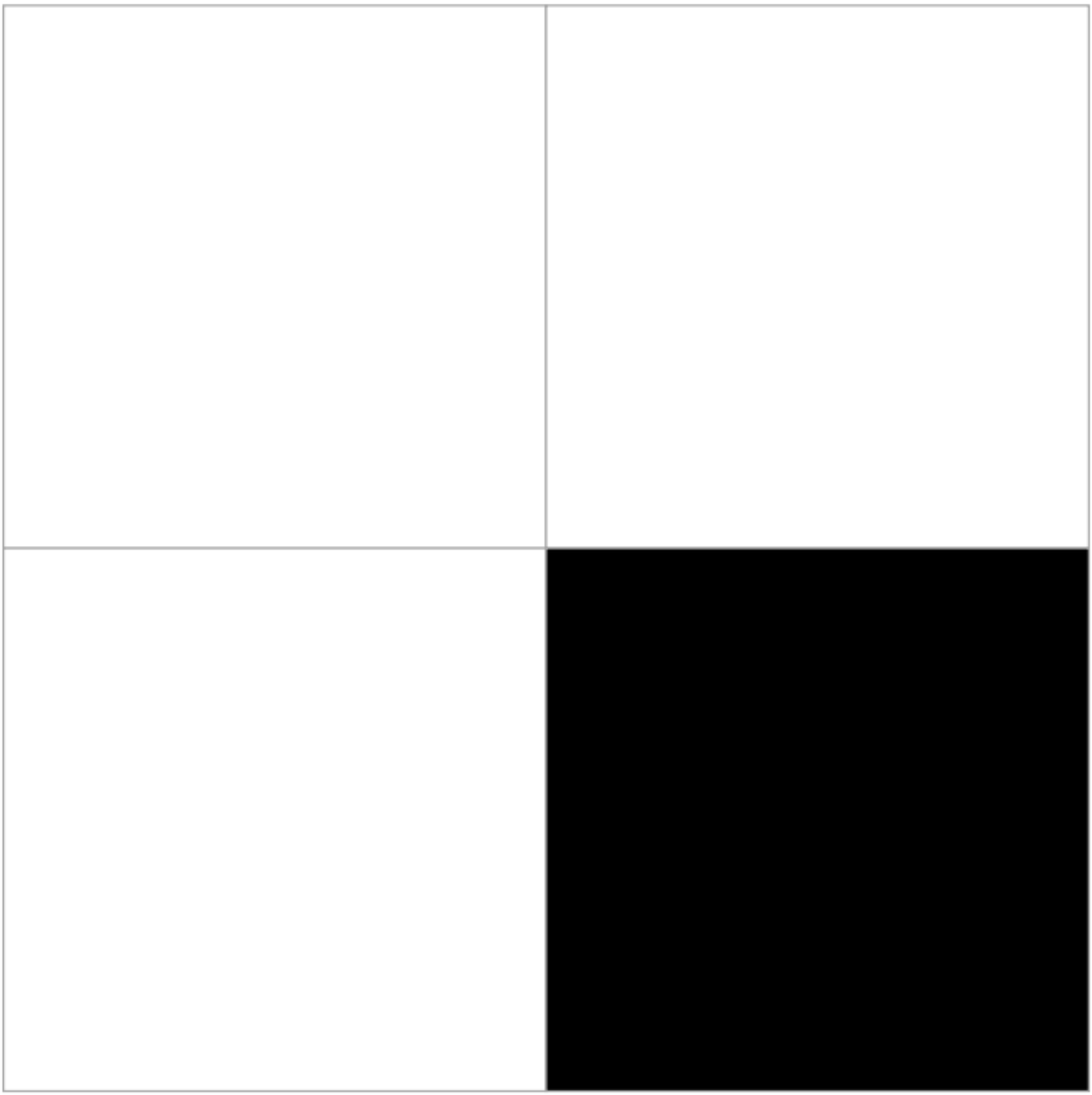
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



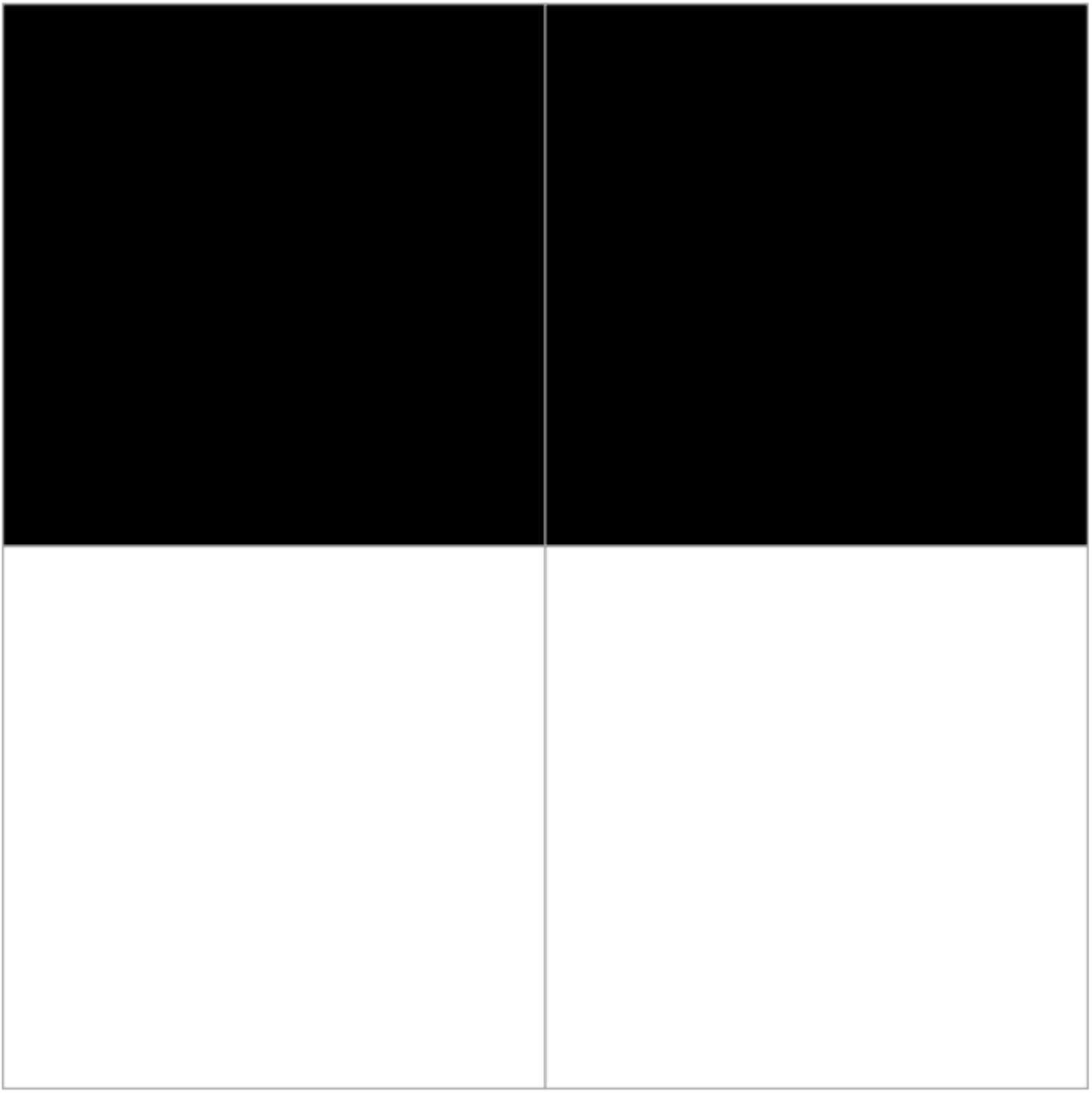
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



