

Math Games

For Skills and Concepts

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Why use games to practice skills?

- 1) They are more engaging.
- 2) They provide more practice. Consider the product game: for each move you are considering multiple multiplication problems.
- 3) They are a constructive reward for use in free time in your class, in addition to whole class use.
- 4) They are more likely to involve parents and other family members with homework. Be sure to send home the instructions or rules. Or consider hosting a night where parents can come to play with the kids. Or pull them out at parent-teacher conferences.
- 5) They can be really fun. (Duh!)



Where can you find more?

- 1) Best source: exemplary curricula.
 - o For elementary, Investigations in Number, Data, and Space (which even includes computer games) and Everyday Math.
 - o For middle school, Connected Math Project and MathScape (among others).If you are lucky enough to be in a school using these curricula, use the games! If not, you can find copies available from your district math curriculum supervisor, from university libraries (the KCRC at GVSU), or order them yourself from amazon.com.
 - o The internet, but be careful! There are a lot of useless games out there.
- 2) Make your own. Once you get the idea for what skill practice your students need, think of a way from them to generate problems. This will often lead to a game structure. Or, once you are familiar with other constructive games, adapt those to your purpose.
- 3) Sharing with your colleagues. In your school, from your college, at math meetings... don't be shy. If you write one up that you'd like to share via internet, I'd be happy to post it. If it's original, be sure to include a copyright with permission granted for educational use. If it's from another source, or closely adapted from another source, please cite that source.

How do you evaluate games?

- 1) Examine mathematical richness. If the game is just window dressing for drill and kill (like math bingo) evaluate it deservingly. Look for problem solving, need for strategy, and math content required.
- 2) Is speed required? The best games offer equal opportunity (or nearly so) to all your students. Games that require computational speed to be successful will disenfranchise instead of engage your students who need the game the most.
- 3) Do you find the game interesting or fun? Then your students probably will also.



Tens Go Fish

From **Number Games and Story Problems: Addition and Subtraction**
Investigations in Number, Data, and Space

What Happens

In the game Tens Go Fish, students make combinations of ten with two addends.

Introducing Tens Go Fish

If your students are familiar with the card game Go Fish, they will need just a brief introduction to Tens Go Fish.

First explain about “making 10” with pairs of Number Cards. Draw five Number Cards in a row on the board or on chart paper. Include one pair that makes 10. For example, you might select the cards 4, 1, 5, 7, and 9.

I'm going to show you a game called Tens Go Fish. The object is to find pairs of cards that add up to 10. Each player gets five cards to start. Let's say these cards are the cards in my hand: 4, 1, 5, 7, and 9. Can I make 10 with two of these cards? ...OK, I could make 10 with the 1 and the 9. That's my first pair.

Redraw the 1 and 9 cards, as a pair, to one side.

If I look at my hand when the game starts, and I have a pair that make 10, I can take them out and then draw two more cards.

Replace the cards you have put down with two more cards; this time making sure that no pairs of cards in your hand make 10. For example, if you have 4, 5, and 7, you might add another 4 and a 2.

Let's say I drew a 4 and a 2, so now these are my cards: 4, 2, 4, 5, and 7. Do any two of these cards make 10?

When it's my turn, I can ask the other player for a certain card that I need to make a total of 10. For example, suppose I wanted to make 10 using the 2 in my hand. What card would I need to add to the 2 to make 10?

So, if I was playing with Claire, I might ask, “Claire, do you have an 8!” If Claire has an 8, she gives it to me. I put the 8 and the 2 down as a pair, and draw the top card from the deck. If Claire does not have an 8, she says “Go Fish.” I take a card from the top of the deck.

Each time I draw a new card, I check to see if I can make 10 with that card and one already in my hand. If I can, I put the pair aside and draw a new card. If I can't, my turn is over.

Start a demonstration game with a student volunteer. Explain that for this game, you will be showing students your cards so that they can learn how to play. When students play in pairs, they will not show their cards to their partners. As you play, involve students in your turn.

I have a 5, 7, 2, 1, and 4. Can I use two of these cards to make 10? No one sees away? OK, so what could I do next?

You might decide to play an entire demonstration game, or if you think most students understand how to play, just play for a few turns. In this case, explain that the game continues with each player trying to make combinations of 10. The game is over when there are no more cards.

