



ST Math

Teacher Guide to Supporting 3rd Grade Students Learning From Home

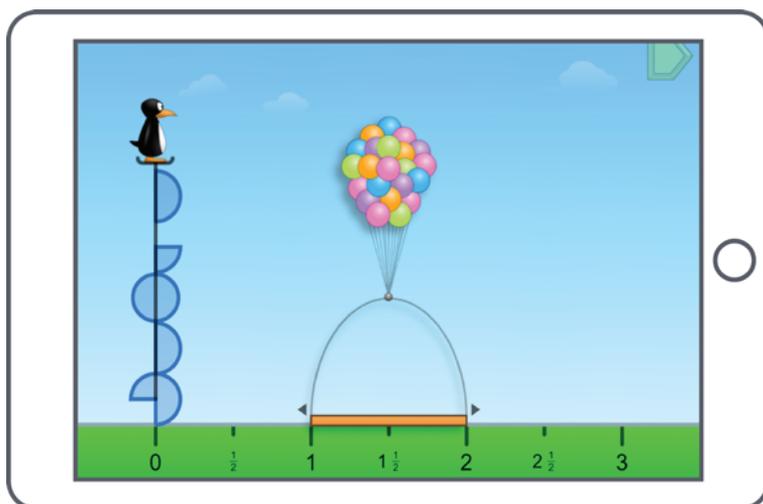


MIND
RESEARCH INSTITUTE

With the spread of Coronavirus, COVID-19, schools across the country are temporarily closing. At [MIND Research Institute](#), our mission is to ensure that all students are mathematically equipped to solve the world's most challenging problems. That's why we stand ready to provide resources and no-cost access so the learning can keep on happening, even if school is temporarily closed.

This guide provides support and resources that teachers can use for remote learning. There's also a companion guide for parents. All resources in the parent guide are included here to support teachers as they plan their remote instruction. The three types of resources in this guide are outlined below.

ST Math Program: [ST Math](#) is a PreK-8 visual instructional program that leverages the brain's innate spatial-temporal reasoning ability to solve mathematical problems. Its unique, patented approach provides students with equitable access to learning through challenging puzzles, non-routine problem solving, and informative feedback. With ST Math, students build deep conceptual understanding, and schools see proven, repeatable results.



Hands-On Math Activities: These activities focus on specific math concepts within a grade level. Each activity is designed to engage students in learning that is hands-on and promotes understanding of the concept. These activities are meant to be done with a parent or guardian. It's a fun way for children and parents to do math at home. Each activity includes clear directions, vocabulary words, and questions parents can ask to support their children during the activity.

Number Sense Games: Number Sense is an area that is critical to mathematics learning. It includes mathematical concepts like counting, adding, subtraction, multiplication, division, fractions, place value, estimation, and many others. Included in this packet are activities that students can do at home with their families to build number sense and practice those critical skills in a fun and engaging way through gameplay.

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Planning strategy for creating virtual ST Math Lessons.

A collection of hands-on, grade-band activities focused on practicing and exploring math concepts. (Students will not get on ST Math for these activities.)

Virtual Math Talk/Number Sense Games 24-48

Use the ST Math Creature Board to do a virtual math talk with your students.

Hands-on games and math stories designed to support students in building number sense. (Students will not get on ST Math for these activities.)

Using These Resources

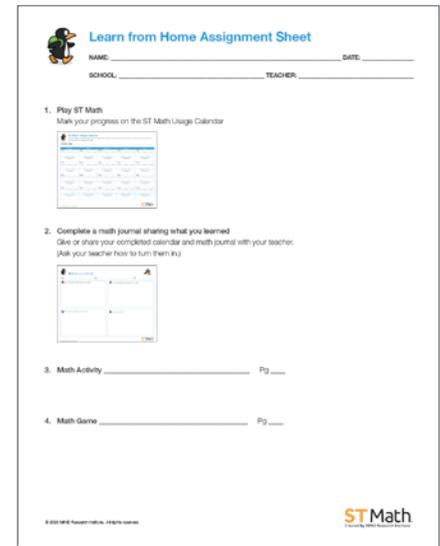
As you review this packet and prepare to use these resources to support you in planning your remote learning, here are some suggestions for you.

Provide your students with an assignment sheet.

- Download the assignment sheet from this packet and use it to communicate with your students the expectations for their work during the week.

Review the tips for parents.

- These are tips that are provided in the parent guide, but also are good reminders that you may want to include in your email communications.



Learn from Home Assignment Sheet

NAME _____ DATE _____
SCHOOL _____ TEACHER _____

1. Play ST Math
Mark your progress on the ST Math Usage Calendar



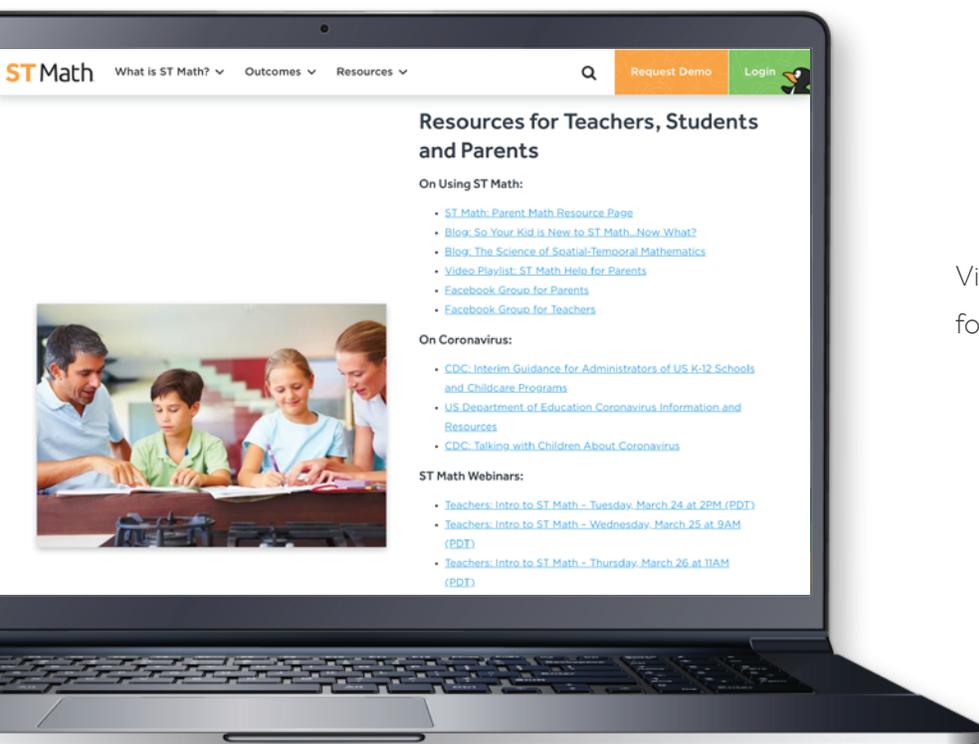
2. Complete a math journal sharing what you learned
Give or share your completed calendar and math journal with your teacher.
(Ask your teacher how to turn them in.)



3. Math Activity _____ Pg _____

4. Math Game _____ Pg _____

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Visit stmath.com/coronavirus for additional information and support.

ST Math

Resources to support, monitor, and assess student learning while they play ST Math.

Teacher Guidance:

- Encourage students to work independently on ST Math and track their usage on the ST Math calendar. Recommended usage time is 20 to 30 minutes at least 3 times per week.
- Remind your student to use the Think Before You Click strategy to help them think through games. This will help support them when they are stuck on puzzles. For more information on this strategy, view the videos on our instructional resources [Youtube playlist](#).
- Encourage parents to support the student's thinking by asking [facilitating questions](#) instead of telling or showing the student how to solve the puzzles. The parent guide includes a facilitating questions poster. For more information on how parents can facilitate student thinking as they work on ST Math puzzles, view the videos on our instructional resources [Youtube playlist](#).
- Consider posting or emailing a link to the Think Before You Click and Facilitation videos for easy access for parents.
- Review the other resources on the site to determine what other things you might want to share to support the use of ST Math at home.

Below are tips to share with families working with their children at home:

- Work with your child to set goals and monitor their progress toward achieving their goals. This is a great opportunity to help your child see that they can achieve their goals.
- When your child is finished playing ST Math, have them complete a math journal to share what they have learned.
- If possible, take time to sit with your child and ask them to explain to you what they are learning with ST Math.
- A fun way to share learning together is to have your child "teach" a family member how to play one of the ST Math games. They can share the mathematics in the game.
- If your child gets stuck playing the ST Math puzzles, you can have them think through the questions on the Think Before You Click poster. If you are able, you can use the questions on the Facilitating Questions poster to help your child problem-solve through the ST Math games.



ST Math® Usage Calendar

Mark your progress every time you use ST Math. Try to play at least 30 minutes. Color the box each day that shows the number of minutes you played. Fill in how many puzzles you completed in ST Math.

STUDENT NAME: _____

MONDAY			TUESDAY			WEDNESDAY			THURSDAY			FRIDAY		
DATE:														
10 min.	20 min.	30 min.	10 min.	20 min.	30 min.	10 min.	20 min.	30 min.	10 min.	20 min.	30 min.	10 min.	20 min.	30 min.
Number of Puzzles I Completed:			Number of Puzzles I Completed:			Number of Puzzles I Completed:			Number of Puzzles I Completed:			Number of Puzzles I Completed:		
DATE:			DATE:			DATE:			DATE:			DATE:		
10 min.	20 min.	30 min.	10 min.	20 min.	30 min.	10 min.	20 min.	30 min.	10 min.	20 min.	30 min.	10 min.	20 min.	30 min.
Number of Puzzles I Completed:			Number of Puzzles I Completed:			Number of Puzzles I Completed:			Number of Puzzles I Completed:			Number of Puzzles I Completed:		
DATE:			DATE:			DATE:			DATE:			DATE:		
10 min.	20 min.	30 min.	10 min.	20 min.	30 min.	10 min.	20 min.	30 min.	10 min.	20 min.	30 min.	10 min.	20 min.	30 min.
Number of Puzzles I Completed:			Number of Puzzles I Completed:			Number of Puzzles I Completed:			Number of Puzzles I Completed:			Number of Puzzles I Completed:		
DATE:			DATE:			DATE:			DATE:			DATE:		
10 min.	20 min.	30 min.	10 min.	20 min.	30 min.	10 min.	20 min.	30 min.	10 min.	20 min.	30 min.	10 min.	20 min.	30 min.
Number of Puzzles I Completed:			Number of Puzzles I Completed:			Number of Puzzles I Completed:			Number of Puzzles I Completed:			Number of Puzzles I Completed:		



Math Journal with JiJi



NAME: _____ GAME: _____ DATE: _____

1 WRITE OR DRAW SOMETHING YOU LEARNED

2 TELL SOMETHING THAT WAS EASY OR HARD

3 TELL HOW THIS HELPS YOU WITH MATH

4 MATH VOCABULARY



Math Journal with JiJi

Write or draw something you learned today. Write in one box each day.