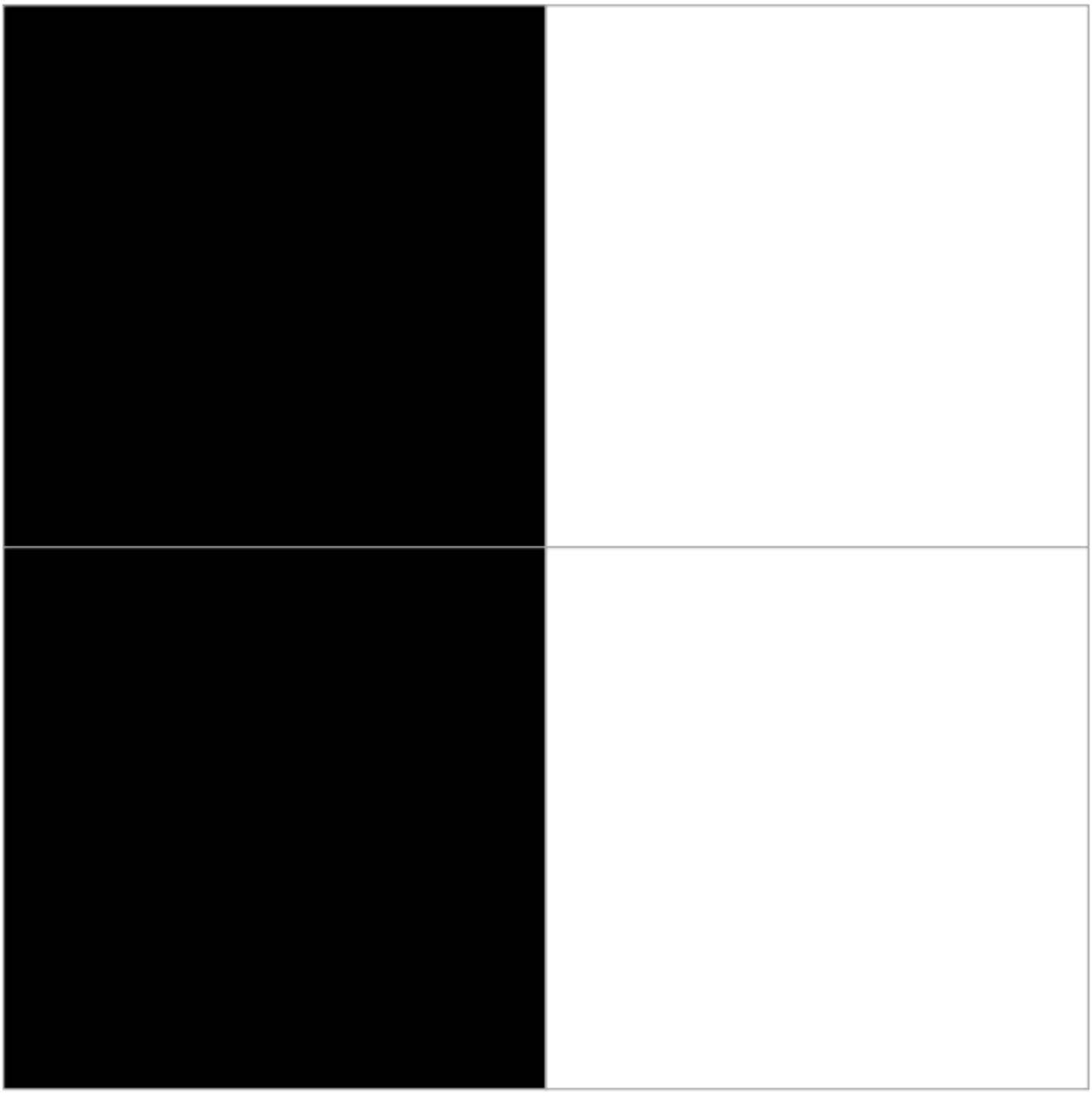
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



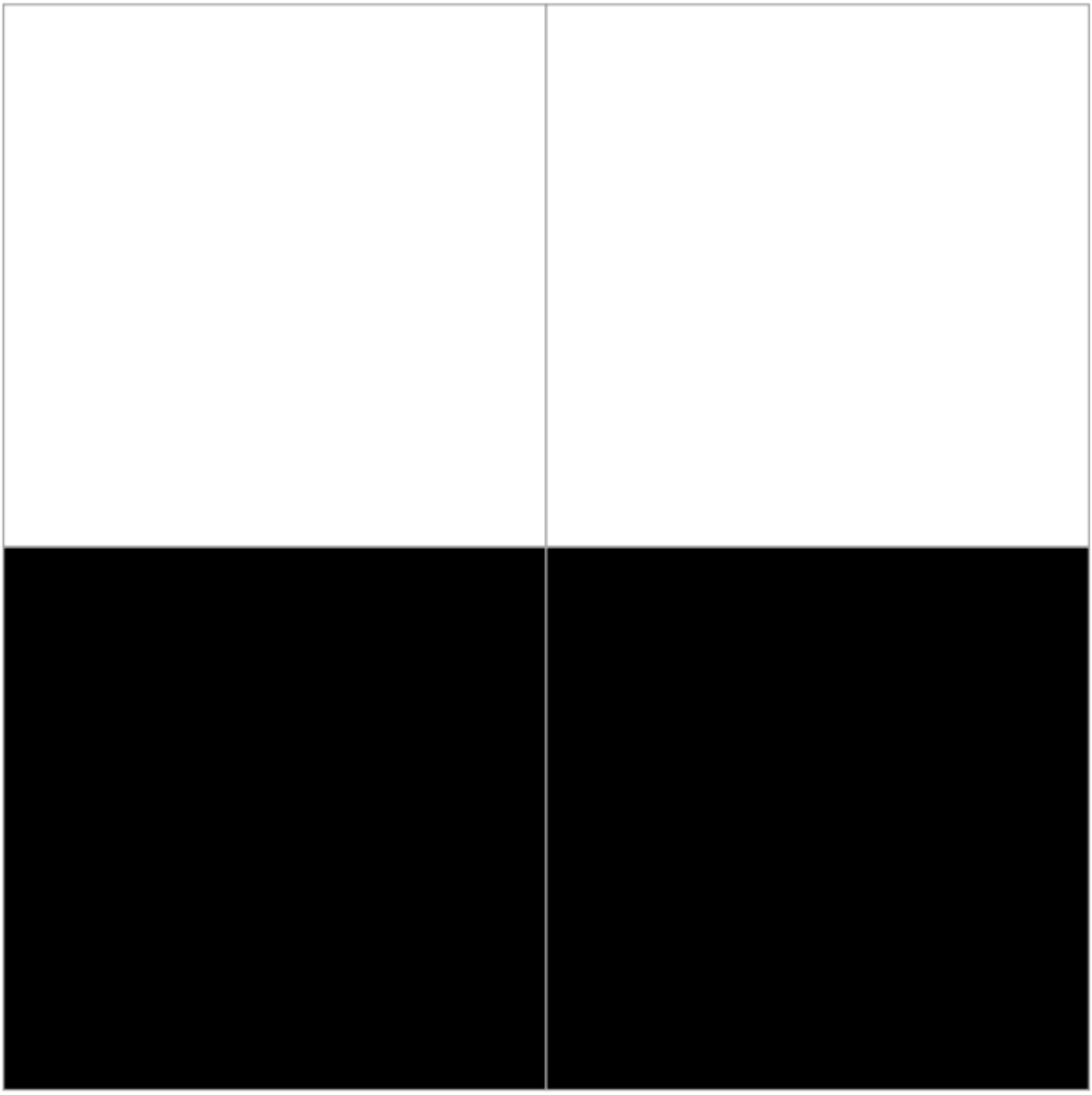
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



