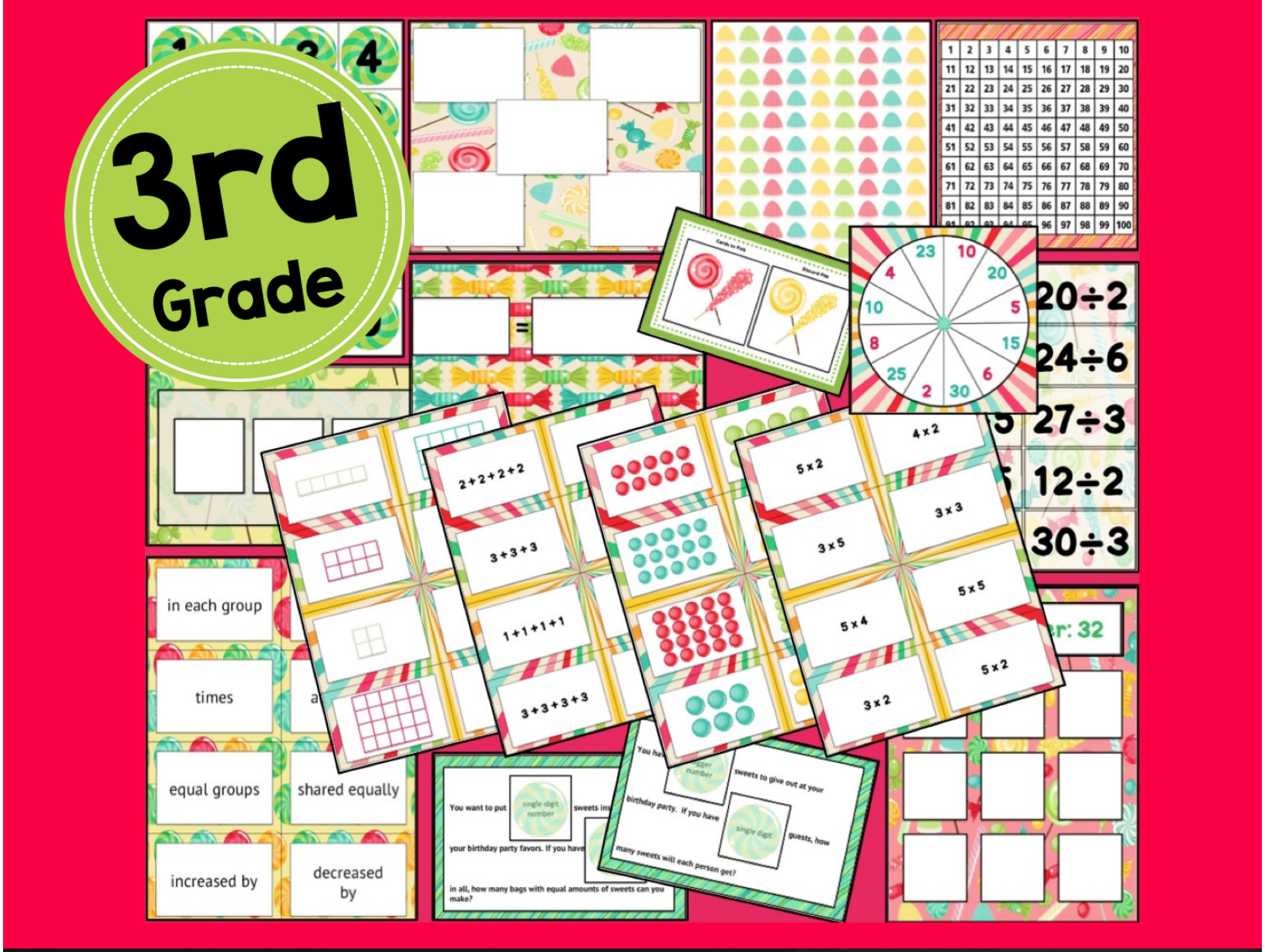
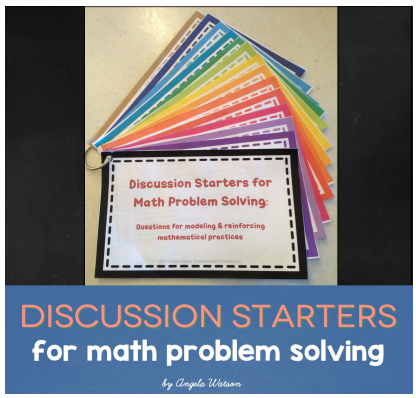


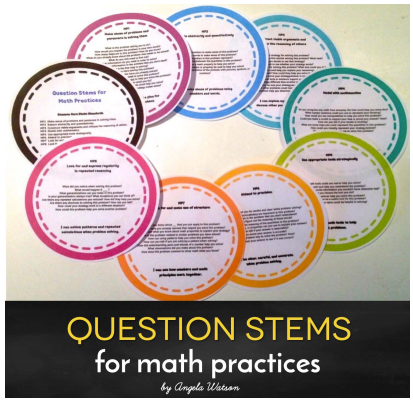
OPERATIONS & ALGEBRAIC THINKING

11 math partner games

by Angela Watson

Check out the complete product line for 3rd grade math!





Editable fact practice games for school or home

Editable times tables practice games for school or home

Equal Sharing

Materials: Counters, division sentence cards, pencils and paper or math journals (optional)

Directions: Put all the division sentence cards in a facedown stack. Each player takes one card and uses counters to represent the problem. For example, if your card reads 10 ÷ 2, you would take 10 counters and divide them into 2 equal groups. When both players are done representing their problems, show your counters to each other and try to guess the number sentence that was on the card. If you want to keep score, award one point for every number sentence you correctly represent with counters and one point for every number sentence your partner makes that you correctly identify. Keep playing until time is up. The person with the most points wins!

Challenge: Can you solve the division problems and write the complete equations? In the example above, you would write 10 ÷ 2 = 5. You can earn one extra point for each correctly written division equation. Or, try writing a word problem for your equation. See if another pair of students in the classroom can solve it!

