

# Copy My Pattern

Players 2-6



Ages 2+



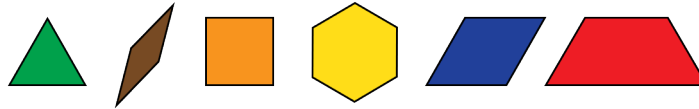
5-10 min

## GOAL

To recognize a shape pattern and copy it.

## MATERIALS

Pattern blocks or paper shape cut-outs.



Any pattern templates



## VOCABULARY

Pattern  
Repeat  
Square  
Triangle

## QUESTIONS

Do you see a pattern?  
What pattern do you see?  
What part of the pattern repeats?

## HOW TO PLAY

1. Choose a pattern template or create your own simple repeating pattern (e.g., circle, square, circle, square).
2. Place the rest of the pattern blocks or other materials you are using in a pile.

3. Place your pattern down in front of children. If necessary, tape your template or pattern pieces to a surface to prevent sliding.

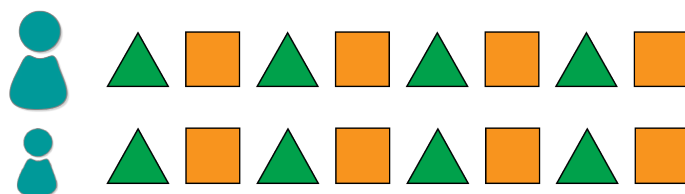
Say, "Here is my pattern! Let's say the pattern together."



Together, chant, "triangle, square, triangle, square, triangle, square, triangle, square." Point to each shape as you say its name.

Say, "Now it's your turn. Can you copy my pattern? Use this pile of shapes to copy my pattern."

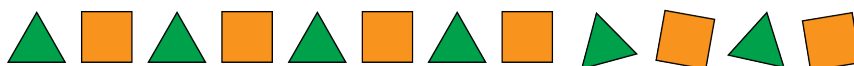
Wait for children to copy your pattern. If needed, allow them to put their pattern directly underneath yours, matching the shapes with 1:1 correspondence.



Say, "Yes, you copied my pattern!" Chant the pattern together, pointing to each shape as you say its name.

Continue playing with different patterns. When children are ready, have them choose a pattern template or make their own pattern for others to copy.

*Variation:* Have children extend your pattern! Allow them to build onto your pattern instead of copying it:



## TIPS FOR PLAYING

- Many stories, dances, and chants follow a predictable pattern. "Five Little Monkeys" follows a pattern where the words repeat but the number of monkeys decreases by one each time. "Head, Shoulders, Knees, and Toes" follows a pattern that

speeds up as you go. Dancing or movement patterns such as "clap, clap, stomp, clap, clap, stomp" also help children build an understanding of pattern through movement. As you engage children in these everyday activities, help them notice the pattern and describe it in words.

## WHAT CHILDREN ARE LEARNING

- Children may begin to understand that patterns are made up of repeating units, but it may take more time for them to be able to consistently identify the repeating unit or to create their own patterns. With time and experience, children will be able to see the underlying mathematical structure in patterns and can use symbols such as letters to represent the structure of the pattern.
- Notice whether children use the same repeating unit for their whole design. If they do change the pattern part way through, you can say you noticed that they started a new pattern and talk about how it's different.

## MATH TOPICS

Patterns and Structure

Sorting and Attributes

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 Copy My Pattern.

# Dance Patterns

Players 2-6



Ages 3+



5-10 min

## GOAL

To recognize a pattern and predict what comes next.

## MATERIALS

Bodies



## VOCABULARY

Pattern

Repeat

Before

After

## QUESTIONS

What was the pattern I made?

How did you know what came next?

## HOW TO PLAY

1. Choose an area where children can move around freely.
2. Begin doing a simple movement pattern, such as: stomp, clap, stomp, clap, stomp, clap.



Have children join in making the movements as soon as they recognize the pattern.

Once most children have joined in, say, “freeze!” and have children freeze in place.

Ask, “What movement comes next?” Wait for children to say or demonstrate the next movement in the pattern.

Continue to play using different movement patterns. You can include: touching your toes, touching your head, reaching your hands in the air, putting your hands on your hips, and jumping on one foot or two feet!

### TIPS FOR PLAYING

- For a higher challenge, make a “mistake” (e.g., stomp, clap, stomp, clap, stomp, stomp). See if children catch your mistake and ask them to correct it!

### WHAT CHILDREN ARE LEARNING

- This game is a great way for children to get up and move, and to experience patterns by sight, sound, and feel!
- When you ask, “what comes next?”, you are helping children recognize a pattern's repeating unit. For example, if they say that 'clap' comes next because the pattern goes “stomp, clap, stomp, clap, stomp, clap,” they've recognized that the pattern's repeating unit is “stomp, clap.”