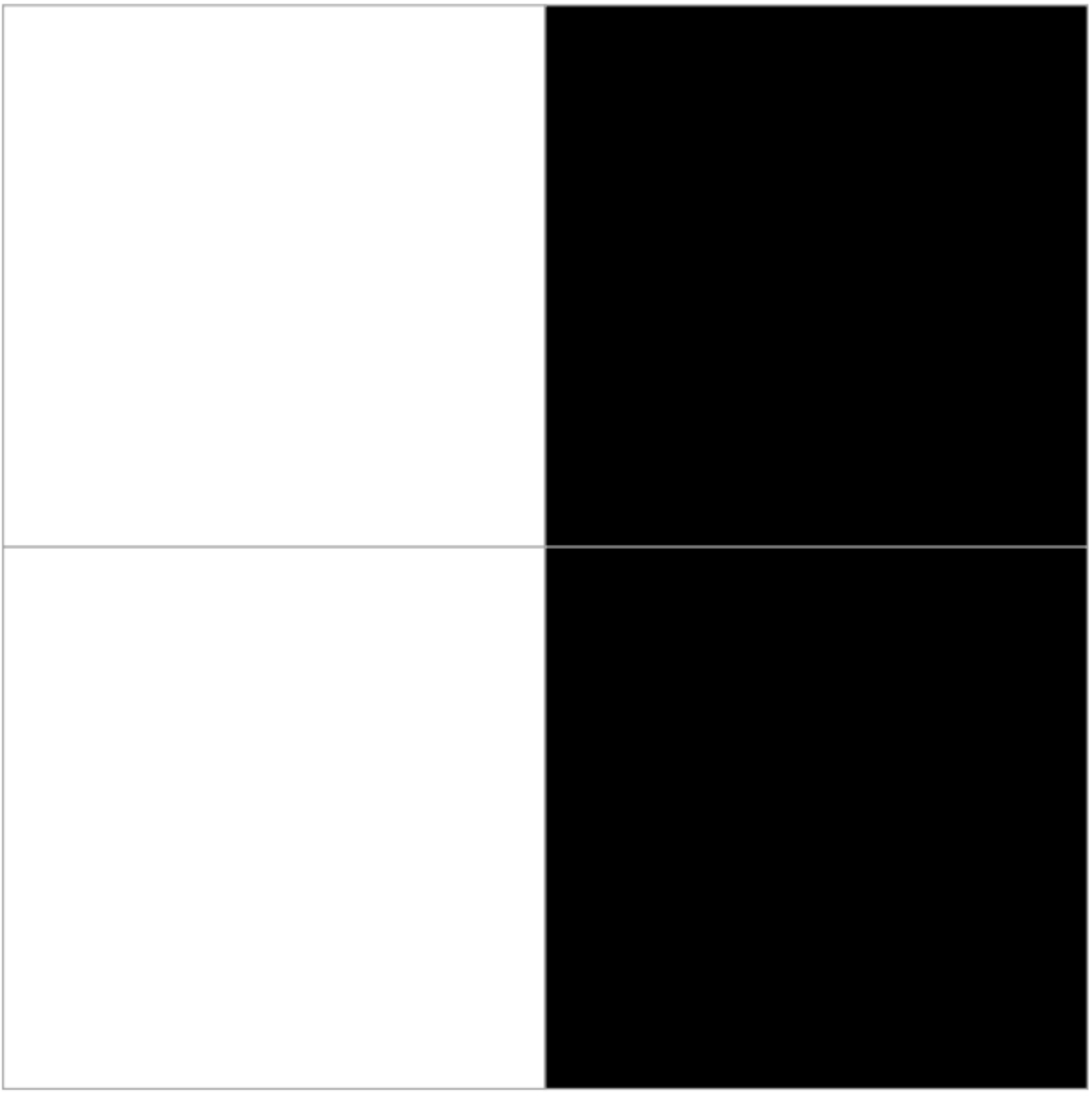
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