Math Talk:

What do the numbers in a division problem mean?
How can you find a quotient using equal groups?
Why must groups be equal when dividing?
How is equal sharing related to division?
What does it mean to divide?
What are some ways you can model division?

CCSS: Represent and solve problems using multiplication and division.

3.OA.A.2 Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.

I can find the quotient of whole numbers using equal groups.
I can tell what the numbers in a division problem mean.
I can explain what division means.
I can show division as equal sharing.

Game Direction Pages

Biggie

Materials: Biggie game board for each player; number cards (1-10, operation sign cards (for Challenge activity only)

Directions: Deal the cards to each player, keeping them face down. On the count of three, both players flip over two of their own cards on their own game board and multiply them together. Both players must say their number sentence out loud, such as, "4×6=12." Be sure to check each other's answers and make sure they are correct! The person with the biggest product says "Biggie" and gets to keep all four cards. (So, if your partner's number sentence is 5x3=15, your product of 12 is bigger than your partner's product of 15, and you would keep all four cards.) Continue playing until there are no cards left. The person with the most cards wins the game! You can play again until time is up.

Challenge: You can also play the game as "Tiny" and the person with the smallest product gets to keep all 4 cards. Or, include the operation sign cards in your game play, flipping over one operation card for each round so that you have to practice multiplying, adding, subtracting, and dividing during the game.

Math Talk:

What strategies did you use to multiply the numbers?
What strategies did your partner use?
Which strategies worked best? Why do you think that is?
How could you tell which person had the biggest product?
How could you prove your answer?

CCSS: Multiply and divide within 100.

3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

I can memorize all products within 100.
I can use strategies to solve a multiplication problem.
I can use strategies to solve a division problem.

Equal Sharing

Materials: Counters, division sentence cards, pencils and paper or math journals (optional)

Directions: Put all the division sentence cards in a facedown stack. Each player takes one card and uses counters to represent the problem. For example, if your card reads 10 ÷ 2, you would take 10 counters and divide them into 2 equal groups. When both players are done representing their problems, show your counters to each other and try to guess the number sentence that was on the card. If you want to keep score, award one point for every number sentence you correctly represent with counters and one point for every number sentence your partner makes that you correctly identify. Keep playing until time is up. The person with the most points wins!

Challenge: Can you solve the division problems and write the complete equations? In the example above, you would write 10 ÷ 2 = 5. You can even one extra point for each correctly written division equation. Or, try writing a word problem for your equation. See if another pair of students in the classroom can solve it!

Math Talk:

What do the counters in a division problem mean?
How can you find a quotient using equal groups?
Why must groups be equal when dividing?
How is equal sharing related to division?
What does it mean to divide?
What are some ways you can model division?

CCSS: Represent and solve problems using multiplication and division.

3.OA.A.2 Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.

I can find the quotient of whole numbers using equal groups.
I can tell what the numbers in a division problem mean.
I can explain what division means.
I can show division as equal sharing.

Target Number Challenge

Materials: One Target Number Challenge game board for sharp, Target Number Challenge cards, number cards 1-13

Directions: Both players choose one Target Number Challenge card to share and place it on the game board. Turn the number cards face down in a stack and take turns picking them and placing them anywhere on the board. Then take turns trying to find cards on the board that equal the target number when multiplied or divided. For example, if the target number is 12, you could take the 6 and 2 cards and say "6×2=12" or take 24 and 5 cards and say "24÷2=12."

If a player is able to make the target number, she or he says the number sentence out loud and keeps the cards. The player then takes more cards from the face down stack to fill the empty spaces on the game board, and changes the target number Challenge card so the goal is to make a new number. Both players take turns doing this. If you can't make the target number, say "pass" and give the other person a turn. If neither of you can make the target number, each of you takes another number card from the stack, says it at the bottom of the game board so there are a total of 13 cards on the board, and tries to be the first one to make the target number. The person with the most cards when no more matches can be made wins the game! Play again until time is up.

Challenge: Change the game rules so that you can use more than two cards and other operations. For example, you could use the 1, 10, and 2 cards and say "1x10÷2=12."

Math Talk:

What strategies did you use to make the target number?
Are there other ways that the target number could be made?
How did you use mental math strategies help you play this game?
How would this game be different if you used other operations?

CCSS: Multiply and divide within 100.

3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

I can memorize all products within 100.
I can use strategies to solve a multiplication problem.
I can use strategies to solve a division problem.

What's the Story?

Materials: What's the Story cards, number cards, pencils, math journals or paper, blank note, mat for organizing cards (optional)

Directions: Choose a What's the Story card to share with your partner. Put the number cards in a face down stack. Each player picks one number card. Show the cards to each other. Then use your number cards and What's the Story card to make up a word problem with your partner and illustrate it. For example, if your number cards read 30 and 10, and your What's the Story card reads how many more, you could make up a problem like, "There are 30 boxes. Julio wants 10 books. How many more books does he need?" Both players should write the word problem down and solve it together using any strategy you choose.

Challenge: Can you create a two-step word problem with your partner? Another idea is to use the same number cards in your partner but create different word problems than one another. Switch papers and solve!

Math Talk:

How can you tell which operation to use with a key word?
Can some key words be used with more than one operation?
How many steps are in your word problem? How do you know?
How did you decide the order of operations when solving?
What strategies did you use for solving your problem?
Is there another way to solve the problem? How?
How could estimation help you solve the problem?

CCSS: Represent and solve problems using multiplication and division.

3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

I can multiply to solve word problems.
I can divide to solve word problems.
I can decide when to multiply or divide to solve word problems.

3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

I can find the missing number in a multiplication problem.
I can find the missing number in a division problem.

CCSS: Solve problems involving the four operations, and identify and explain patterns in arithmetic.

3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

I can identify the order of operations of a problem.
I can identify different strategies for estimating.
I can construct an equation with a letter standing for the unknown quantity.
I can solve two-step word problems using the four operations.
I can justify my answers using estimation strategies and mental computation.

