

Pattern Blocks Set 1

Puzzles with Color

Players 1+



Ages 3+



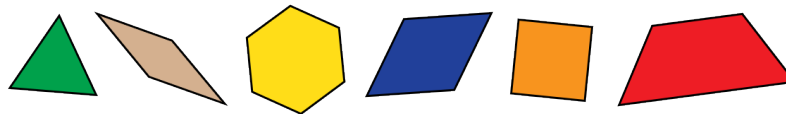
5 min+

GOAL

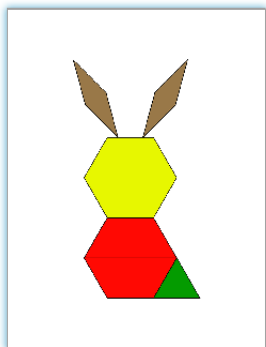
Fill in the puzzle with pattern blocks.

MATERIALS

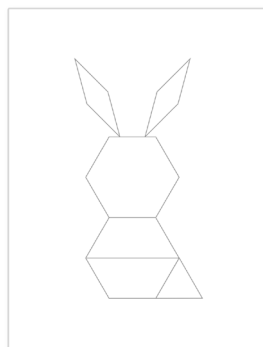
Pattern Blocks or paper shape cutouts



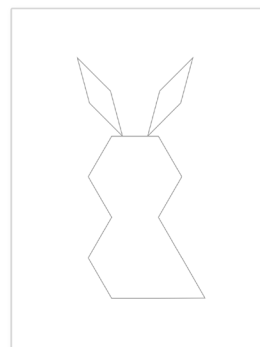
For this game, use puzzle templates from Set 1:



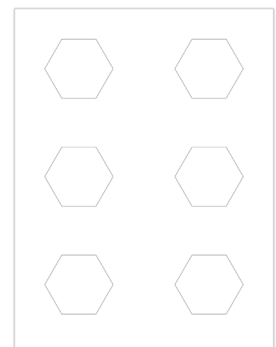
Set 1: Color Puzzles



Set 2: Shape Puzzles



Set 3: How Many Ways?



VOCABULARY

	Circle		Rhombus
	Triangle		Pentagon
	Rectangle		Hexagon
	Square		Octagon

[Shape Attributes](#)

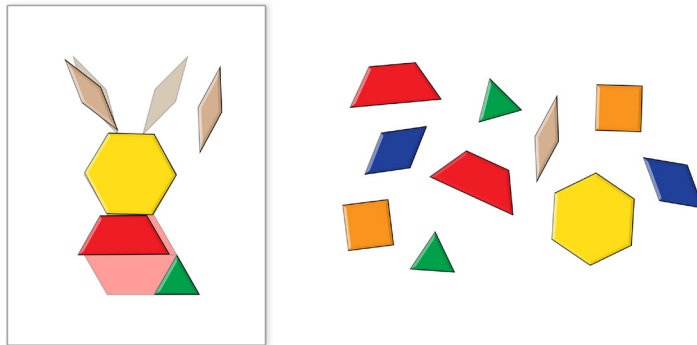
QUESTIONS

How did you know which piece to place there?

Could you have filled that shape in a different way?

HOW TO PLAY

1. Each child chooses a puzzle template.
2. Make sure the children have enough pattern blocks to cover their puzzle(s).
3. Have children place pattern blocks on top of each shape of the puzzle until the puzzle is completely assembled.



TIPS FOR PLAYING

- Give children time to build their own designs with the pattern blocks as well as use the templates.
- Place the pattern blocks in a large open container, such as the top of a box, to help keep them on the table instead of on the floor.
- When children first begin, they may not place the blocks into the outlines precisely. As they gain experience, they may become more precise in placing their pattern blocks within the lines.

WHAT CHILDREN ARE LEARNING

- Observing children as they play with pattern block puzzles is a great way to see their spatial reasoning skills develop. Spatial reasoning is our ability to think about objects and shapes and to move them around into new and different positions.

- As children work on their puzzle templates, talk about the shapes that they're using. This will give them lots of opportunities to learn shape names and attributes. As you talk about the shapes, notice which attributes children seem interested in—color, size, number of sides, length of sides, etc.
- Help children learn to identify shapes even as the orientation of the shape changes. An “upside down” triangle is still a triangle, and a square tilted on its corner is still a square!
- As children hear and gain practice using the vocabulary of shapes, you can point out similarities and differences in vertices or angles,* number of sides, and length of sides. You can also use measurement words like “same/equal,” “more/less,” and “shorter/longer.”

* A note about the vocabulary: A vertex (plural: vertices [vur·tuh·seez]) is where two sides meet. An angle is the space between where two lines meet. Angles are usually measured in degrees. For example, a square has four vertices and four 90° angles.