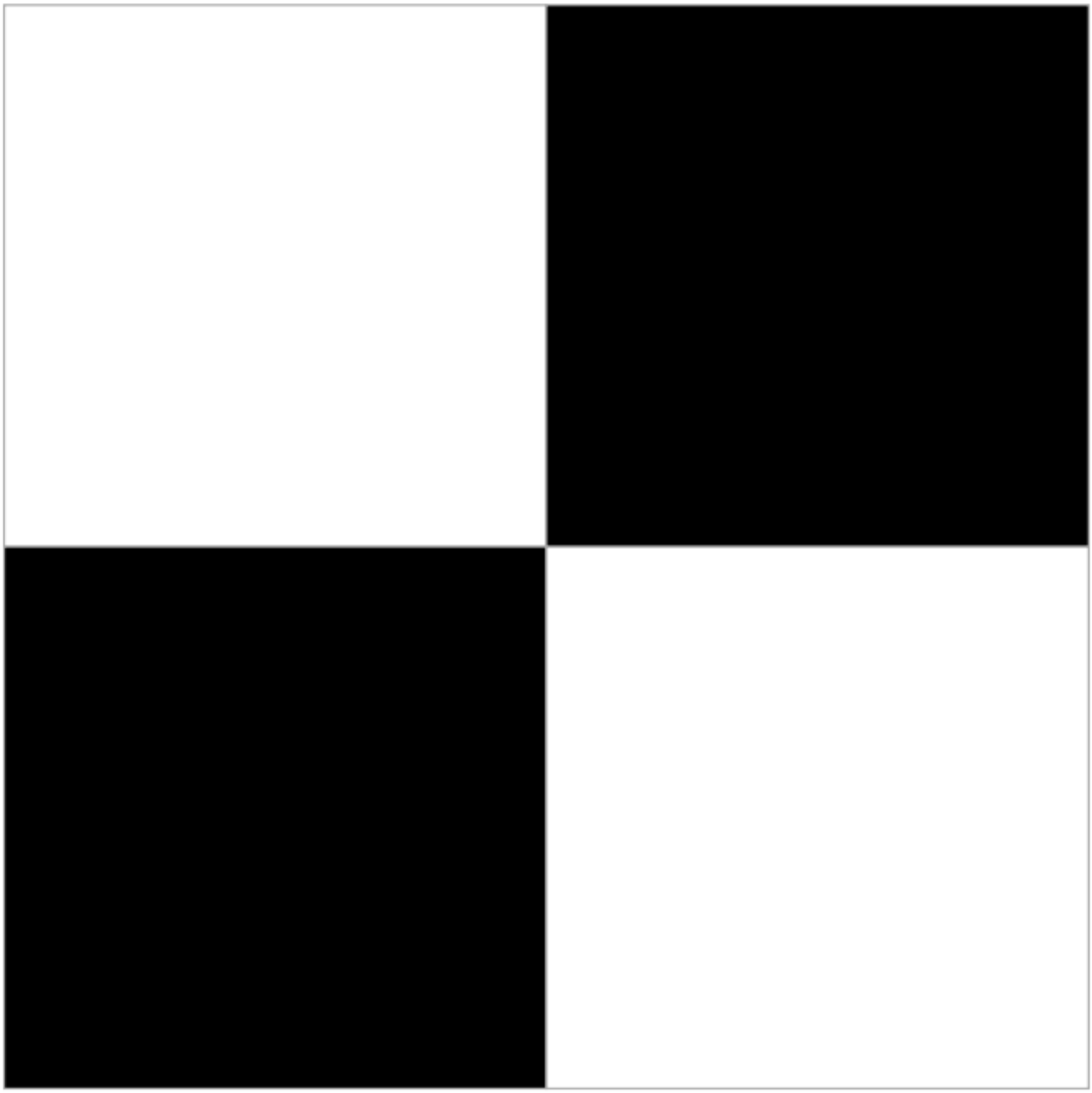
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



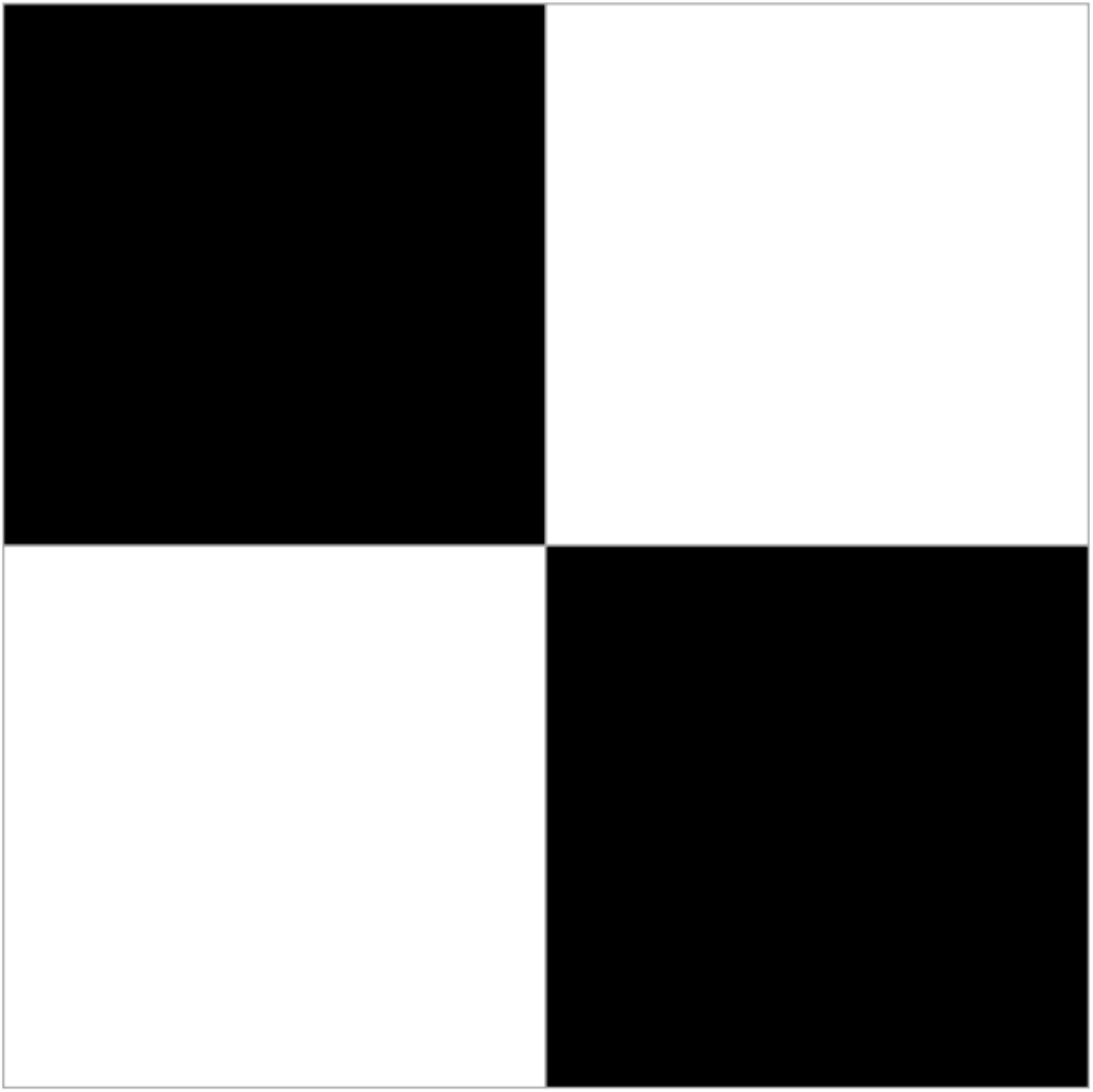
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