1, 2, 3, Flip

Materials: 1, 2, 3 Flip game board, number cards (0-12), multiplication sign cards, FLIP cards and subtraction, division, and addition sign cards (for the Challenge only)

Directions: Place the multiplication sign card in the center space of the game board. Mix up all the number cards (in one face down stack, and deal them evenly so both players get the same amount. Both players say "1, 2, 3, flip!" and flip over the top card in their stack. Player 1 puts her card to the left of the multiplication sign and Player 2 puts his to the right of the multiplication sign. The first player to multiply the numbers together correctly keeps the cards. You MUST say the entire number sentence (like "2x8=16"), not just the answer. If both players say the number sentence at the same time, leave the cards on the board and flip over another set of cards directly on top of them. The person who wins that round gets to keep all 4 cards. Continue playing until one player has all the cards. You can play again if you have time.

Challenge: Practice all the operations! Mix up the addition, subtraction, multiplication, and division sign cards and place the sign card in the center space of the game board. Mix up the cards that say FLIP with the number cards. Before dealing them, if a player gets a FLIP card during play instead of a number card, turn he or she must flip over the operation sign in the middle of the game board so it shows the next operation sign, and then flip over another number card. The players then race to solve the new number sentence. The next time a flip card appears, flip the operation sign card again on a new card shows. If a number sentence is impossible for a third grader to solve (like 8 ·20 = 11×4, flip over two new cards on top of the old ones and solve that number sentence instead.

Math Talk:

What math strategies helped you figure out the answers quickly?
How did you use mental math when playing this game?
Why might it be important to memorize multiplication facts?

CCSS: Multiply and divide within 100.

3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

I can memorize all products within 100.
I can use strategies to solve a multiplication problem.

Find My Pattern

Materials: Two copies of the Hundred chart, counters, number cards 1-10

Directions: Place a folder or divider between you and your partner so you can't see each other's hundred chart. Each player secretly takes one number card. Multiply the number on the card times every number 1-10 and cover the products on your hundreds chart. For example, if your card has a 1 on it, you would multiply 1x1 and cover that 1, 1x2 and cover the 10, 1x3, and cover the 15, and so on. When both players are done, remove the divider and look at each other's boards. Try to guess which number you were multiplying by and explain the pattern. For example, your partner might say, "I see 5, 10, 15, and so on covered. The pattern is counting by 5s (or multiples of 5), so you must have been multiplying by the number 5!" Show each other your cards to check your answers: use a multiplication table if needed. Then clear your boards and play again with new number cards until time is up!

Challenge: Can you think of another way to represent a pattern? For example, instead of using a hundred chart, you could draw equal groups or arrays, or use counters. Have your partner watch as you model each amount and try to guess the number you're multiplying by.

Math Talk:

What properties of multiplication did you notice as you played?
What strategies did you use to find the pattern?
How can you use patterns to solve problems?

CCSS: Understand properties of multiplication and the relationship between multiplication and division.

3.OA.B.5 Apply properties of operations as strategies to multiply and divide.

I can use the properties of multiplication and division to solve problems.

CCSS: Solve problems involving the four operations, and identify and explain patterns in arithmetic.

3.OA.D.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

I can identify patterns.
I can explain rules for a pattern using properties of operations.
I can explain relationships between the numbers in a pattern.

Back and Forth to 100

Materials: Two hundred chart game boards, Back and Forth to 100 spinner, one gumdrop counter for each player

Directions: Each player chooses a gumdrop as his or her game piece and places it on the zero spot of his or her game board. Players then take turns spinning the spinner and moving that many spaces on the board. If the number spun is green, move forward. If it's red, move backward. Use patterning and skip counting to help you. Be sure to think about as you move your piece and tell your partner your number sentence. For example, if your game piece is on 15 and you spin a green 20, you would say, "25+20!" I can move my piece 10 spaces at a time by going down one row: 35, 45, 25+20=45! The first person to reach 100 wins! You can play again until time is up.

Challenge: This time, start the game with your game piece on the number 100. See which player can be the first one to get to 0!

Math Talk:

What patterns did you notice in the hundred chart?
How did recognizing patterns help you move quickly on the chart?
How are the patterns in the chart related to multiplication?
What other patterns do you notice in multiplication?
How can finding patterns help you solve real world problems?

CCSS: Solve problems involving the four operations, and identify and explain patterns in arithmetic.

3.OA.D.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

I can identify patterns.
I can explain rules for a pattern using properties of operations.
I can explain relationships between the numbers in a pattern.

Guess the Order

Materials: Two copies of the Guess the Order game boards, number cards, multiplication and division sign cards, math journals or blank paper, pencils

Directions: Place a folder or other divider between you and your partner, so you can't see each other's work. Each player takes a game board and uses number cards to make up a multiplication or division number sentence. For example, you can use the number cards for 7, 5, and 35 and a division sign card to make 35÷7=5. When you are sure your number sentence is correct, write it down on paper and place the cards in the empty space at the bottom of your game board. When both players are done, switch game boards. Move the cards around on each other's game boards to try to create a correct number sentence in the white boxes at the top of the game board. Check each other's work by showing what you wrote on your paper, paying careful attention to whether your partner can arrange the numbers in a different order than you did and still be correct. Each player gets one point for each correctly solved problem. The person with the most points wins!

Challenge: This time, see if you can figure out the corresponding multiplication or division sentences (fact family) that goes with the number sentence your partner created. For example, if your partner created 35÷7=5, you would write that down, along with 7×5=35, 5×7=35, and 5x7=35.

Math Talk:

How does the order of the digits in a multiplication problem affect the product?
How can there be more than one way to arrange the cards?
Would your number sentence make sense if you had a different operation sign? Why or why not?

CCSS: Represent and solve problems using multiplication and division.

3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

I can find the missing number in a multiplication problem.
I can find the missing number in a division problem.

CCSS: Understand properties of multiplication and the relationship between multiplication and division.