MATH TOPICS

Patterns and Structure

Shapes and Geometry

VIDEO



Watch Game Video

View the QR code in your smartphone's camera app or QR code reader to watch a video that shows how to play *Puzzles with Color*.

Pattern Blocks Set 2

Outline Puzzles

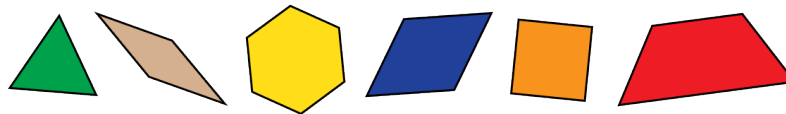
Players 1+ Ages 4+ 5 min+

GOAL

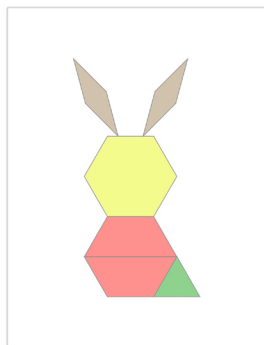
Fill in the puzzle with pattern blocks.

MATERIALS

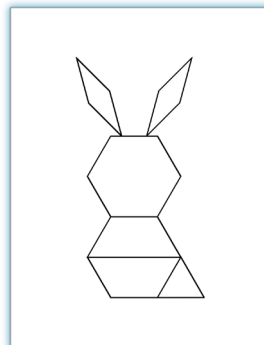
Pattern Blocks or paper shape cutouts



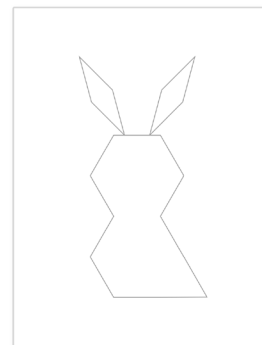
For this game, choose a puzzle template from Set 2:



Set 1: Color Puzzles

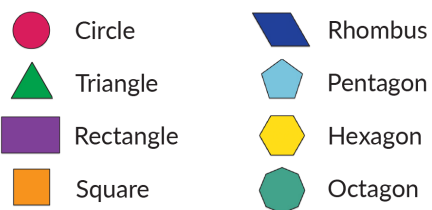


Set 2: Shape Puzzles



Set 3: How Many Ways?

VOCABULARY



[Shape Attributes](#)

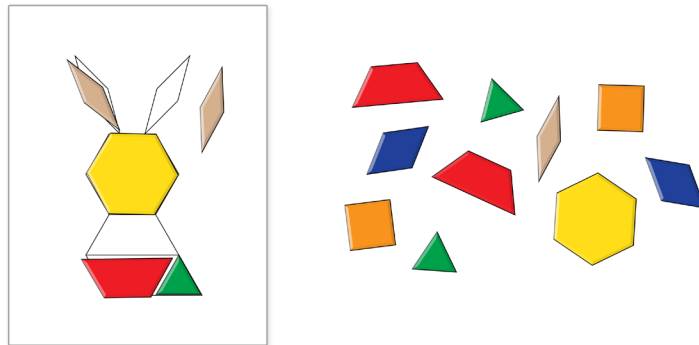
QUESTIONS

What happens if we flip this piece? Does that help it fit?

What happens if we rotate this piece? Does that help it fit?

HOW TO PLAY

1. Children choose a puzzle template with each shape outlined in black.
2. Give everyone enough pattern blocks to fill in the puzzle.
3. Children then place the pattern blocks on each shape of the puzzle until it is completely filled in.



TIPS FOR PLAYING

- Give children time to build their own designs with the pattern blocks as well as use the templates.
- Place the pattern blocks in a large open container, such as the top of a box, to help keep them on the table instead of on the floor.
- For younger players, try starting with Set 1. For the highest level of challenge, try Set 3 where there are no outlines for individual shapes and children can try filling in the puzzle in multiple ways.

WHAT CHILDREN ARE LEARNING

- Observing children as they play with pattern block puzzles is a great way to see their spatial reasoning skills develop. Spatial

reasoning is our ability to think about objects and shapes and to move them around into new and different positions.

- As children fill in their shape outlines, notice whether they know right away which block to get or if they use trial and error with a few different blocks to see which ones fit.
- You can also notice whether children are able to shift, rotate, and flip the blocks to make them fit. Give children plenty of time to try on their own. Then, if needed, you can make suggestions about different blocks to try.

MATH TOPICS

Patterns and Structure

Shapes and Geometry

VIDEO



Watch Game Video

View the QR code in your smartphone's camera app or QR code reader to watch a video that shows how to play *Outline Puzzles*.