### MATH TOPICS

Patterns and Structure

## 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 Dance Patterns.

# Caterpillars and Crafts

Players 2-6



Ages 4+



10-15 min

## GOAL

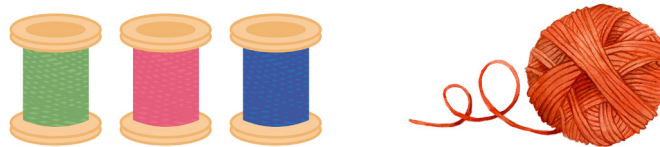
To create a pattern.

## MATERIALS

Stringing beads



Pipe cleaners, yarn, or string



## VOCABULARY

Pattern

Shop

Beside

Repeat

Between

## QUESTIONS

What pattern do you see?

What comes next? How do you know?

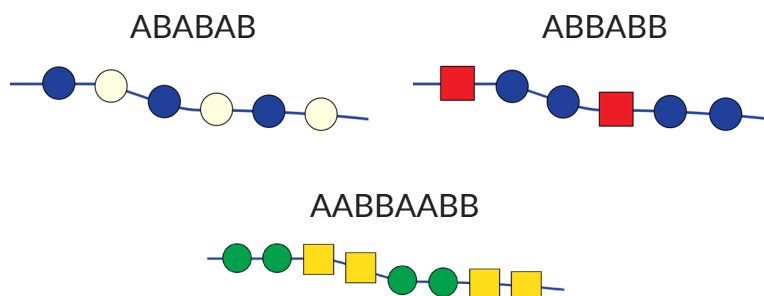
Can you tell me about the pattern you made?

## HOW TO PLAY

1. Set up a “Caterpillars and Crafts Shop” by putting all the materials on a table or other flat surface.
2. Using the stringing beads and pipe cleaners, yarn, or string,

make several examples of AB, ABB, and AABB patterns for children to copy. Make more complex patterns as children are ready.

3. Say, “We are going to make caterpillars and crafts to sell to our customers at our shop!” Show children the AB, ABB, and AABB patterns that you made.



Say, “Can you use these materials to copy the patterns that I made? We will sell your patterns at the shop.”

Have children make new crafts by copying the patterns. Once children are ready, have them design their own bead patterns to sell to customers at the Caterpillars and Crafts Shop.

Variation: Make growing patterns and symmetrical patterns for children to copy. To learn more about patterns, watch our Intro to Patterns video, available using the QR Code on the next page or by visiting [www.ym.edc.org](http://www.ym.edc.org).

### TIPS FOR PLAYING

- Many stories, dances, and chants follow a predictable pattern. “Five Little Monkeys” follows a pattern where the words repeat but the number of monkeys decreases by one each time. “Head, Shoulders, Knees, and Toes” follows a pattern that speeds up as you go. Dancing or movement patterns such as “clap, clap, stomp, clap, clap, stomp” also help children build an understanding of pattern through movement. As you engage children in these everyday activities, help them notice the pattern and describe it in words.

## WHAT CHILDREN ARE LEARNING

- Copying patterns helps children understand what patterns are. It also helps them identify and understand a pattern's repeating unit.
- Children may begin to understand that patterns are made up of repeating units, but it may take more time for them to be able to consistently identify a pattern's repeating unit or create their own patterns. With time and experience, children will be able to see the underlying mathematical structure in patterns. For example, with support, they will start to see that a caterpillar with "blue, red, green, blue, red, green" is just like a bracelet's pattern of "purple, yellow, black, purple, yellow, black," because they can both be labeled ABC patterns.

## MATH TOPICS

Patterns and Structure

Sorting and Attributes

## VIDEO

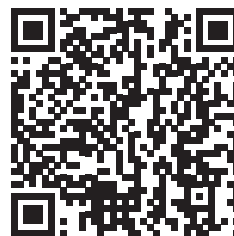


### Watch Game Video

View the QR code in your smartphone's camera app or QR code reader to watch a video that shows how to play Caterpillars and Crafts.

### Watch the Intro to Patterns Video

View the QR code in your smartphone's camera app or QR code reader to watch a video with more information on playing with patterns.



# What's Missing?

**YM** | YOUNG  
MATHEMATICIANS

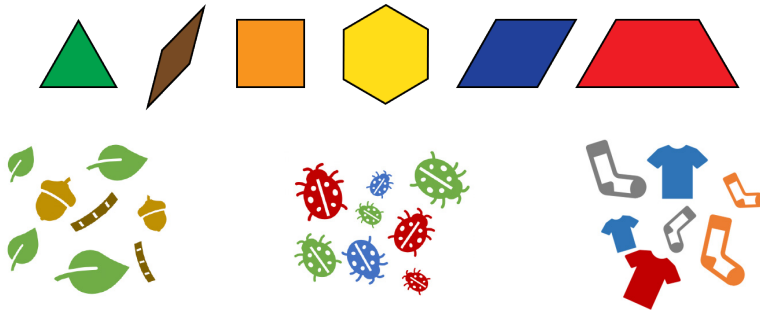
Players 1-4    Ages 4+    5-10 min

## GOAL

To fill a pattern's missing piece.

## MATERIALS

Any materials you have enough of to make a pattern.