3.OA.B.5 Apply properties of operations as strategies to multiply and divide.

I can use the properties of multiplication and division to solve problems.

3.OA.B.6 Understand division as an unknown-factor problem.

I can identify the multiplication problem related to the division problem.
I can use multiplication to solve division problems.
I can recognize and explain the relationship between multiplication and division.

Sweet Word Problems

Materials: One copy of each Sweet Word Problems game board, number cards, counters (optional)

Directions: Each partner chooses a Sweet Word Problems game board. Put the number cards in a face down stack. Each partner chooses number cards without looking, and places those numbers on his or her board. Then switch boards and solve each other's problems using the counters (or another strategy.) Afterwards, take turns explaining how you solved and how you know your answer is correct. Then pick a new game board and new number cards and play again! You can keep playing until time is up. If you want to keep score, give each player one point for every correctly solved problem.

Challenge: Instead of choosing your own game board, share one with your partner. Each of you must solve the problem using a different strategy. See if you both come up with the same answer! Talk about your strategies together.

Math Talk:

How many steps were in your word problem? How do you know?
How could you tell which operation to use when solving?
Could more than one operation be used to solve? Why or why not?
What strategies did you use to find the unknown number?
What other strategies could you use to solve the problem?
Can you prove your answer using estimation or another strategy?

CCSS: Represent and solve problems using multiplication and division.

3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

I can multiply to solve word problems.
I can divide to solve word problems.
I can decide when to multiply or divide to solve word problems.

3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

I can find the missing number in a multiplication problem.
I can find the missing number in a division problem.

CCSS: Solve problems involving the four operations, and identify and explain patterns in arithmetic.

3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

I can identify the order of operations of a problem.
I can identify different strategies for estimating.
I can construct an equation with a letter standing for the unknown quantity.
I can solve two-step word problems using the four operations.
I can justify my answers using estimation strategies and mental computation.

Trade an Array

Materials: Trade an Array game board for players to share, array cards, repeated addition cards, multiplication cards (for challenge only)

Directions: Put the game board in between both players and place five array cards face up on the board. Then deal 4 repeated addition cards to each player. Players flip over their four cards and take turns trying to find an array on the game board that shows the same amount as a card in their hands. Be sure to explain to your partner why you think two cards are a match. For example, you could say, "I'm taking a card with an array of 5 rows of 2 from the game board because I have a card in my hand that says 5 + 5. They're a match because both equal 10." Keep all your matches in a stack, and draw two more repeated addition cards to replace the one from your hand and two more array cards to replace the one you took from the board. Continue taking turns until no more cards can be matched. The person with the most matches wins!

Challenge: Use the multiplication cards instead of the repeated addition cards. Or, use all three types of cards! See if you can match an array, a repeated addition sentence, and a multiplication sentence.

Math Talk:

What is an array?
How are equal groups similar to arrays? Different?
Can an array have any number of objects in it? Why or why not?
How are equal groups important in multiplication?
What strategies can you use to prove that two cards show the same amount?
How is repeated addition related to multiplication?

CCSS: Represent and solve problems using multiplication and division.

3.OA.A.1 Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.

I can multiply to find the product.
I can show products using equal groups, arrays, and repeated addition.

Product Spin Off

Materials: Product Spin Off spinner, array picture cards, multiplication cards

Directions: Mix up all the array picture cards and multiplication cards and place them in one facedown stack. Player 1 spins the spinner: the number spun is the product both players will try to find on a card. Player 2 draws a card from the stack and explains why the card is equal or not equal to the product spun. (For example, "My card has 4 groups of 5 which makes 20, but the product on the spinner is 18, so they're not equal" or "My card has 5x3 and the spinner shows 18, so they're equal!") Take turns playing. Whenever the card and spinner match, the player gets to keep the card and spin the spinner again to get a new product for the players to find. The person with the most cards when time is up wins the game.

Challenge: Add in the repeated addition cards and have to look for products in three different ways! Or, use the blank cards to make your own pictures of equal groups, multiplication sentences, and repeated addition sentences.

Math Talk:

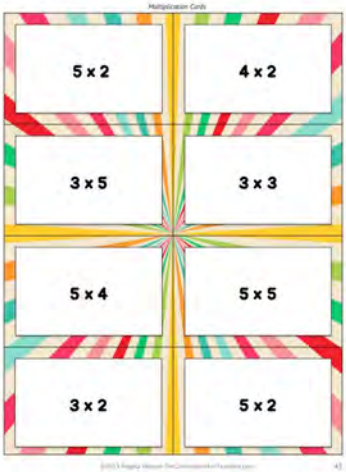
How can you explain what *array* means in your own words?
Can arrays have an odd number of objects? Why or why not?
Why are equal groups needed for repeated addition?
Is there more than one repeated addition sentence for each array?
How can that be possible?
How can we connect multiplication facts with their array models?
Can a product have more than one multiplication sentence? How?

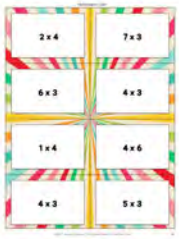
CCSS: Represent and solve problems using multiplication and division.

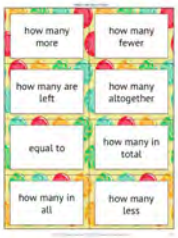
3.OA.A.1 Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.

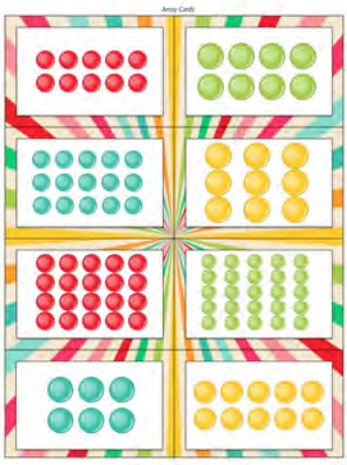
I can multiply to find the product.
I can show products using equal groups, arrays, and repeated addition.