Pattern Blocks Set 3

How Many Ways? Puzzles

Players 1+

Ages 5+

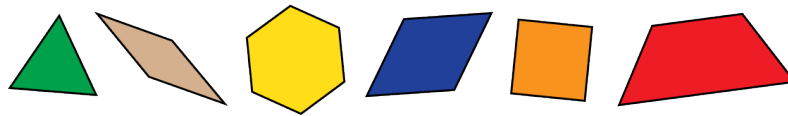
5 min+

GOAL

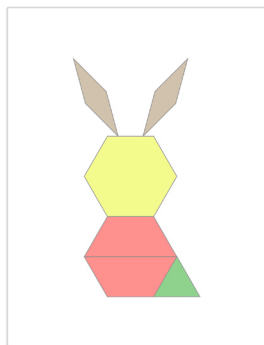
See how many different ways you can fill in the puzzle outlines.

MATERIALS

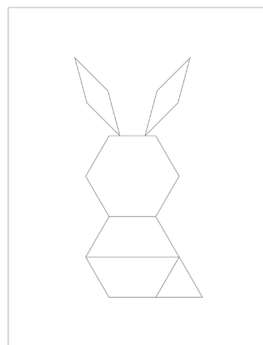
Pattern Blocks or paper shape cutouts



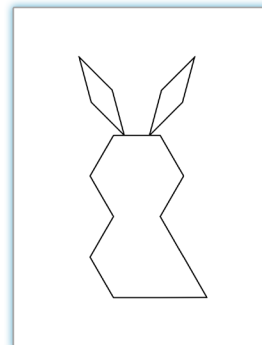
For this game, choose a puzzle template from Set 3:



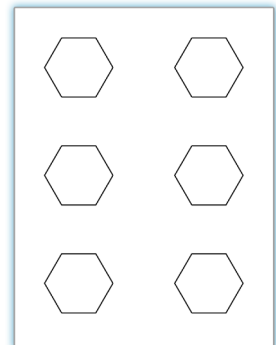
Set 1: Color Puzzles



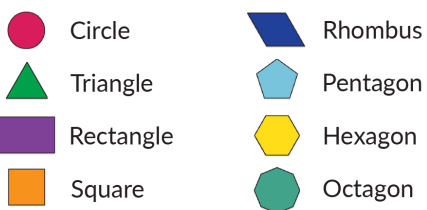
Set 2: Shape Puzzles



Set 3: How Many Ways?



VOCABULARY



[Shape Attributes](#)

QUESTIONS

How did you know which piece to place there?

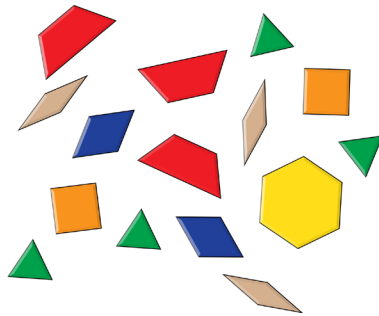
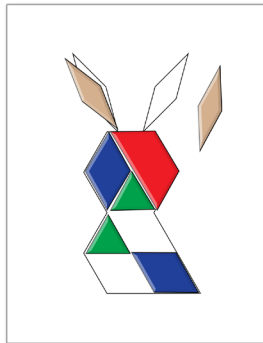
How many ways can you fill in this outline?

Can you fill in this design with more blocks?

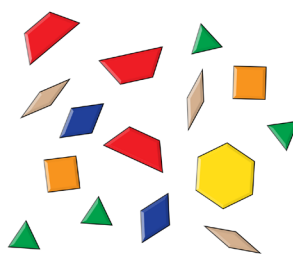
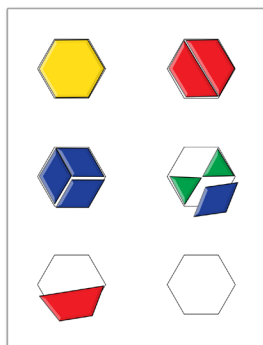
Can you fill in this design with fewer blocks?

HOW TO PLAY

1. Children choose a puzzle template with outline only.
2. Give everyone enough pattern blocks to fill in the puzzle.
3. Children fill in the puzzle with the pattern blocks.



4. Encourage children to explore and use different combinations of blocks to complete the designs.
5. For an additional challenge, we've included templates with several copies of the same outline. For example, these hexagons can be filled in using different combinations of blocks.



To help children get started with this, you can ask questions like, “How many trapezoids make a hexagon? How many blue rhombuses? How many triangles? How can we make a hexagon using one trapezoid, one blue rhombus, and one triangle?”