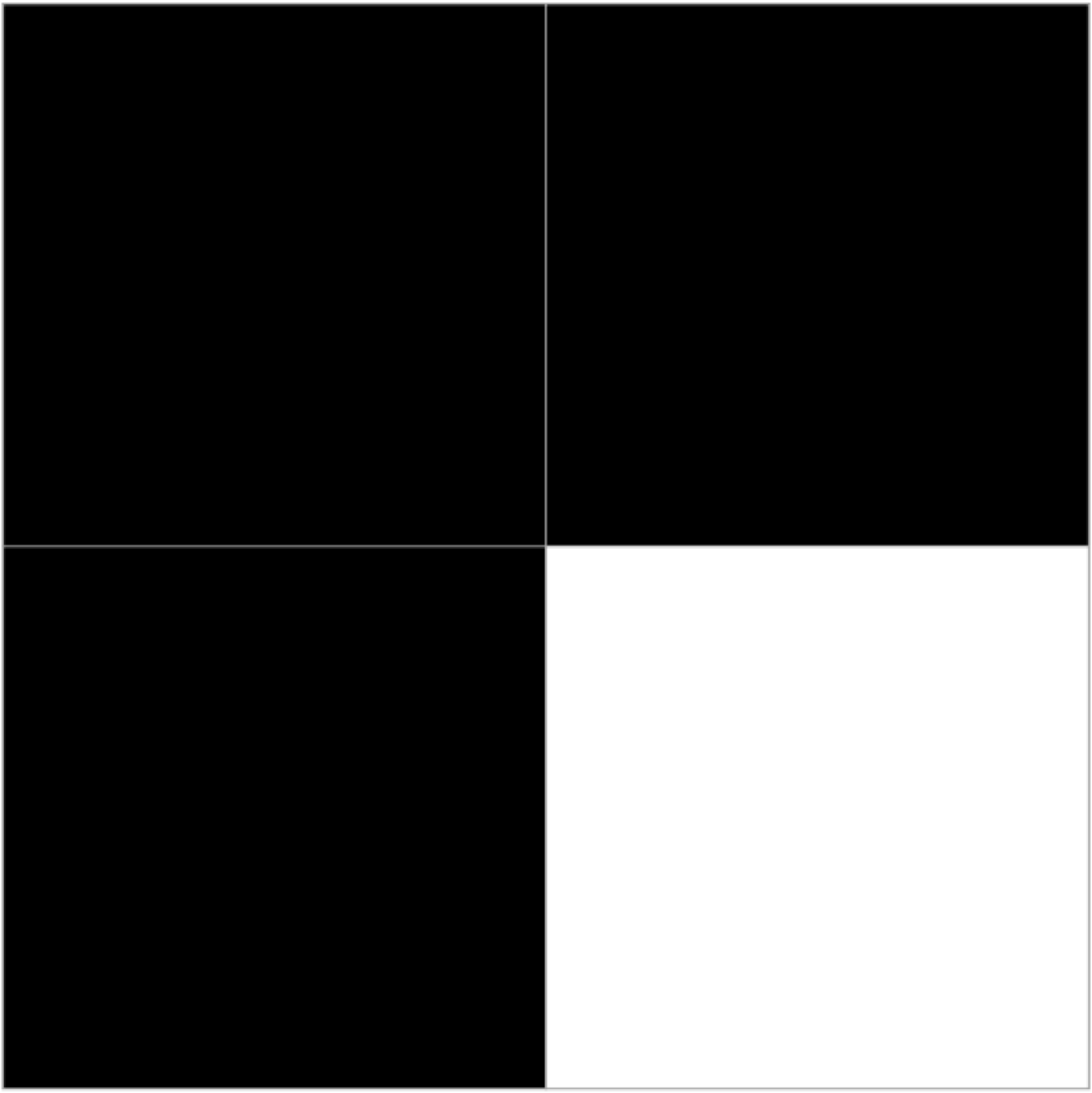
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



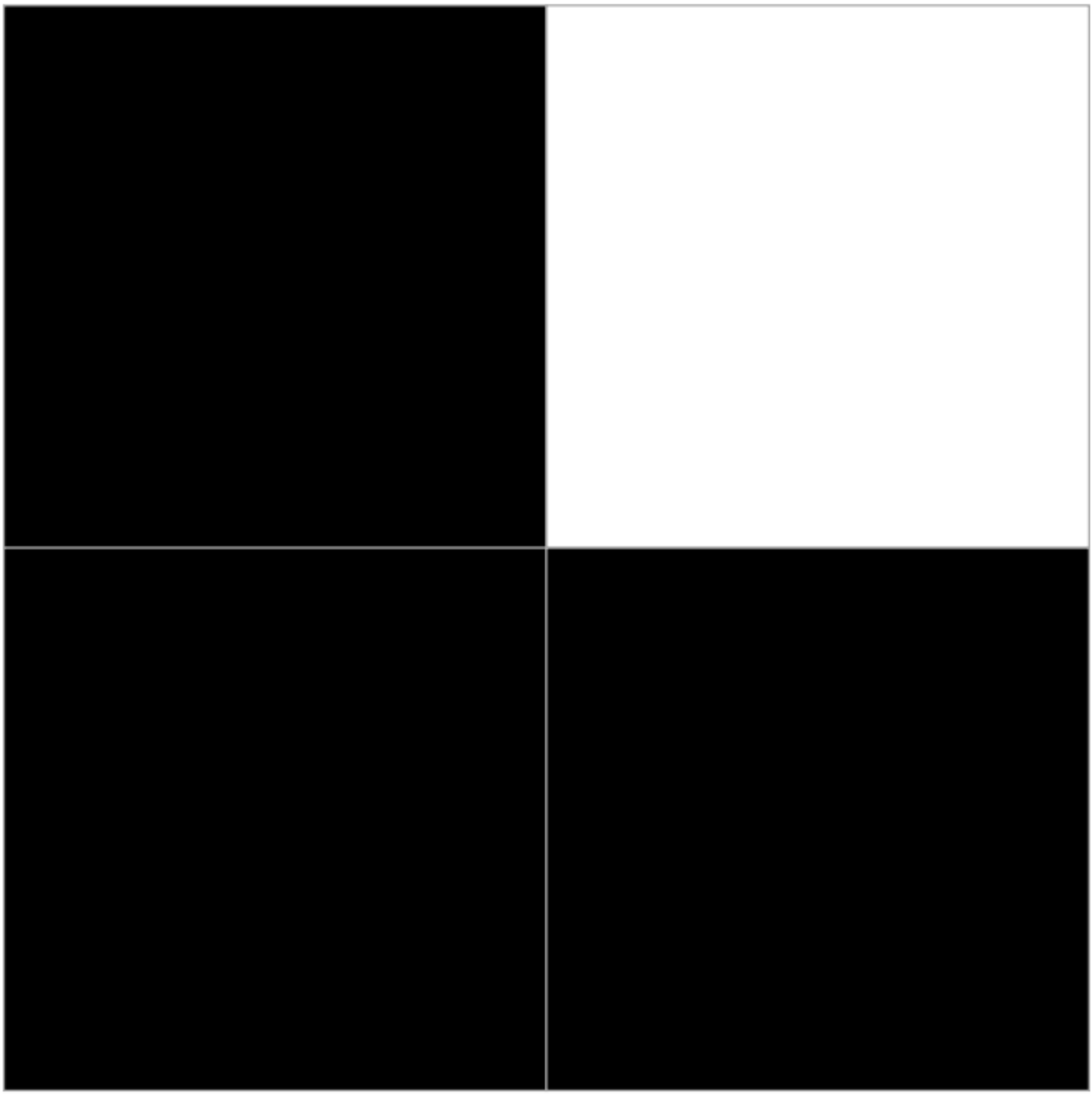
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