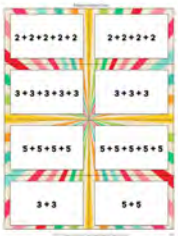
Game Resource Pages: Cards, Game Boards, Etc.

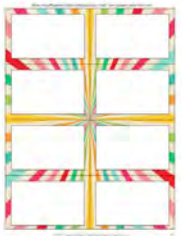


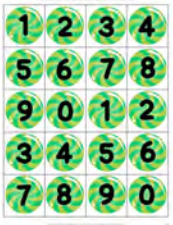


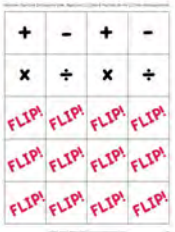


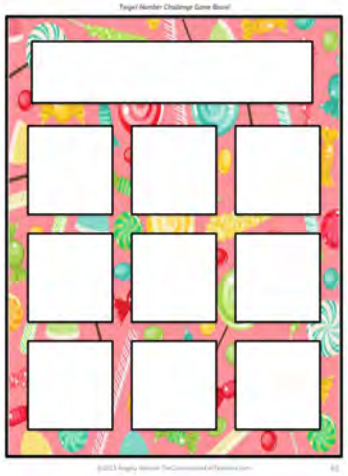


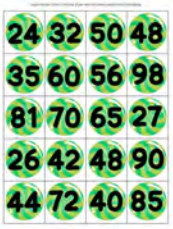


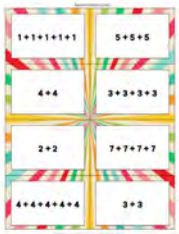


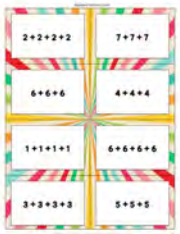


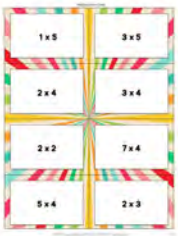


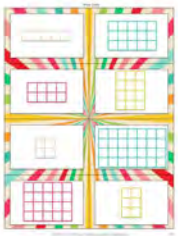


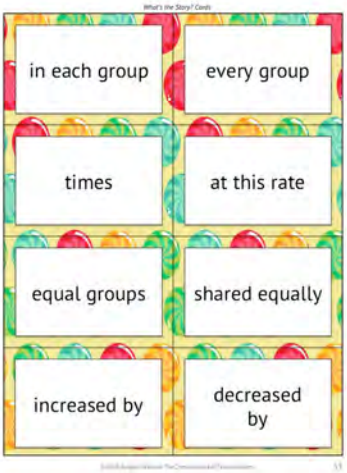


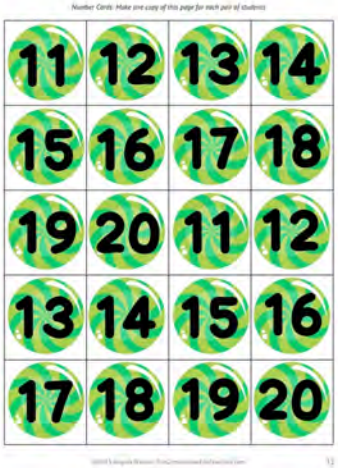


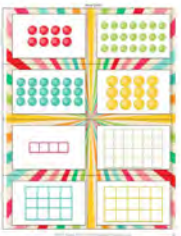


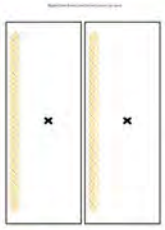












All Pages in Product

Table of Contents

List of Games and Skills Covered

Pg	Game Title	Main Skills	CCSS
20	Trade An Array	Multiply and show products using equal groups, arrays, and repeated addition	3.OA.A.1
21	Product Spin Off	Multiply and show products using equal groups, arrays, and repeated addition	3.OA.A.1
22	Equal Sharing	Find the quotient using equal groups; show division as equal sharing	3.OA.B.2
23	What's the Story?	Use all four operations to solve one and two step word problems; find the missing number in multiplication and division problems	3.OA.A.3 3.OA.A.4 3.OA.D.8
24	Sweet Word Problems	Use all four operations to solve one and two step word problems; find the missing number in multiplication and division problems	3.OA.A.3 3.OA.A.4 3.OA.D.8
25	Guess the Order	Find the missing number in multiplication and division problems; apply properties of operations when multiplying and dividing; recognize the relationship/properties of multiplication and division	3.OA.A.4 3.OA.B.5 3.OA.B.6
26	1,2,3 Flip	Memorize all products within 100; use strategies to solve multiplication problems	3.OA.C.7
27	Target Number Challenge	Memorize all products within 100; use strategies to solve multiplication problems	3.OA.C.7
28	Biggie	Memorize all products within 100; use strategies to solve multiplication problems	3.OA.C.7
29	Back and Forth to 100	Identify numerical patterns; explain rules for a pattern using properties of operations; explain relationships between the numbers in a pattern	3.OA.D.9
30	Find My Pattern	Identify numerical patterns; explain rules for a pattern using properties of operations; explain relationships between the numbers in a pattern; use the properties of multiplication and division to solve problems	3.OA.B.5 3.OA.D.8

Notes About Materials

You can use the gumdrop counters on page 36 as counters, or use your regular counters. There are optional card organizers, work mats, and score keeping sheets to help students keep their materials organized during game play.

Larger number cards are included on page 33 if you want to make a game more challenging. You can use them whenever game materials just say "number cards": I don't recommend using them when the game materials specify just using cards 1-10 or something similar.

Be sure to print the game cards on stock paper or mount them on construction paper so students can't see through them!

The only items you need to supply in addition to the printables from this packet are:

- ❑ Class set of pencils, crayons/colored pencils, and paper or math journals (or use individual dry erase boards)
- ❑ Half class set of clear spinner overlays, or paperclips to make your own spinners (directions here).