NAME: _____ GAME: _____

1

2

3

4

WRITE MATH WORDS YOU USED IN THIS GAME.





NAME: _____ DATE: _____

OBJECTIVE PROGRESS	SYLLABUS PROGRESS	TIME SPENT	# OF PROBLEMS SOLVED

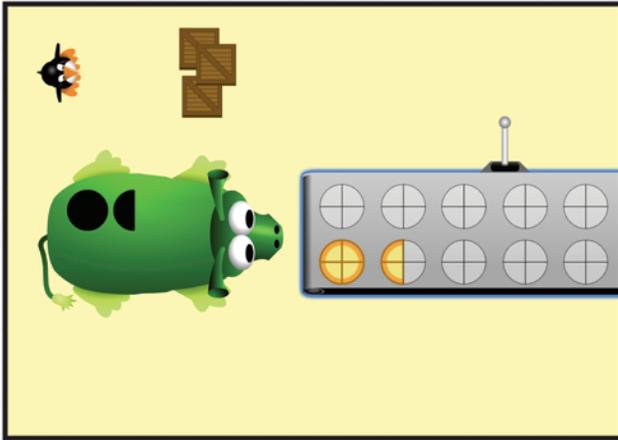
SOMETHING I LEARNED TODAY IS . . .

SOMETHING THAT WAS EASY / HARD FOR ME WAS...
(circle one)

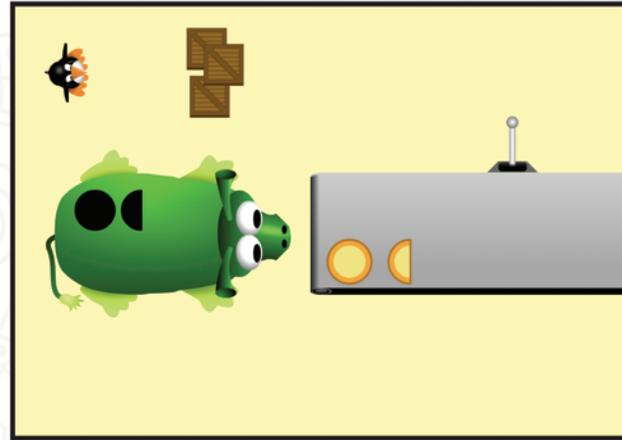
ONE WAY THIS CONNECTS TO WHAT I LEARNED IN CLASS IS . . .

Think Before You Click

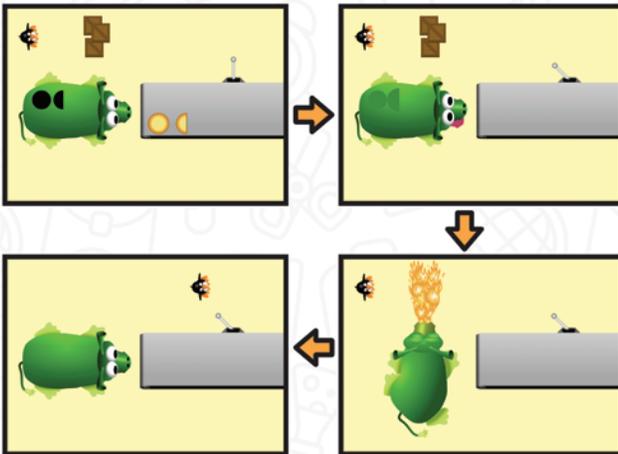
1 What do you notice?



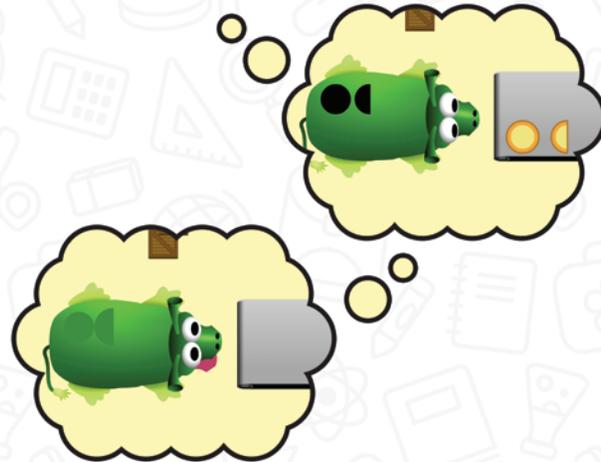
2 What is your strategy?



4 What did you learn?



3 Try your strategy. What happened?

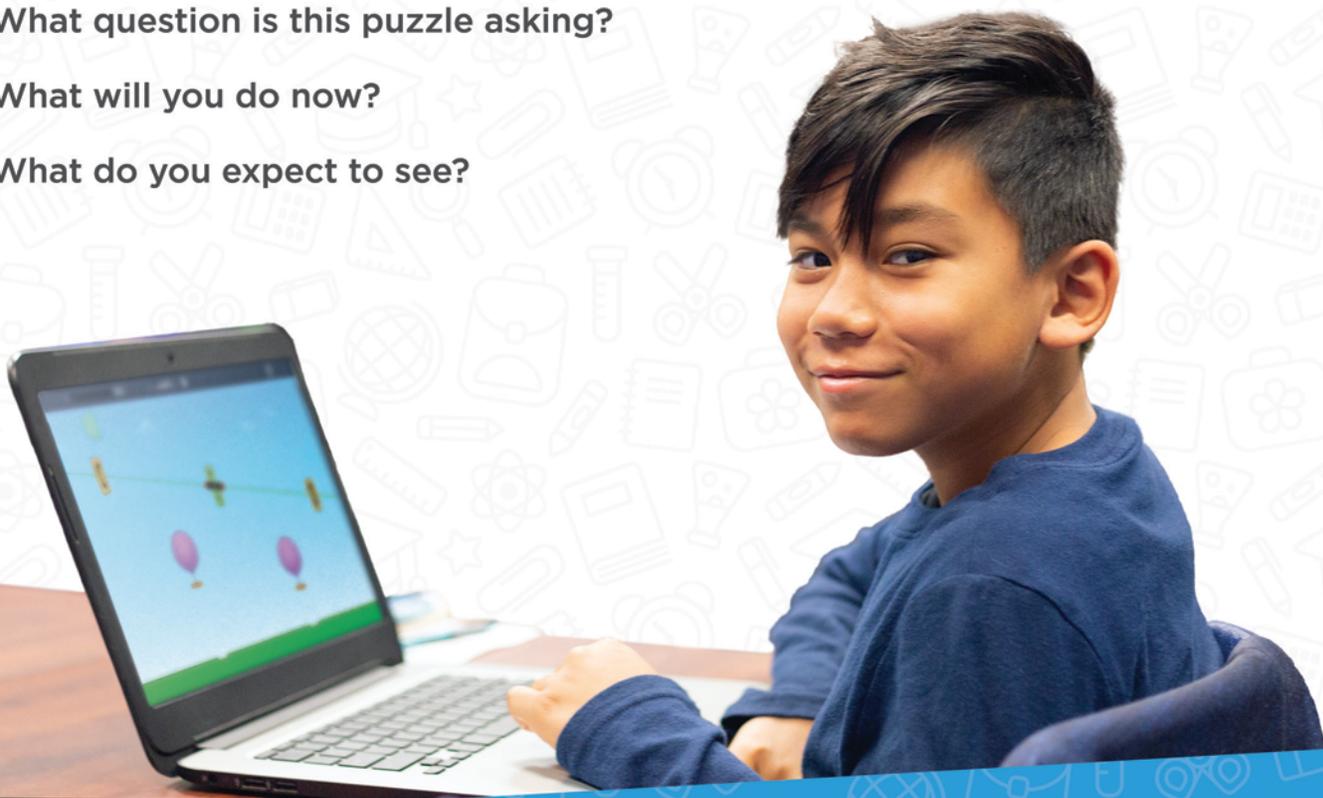


Facilitating Questions

In ST Math®, the puzzles start off simple and then get more challenging as the student progresses. When they reach a challenging problem, they may ask for your help.

To help them, ask questions like:

- What do you notice about the puzzle?
- What did you learn from the previous level that can help you here?
- What can you click?
- Describe what you see after you click. What did you learn?
- Describe the strategy that you are going to use.
- What can you do to get JiJi across the screen?
- What question is this puzzle asking?
- What will you do now?
- What do you expect to see?



Hands-On Math Activities

A collection of hands-on, grade-band activities focused on practicing and exploring math concepts.

These activities correlate to our games.

Teacher Guidance:

- These activities focus on specific math concepts within a grade-level. Each of the hands-on math activities are correlated to an ST Math game. These games are great for you to use with your students in your one-on-one meetings, or in virtual lessons. The visual models in the games help students “see” the mathematics.
- As students do these activities with their families, you may want to have students write what they learned during the activity, or write their answers to the questions so you can assess their learning. Below are some tips that you can share with parents as they do these activities with their children.

Below are tips to share with families working with their children at home:

- These are great activities for you to do with your child. Family members can use the questions and ideas provided to promote math conversations.
- Once your child finishes the activity, have them write a 5-sentence summary or draw a picture of what they learned. They should also list any questions they have for their teacher.

Hands-On Math Activity Resources in the Teacher Guide

The resources in the table below are provided in the Parent and Teacher Guides to support students as they learn at home.



Math Activity Guide: This guide outlines activities, their related materials, and math concepts.