If you never have a 10 and a 0 card in one hand during the demonstration game, find these cards and be sure students recognize that they can make a pair with 10 and 0.

As you collect pairs that make 10, put each one in a separate pile. Explain that this is so the cards don't get mixed up, because at the end of the game, players turn over their pairs and list all the combinations of 10 they made, using addition notation. Model this for your students.

Rules: Tens Go Fish

Materials: Number Cards with wild cards removed (1 deck per pair); card holders (optional); unlined paper; counters (available)

Students play in pairs or threes. Each player is dealt five cards. (Use card holders, made as described on p. 101, if the numbers show through to the back of your cards.) Players take turns asking each other for cards that will make 10 with a card already in their hand. They place any pairs made on the table and draw a new card from the deck at the end of each turn. If a card drawn from the deck makes a pair with a card in the hand, the player puts that pair down and draws again.

If a player uses up all his or her cards and there are still cards left in the deck, that player draws two cards. The game is over when there are no more cards in the deck. At the end of the game, players list the combinations of 10 they made.

For more challenge, students can play the game in groups of three or four; with more players, it is more difficult to remember the cards other players have asked for.

Observing the Students: Tens Go Fish

How do students decide which card to ask for? Do they use knowledge or combinations of 10? Do they use counting strategies to find a number that goes with a card in their hand to make 10? Do they seem to ask for cards at random?

Are students able to keep track of the cards other players have asked for? Do they use this to reason about what cards the other player has?

Some pairs might benefit from playing cooperatively. After a player chooses one card to use to make 10, both players figure out together which other card is needed to finish the pair. If the other player does not have this card, the pair can look for another way to make 10, using one card from each hand.

Variations

- Different cards will work on different skills.
- Vary the target sum for other fact practice.
- Allow more than 2 cards for a sum to ten.
- Play rummy style where you keep cards in your hand until you can lay them all down
- Keep score by counting up points on the table subtracting points in hand.



The Sums Game

10	2	3	4	5
8	6	12	10	7
9	11	14	18	13
12	16	10	17	15
6	9	5	7	10

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

Play begins with each player covering a number from 1 to 9 at the bottom. The 2nd player then covers the sum of those two numbers on the game board. The 1st player can then select one new number from 1 to 9 at the bottom and cover the sum of those two numbers. Play continues until one player has covered four squares in a row, horizontally, vertically, or diagonally.

(Adaptation of the Product Game)

Five In a Row

Players: 2 and up

Materials: 1 Gameboard per player, counters, Number cards (1 to 10 only), chips to cover spaces.

Goal: Cover 5 spaces in a row, vertically or horizontally or diagonally.

Gameplay: Shuffle the number cards and put in a face down pile. On each turn, put the top three cards face up. Each player can cover up any number which is the sum of any two of the revealed cards. For example, 3, 4 and 9 would mean you can cover 7, 12 and 13. Since each child has a different gameboard, this prevents just copying the spaces covered.

Questions: Which cards do you need turned up to cover ___ or to finish a row? If a 4 is turned up, what other numbers would you like to see turn up?

Variations:

- 1) Turn up five cards, cover any combination of 2. (There's up to 10 possible combinations!) Or do this and allow students to cover only 3 of the combinations they see.
- 2) Have students work cooperatively on the same board. Or have students make their own boards.

Game Boards are 5 by 5 grids, with numbers from 2 to 20 distributed randomly. Use multiple 10s or other sums of interest, and few low numbers. Kids can make up their own boards.

Sample Five In a Row -- Game Board

2	4	6	8	10
10	10	12	12	14
16	18	20	19	17
15	13	11	11	11
9	9	7	5	3

Roll+10

Roll+20

Roll+10

Close To 1000

Materials

- One deck of Numeral Cards
- Close to 1000 Score Sheet for each player
- Players: 1., 2, or 3

How to Play

1. Deal out eight Numeral Cards to each player.
2. Use any six cards to make two numbers. For example, a 6, a 5, and a 2 could make 652, 625, 526, 562, 256, or 265. Wild Cards can be used as any numeral. Try to make two numbers that, when added, give you a total that is close to 1000.
3. Write these numbers and their total on the Close to 1000 Score Sheet. For example: $652 + 347 = 999$.
4. Find your score. Your score is the difference between your total and 1000.
5. Put the cards you used in a discard pile. Keep the two cards you didn't use for the next round.
6. For the next round, deal six new cards to each player. Make more numbers that come close to 1000. When you run out of cards, mix up the discard pile and use them again.
7. After five rounds, total your scores. Lowest score wins!