Game Assembly Instructions

Pg	Game	Materials
20	Trade An Array	Trade an Array game board for players to share, array cards, repeated addition cards, multiplication cards (challenge only) (print pgs 37-47)
21	Product Spin Off	Product Spin Off spinner, array picture cards, multiplication cards (print pgs 37-49, 43-48)
22	Equal Sharing	Counters, division sentence cards, pencils and paper or math journals (optional) (print pgs 36, 49-50)
23	What's the Story?	What's the Story cards**,** number cards, pencils, math journals or paper (print pgs 31-33, 51-53) (optional: blank work mat for organizing cards pg 69)
24	Sweet Word Problems	One copy of each Sweet Word Problems game board, number cards, (print pgs 31-33, 54-59) (optional: counters pg 36)
25	Guess the Order	Two copies of the Guess the Order game boards, number cards, multiplication and division sign cards, math journals or blank paper, pencils (print pgs 31-34, 60)
26	1,2,3 Flip	1, 2, 3 Flip game board, number cards 0-9, multiplication sign cards, FLIP cards and subtraction, division, and addition sign cards (for the Challenge only) (print pgs 31, 34, 61)
27	Target Number Challenge	One Target Number Challenge game board to share, Target Number Challenge cards, number cards 1-12 (print pgs 31-32, 62-64)
28	Biggie	Biggie game board for each player, number cards 0-9, operation sign cards (for Challenge activity only) (print pgs 31, 34, and 65)
29	Back and Forth to 100	Two hundred chart game boards, Back and Forth to 100 spinner, one gumdrop counter for each player (print pgs 29, 36, and 67)
30	Find My Pattern	Two copies of the hundred chart, counters, number cards 1-9 (print pgs 31, 36)

Math Partner Games: 3rd Grade Operations & Algebraic Thinking

11 Common Core-aligned games for teaching addition, subtraction, and more!

How do math partner games align with CCSS?

The games in this PDF were created for (not retro-fitted to) the Common Core State Standards (CCSS) for third grade math. There are 2-3 games for each of the operations and algebraic thinking standards. The table on page 15 shows you which standard(s) are addressed in each game.

The standards as well as "I Can" statements with child-friendly language are included in each game's instructions. Since there isn't one set of "I Can" statements that all states use, I've chosen terminology that I think is simple and easy for you to make sense of.

Additionally, the "Model and reinforce mathematical practices" domain of the CCSS is integrated in each and every game through the actual game play, the "math talk" discussion/reflection prompts, or both. (You can find more math talk questions here.) The standards for math practices are:

MP1 Make sense of problems and persevere in solving them.
MP2 Reason abstractly and quantitatively.
MP3 Construct viable arguments and critique the reasoning of others.
MP4 Model with mathematics.
MP5 Use appropriate tools strategically.
MP6 Attend to precision.
MP7 Look for and make use of structure.
MP8 Look for and express regularity in repeated reasoning.

What's a math partner game?

Similar to math tubs, the math partner games I use are two-player games that reinforce a variety of math skills, including problem solving and logical thinking. The games are open-ended and easily differentiated and individualized.

Are math partner games the same as math centers?

It depends on your definition. Typically in my classroom, partner game time is separate from center time because centers are independent activities while math games are multi-player and encourage discussion and collaborative problem solving. However, if you have students complete math centers cooperatively, then math partner games would be a perfect fit!

There IS one major difference between the partner game arrangement I describe here and typical centers. When kids are in centers, usually you (the teacher) are working with a small group. Since you're busy teaching, it's hard to tell whether the rest of the class is actually learning anything in their centers and games or if they've just mastered the art of looking busy.

During the math partner game set up I recommend here, you are *not* responsible for small group instruction, so you're free to facilitate students' thinking and engage kids in conversations about what they're learning.

What are the advantages of using math partner games?

Math partner games are a great opportunity for the teacher to:

- Take anecdotal notes and/or assess children in meaningful scenarios
- Support students who are struggling academically as well as socially, because you'll have the time to help solve disputes and model social problem solving skills
- Challenge high-achievers who are easily bored
- Allow students to actively construct knowledge through collaborative hands-on activities
- Model logistical thinking and encourage discussion (connecting words and math is difficult for many students)
- Provide problem solving and math skill practice that kids really enjoy

How many times do kids play the same game?

Generally, students play the same game for an entire week so that they have time to master the rules. Once they understand the basics, they can really start focusing on the targeted math skills, determining patterns and strategies, and engaging in higher-level thinking discussions.

For how long do kids play the games?

I prefer to have pairs of students work with each game for 7-15 minutes daily. Though some games naturally lend themselves to the shorter or longer end of that range, ten minutes is pretty optimal and a good target to aim for.

Though most of the games end only when time is up, ALL of the games are open-ended enough that students won't need to ask, "I'm done, now what should I do?" The instructions also provide Challenge activities which you can have students do if they have time, or you can assign them to certain students for differentiation. I usually have the class do the extra challenge for the last two or three days of the week, unless they haven't yet shown proficiency with the basic level of game play.

There are also Math Talk questions which you can have students reflect on in writing using math journals or other formats. Once a week (or even more often), you may want to allow several extra minutes for students to talk or write about the Math Talk questions.

How do I make time for math partner games?

There are many ways to incorporate game time into your schedule. I prefer using them daily for up to 15 minutes, but I've also used them as fun math practice on Friday afternoons for about 25 minutes each week.

For awhile, my district required that I conduct standardized test prep/spiral review practice with the kids for 20 minutes at the start of the math period. I chose to follow that with 10 minutes for math partner games, and then launched into my math concept/skill lesson for the day. The active, hands-on partner games were the perfect way to clear students' heads before instruction resumed.

The fact that math partner games are great for breaking up long periods of direct instruction and guided practice is increasingly important as the CCSS

moves us toward deeper study of math concepts. Many teachers now have longer math periods and are expected to spend several weeks on the same topic (whereas before, we might have only had several days per concept). Math partner games are a way to fill that extra time with meaningful opportunities for students to explore and talk about math concepts.