TIPS FOR PLAYING

- Set 3 is the most challenging pattern blocks set because there are no shape outlines or colors to help children identify which block will fit where.
- Place the pattern blocks in a large open container, such as the top of a box, to help keep them on the table instead of on the floor.
- To compare different solutions of the same puzzle, you can either use multiple copies of the template or take a picture of one solution before trying another.
- Our puzzle sets are scaffolded so that each child can play at their “just right” level of challenge. Children at the beginner level can use Set 1’s colors to help them figure out where their blocks should go. Then, at the intermediate level, they can solve Set 2’s puzzles using shape outlines. When they’re ready for the highest challenge, children can explore Set 3 and solve the puzzles with outer outlines only.

WHAT CHILDREN ARE LEARNING

- The puzzles in Set 3 are designed to push children’s thinking about how to put together and take apart shapes. With practice, they may recognize that there are many ways that different shapes can be formed. For example, using one blue rhombus and one triangle to form a trapezoid.
- In Set 3, some templates have many copies of a single puzzle on the same page. By seeing different ways of composing the same puzzle, you can compare and discuss the different solutions.

MATH TOPICS

Patterns and Structure

Shapes and Geometry

VIDEO



Watch Game Video

View the QR code in your smartphone's camera app or QR code reader to watch a video that shows how to play *How Many Ways?* puzzles.

Count and See Board Game

YM | YOUNG MATHEMATICIANS

Players 2



Ages 3+



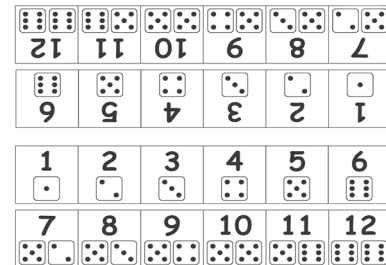
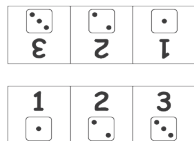
5–10 min

GOAL

To mark all the numbers on your side of the board based on the rolls of the dice.

MATERIALS

Count and See Boards



You can make special dice by drawing 1, 2, and 3 dots on a cube



Regular Dice



Tokens



VOCABULARY

Dice

Token

Combine numbers

QUESTIONS

What number(s) do you still need to roll?

How did you decide which number(s) to put tokens on?

HOW TO PLAY

There are three different versions of the *Count and See* Board Game. Use the board and dice combination that are at the right level for your child.

In all versions, the game ends when there are tokens on all the numbers.

1–3 Board

1 	2 	3

Die with 1–3 Dots



The first player rolls the die and places a token on the number that matches the number they rolled. Then the next player rolls the die and tries to put a token on one of their numbers.

1–6 Board

1 	2 	3 	4 	5 	6

Two Dice with 1–3 Dots



The first player rolls the dice and can place tokens on **one** of the rolled numbers, **both** rolled numbers, **or** the **sum** of the two rolled numbers. Then it's the next player's turn.

1–12 Board

1 	2 	3 	4 	5 	6
7 	8 	9 	10 	11 	12

Two Dice with 1–6 Dots



The first player rolls the dice and can place tokens on **one** of the rolled numbers, **both** rolled numbers, **or** the **sum** of the two rolled numbers. Then it's the next player's turn.

TIPS FOR PLAYING

- Make rolling doubles a “wild”. When a player rolls a “wild”, they can place a token on any number. See if children choose wisely! Help them choose a number that would otherwise be hard to roll. This can also speed the game up.

- You can also play this game with subtraction. After rolling the dice, subtract the smaller number from the bigger number. Put a token on the number that represents the difference. For example, if a player rolls 6 and 2, they can subtract $6 - 2 = 4$ and put a token on 4. You can also place a zero to the left of the 1, which provides an extra challenge because you need to roll doubles to mark it.

WHAT CHILDREN ARE LEARNING

- Children are recognizing the numbers of dots on the dice and connecting the quantity of dots to the numerals on the board.
- When children combine their dice roll, they are adding two numbers together to make a new number. To combine numbers, children may need to count each dot on both dice. Or, if they roll a 3 and a 2, they might count on from 3 and say “4, 5”. Counting on means that instead of starting at 1 and counting all the way up to 5, we count on from 2 or 3.
- Children may also start to notice that some numbers are hard to roll while others come up a lot. Help them think about their game strategy, and where to place tokens based on which numbers are easier to roll.

MATH TOPICS

Number: Counting and Cardinality

VIDEO



Watch Game Video

View the QR code in your smartphone's camera app or QR code reader to watch a video that shows how to play the *Count and See Board Game*.