Scoring Variation

Write the score with plus and minus signs to show the direction of your total away from 1000. For example: If your total is 999, your score is -1. If your total is 1005, your score is +5. The total of these two scores would be +4. Your goal is to get a total score for five rounds that is close to 0.

Score Sheet for **Close To 1000**

Game ____		Score
Round 1	____ + ____ = ____	____
Round 2	____ + ____ = ____	____
Round 3	____ + ____ = ____	____
Round 4	____ + ____ = ____	____
Round 5	____ + ____ = ____	____
Total Score		____

Score Sheet for **Close To 1000**

Game ____		Score
Round 1	____ + ____ = ____	____
Round 2	____ + ____ = ____	____
Round 3	____ + ____ = ____	____
Round 4	____ + ____ = ____	____
Round 5	____ + ____ = ____	____
Total Score		____

Close to Zero

From **Mathematical Thinking in 5th Grade**

Investigations in Number, Data, and Space

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This is a game that has many variations in the *Investigations* curriculum.

Math content: place value, mental math, estimation

Materials: a deck of number cards or playing cards with 10s, Queens and Kings removed.

Players: 2 to however many the deck supports.

Gameplay: Deal out 6 cards to each player. The goal is to arrange the cards as two 3 digit numbers whose difference is as close to zero as possible. Arrange the 3 digit numbers for larger – smaller. After doing this five times, the sum of the differences is taken, and the lowest score wins. All cards go to the discard pile. When out of cards, shuffle up the discard pile to deal more cards.

Variations:

- 1) 2 players. Deal three cards to each player. Players take turns going first, making a three digit number. The other player makes the 2nd number and scores the difference. Note that there is perhaps a lesser amount of problem solving here, but the game feels more competitive.
- 2) Deal 4 cards to each player and make two 2 digit numbers. (Good variation for late second or third grade.)
- 3) Deal an extra card so that players use all but one card to make their numbers. Makes scores much lower.
- 4) The game can be adapted to addition. For example: Deal 4 cards, and make two 2 digit numbers whose sum is as close to 100 as possible. Scoring can be: a) the difference between the sum and 100, taken as a positive number. (i.e. 112-100 or 100-87). Play 5 times, add the distances from 100 and the lowest score wins. Or, b) you only score if under 100. Over 100 means zero points. Play 5 times, highest score wins. Note that some deals of four cards have no sum under 100, so the five card variation can be used if you are scoring this way.
- 5) Calculators can be used at some, all or no points in this game to change the pedagogical focus.

Sample Score sheet:

$\underline{\quad} \underline{\quad} \underline{\quad} - \underline{\quad} \underline{\quad} \underline{\quad} =$	$\underline{\quad} \underline{\quad} \underline{\quad}$
$\underline{\quad} \underline{\quad} \underline{\quad} - \underline{\quad} \underline{\quad} \underline{\quad} =$	$\underline{\quad} \underline{\quad} \underline{\quad}$
$\underline{\quad} \underline{\quad} \underline{\quad} - \underline{\quad} \underline{\quad} \underline{\quad} =$	$\underline{\quad} \underline{\quad} \underline{\quad}$
$\underline{\quad} \underline{\quad} \underline{\quad} - \underline{\quad} \underline{\quad} \underline{\quad} =$	$\underline{\quad} \underline{\quad} \underline{\quad}$
$\underline{\quad} \underline{\quad} \underline{\quad} - \underline{\quad} \underline{\quad} \underline{\quad} =$	$\underline{\quad} \underline{\quad} \underline{\quad}$
Total: $\underline{\quad} \underline{\quad} \underline{\quad} \underline{\quad}$	

Calculator Get Down

I first and last saw this game in a “calculator fun book” about 30 years ago, but long ago lost track of the book and author. (Yes, there were calculators then. They could add, subtract, multiply and divide, and got hot if you left them on too long.)

Math content: mental math, operations, divisibility rules.

Materials: 1 calculator

Players: 1

Gameplay: Enter a random 6 digit number with no repeats. Using only +, −, * and / perform operations on this number to get to zero – using only 2 digit operands, and 6 or less steps! Ask students to keep a record.

