

Pattern Block Puzzles



HOW TO PLAY: PATTERN BLOCK PUZZLES

Math children are practicing:

- Knowing names of familiar shapes
- Describing and comparing attributes of shapes using age-appropriate geometric language (corners/angles, sides, length, same/equal, more/less, shorter/longer)
- Composing (putting together) and decomposing (taking apart) shapes
- Thinking flexibly and logically about shape

Materials

- Pattern Blocks (set of 250)
- Pattern Block Animal Puzzles (9 designs, 18 pages, double sided—cat, dog, caterpillar, snake, giraffe, turtle, fish, dragonfly, rabbit)
- Pattern Block Simple Geometric Puzzles and “How many ways can you make a...” puzzles (10 pages, double sided)
- Pattern Block Puzzles: “How many ways can you make a....triangle, hexagon, rhombus, parallelogram, and star” (5 pages)
- *Other:* Any other pattern block templates of tangram games you have

Picture Book: Mouse Shapes by Ellen Stoll Walsh

- *Circle time:* Read the book aloud. Point out the shapes the mice are using to build pictures and ask children to identify the shapes too.
- *Art table:* Use paper and cut out shapes to have children create their own designs—a great way to get them thinking about how geometric shapes fit together and make pictures. Have children tell you about what they create and write it down on their paper, such as: “I used a circle, 5 triangles, and 6 long, skinny rectangles to make a cat face.”

Suggested plan for playing with pattern block puzzles	
Game	Materials
Free play with pattern blocks	Pattern Blocks
Mystery Container	Mystery Container & Pattern Blocks
Geometric Puzzles	Geometric Puzzles & Pattern Blocks
Animal Puzzles with color and outlined shapes	Animal Puzzles & Pattern Blocks
Animal Puzzles with outlined shapes and blank inside	Animal Puzzles & Pattern Blocks
How Many Ways Puzzles	How Many Ways Puzzles & Pattern Blocks
Step on It! Shape Game	Large Floor Space & Masking Tape

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Pattern Block Puzzles



Tips from the classroom:

- 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 printer paper box, to help keep them on the table instead of on the floor.
- Have children challenge each other to 'copy' or build the same design a friend did (while they can still see it).

Questions to ask:

- Can you build that another way using different shapes?
- How many triangles/rhombuses/hexagons did you use?
- Could you build that only using triangles? How many do you think you'd need?
- What's the difference between a triangle and a square? A square and a rectangle? A rhombus and a square?
- **Is there another way?**
- **I wonder, if we...**
- **What would happen if...**
- **What do you think we should do next? Why?**
- **What made you think that?**
- **Did we do that right? Does it look right?**
- **I was thinking about it this way... What do you think?**

Praising the process:

- You're working hard!
- Good idea!
- Keep trying!
- I like how you took your time and worked hard on that.

Free Play (focus on getting familiar with materials)

1. Allow children to explore freely with the materials and notice what they do.
 - Do they make designs?
 - Do they pile them on top of each other?
 - Do they use the shape names or the color names to identify shapes?
2. Introduce vocabulary:
 - Triangle, square, rhombus, trapezoid, hexagon
 - Sides (length, how many?)
 - Angles/corners (bigger, smaller, pointy, almost straight)

About the learning in free play. Allowing the children to explore the materials gives you a chance to see what students know and are ready to learn. It also gives you a chance to

Pattern Block Puzzles



introduce vocabulary—shape names, sides, angles—in a play context. As you introduce the language notice what attributes they are focusing on—color, size, number of sides, length of sides, size of angles, etc. See if they identify shapes correctly even if the orientation of the shape is different (e.g. an 'upside down' triangle or a square on its corner).