How are kids paired up?

I recommend that math game partners be selected by the teacher (rather than self-selected) so that students are paired homogeneously. This is important because if you have heterogeneous pairs (mixed ability levels), the less advanced child will lose frequently and get frustrated. Kids only enjoy playing the games if they regularly experience success and feel like they have a fair shot at winning.

Another reason why I think it's better to pair kids with similar ability levels for math partner games is so that game play can be differentiated. You'll be able to spend more time supporting your struggling students since they'll be working together. And having your highest-performing kids paired together will be extremely valuable for them because they can play quickly and enjoy being challenged in a way that doesn't always happen during the average mixed-ability cooperative activity. Since most of us have students work in mixed-ability groups throughout the school day, math partner games can be a rare opportunity for students to work one-on-one with another child who's learning at a similar pace.

I also think it's important to consider students' personalities when pairing. I don't like to pair kids who know each other too well because they'll play around, but if they don't like each other or are both very shy or competitive, there can be problems as well.

Math Game Partners

Partner 1	Partner 2
Gabriella	Fadlaine
Angel	Claritza
Rolando	Lucas
Mabelin	Ana Jennsy
Nickolas	Jerrell
Manny	Peterson
Amy	Keisha
Carlo	Anna
Isaiah	

6 Minute Solution Partners

	Partner 1	Partner 2
A	Gabriella	Angel
B	Claritza	Amy
C	Fadlaine	Keisha
D	Peterson	Manuel
E	Isaiah	
F	Rolando	Lucas
G	Nickolas	Mabelin

Pages 18 and 19 are blank partner lists which you can fill out and display so students know who their partners are. Before sending students off to play the games, I usually have the class look at the list and raise their hand if their partner is not in the room so that I can re-partner students for the day as needed.

I generally make changes to the partner list based on my observations and student input. I've found that some kids want to keep the same partner for months, but most kids want to change partners every few weeks, and I try to accommodate them either way so they enjoy the games more.

For variety, I do allow students to pick any partner they want on special occasions (short weeks, days when we have an assembly and the math block is cut short, etc.) as well as when we go back to review previously taught skills. Some kids choose to play with friends that are more or less advanced than them, and that allows them to experience the game in a different way. Interestingly, I've found that about half the students still choose their regular math game partner: the kids tend to get into certain rhythms and playing styles and enjoy the familiarity.

Can students choose the game they want to play?

Yes! After a few weeks when you have introduced several games, you can let each set of partners choose one of the games to play, and have the class practice playing different games at the same time. I highly recommend doing that occasionally throughout the year, such as:

- Short weeks when you only have school for 2-3 days and therefore don't want to introduce a new game.
- When you want to review a variety of skills and concepts. Do two or three 10 minute sessions back to back, and let kids change their games for each session.
- When a lot of students absent: let kids pick their own partners and own games for a special treat.
- At the end of the year when you have already introduced all the games.

When students are all playing different games, you may need to have printed directions available in case kids forget the rules. You should also talk with students about what they should do if they get stuck.

How do I use the "Challenge" section of the games?

You can offer the challenge as an option for students if they'd like to try it, or assign it only to certain students to differentiate game play. Another idea is to use that section after students have played the regular way several times, or later in the school year when reviewing previously taught skills.

How do I use the "Math Talk" section of the games?

You can teach students to talk about these questions with their partners, or ask the questions yourself as an informal assessment while observing game play. Or, use the Math Talk questions to facilitate mini-lessons and/or debriefing sessions before and after game play. The questions also work well as math journal prompts and written reflection topics.

How do I introduce math partner games to my class?

I strongly recommend that you model how to play the games FIRST. Introduce the games one at a time to your class, one game per week. During the modeling, you can demonstrate the basics of the game by playing against a volunteer. I used an Elmo (document camera) to help with this, placing the pieces under the Elmo so the class could see what was happening. I then guided two other volunteers as they played together for the class. This technique is a great way to model mathematical thinking and reasoning and draw attention to the math strategies you want students to use.

Right after the modeling/demonstration, release students to try playing the game with their partners. If you see a lot of kids making the same mistakes or demonstrating major misconceptions, end the game time a little early. Talk about it afterward, and do more modeling the next day.

For younger students (and for most classes at the beginning of the year), I'd suggest modeling the game on the first *two* days students play it. The first day, your demonstration should be very in-depth and focus on what to do if kids get stuck or disagree with one another, as well as what to do when they're finished and how to clean up the game properly. The second day's demonstration can focus more on applying math skills and strategies. I often do two or three days of demonstrations/skill mini lessons with more complex games, even if it's just quick refresher with two student volunteers before releasing the rest of the class to play.

Why not have kids play all different games at once, like in math centers?

I like having the whole class play the same game because you can conduct mini-lessons/strategy discussions around shared experiences before and after game play. Also, since students play the same game for a week, you have lots of targeted opportunities for identifying and addressing misconceptions and scaffolding student learning.

Could the games also be used as centers?

Sure! Its totally your choice how to use the games—they'd work just fine in traditional centers, math tubs, math work stations, etc. You could choose to play some of the games using the system I describe here, and place the rest in centers for kids to explore independently. **I do still recommend you model game play for the students before expecting them to play on their own.**

How do I open the math partner game time?

When you first introduce a game at the beginning of the week, you'll start your math partner game time with modeling. By mid-week, you can start the time with a mini lesson focusing on the higher-order thinking skills you want students to develop. You can pose particular scenarios that might arise during game play and have students suggest strategies for solving them, or mention a challenge that one team of students experienced the day before and have students talk about what they would do. You can also mention any classroom management issues that arose, or remind students of skills and strategies you'd like them to apply.

How do I close the math partner game time?

You can end the math partner game time with a whole-class debriefing session. Students can talk about what strategies worked well and which didn't. Use the Math Talk questions provided for each game to help you facilitate the discussion. Students can also reflect on these questions in writing (i.e. in math journals), or by talking with their partner (or a different partner in a turn and talk or think-pair-share activity.)