Example: 342987. (1) −37. (2)/50. (3) −59. (4) /40. (5) −85. (6) −85.

Variations: Don’t even get me started. Good order of operations practice to write down a single equation of what they did.

Flip – a free game by James Ernest

Players: 2

Playing Time: 5 minutes

Equipment: Ten 6-sided dice

To Begin: Each player rolls five 6-sided dice. The player who rolls the lowest total goes first.

On Each Turn: You may do one of two things. You may either flip over one of your own dice, or you may instruct your opponent to play one of his dice into the middle of the table.

Playing: When you make your opponent put a die in the middle, you choose the die. Your opponent puts it into the middle. He may then withdraw any combination of dice from the middle which totals less than the value of the die he put in. So, for example, if he plays a 5 into the middle, he could take out up to 4 points worth of dice in any combination.

Winning: To win the round, you must be the last player with any dice left. To keep score over several rounds, record the sum total of the dice you keep. In that case, play to 50 points.

Stalemate: To avoid stalemate, it is illegal to flip the same die twice without first making your opponent play.

Note: This game requires some modeling, as the reverse nature of the decisions makes it difficult for students to get the hang of it.

Number Strings

Players take turns breaking down a number by multiplication. The first player starts with a whole number. The next player makes a string of two numbers that multiply to give the first. The next player then can break down one of the two numbers, making a three number string. The last player who can break it down is the loser of the game. Numbers chosen must be able to be broken down more than once.

Players may not reuse starting numbers. 1 may not be used in the breakdown.

Examples:

A) 46

2x23

Can only be broken down once, player who started loses.

B) 36

4x9

2x2x9

2x2x3x3 – loses.

The Product Game

1	2	3	4	5	6
7	8	9	10	12	14
15	16	18	20	21	24
25	27	28	30	32	35
36	40	42	45	48	49
54	56	63	64	72	81

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

Play begins with each player covering a factor from 1 to 9 at the bottom. The 2nd player then covers the product of those two numbers on the game board. The 1st player can then move either one of the factor numbers and covers the new product. Play continues until a player can cover four products in a row, horizontally, vertically or diagonally.

(From CMP)

Prime Time

Free	50	10	6	18
15	9	27	30	105
4	70	49	35	20
8	25	14	28	42
147	21	75	175	63
45	98	12	125	Free

Factor List

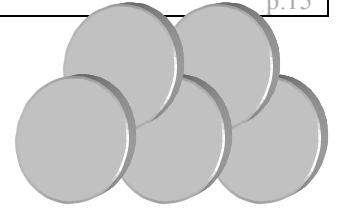
Rules

2	3	5	7
2	3	5	7
2	3	5	7

Player A covers a factor and then Player B covers a factor and the product. Players then take turns either changing one factor or adding or removing a factor chip. Play continues until one player has covered four in row (horizontally, vertically or diagonally) or neither player will be able to. (From CMP)



Score Factor



Game Board

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40

Player A chooses a number on the game board and covers (or circles) it. Using a different color, player B covers all of the proper factors. Player B then circles a new number, and Player A covers all of the uncovered, proper factors of that number. If a player circles a number with no uncovered factors, that player scores no points and loses that turn. The game ends when there are no numbers left that have an uncovered proper factor. Each player scores points equal to the total of the numbers they covered.