Mystery Container

1. Cover a container with paper and label it the Mystery Container. Place pattern block shapes (or other shapes) inside—the same number of shapes as the children in your class or in the group you are working with. Put a set of matching shapes for yourself in a bag or other container.
2. Ask each child in the group to close his/her eyes and pick out one shape from the Mystery Container.
3. From your own bag, hold up one shape. Ask children to name who has a shape that matches yours exactly. Name the shape and point out how many sides and corners the shape has and whether the sides are straight or curve. You can fit the shapes together to prove the match.
4. Repeat with another shape.
5. *Variation:* Pass out at least 2 of each shape to the group of children. Have children find the person with the matching shape. Ask children to name the shape.
6. *Variation:* Hide a shape in the container. Display 3 to 5 shapes—one of which matches the shape hidden in the container. Ask a child to reach in and guess which shape it is—the child can point to the matching shape.

About the learning in this game. This is a fun small or whole group activity to get children engaged in learning the shape names and shape attributes. It's a great activity to include during circle time or as a game in other parts of your day.

Pattern Block Puzzle Templates: Geometric Puzzles

1. Children choose a geometric puzzle and fill in the outline with the pattern blocks.
2. Watch out—a few of these puzzles look 3D and can trick kids but they are fun to figure out.

About the learning in this game. The simple geometric puzzles are a good place to begin to see if children are manipulating the pattern blocks as individual shapes or ready to combine them to make more complex pictures. Notice whether they fit the blocks into the boundaries or lay blocks that go over the lines. A few of these puzzles look three-dimensional and can be particularly hard to figure out. If you hold your hands over the other shapes so they are just looking at the outline of one shape at a time it can be easier for them to see.





Pattern Block Puzzle Templates: Animal Puzzles

1. Children choose an animal puzzle and fill in the outline with the pattern blocks.
2. The outlines with colored shapes are the easiest because children can match color and shape. Then the puzzles with the shapes all outlined, then the puzzles with just the outside line. Challenge children to fill in the blank outline in different ways—see how many ways they can come up with.

About the learning. The animal puzzle templates are designed with scaffolding so children can begin by matching the pattern blocks by color and move on to the other outlines when they are ready. As children play, notice if they are able to fit the blocks into the puzzle or if they don't pay attention to whether or not they fit exactly. Notice if they know ahead of time which block to get or if they use trial and error to find ones that fit. Notice if they rotate and flip the shapes to make them fit.

*Pattern Block Puzzle Templates: *How Many Ways Can You Make A..?*

1. Children choose a *How Many Ways Can You Make A... puzzles*.
2. At first children may fill in all the shapes the same way. Encourage them to explore different combinations of pattern blocks they can use to complete the designs. See who can find the most.

About the learning in this game. Children may begin by 'solving' the puzzle the same way each time. As they get more comfortable, challenge them to see how many different combinations of blocks they can use to fill in the designs. These puzzles are designed to give children practice in thinking about how shapes can be put together and taken apart and are particularly fun for children who are ready for a challenge.



Step On It! Shape Game

1. Using masking tape, outline large shapes on the floor. Start with just 2 or 3 shapes. For example, a triangle, rectangle, square, hexagon, trapezoid, etc.
2. Gather a group of children around the shapes on the floor. Walk the perimeter of each shape—emphasizing the straight edges and corners. Name the name of each shape and how many sides. One at a time, you can ask the children to do this too.
3. Ask the children to stand away from the shapes. Call out the name of one of the shapes, “square”, and ask the children to stand inside that shape. Give them about a count of 5 to move there. Ask the children how they know it’s a square. For example, “I know it’s a square because it has 4 sides that are all the same length and 4 corners that are right angles like the corners of a piece of paper.”
4. Repeat with another shape.
5. *As you play more...* Make several of each shape. For triangles, make sure you make several different types.
6. *Variations:* Draw chalk shapes outside on the blacktop or make laminated shapes to tape on the floor.
7. *If you are playing whole group.* Have 5 children step on the shapes and the rest of the children to watch and make sure they step on the correct shapes. Repeat until all children have a turn.

About the learning in this game. This is a fun way to have children practice identifying shapes, practice naming shapes, and practice describing shape attributes. Encourage and help children to use precise language to clearly identify each shape—this helps to build their vocabulary and language skills