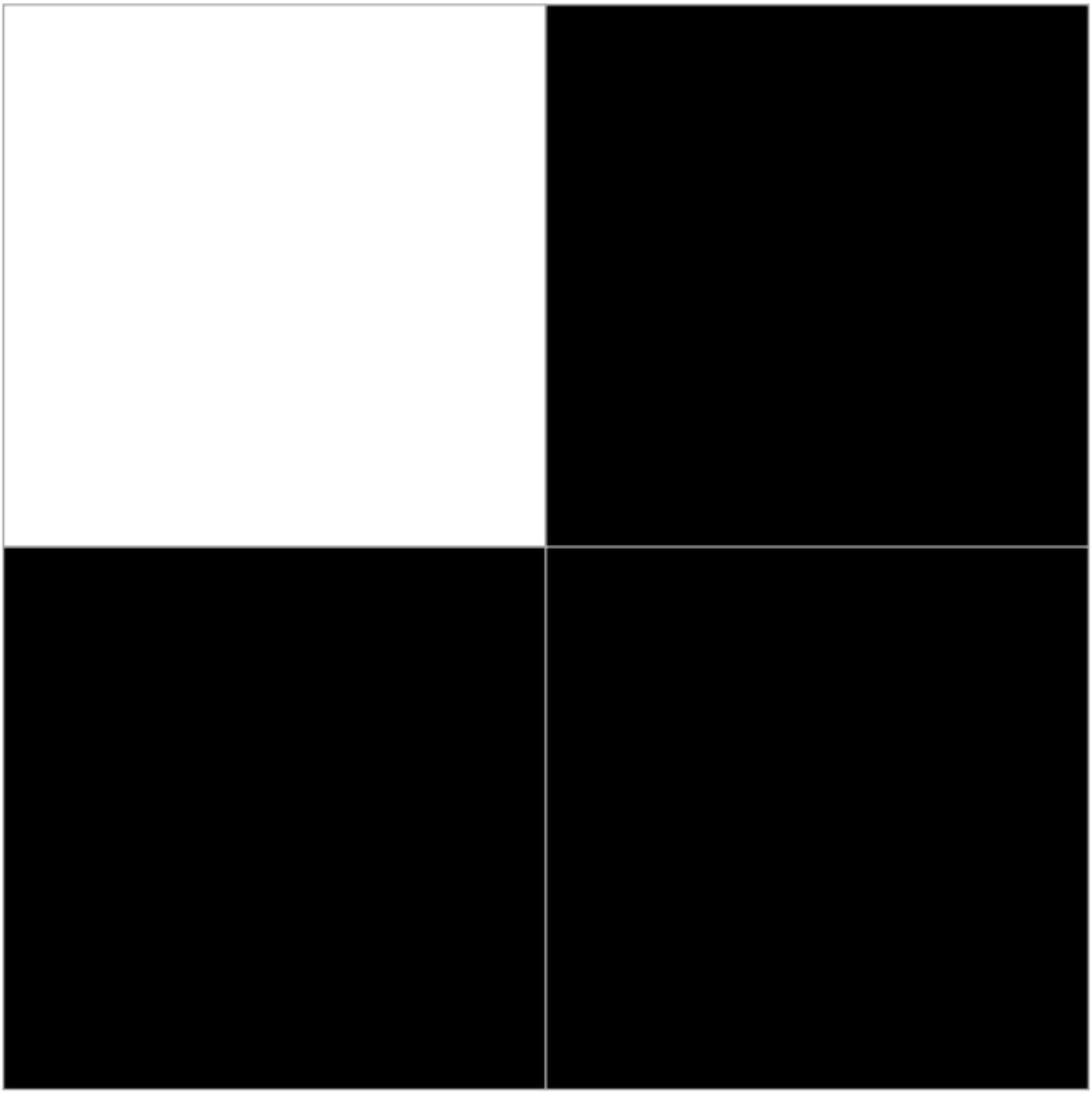
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



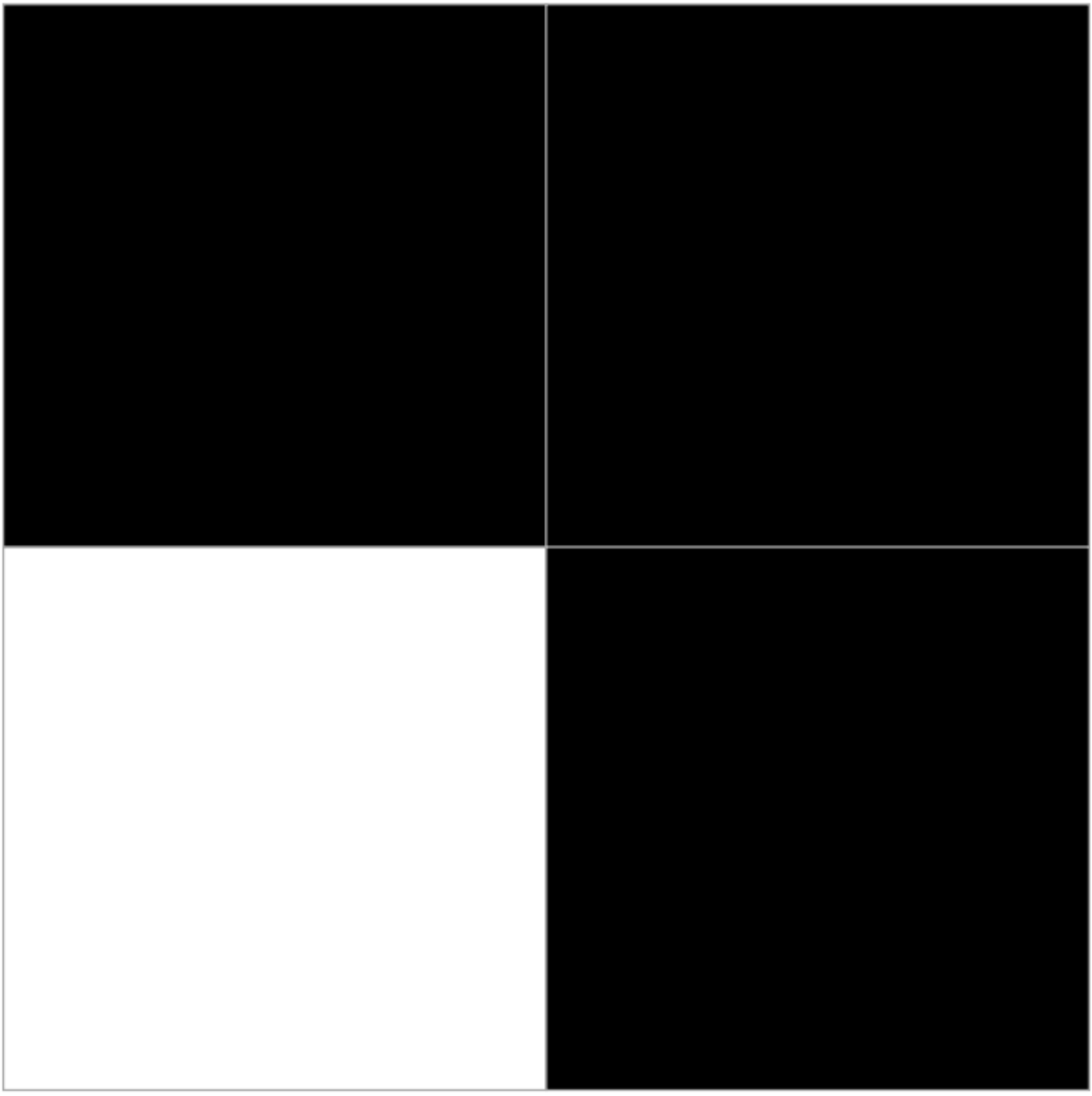
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