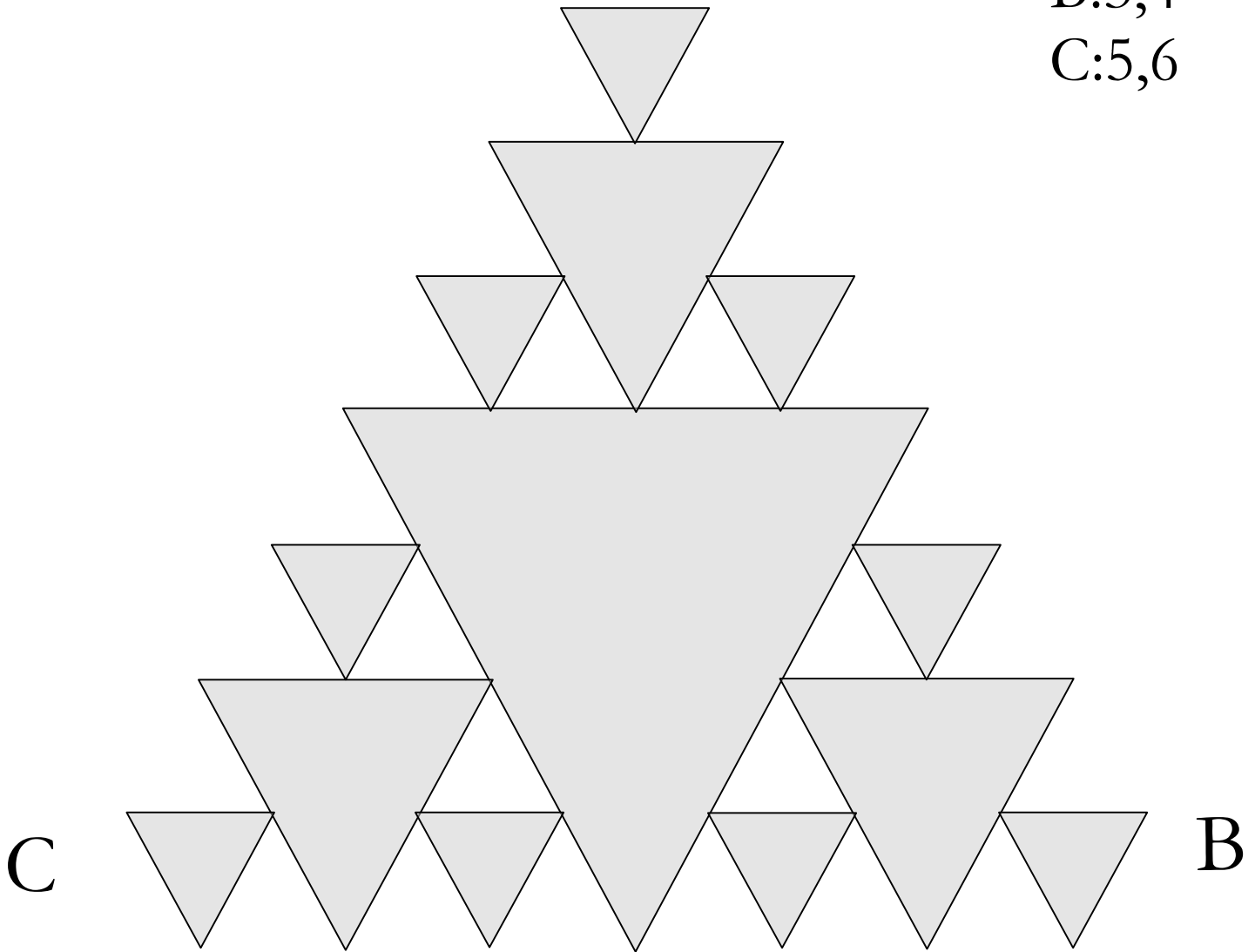
Triangle Game

A

A:1,2

B:3,4

C:5,6



Game 1

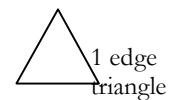
Three players. Each takes a vertex. Roll dice to determine who goes first. Play proceeds counter-clockwise.

First player circles their vertex, rolls, and moves halfway towards the indicated point. Subsequent players roll a die, and move the point halfway towards the vertex rolled. Continue until each player has rolled twice. The winner is the player whose vertex is closest to the point at the end of the game. Players should play new games on the same board.

Game 2

Any number of players and a referee. Referee chooses a vertex (A, B or C) as a starting point and a target white triangle. Players write down a sequence of vertex moves. Closest player to the target triangle after their sequence of moves wins and is the next referee.

Triangle Size (edges)	8	4	2	1
Sequence Length	3	4	5	6



Racin' Robots

2-3 players

Materials: Board, cards (printed two-sided or on colored paper), robot piece for each.

Goal: get your robot to his delivery spot to finish his job of transporting widgets.

Gameplay: Randomly determine who goes first. Each player draws four cards, and lays down 2 cards to program their robot. Their robot may be placed in any direction in the home square. Note that a flipped robot has the reverse orientation of an unflipped robot. On a player's turn, they:

- 1) Lay down a third program card for their robot.
- 2) Turn over the front program card and make the robot do that movement. The card then goes to the discard pile.
- 3) Draw back up to four cards in hand.

All directions are given from the robot's perspective. Example: forward means the direction the robot is facing. Left is the robot's left, etc.