Math Activity Sheets: These activity sheets include directions, vocabulary words, sample questions, and extension ideas. The activities are designed so that students can complete with the teacher or at home with their families.



Grade 3

Game	Materials Needed	Concepts	ST Math Game Connection
Add It Up!	<ul style="list-style-type: none"> Any small household items. Some examples include cereal, coins, beans, crayons, etc. 	Multiplication is related to addition. When you multiply you are adding together equal groups.	<p>Third Grade Objective: Multiplication Concepts</p> <p>Game: How Many Legs</p>
Equal Groups	<ul style="list-style-type: none"> Any small household items. Some examples include cereal, coins, beans, crayons, etc. Small plates Number cube or dice 	Division is related to subtraction. Repeated subtraction can form equal groups. Fair sharing (dealing out) one at a time can form equal groups too.	<p>Third Grade Objective: Division Concepts</p> <p>Game: Fair Sharing L.I.</p>
Modeling Multiplication and Division	<ul style="list-style-type: none"> Any household item you have 30 of. Some examples include cereal, coins, beans, crayons, etc. 	Multiplication is counting equal groups and division is creating equal groups	<p>Third Grade Objective: Multiplication and Division Relationships</p> <p>Games: Build Expressions Multiplication and Division Fact Family</p>
Build It	<ul style="list-style-type: none"> Square shaped household items (Post-It© notes, square crackers, notecards cut into squares) Rectangle shaped pieces of paper 	Area is the number of unit squares needed to cover a rectangle. Perimeter is the sum of the lengths of all 4 sides of a rectangle.	<p>Third Grade Objective: Area and Perimeter</p> <p>Game: Select Area and Perimeter</p>
Name It	<ul style="list-style-type: none"> Pencil Crayons Sticky notes (or small square pieces of paper) 	A fraction is written with a numerator and a denominator. The denominator represents the total number of equal pieces. The numerator represents how many of those equal pieces were counted.	<p>Third Grade Objective: Fraction Concepts</p> <p>Game: Crank Pies</p>
Pattern Detectives	<ul style="list-style-type: none"> Pencil and paper 	Patterns in the addition or multiplication table can be identified and explained using the properties of operations.	<p>Third Grade Objective: Number Patterns</p> <p>Games: Make It Linear Hundreds Pit</p>
Shape Up	<ul style="list-style-type: none"> Toothpicks Notecard or piece of paper 	Shapes can be classified according to attributes, such as number of sides and types of angles.	<p>Third Grade Objective: Shapes</p> <p>Game: Shape Types with Quadrilaterals</p>
Nickels and Dimes	<ul style="list-style-type: none"> Nickels Dimes Pencil and paper 	Some problems have more than one step. Parentheses can help to clarify these steps.	<p>Third Grade Objective: Unknowns in Two-Step Problems</p> <p>Games: How Many Legs Which Parentheses</p>



Add It Up!

Activity for 3rd Grade Students

This game focuses on helping children to make the connection between addition and multiplication. Your child should understand that when they multiply 4×3 , for example, they are finding the total of 4 groups of 3. This is the same as $3 + 3 + 3 + 3$ which is equal to 12.

Directions:

- Gather paper, a pencil, a number cube (dice) and some small household items like cereal, beans, buttons, pennies, etc.
- Ask your child to roll the number cube to determine how many groups to draw. For example, if they roll a 5 they would draw 5 circles to represent the 5 groups.
- Have your child select a specific household item (e.g., pennies) then roll the number cube again to determine how many (pennies) are in each group. Place that number of (pennies) in each group. Place that number of (pennies) in each group.
- Work together to write the repeated addition sentence to represent the groups (e.g., 5 groups of 2 objects would $2 + 2 + 2 + 2 + 2 = 10$).
- Work together to write the repeated addition sentence as a multiplication sentence ($5 \times 2 = 10$).
- Roll again and repeat.



Math Words to Use:	Materials	Sample Questions to Ask:
Multiply Groups of Equal groups Skip counting	<ul style="list-style-type: none">• Any small household item Some examples include cereal, coins, beans, crayons, etc.• ST Math Creature Board	<ul style="list-style-type: none">• How do you know your groups are equal?• How many equal groups do you have?• What are different ways to find the total number of objects you have?• How could you represent your model with an equation?

Ideas to extend Learning:

- Use the ST Math Creature Board to create multiplication situations. Roll a number cube (or draw a card) and then pick a Creature. Ask your child to write both a repeated addition sentence and a multiplication sentence to represent the total number of shoes the creatures would wear.
- Pose just a multiplication problem (e.g., 3×6) to your child and see if they can represent the problem with a picture, model, or story problem.
- Look for equal groups of objects around your house (e.g., toy cars with 4 wheels each, pairs of shoes, chairs with 4 legs each, windows with 6 panes each). Ask your child to represent the groups with both a repeated addition sentence and a multiplication sentence.
- Find sets of items around the house and have your child put them into different number of equal groups (e.g., eggs into 2, 3, 4, 6 groups).



Equal Groups

Activity for 3rd Grade Students

This game focuses on helping children to make the connection between division and subtraction. Your child should understand that one strategy for division is to make fair shares. This strategy is a lot like dealing out a deck of cards - each group gets one before any group gets 2 (one for you, one for me, two for you, two for me, etc.).

Directions:

- Gather paper, a pencil, small plates and some small household items like cereal, beans, buttons, pennies, etc.
- Write out a series of division problems (without remainders) for your child to solve.
- Work with them to recognize what the parts of a division problem represent. For example, for the problem $12 \div 4$, the 12 represents the total number of items. The 4 represents the number of equal groups that need to be made.
- Have your child select a set of household items to count, like beans. Ask them to count out the number of (beans) to represent the total in the division problem. (ex. 12 beans). Give them plates to use to represent the groups. Ask “How many beans are in each group?” Work together to deal out or “fair share” the items to find the answer.



Math Words to Use:	Materials	Sample Questions to Ask:
<p>Divide Equal groups Fair share</p>	<ul style="list-style-type: none"> • Any small household items. Some examples include cereal, coins, beans, crayons, etc. • Small plates 	<ul style="list-style-type: none"> • How do you know how many total objects you need? • How do you know how many equal groups you need? • How do you know your groups are equal? • How many objects are in each equal group? • What is a multiplication problem related to this division problem?

Ideas to Extend Learning:

- Look with your child at a completed model of one of the division problems. Help your child to see that by creating equal groups they have made a model of a repeated addition sentence. Help them to write the repeated addition sentence and the related multiplication sentence.
- Work together to make a list of times your child and your family have used division.
- Show your child another common way to represent a division problem (e.g., $15 \div 3$). Talk to them about how to “read” this problem (e.g., “15 divided by 3”) and ask them to show their strategy to solve the problem.



Modeling Multiplication and Division

Activity for 3rd Grade Students

This game focuses on helping children to understand the meaning of multiplication and division. For example, $6 \div 3$ means a group of 6 objects placed into 3 equal groups. 6×3 means 6 groups of 3 objects each.

Directions:

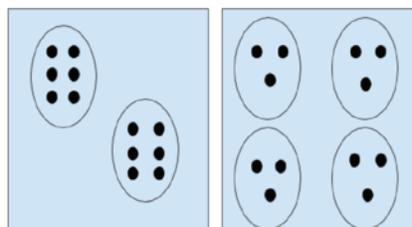
- Gather 30 household items (30 of the same object would help to make sure the math concept is clear so cereal, coins, beans, etc. would work best).
- Pose the following problems one at time to your child and ask them to “read” each problem out loud to you. ($12 \div 3$, 4×5 , 2×9 , $24 \div 6$, 5×6 , 7×3 , $28 \div 4$)
- Have your child use the household items to represent and solve each problem.
- Encourage your child to think out loud as they work (e.g., “For $12 \div 3$, I need 12 objects. I’m going to pass them out to make 3 equal groups. 1, 1, 1, 2, 2, 2, 3, 3, 3, 4, 4, 4. Each group has 4 so the answer to $12 \div 3$ is 4.”)



Math Words to Use:	Materials	Sample Questions to Ask:
<p>Multiply Divide Groups of Equal groups Skip counting</p>	<ul style="list-style-type: none"> • Any household item you have 30 of, such as cereal, coins, beans, crayons, etc. 	<ul style="list-style-type: none"> • What was your first step when you represented this problem? • How did you represent the multiplication problem? • How did you represent the division problem? • How could you prove your answer is correct? • How is the way you represent a multiplication problem different than the way you represent a division problem? Why?

Ideas to Extend Learning:

- Discuss how multiplication and division are related. How can you use a multiplication fact you know, for example, to solve a related division fact?
- Have your child write all of the related facts (fact family) for each problem they solve.
- After your child models a division problem, have them write the repeated addition sentence that represents the equal groups they made.
- Look at the images below. What is the same? What is different?





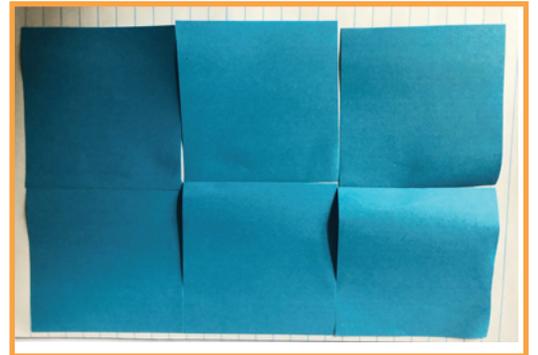
Build It

Activity for 3rd Grade Students

This game focuses on helping children to understand how to find the area and perimeter of a rectangle. Your child should recognize the area as the number of unit squares needed to cover a rectangle. Perimeter is the sum of the lengths of all four sides of a rectangle.

Directions:

- In these activities, focus on the difference in the two types of measurement. Area is the total number of unit squares needed to cover the inside of the rectangle. Perimeter is the distance around the outside of a rectangle.
- Gather square shaped household items (e.g., sticky notes) as well as rectangle shaped pieces of paper from around the house.
- Have your child use their “unit squares” to cover a piece of rectangle shaped paper. Count the squares to find the area of the rectangle.
- Have your child measure and label the length of each side of the rectangle using one side of their unit squares. Add together the side lengths to find the perimeter.
- Repeat with other rectangle shaped pieces of paper.