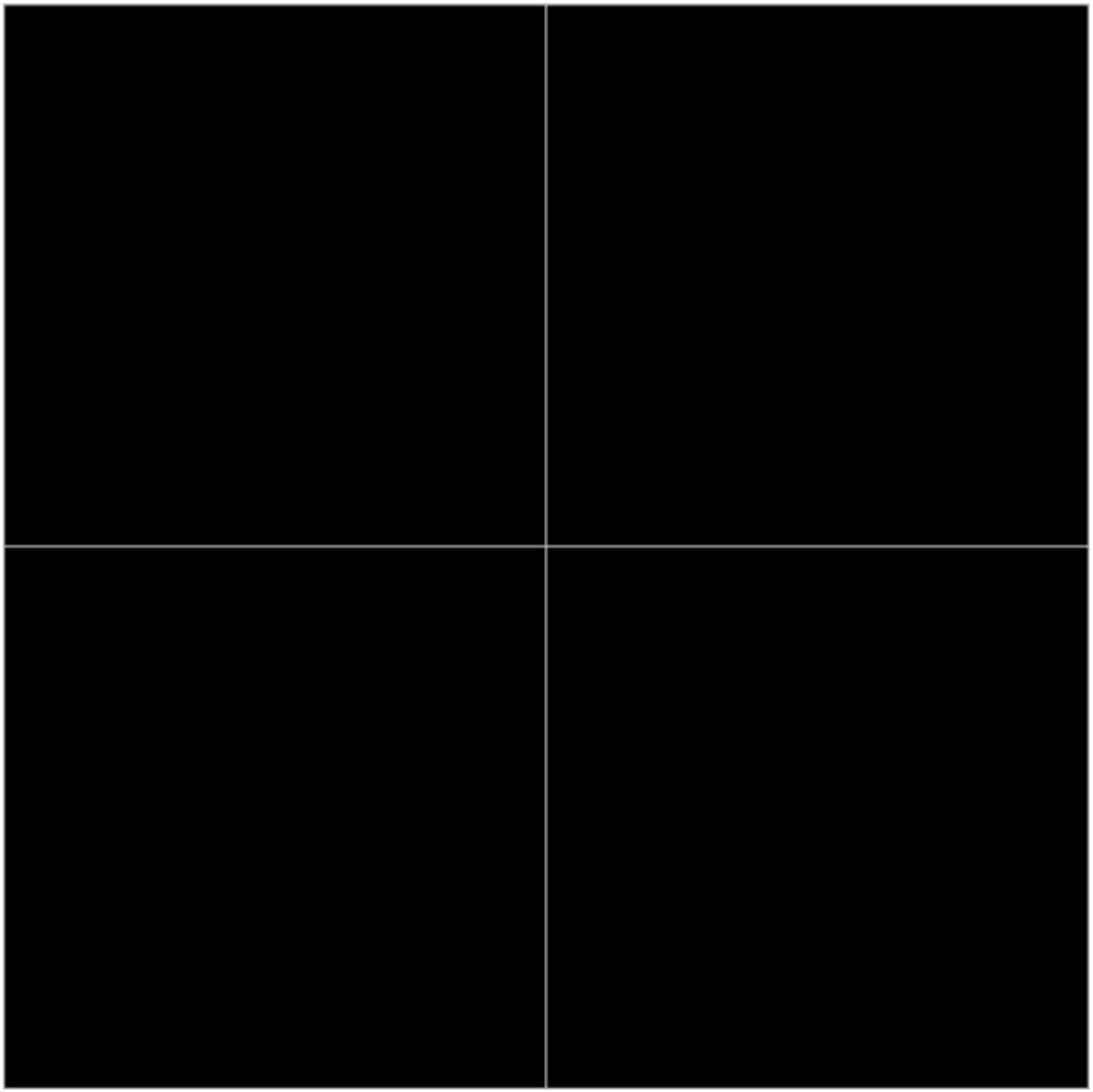
Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

PANDA SQUARES



Based on "Bits" from *Ivan Moscovich's Super Games* (Hutchinson, 1984)

Nim Games

Materials: 7 small objects like coins, buttons or beans

How to Play:

- Place the seven objects in a line and decide who will go first. (In the next game, the other player will have the first turn!)
- Each player takes it in turns to take away either one counter or two counters.
- The player that has the last turn wins

Play several times so that you get a good 'feel' for the game.

Are there any points in the game, before the end, when you know who the winner is going to be? How do you know?

Can you find a way to play so that you are sure you will win right from the start?

Does it matter who has the first turn? Why or why not?

Variations

- Change the total number of objects
- 1-2-3 Nim: players may take one, two, or three counters per turn.
- Poison: Whoever takes the last counter loses.

Adapted from https://mathforlove.com/lesson/1-2-nim/

Return to Activity Grid

How Close to 100?

Materials

- Two dice
- Recording sheet

How to Play

- This game is played in partners. Two children share a blank 100 grid.
- The first partner rolls two number dice.
- The numbers that come up are the numbers the child uses to make an array on the 100 grid.
- They can put the array anywhere on the grid, but the goal is to fill up the grid to get it as full as possible.
- After the player draws the array on the grid, she writes in the number sentence that describes the grid.
- The second player then rolls the dice, draws the number grid and records their number sentence.
- The game ends when both players have rolled the dice and cannot put any more arrays on the grid.

How close to 100 can you get?