If a robot moves onto another robot's square it pushes that robot back one spot in the direction the moving robot is heading.

If a robot lands on a square with text, follow those directions.

If there are no more cards to draw, shuffle the discard pile and put it into the deck.

If the robot would be put off the board, it relocates to start.

If you play a push card on an opponent, play an additional program card on your own robot.

Turns are around the center point.

Variation: Play so that if you go off an edge you come onto the opposite side. (Less frustration this way.)

Math:

As you play, think about how the different motions combine.

How would the game be different if the motions were to some standard system instead of relative to the robot?

What new motion cards could you make?


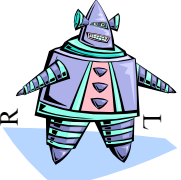
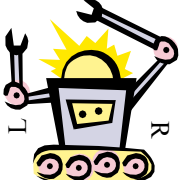
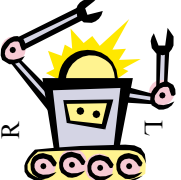
Which motion cards were more difficult to use?

What's the difference between a vertical flip and a 180° turn?

Inspired by the game **RoboRally**, designed by Richard Garfield.

Move forward one	Move forward one	Move forward one	Flip over right hand edge	Flip over right hand edge
Move left one	Move left one	Move left one	Flip over left hand edge	Flip over dotted line
Move right one	Move right one	Move right one	Flip over left hand edge	Flip over dotted line
Move back one	Move back one	Move back one	Turn 90° right	Push forward one (this card may be swapped with an opponents program)
Move forward two	Move forward two	Move forward two	Turn 90° right	Push backward one (this card may be swapped with an opponents program)
Move forward three	Move forward three	Move forward three	Turn 90° right	Flip over horizontal center line
Move back two	Move back two	Move back two	Turn 90° left	Flip over vertical center line
Turn 180°	Turn 180°	Turn 90° left	Turn 90° left	Turn 90° in a direction of your choice.

Race Board

ROBOT 2 START					ROBOT 1 FINISH	
			Rotate 90° right around center			
	Move Forward 2 spaces					
					Move Left 2 spaces	
		Rotate 90° left around center			ROBOT 2 FINISH	
ROBOT 1 START						
 L R	 R L	Cut out Robots into two strips, fold along right hand edge to get a robot with a front and back.			 L R	 R L

Polygon Capture – Game Rules

Preparation:

Each pair of players needs a set of property cards and a set of polygon cards. The polygons go into the center of the playing area and the side and angle property cards are separated into two piles.

Goal:

Capture the most polygons.

Play:

1. Randomly choose who goes first.
2. Player 1 flips over an angle card and a side card. She captures any card which satisfies **both** these properties. When finished she says: “Done”
3. Player 2 may capture any polygons which player 1 missed.
4. Player 2 takes a turn, turning over two new property cards and capturing the appropriate polygons.
5. Play continues in this manner until two or fewer polygons remain.

Notes:

If you run out of angle or side property cards, reshuffle that pile and continue.

If the active player believes no polygons can be captured, the other player gets a chance to capture any matches. If there is a match, the turn is done. If not, the active player can choose to turn over one more property card, choosing either angle or side. If they believe still no polygons can be captured, they must say, “Done” and end their turn.

Any player can **challenge** the capture of a polygon. If a player chose a polygon incorrectly, it goes back into the center pile and their turn is done.