Math Words to Use:	Materials	Sample Questions to Ask:
<p>Area Perimeter Unit square Cover Side length</p>	<ul style="list-style-type: none"> • Square shaped household items (Sticky notes, square crackers, notecards cut into squares) • Rectangle shaped pieces of paper 	<ul style="list-style-type: none"> • How are area and perimeter different? • How did you solve for the area? Why? • How did you solve for the perimeter? Why? • How did you use what you know about rectangles to find the area and perimeter? • When would we need to find the area of an object in real life? • When would we need to find the perimeter of an object in real life?

Ideas to Extend Learning:

- Ask your child to create rectangles with the same area but different perimeters or the same perimeter but different areas.
- Challenge your child to find a missing side length if the perimeter of a rectangle is given.
- Use the model your student made with their square units to introduce the formula for area ($A = L \times W$).



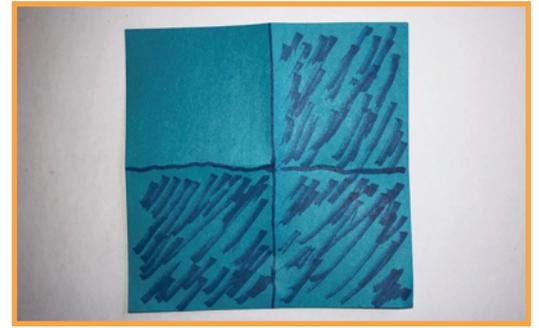
Name It

Activity for 3rd Grade Students

This game focuses on helping children to understand what the parts (numerator and denominator) of a fraction represent. Your child should understand that the denominator represents the number of equal pieces the whole has been divided into (e.g., $\frac{1}{4}$ tells us the whole has been cut into 4 equal pieces). They should also understand that the numerator represents how many of those equal pieces we have (e.g., $\frac{3}{4}$ means we have 3 of the $\frac{1}{4}$ pieces). Note that it is possible to have a fraction greater than one - such as having 6 pieces that are sized $\frac{1}{4}$ each (equaling $\frac{6}{4}$ or $1\frac{1}{2}$).

Directions:

- Gather a pencil, crayons and sticky notes or other small pieces of square shaped paper.
- Work together to fold to divide the sticky notes into halves, fourths and eighths. Make 3-4 of each denominator.
- Have your child randomly shade in fractional parts on the sticky notes (e.g., 2 pieces on this one, 3 on this one, 1 on this one, and so on).
- Work together to name each complete square. Start with the denominator first by counting the total number of equal pieces. Then count the number of pieces that were colored to write the numerator.



Math Words to Use:	Materials	Sample Questions to Ask:
<p>Fraction Equal parts Halves Fourths Eighths Numerator Denominator</p>	<ul style="list-style-type: none"> • Pencil • Crayons • Sticky notes (or small square pieces of paper) 	<ul style="list-style-type: none"> • How many equal pieces do you see? • How many equal pieces did you color in? • What does the numerator represent? • What does the denominator represent?

Ideas to Extend Learning:

- Use (or make) a sticky note fraction to represent $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$. Talk with your child about how the pieces compare. Ask your child why the fractional pieces get smaller as the denominator gets bigger.
- Ask your child to fold a sticky note into 4 equal pieces. Then ask them to color 4 of the pieces. Talk together about how to name the fraction ($\frac{4}{4}$) and what that fraction represents. Explore other ways 1 whole can be written as a fraction.
- Go on a fraction hunt in your home. Look at measuring cups, recipes in cookbooks, the amount of liquid left in containers in your refrigerator, etc.



Pattern Detectives

Activity for 3rd Grade Students

This game focuses on helping children to see arithmetic patterns in addition and multiplication tables. Your child should use what they know about skip counting, addition and subtraction to help them to see the patterns and state the rule of the pattern.

Directions:

- Show your child the pattern “5, 10, 15, 20, 25, 30...”
- Talk together about what is happening between the consecutive numbers in the pattern. Ask your child how you could use this to state the rule of the pattern.
- Look again at the numbers in the pattern. Ask your child if the numbers are odd or even. Discuss why the numbers here alternate between odd and even. What happens when we add an odd number and an odd number? An even number and an odd number?
- Continue with the other patterns listed. Investigate how the consecutive numbers change. Decide whether the numbers are odd or even or both and why.
- Patterns to investigate include: (4, 8, 12, 16, 20, 24...), (7, 14, 21, 28, 35...), (1, 3, 5, 7, 9, 11...), and (100, 200, 300, 400, 500...).



Math Words to Use:	Materials	Sample Questions to Ask:
<p>Even Odd Rule</p>	<ul style="list-style-type: none"> • Paper and pencil 	<ul style="list-style-type: none"> • Why are all of the numbers in this pattern even/odd? • Why do the numbers in this pattern alternate between even and odd? • What comes next in this pattern? How do you know? • How does this pattern relate to multiplication?

Ideas to Extend Learning:

- Print out a multiplication table and cut it apart into puzzle pieces. Ask your child to put it back together and explain their strategy.
- Challenge your child with patterns that do not start with the first number in the pattern and ask them to extend the pattern (e.g., 36, 40, 44, 48, ___).
- Investigate the skip counting patterns for $\times 2$, $\times 4$ and $\times 8$. How do they relate to each other? How can we use what we know about doubles to solve for $\times 4$ and $\times 8$?



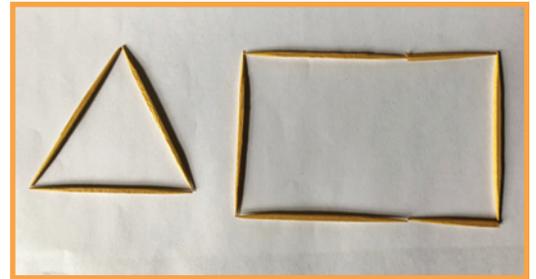
Shape Up

Activity for 3rd Grade Students

This game focuses on helping children to use geometry vocabulary to name and classify shapes. Your child should understand that shapes can be named and classified based on attributes such as the number of sides, types of angles and more.

Directions:

- Give your child toothpicks and ask them to make the different shapes from the list below.
- After your child makes each shape, talk about its attributes. Ask questions about the number of sides, number of vertices (corners), and number of angles.
- Use the corner of a notecard or piece of paper as a “square corner checker”. Have your child determine which shapes have “square corners” (right angles), such as squares and rectangles.
- Repeat with all of the shapes in the list. Help your child to use correct geometry vocabulary as they describe the shapes.
- Shapes to make: square, rectangle, rhombus, pentagon, hexagon, octagon



Math Words to Use:	Materials	Sample Questions to Ask:
<p>Triangle Quadrilateral Rhombus Square Rectangle Pentagon Hexagon Octagon Vertices Right angle</p>	<ul style="list-style-type: none"> • Toothpicks • Notecard or piece of paper 	<ul style="list-style-type: none"> • What is the name of this shape? • How many sides/vertices/angles does this shape have? • A quadrilateral is a shape with four sides. Which shapes did you make that are quadrilaterals? • How do you know this shape has a square corner (right angle)? How many does it have? • Do all of one type of shape look alike? Why or why not?

Ideas to Extend Learning:

- Ask your child to compare two shapes. Have them focus on what the shapes have in common and what is different (e.g. square vs rhombus, square vs rectangle, pentagon vs quadrilateral).
- Explain that parallel lines are lines that do not touch and will never touch. Can your child identify shapes that have sets of parallel sides? Then explain that perpendicular lines are lines that cross to form right angles. Can your child identify shapes that have perpendicular sides?
- Congruent shapes are two shapes that are the same size and same shape. Can your child use toothpicks to build sets of congruent shapes?



Nickels and Dimes

Activity for 3rd Grade Students

This game focuses on helping children to perform more than one operation in a single problem. Your child does not yet have to know the order of operations, so parentheses can help to clarify which operation is completed first in a two-step problem.

Directions:

- Gather a pile of nickels and dimes.
- Have your child grab a handful of the coins and sort them into two groups (nickels and dimes).
- Work together to write an equation to represent the total value of the coins. For example, if your child grabs 3 nickels and 4 dimes, the total value could be written as $(3 \times 5) + (4 \times 10)$.
- Explain to your child that the operations inside the parentheses are completed first (e.g. $3 \times 5 = 15$ and $4 \times 10 = 40$) and then the two answers are added together (e.g., $15 + 40 = 55$).
- Have your child return the coins, grab another handful and repeat.



Math Words to Use:	Materials	Sample Questions to Ask:
<p>Parentheses Operation Two-step problem</p>	<ul style="list-style-type: none"> • Nickels • Dimes • Paper and pencil 	<ul style="list-style-type: none"> • How could we represent the total value of the nickels? • How could we represent the total value of the dimes? • How do we find out the total value of the coins all together? • What do the parentheses tell us to do in this equation?

Ideas to Extend Learning:

- Pose two-step word problems for your child to solve. The word problems could involve the same operation or two different operations. For example, “Maddie has 3 bags of pencils with 8 pencils in each bag. If she gives away 12 pencils to her friends, how many pencils will Maddie have left?”
- Explain to your child that a variable is a letter or symbol that represents an unknown. Use a variable in each equation you write to represent the coins they grabbed.
- Challenge your child by adding a few quarters into each handful of coins to make the problem a three-step problem.

Virtual Math Talk with the Teacher

Teacher Resource

- Math talks are great ways to have students explore math concepts. Use the ST Math Creature Board to explore number concepts with your students. Challenge your students to use pictures to solve the problem and then write it symbolically.
- Use the ST Math Creatures Board to pose questions to your students online. The table below has some examples.
- The ST Math Creature Board is also a great resource to use to play the Creature Target Game. This is a great game where you can give your students target numbers and then have them submit their responses. The responses can be discussed in one on one meetings, during office hours, and through online instruction.
- Both the Creature Problem Solving and the Creature Target Game are great opportunities to talk about Number Pairs/Make Ten, Addition Concepts, Skip Counting, Additive/Multiplicative Reasoning, Multiplication Concepts, Factors, Multiples, etc.).