You can switch up your approach as needed, or make a schedule and debrief in a different way each day of the week. Again, the conversations will be more superficial at the beginning of the week and will move toward critical thinking as students have more experiences with the game.

How do I store and organize math partner games?

You'll need to have *half* a class set of all your game cards and most of the materials, such as spinners. In other words, if you have 26 students, you need 13 sets of each game. In many games, students share a game board, so you only need a half class set of those, but in other games, students will each need their own board.

The type of organizational system you choose should be based on the materials you have and the size/type of your math games. If you have lots of larger materials that you're using in addition to the games in this PDF, you'll need to consider that in your planning. I'll share with you the systems I've used over the years, and then explain what I think is the best way to organize and distribute this particular set of geometry games.

My first year using math partner games, I simply had a milk crate full of plastic baggies with materials inside. As my collection of games grew, I started keeping the plastic baggies in plastic tubs (containers). Some were the small kind you'd find at the dollar store and some were larger like dishwashing tubs, depending on the size of the materials that went inside.

Eventually I found the toy organizer you see pictured above. (Mine was from Big Lots, but I believe you can still get something similar at Target.) I used the large, colorful bins to hold the partner games my class was currently using. There was one bin for each game, and each bin held the set of materials for that game. For most games, I had a plastic baggie or manila envelope for each pair of students, so the bin for a certain game

usually had about a dozen baggies or envelopes inside. The games for units we weren't currently studying were hidden away in cabinets or other plastic containers.

I also kept one set of each game in a hanging shoe organizer, which you could see hanging on the door in the previous page's picture and as a close up below. Later in the school year, I'd allow students to choose the game they wanted to play. Each set of partners would simply walk over to the shoe organizer, pick a game and take out the materials, then return them after game play. I also allowed students to use the games in the shoe organizer at other times in the day (before and after school, during indoor recess, etc.) We called it "Free Choice Math Partner Games." I had a milk crate to hold the games that were too large to fit in the shoe organizer.

How do I pass out and collect the games?

For the games in this PDF, I recommend using just two baggies for each pair of students, one for the number cards/operation sign cards/FLIP cards, and one for the arrays/repeated addition/multiplication cards. There will be times when you want kids to use multiple sets of cards during a single game, so having similar cards altogether makes sense and saves you plastic baggies. It's not a bad idea to mark some place on each card with a symbol, color, or number to indicate which bag it came out of, in case a stray piece is found on the floor.

Each day as you begin math partner games, write on the board which cards students should take out of the baggies. They can leave the rest of the cards in the bag (or even choose to include them if they decide with their partners to make the game more challenging.)

Each set of game boards could be kept in a single file folder or manila envelope: ditto with other materials needed. When you're ready for students to play a game, place the file folder full of game boards (or other materials) and the corresponding set of baggies on a table. Have all the "Partner 1s" in your math partner list (see pages 18-19) come up to the table in an orderly line and take one of everything. The Partner 2's are responsible for returning the materials to the same spot after game play.

If you practice your expectations for this, the system for distributing and collecting game materials will go very, very quickly. Sometimes it helps to set a timer for one minute: at the end of the minute, all the partner 1s should have the necessary materials and both partners should be in their "spot" in the room where they play the math partner games. If there is any pair of students who has not yet begun game play when the timer goes off, you can assist them with whatever they need to get started.

How can I save ink, paper, and time?

Some of the same cards and game boards can be used for multiple games, so that helps a lot. Here are some other tips to help you save ink, paper, and time as you create the games:

✓ **Pick the games you want to use, and THEN print**. You'll probably find that there are more than enough games here and you won't have time to implement them all, so don't print anything until you're sure you'll use it.

✓ **Be selective about the game resources you print.** There are multiple game boards for some games so you can differentiate game play for students. You might not need them all.

✓ **Use only a digital copy of the game instruction sheets**. You can use an LCD projector with a document camera or interactive whiteboard to project the directions for the class to see if needed. But the only time you'll need a printed copy (other than possibly for yourself) is if you decide to place one copy of the game in a Free Choice Math Partner Game area like the hanging shoe organizer I described, or if you want kids to use the games in math

centers/stations. In those instances, you could print a single copy of the instructions. But, for regular math partner game time, it's not necessary to print the instructions for each pair of kids. You will have already modeled game play for the class multiple times (which means they'll know the game far better than if they'd just read the directions), and you'll be walking around the room facilitating as kids play in case they need help.

✓ **Print most (or all) of the game resources in black and white and have students color them for you. Or, print onto colored paper!**. Black and white copies can still be very visually appealing, and you have the option of printing onto colored stock paper or using colored pencils/markers to add interest. You may want to print your class set in black and white, and then make one or two full color copies to use when modeling the game for the class and for later on if you place the games in your math centers or stations. You can let a different pair of students use the full color version each day as recognition of exemplary work in the previous day's math game time.

I'm ready! How do I get started?

Start by figuring out which standards you want students to practice through the games. The table on the next page of this packet tells you which games align to each standard.

Read the instructions for the games you're interested in, and check out the game resources (game boards, cards, etc.). Decide which ones are the best fit for your students' needs, and print! Use pages 16-17 to help you assemble the games and collect any extra materials you might need. Have fun!

ANGELA WATSON'S
truth *for* teachers

BUT WAIT! THERE'S MORE...

I'm Angela Watson, the creator of this resource. I'm a National Board Certified Teacher with a masters degree in Curriculum and Instruction, and have 11 years of classroom teaching experience and over a decade of experience as an instructional coach. I currently work as a Productivity and Mindset Specialist in the area of educational consulting. In practical terms, this means I author books, design curriculum, and provide professional development services. Everything I do is centered on sharing more effective, efficient, and *enjoyable* ways of teaching and learning!

I founded my website (**TruthforTeachers.com**) in 2003 to connect with other educators. You can now find thousands of ad-free articles and resources there from me and our K-12 teacher-writer's collective.

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