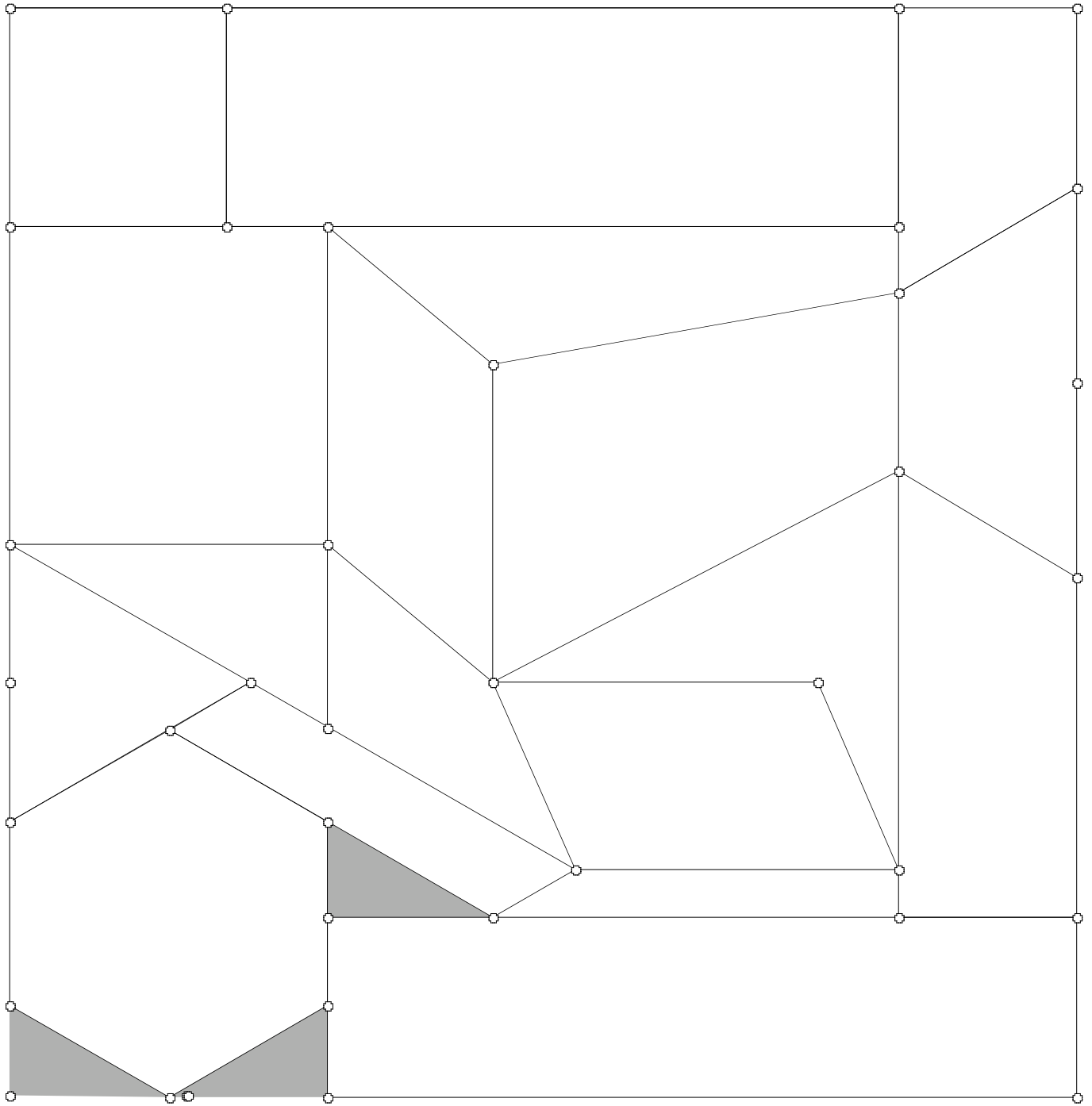
If the **Wild Card** comes up, the player may choose any side property. For example, if the angle card is “All angles are right angles”, she may choose “All opposite sides are equal” and capture all rectangles.

If the **Steal Card** comes up, the player picks one side property and one angle property, and steals all of the polygons the other player has captured which satisfies those properties. Ignore the other card.

Example:

Player 1 turns up “All angles have the same measure” and “It is a quadrilateral”. She then captures the square, the short rectangle and the right trapezoid and says “Done.” Player 2 may then capture the long rectangle. Then he begins his turn.

Source: Carroll, William M., **Polygon Capture: a Geometry Game**, *Mathematics Teaching in the Middle School*, Oct 1998. Vol. 4, Iss. 2; p. 90



All angles are right angles	At least one angle is obtuse	No angle is a right angle	At least one angle is less than 90°
At least one angle is a right angle	At least two angles are acute	All angles have the same measure	STEAL CARD Select a <i>pair</i> of properties. Steal all these polygons from your opponent.
No pairs of sides are parallel	All sides are of equal length	Exactly one pair of sides is parallel	At least one pair of sides is perpendicular
All pairs of opposite sides are parallel	It is a quadrilateral	All pairs of opposite sides have equal length	WILD CARD Pick your own side property



Target Practice

Players: 2 teams.

Playing time: as long as you want.

Equipment: two differently colored dice, paper, graph paper.