Creature Problem Solving

Using the creatures on the board, children can solve problems about the number of shoes each creature can wear.

(NOTE: the snake has no feet so it represents 0.)

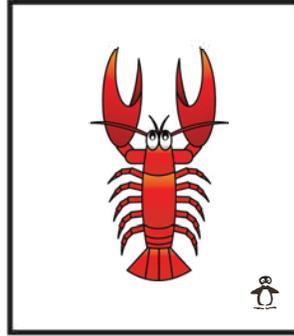
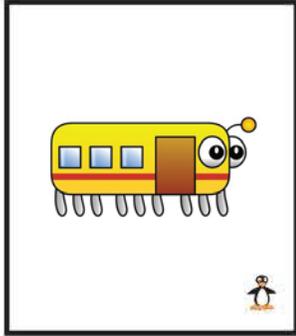
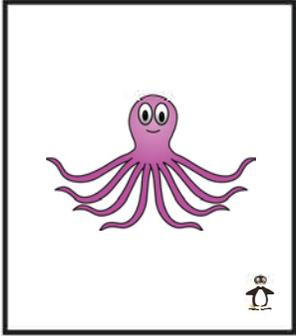
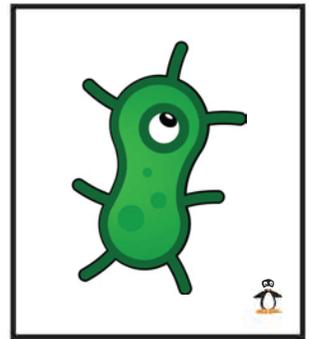
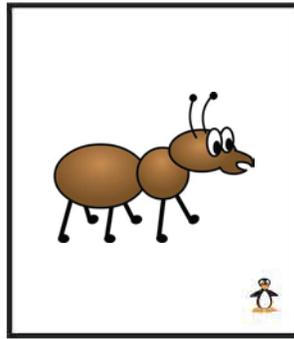
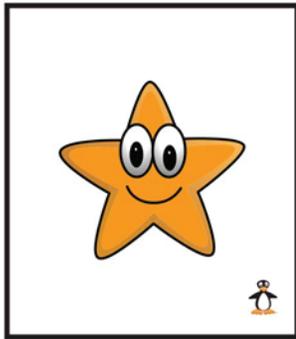
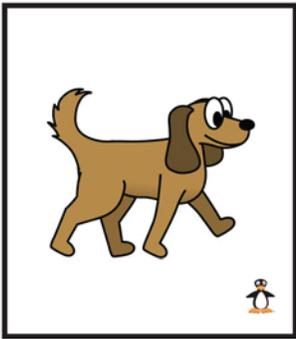
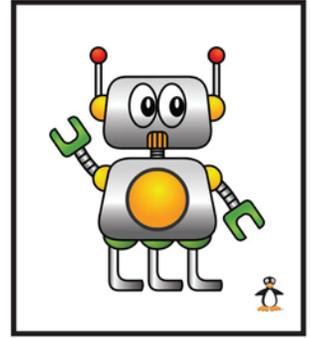
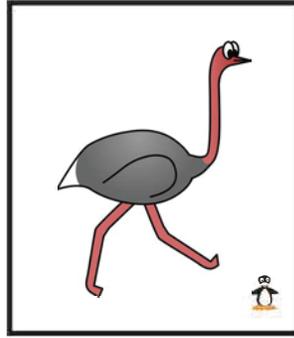
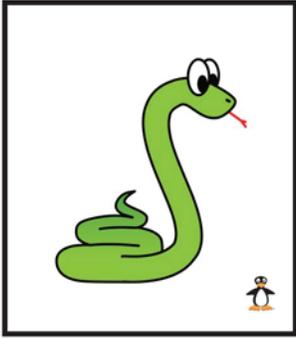
PreK-Grade 2 Ideas	Grades 3-5 Ideas
Find one creature that can wear 6 shoes. Prove that you are correct. Can you find two creatures that together can wear 6 shoes?	JiJi wanted to practice skip counting. JiJi looked at the creatures on the playground and used one of the creature's legs to skip count to 24. Which creature's legs could JiJi have used?
Angela had 10 shoes. She put them on two of the creatures. Which creatures could she put them on?	I have some creatures. Together they wear 12 shoes. If I only have 1 type of creature, which creature do I have and how many?
Paul had some shoes. He put them on robots and ants with exactly enough. How many shoes could he have?	There are 36 shoes and one type of creature. How many of those creatures do I need? Find three different ways.

Creature Target Number game

- Show the ST Math Creature Board.
The challenge is to see how many shoes each creature can wear.
Snake = 0, Eyeball = 1, Ostrich = 2, Robot = 3, Dog = 4, Starfish = 5, Ant = 6, Amoeba = 7, Octopus = 8, Bus = 9, Lobster = 10
- Give a target number. Have students identify the creatures who can wear the same number of shoes as the target number.
- Students may use any combination of creatures.
Example: Give a target number of 10. Children may choose one dog and one ant ($4 + 6$) or one octopus and one ostrich ($8 + 2$).
- Students may use any operation to make a target number.
- Give a target number of 18. Students may choose three ants (3×6) or four stars minus an ostrich ($4 \times 5 - 2$).
- If you are not able to be online with all your students at the same time, pose a few questions and have them send their responses to you.



ST Math Creature Board



Thinking Space

Target Number

Number Sense Games

Hands-on games and math stories designed to support students in building number sense.

Teacher Guidance:

- These games are for students to play with their families at home. The games are focused on number sense.
- You may want to go through the games and assign specific games for students to work on at home.
- At the conclusion of game play, you may want your students to write a short summary of their experience.

Below are tips to share with families working with their children at home:

- Play the Number Sense games with your children. This is a great opportunity to strengthen their math skills and have fun at the same time.
- Some of the games in the packet include game boards. All of the game boards can easily be made by your child instead of printing them out.
- Use the ST Math Creature Board to play the game Creature Target Number. The directions to play the game are included in your packet.
- Once your child gets a sense of how to play Creature Target Number. Challenge them to create their own problems for you.

Number Sense Activity Resources in the Parent Guide

The resources in the table below are provided in the Parent and Teacher Guides to support students as they learn at home.



Grade-Band Game Activity Guide: This guide outlines games, their related materials, and math concepts.



Game Directions: Step-by-step directions on how to play the games. These games are focused on building number sense.



ST Math Creature Board: A creature board highlighting some of the characters from the ST Math games. This board can be used to explore math concepts. Included with this resource are directions for playing the target number game.



Third, Fourth, and Fifth Grade Games to Play at Home

This is a collection of games that can be done with third, fourth or fifth-grade students. A direction sheet is provided for each activity. This outlines the activity, specifies how to play, and offers information around vocabulary words and questions family members can ask to promote thinking. All of the activities are designed for parents and children to play together.

Activity Name	Materials Needed	Key Idea(s)
Final Countdown	<ul style="list-style-type: none">• Deck of Cards• 3 game pieces per player to be used as Multiplication Chips	Adding, subtracting and multiplying whole numbers
Five for Twenty-Five	<ul style="list-style-type: none">• Deck of cards	Adding and subtracting whole numbers
Traffic Light Tic-Tac-Toe	<ul style="list-style-type: none">• Tic-Tac-Toe boards. You will need to print the board or make your own.• Red, yellow and green color tiles	Logic
Dara	<ul style="list-style-type: none">• Dara game board. You will need to print the board or make your own.• 12 small game pieces per player	Logic
Multiplication Connect Four	<ul style="list-style-type: none">• Two paper clips• Two different color chips or game pieces• Game board. You must print the game board.	Multiplying one-digit numbers
Equivalent Fraction Concentration	<ul style="list-style-type: none">• 1 deck of Equivalent Fraction cards. You must print the cards.	Equivalent fractions
Number Line Fraction Bingo	<ul style="list-style-type: none">• 1 set of fraction cards. You must print the fraction cards.• Number line for each player• 4 centimeter cubes for each player	Adding and subtracting fractions
Race to 2	<ul style="list-style-type: none">• 1 set of fraction cards. You must print the fraction cards.• Number line 0 to 2 for each player. You may print the number line of make your own.• 1 small game marker for each player	Adding and subtracting fractions
JiJi Sudoku	<ul style="list-style-type: none">• JiJi Sudoku game boards. You must print the game boards and JiJi cards.	Logic



Final Countdown

For 2 to 4 players

Supplies:

- Deck of cards
- 3 game pieces per player to be used as *Multiplication Chips*

How to Play:

1. Shuffle the cards.
2. Deal out 4 cards per player.
3. Place the remaining cards in the middle face down.
4. Player One places a card from their hand face up in the center and subtracts the value from 100. (For example, Player One plays a 7 and says 93.) They take the top face-down card to replace the card they played.
5. Player Two places a card from their hand face up on top of the first card, subtracts the value of their card from the new number, and takes a card from the face-down pile. (For example, Player Two plays a 10 and says 83.)
6. As play continues, each player adds a card to the pile and states the new difference.
7. After playing their card, each player picks the top face down card from the center deck to replace the card they played.

Multiplication Chips:

- Each player gets 3 *Multiplication Chips* which they can play when it's their turn. The chips change the value of a card.
- The player can use a chip to multiply their played card by 3 or 5. For example, a 6 card played with a chip means the player can subtract 18 or 30.

Aces — 1
Jacks — Double the previous card played
Queens — Wild Card (can be played as any other card in the deck)
Kings — 0
All others — Face value (2 to 10)





Five for Twenty-Five

For 2 - 4 Players

Supplies:

- Deck of cards



Ace = 1
 2-10 = face value
 Jack = 11
 Queen = 12
 King = 13

The Object of the Game:

Have a hand of five cards that total 25 using addition and subtraction.

How to Play:

1. Deal each player five cards.
2. The remaining cards are placed in the center of the group with one card turned up beside the deck.
3. Players take turns picking up and discarding one card. They may take the face-up card or the top card in the stack and discard one of their cards to the face-up stack.
4. When a player has a hand totaling 25 using all five cards, they will call out "25." That player wins if they can successfully show how they made 25.



Traffic Lights Tic-Tac-Toe

©adapted from nrhch.