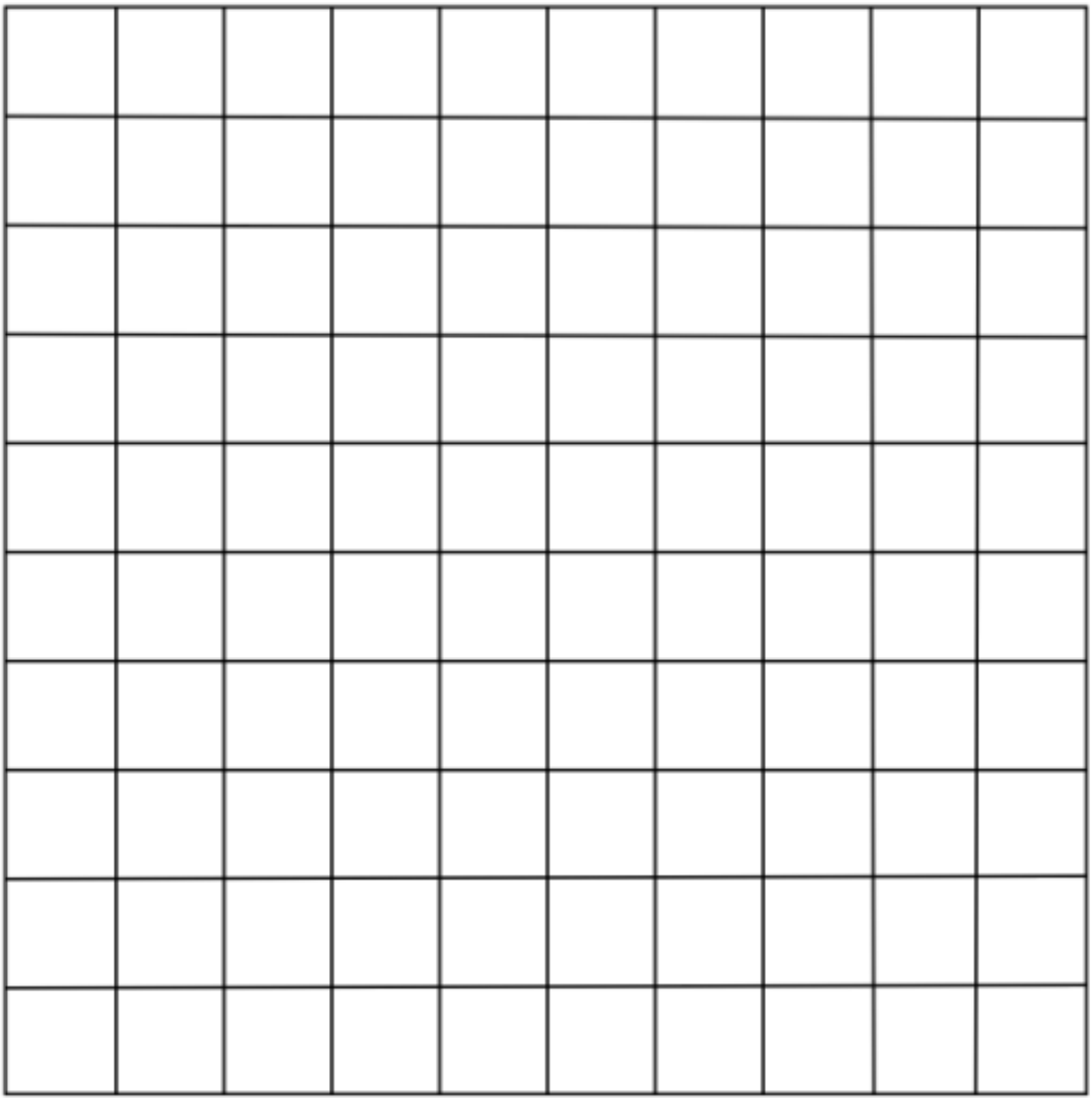
Variation

Each child can have their own number grid. Play moves forward to see who can get closest to 100.

Return to Activity Grid

youcubed
at Stanford University

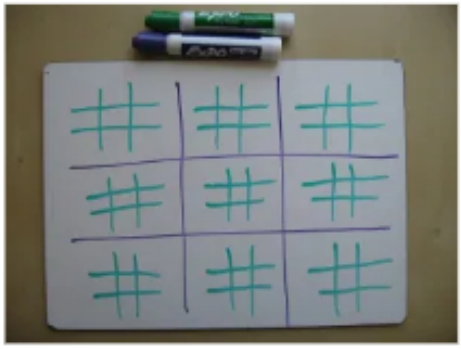
How Close to 100?



1. _____ x _____ = _____
2. _____ x _____ = _____
3. _____ x _____ = _____
4. _____ x _____ = _____
5. _____ x _____ = _____
6. _____ x _____ = _____
7. _____ x _____ = _____
8. _____ x _____ = _____
9. _____ x _____ = _____
10. _____ x _____ = _____

Ultimate Tic-Tac-Toe

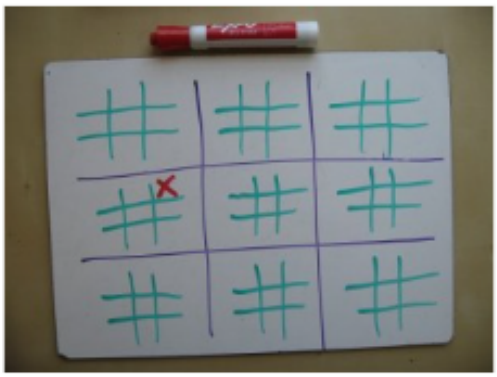
This game is played on a tic-tac-toe board made up of 9 smaller boards.



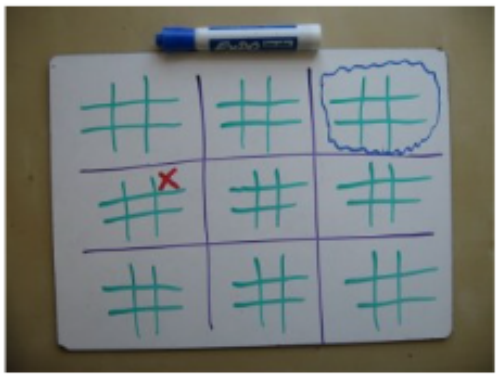
How to Play:

- Each turn, you mark one of the small squares.
- You don't get to pick which of the nine boards to play on. That's determined by your opponent's previous move. Whichever square he picks, that's the board you must play in next. (And whichever square you pick will determine which board he plays on next.)

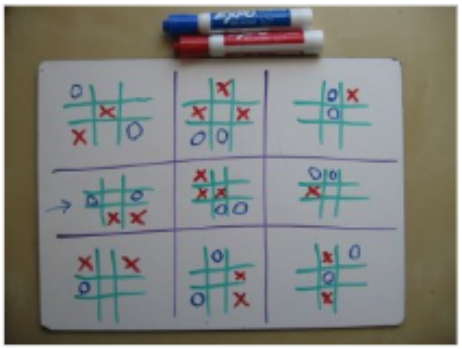
For example, if I go here…

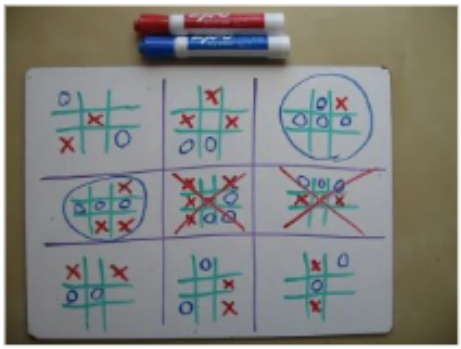


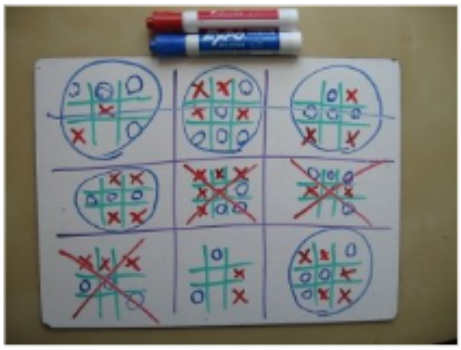
Then your next move must be here…



- When you get three in a row on a small board, you've won that board.
- To win the game, you need to win three small boards in a row.







Adapted from
https://mathwithbaddrawings.com/2013/06/16/ultimate-tic-tac-toe/

Return to Activity Grid