Game play: On each turn, each team rolls the pair of dice to come up with a set of target points. They then come up with an equation, to hit as many of the target points in the graph of the equation as possible. On each round, you roll the same number of targets as the round number; ex. on round three, three targets. For each target scored, you get the same number of points as the round; ex. If you hit two targets on round three, you score 6 points. Play for at least five rounds.

Variations: For variety, allow teams to make any given roll positive or negative. For challenge, include (0,0) as an extra target point in each round.

Round	Points	Equation	Targets Hit	Score
1	(,)			
2	(,), (,)			
3	(,), (,), (,)			
4	(,), (,), (,), (,)			
5	(,), (,), (,), (,), (,)			
			Total	

Pig (Wikipedia version.)

Pig is a simple folk jeopardy [dice game](#) first described in print by [John Scarne](#) in 1945. As with many games of folk origin, Pig is played with many rule variations.

Players: Any number.

Materials: 1 die.

Gameplay: Each turn, a player repeatedly rolls a die until either a 1 is rolled or the player holds and scores the sum of the rolls (i.e. the turn total). At any time during a player's turn, the player is faced with two options: **roll** - If the player rolls a **1**: the player scores nothing and it becomes the next player's turn. **2 - 6**: the number is added to the player's turn total and the player's turn continues. Or the player may **hold** - The turn total is added to the player's score and it becomes the next player's turn. Play to a total (the first player to score 100 or more points wins) or for a set number of rounds.

Questions: The probability of this game is quite interesting, and determining the optimal strategy is such a good problem that this is the center of an *Interactive Mathematics Project* unit.

Radian Race

Players: Two or more.

Playing time: 5 – 10 min.

Equipment: unit circle with angles, dice, markers for player position.

Gameplay: Roll to see who goes first. Highest untied roll wins. Players roll once for the denominator, and then for the numerator, and move that fraction of π . First player to complete the trip around the unit circle wins.

Variations: (1) Play to get exactly to 2π . A roll that would take you past is not moved. Play for a set number of rolls. (2) Moves may be taken clockwise or counter-clockwise, but must be moved. This is also best played for a set number of rounds (like 6 or 10), and the closest player to 2π wins after that number of rounds.

Denominator		Numerator	
Roll	Result	Roll=Result	
1,	Thirds	1,2,3=1/4	4,5,6=2/4
2, 3	Fourths	1,2,3=1/3	4,5,6=2/3
4, 5	Sixths	1=1/6, 2=2/6, ..., 6 = 6/6	
6	Twelfths	1=1/12, 2=2/12, ..., 6=6/12	

$\pi/2$

$\pi/3$

$\pi/4$

$\pi/6$

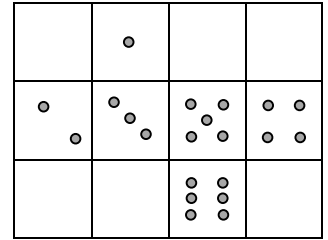
$\pi/12$

Box Builder

2 or more players or teams

Materials: Graph paper, side cutouts (optional), die, record sheet.

Goal: Build boxes with nets to store the largest volume you can.



Play:

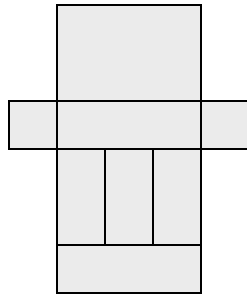
Roll	Piece
1	
2	
3	
4	
5	Pick from any other number
6	

Players take turns rolling a die and recording the piece they got. At any point, they can choose to use up some of their pieces to make a net for a box. They record the net, and score 1 point for each cube of volume. Play continues until one player/team makes a third box, or they roll their 10th piece of one type. The other team gets a last chance to make a box out of the pieces they already have.

Example:

Team 1 has rolled the following:

One of the partners realizes they could build a box with the net



So they cross off the pieces they use and score 6 points.

Variations: Play for surface area. Or you could play until a total is reached, like a total volume of 10 cubes, or a surface area of 100 squares.

			1	2			
			2	2	3	X	
			3	3	X	X	
			X				
			4				

Record Sheet

Score:

game1	game 2

Record rolls: X off a piece when it is rolled. Circle or cross out the X when it's used to make a box.

Piece	game1									

game2									

Have players cut pieces out of a piece of graph paper as they are rolled. Keep these after the first game for playing future games.