For 2 Players

Supplies:

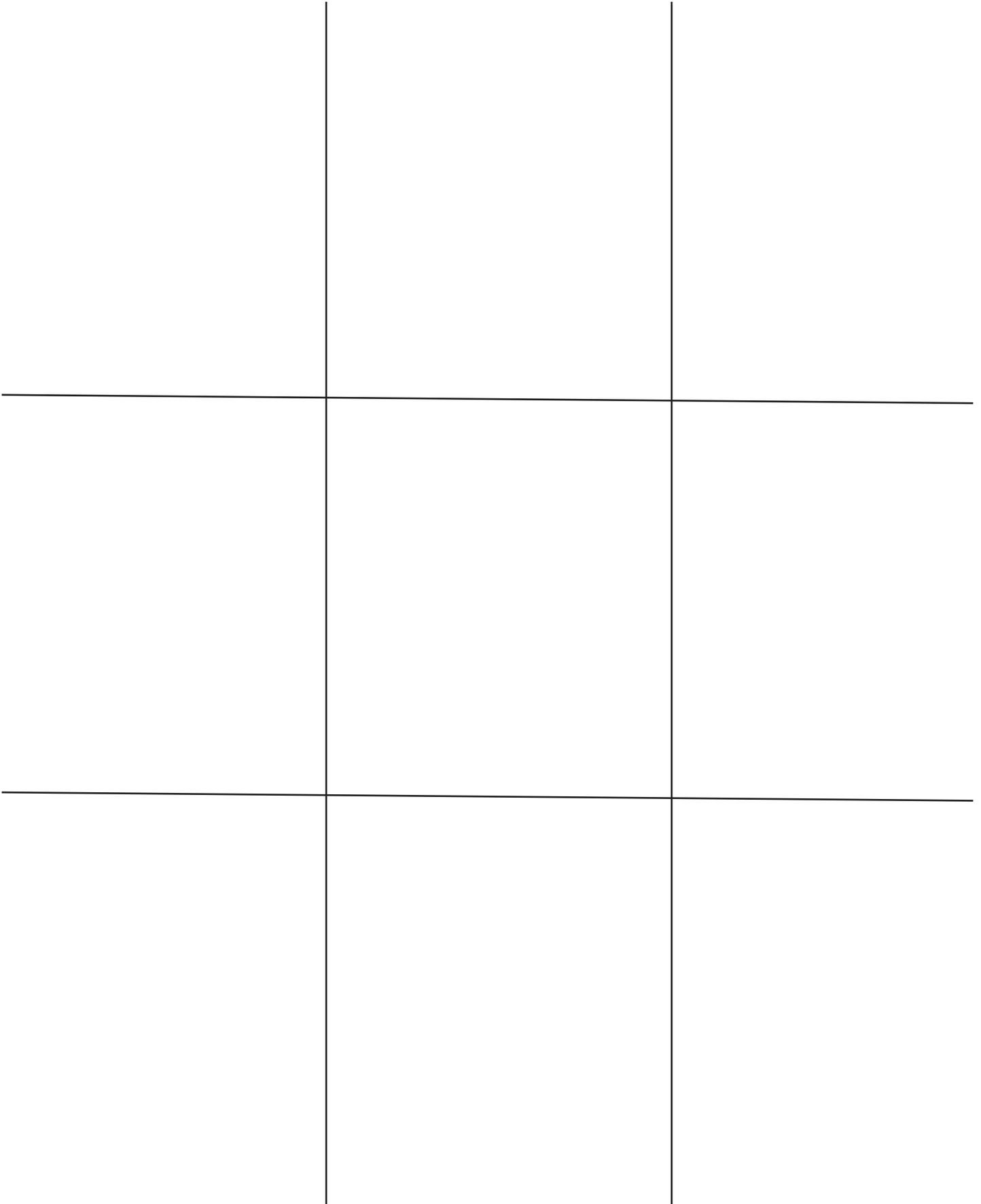
- Tic-Tac-Toe boards
- Red, yellow, and green color tiles

How to Play:

1. Players take turns placing or replacing a tile on the Tic-Tac-Toe board.
2. Only a red tile can be placed in an empty space (cell).
3. A yellow tile replaces a red tile.
4. A green tile replaces a yellow tile. Nothing replaces a green tile.
5. Players can make any possible play in any cell.
6. The winner is the player who places a tile to make 3 same color tiles in a row (across, up and down, or diagonally).



Traffic Lights Tic-Tac-Toe Game Board





Dara

For 2 players

The Object of the Game:

- Be the first to capture 10 of your opponent's game pieces

Supplies:

- Dara game board
- 12 small game pieces per player

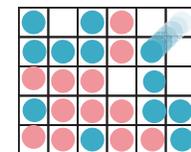
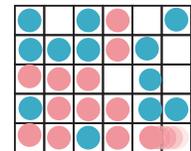
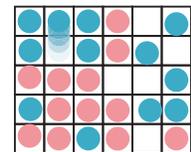
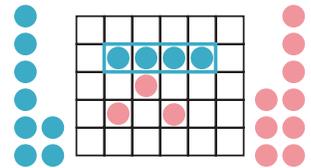
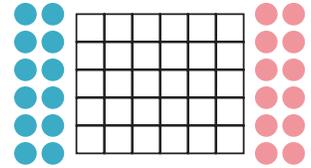
How to Play:

Phase 1: Place Pieces

1. Players take turns placing their game pieces on empty squares.
2. Avoid placing more than three pieces in a horizontal or vertical row. Having more than 3 pieces of the same color in a row is not allowed at any time.

Phase 2: Move and Capture Pieces

3. Once all the pieces have been placed on the board, players take turns moving one of their pieces one space horizontally or vertically, but NOT diagonally.
4. If a player cannot move, their turn is skipped.
5. To capture, a player makes a new horizontal or vertical row of 3 of their pieces.
6. When a new row is made, that player can remove any one of the opponent's pieces from the game.
7. Only one piece can be captured per move, even if multiple rows of 3 are created with one move.
8. Each row of three pieces can be reformed only once by moving one piece out and back in to capture another piece.





Dara



Multiplication Connect Four

For 2 Players

Supplies:

- Two paper clips
- Two different color chips or game pieces

How to Play:

1. Player One places a paper clip on a number on the bottom strip.
2. Player Two places a paper clip on a number on the bottom strip, multiplies the two numbers, and places their piece on that number (product) on the board.
3. Player One moves one paper clip, multiplies the two numbers, and places their piece on that number (product) on the board.
4. Play continues until one player has 4 of their pieces in a row, on the board, without any of the opponent's markers in between their four markers (across, up and down, or diagonal).
5. The first player with four pieces in a row wins.

Examples

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

12	15	20	16	●	9	20	15
13	18	10	●	●	12	19	9
11	8	●	●	●	14	10	16
10	●	●	●	●	10	15	19
13	●	●	●	●	20	12	5

12	15	20	16	7	9	20	15
13	18	10	20	15	12	19	9
11	8	17	13	18	14	10	16
10	●	●	●	●	10	15	19
●	●	●	●	●	20	12	5

Non-Examples

12	15	20	16	7	●	20	15	
13	18	10	20	●	●	19	9	
11	8	17	●	●	●	10	16	
10	6	●	●	●	●	15	19	
13	●	●	●	●	●	20	12	5

12	15	20	16	7	9	20	15
13	18	10	20	15	12	19	9
11	8	●	13	18	14	10	16
●	●	●	●	●	10	15	19
●	●	●	●	●	20	12	5

12	15	20	16	7	9	20	15
13	18	●	20	15	12	19	9
11	●	●	13	18	14	10	16
●	●	●	●	9	10	15	19
●	●	●	●	17	20	12	5

adapted from Marilyn Burn's Pathways

Multiplication Connect Four

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

1	2	3	4	5	6	7	8	9
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Equivalent Fraction Concentration

For 2 - 4 Players

Supplies:

- 1 deck of Equivalent Fractions cards

How to Play:

1. Shuffle the cards and place them face down in an array.
2. Players take turns flipping two cards face up.
3. If the numbers on the cards are equivalent, the player keeps those cards.
4. If the numbers are not equivalent, the cards are turned face down.
5. The player plays until they do not have an equivalent match.
6. Play continues until all cards are removed.
7. The winner is the player with the most cards.

Equivalent Fraction Concentration

$\frac{1}{2}$	$\frac{2}{2}$	$\frac{1}{3}$	$\frac{2}{3}$
$\frac{3}{3}$	$\frac{1}{4}$	$\frac{2}{4}$	$\frac{3}{4}$
$\frac{4}{4}$	$\frac{1}{6}$	$\frac{2}{6}$	$\frac{3}{6}$
$\frac{4}{6}$	$\frac{5}{6}$	$\frac{6}{6}$	$\frac{2}{8}$
$\frac{4}{8}$	$\frac{6}{8}$	$\frac{8}{8}$	$\frac{2}{12}$

Equivalent Fraction Concentration

$\frac{3}{12}$	$\frac{4}{12}$	$\frac{6}{12}$	$\frac{8}{12}$
$\frac{9}{12}$	$\frac{10}{12}$	$\frac{1}{5}$	$\frac{2}{5}$
$\frac{3}{5}$	$\frac{4}{5}$	$\frac{5}{5}$	$\frac{2}{10}$
$\frac{4}{10}$	$\frac{5}{10}$	$\frac{6}{10}$	$\frac{8}{10}$
$\frac{3}{9}$	$\frac{6}{9}$	$\frac{4}{16}$	$\frac{12}{16}$



Number Line Fraction Bingo

For 2 to 4 Players

Supplies:

- 1 set of fraction cards, cut apart
- Number line for each player
- 4 centimeter cubes for each player

How to Play:

1. Shuffle cards and place face down in the center.
2. Each player places their centimeter cubes on various numbers on their number line. (They can place more than one cube on the same number.)
3. Players take turns flipping over two fraction cards at a time. Each player can decide to add or subtract the numbers on the cards. If their sum or difference is a number that they have a cube on, they get to remove the cube. If they have more than one cube on a number they can only remove one of the cubes.
4. When a player has removed all of their cubes, they say, "Bingo!" and win the game.

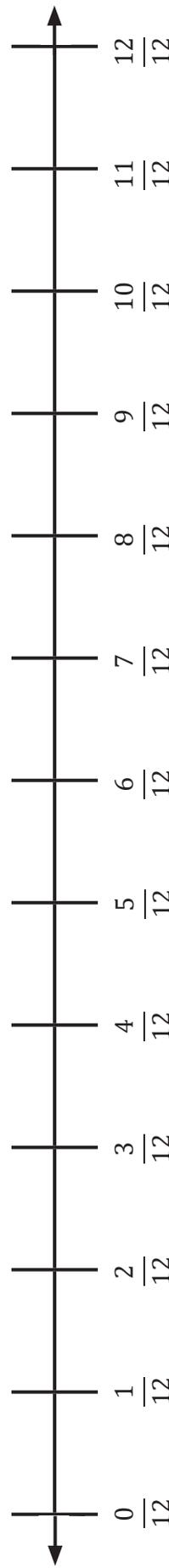
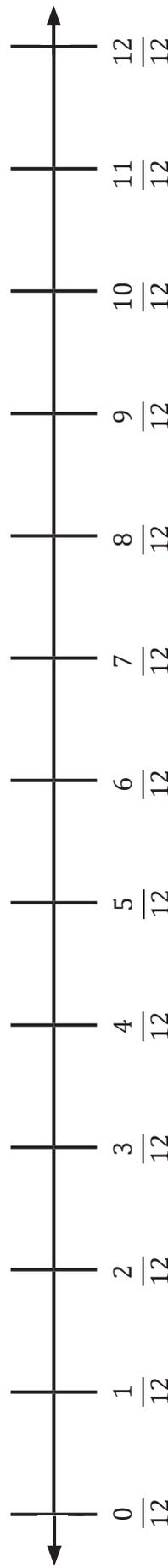
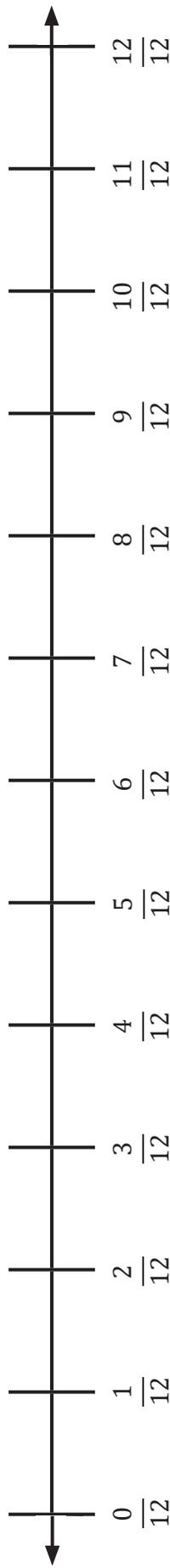
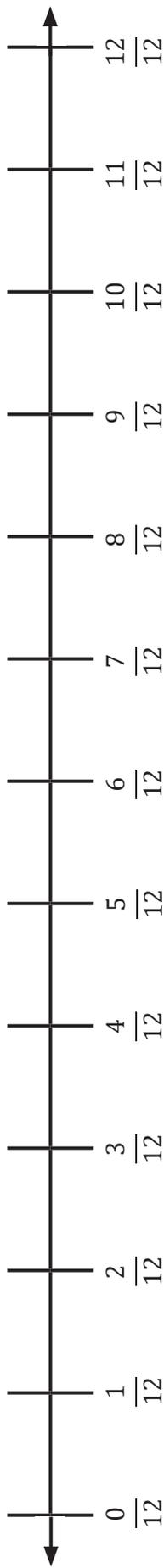
Number Line Fraction BINGO

Cut out cards

$\frac{1}{2}$	$\frac{2}{2}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{3}{3}$
$\frac{1}{4}$	$\frac{2}{4}$	$\frac{3}{4}$	$\frac{4}{4}$	$\frac{1}{6}$
$\frac{2}{6}$	$\frac{3}{6}$	$\frac{4}{6}$	$\frac{5}{6}$	$\frac{6}{6}$
$\frac{1}{12}$	$\frac{2}{12}$	$\frac{3}{12}$	$\frac{4}{12}$	$\frac{5}{12}$
$\frac{6}{12}$	$\frac{7}{12}$	$\frac{8}{12}$	$\frac{9}{12}$	$\frac{10}{12}$
$\frac{11}{12}$	$\frac{12}{12}$	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{1}{12}$

Number Line Fraction BINGO

Cut out number lines





Race to 2

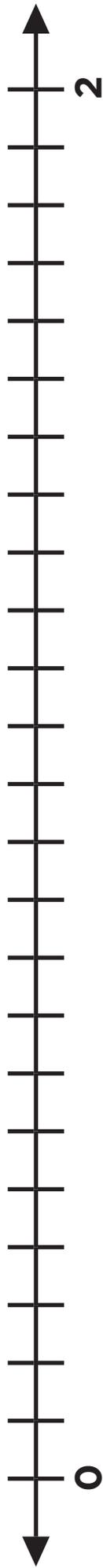
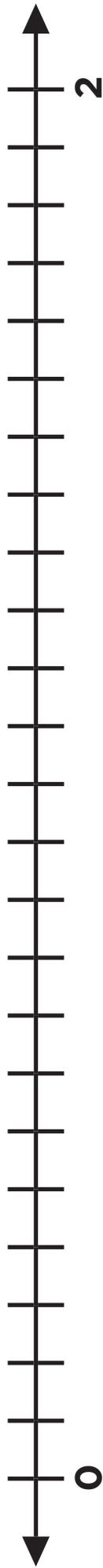
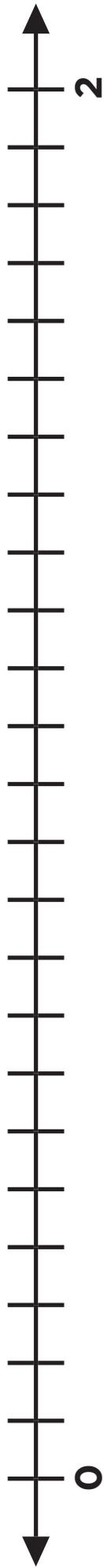
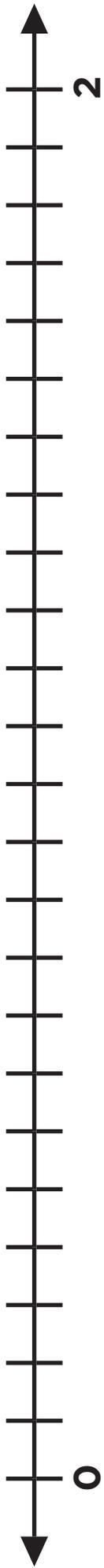
For 2 - 4 Players

Supplies:

- 1 set of fraction cards
- Number line 0 to 2 for each player
- 1 small game marker for each player

How to Play:

1. Shuffle cards and place face down in the center.
2. Each player places their marker on 0
3. Player One flips over one fraction card and moves that value to the right on the number line.
4. Play continues with each player in turn selecting a card and moving that value to the right on their number line.
5. If the selected number results in a number greater than 2, the player subtracts the value and moves to the left of their position on the number line.
6. The winner is the first player to land on 2.



Race to 2

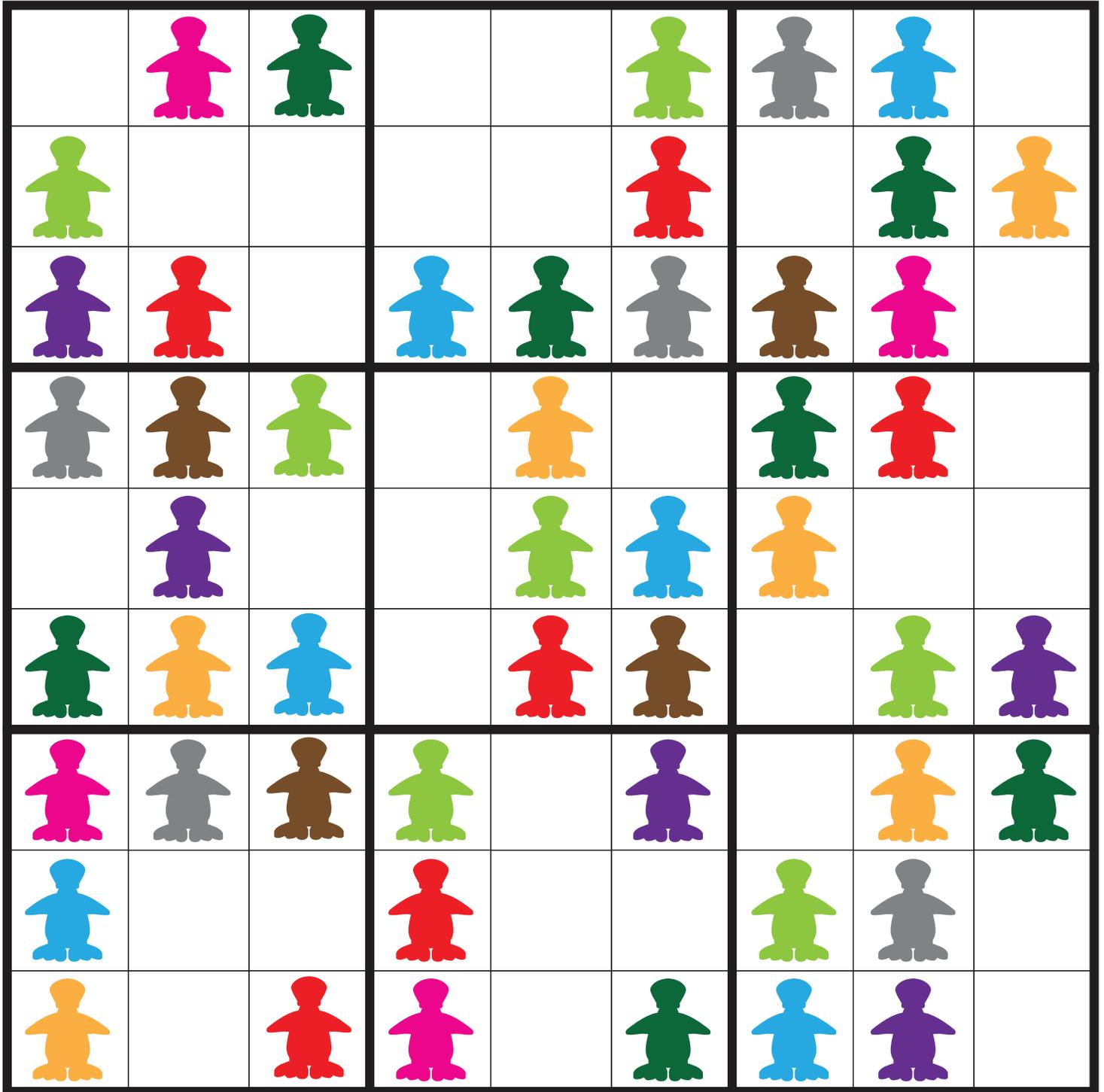
Cut cards apart.

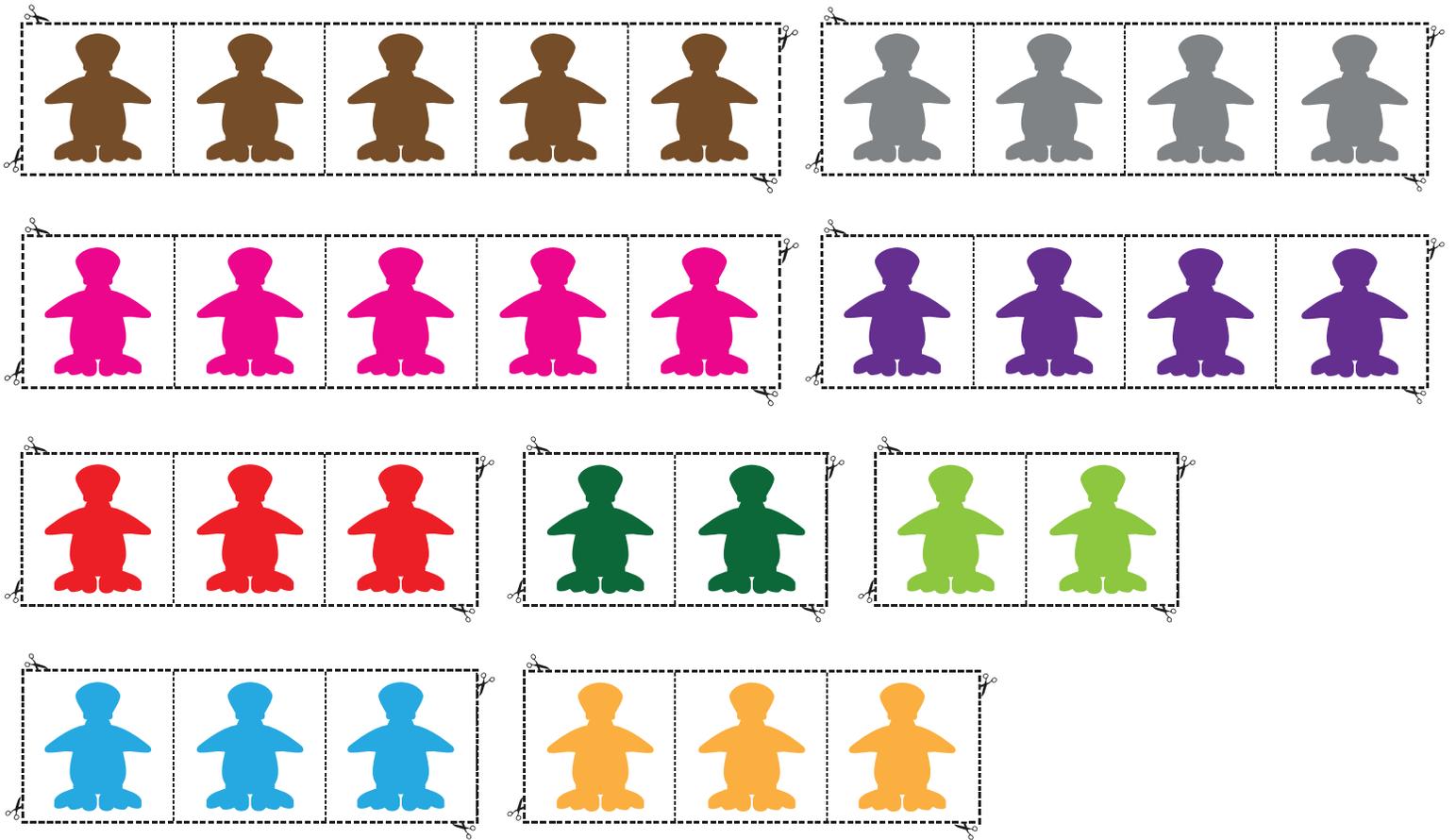
$\frac{1}{2}$	$\frac{2}{2}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{3}{3}$
$\frac{1}{4}$	$\frac{2}{4}$	$\frac{3}{4}$	$\frac{4}{4}$	$\frac{1}{6}$
$\frac{2}{6}$	$\frac{3}{6}$	$\frac{4}{6}$	$\frac{5}{6}$	$\frac{6}{6}$
$\frac{1}{12}$	$\frac{2}{12}$	$\frac{3}{12}$	$\frac{4}{12}$	$\frac{5}{12}$
$\frac{6}{12}$	$\frac{7}{12}$	$\frac{8}{12}$	$\frac{9}{12}$	$\frac{10}{12}$
$\frac{11}{12}$	$\frac{12}{12}$	Lose Your Turn	Draw Another Card	Draw Another Card



JiJi Sudoku

Difficulty Level: Medium





JiJi Sudoku

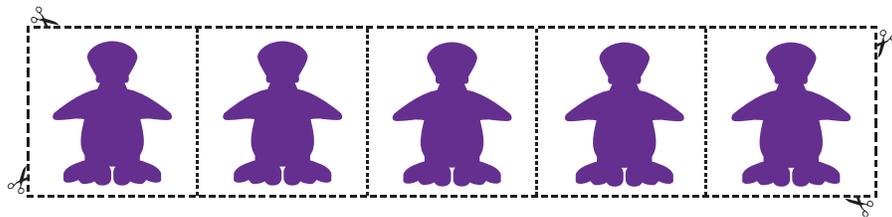
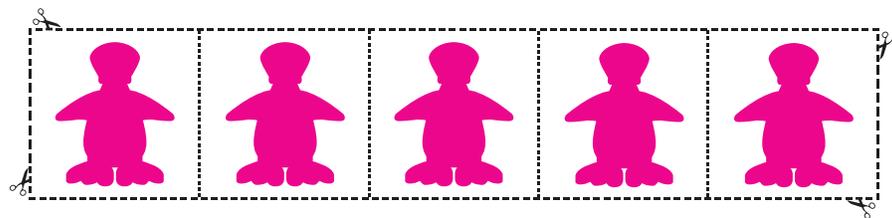
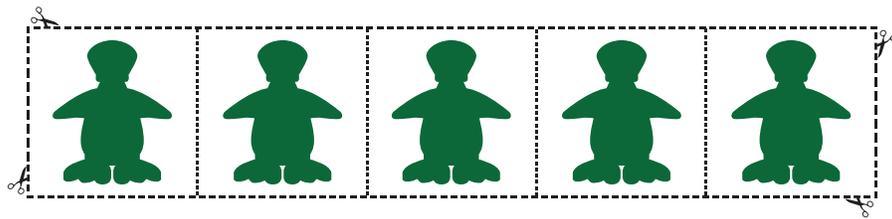
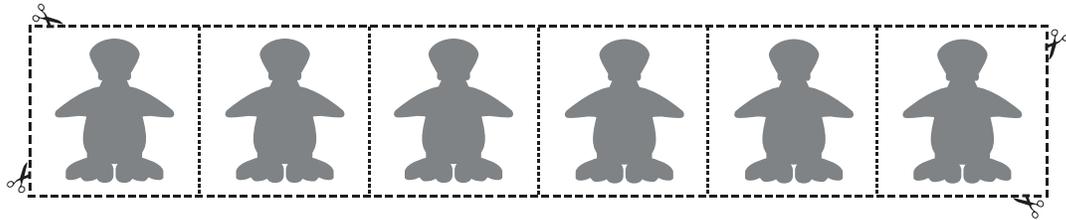
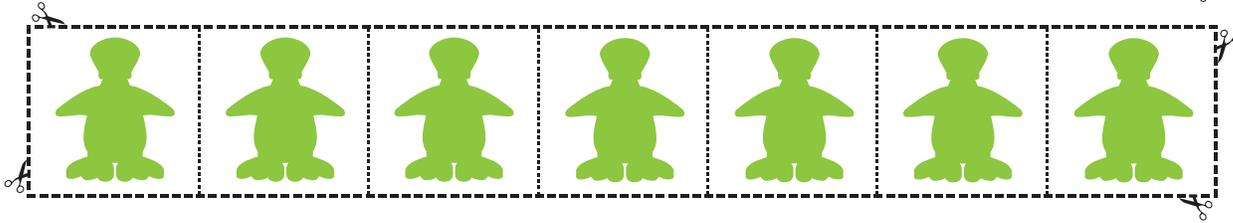
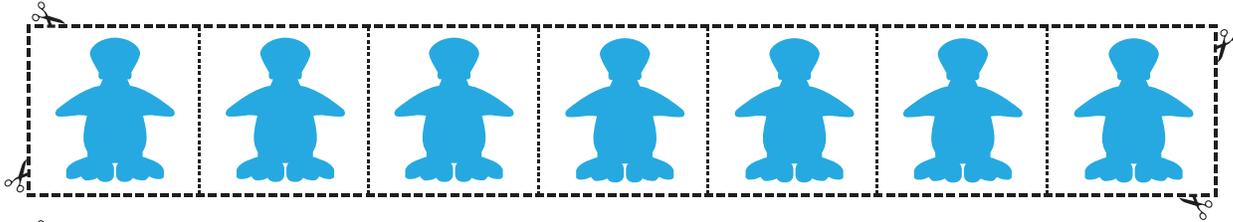
Difficulty Level: Medium
Puzzle pieces



JiJi Sudoku

Difficulty Level: Challenge



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

Easy

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

Medium

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

Medium

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

Hard