## VOCABULARY

Pattern: a design that repeats in a predictable way so that you know what comes next

Missing

Repeat

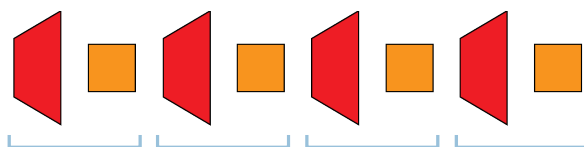
## QUESTIONS

What is repeating in this pattern?

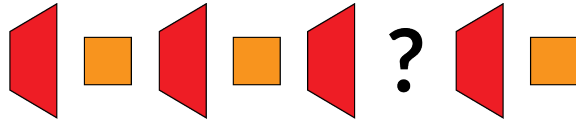
How did you know what was missing?

## HOW TO PLAY

1. Create a pattern that is long enough to have at least three repeating units.



2. Together, chant the items' names out loud, pointing to each item as you say its name.
3. Say, "Close your eyes. I'm going to make a small change in the pattern." Then cover or remove one of the pieces from the pattern.



4. "Now, open your eyes. Can you find what's missing from my pattern?"
5. Once children identify the missing piece, you can ask, "How did you know that was the missing piece?"

### TIPS FOR PLAYING

- Make your pattern long enough so that children can recognize the pattern's repeating unit. About three repeating units is enough, but feel free to make it longer.
- For an extra challenge, you can remove more than one piece from the pattern. For example, you can remove the second trapezoid and the third square. When children have to figure out several missing pieces, they're getting more practice noticing a pattern's underlying structure.

### WHAT CHILDREN ARE LEARNING

- Asking children how they figured out the missing pieces helps you learn about the strategies they are using and how they're beginning to understand pattern structure.
- Ask children to not only solve a problem, but also to explain how they solved it. This helps them practice their mathematical thinking and helps build their language skills.

## MATH TOPICS

Patterns and Structure

## 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 What's Missing.

# Extend the Pattern

Players 1-4



Ages 4+



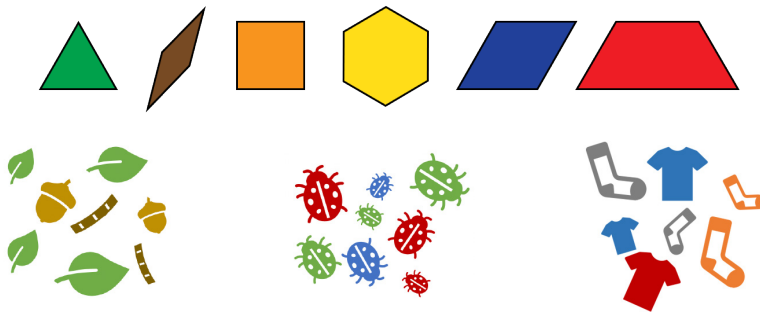
5-10 min

## GOAL

To extend a pattern.

## MATERIALS

Any materials you have enough of to make a pattern



## VOCABULARY

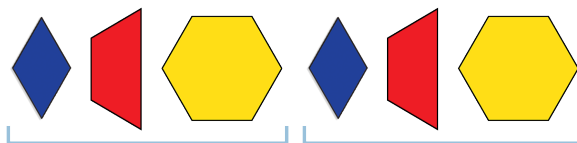
Pattern: a design that repeats in a predictable way so that you know what comes next.

## QUESTIONS

How do you know what comes next?  
What is repeating in this pattern?

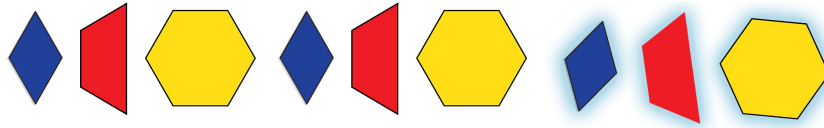
## HOW TO PLAY

1. Create a pattern with at least two repeating units.



2. Then say, "I started this pattern. Can you continue it? Can you extend the pattern?" And see if they're able to figure out what comes next.

3. Sometimes it's helpful to chant the pattern out loud. For example, "Blue, red, yellow, blue, red, yellow, blue...red! Yellow!" or "Rhombus, trapezoid, hexagon, rhombus, trapezoid, hexagon, rhombus...trapezoid! Hexagon!"



### TIPS FOR PLAYING

- Children love to make really, really long patterns. Be sure to leave enough space for their patterns to grow longer!

### WHAT CHILDREN ARE LEARNING

- As children continue the pattern, watch to see if they're able to recognize the pattern's repeating unit. This shows that they're figuring out what's repeating in the pattern.

**What is a repeating unit?** Patterns repeat in predictable ways. One type of pattern is the "red, white" pattern of stripes on the United States flag: red, white, red, white, red, white... In this case the repeating unit is "red, white." A repeating unit is the part of the pattern that repeats over and over again.

### MATH TOPICS

Patterns and Structure

## 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 Extend the Pattern.

# Same Rule, Different Stuff

**YM** | YOUNG MATHEMATICIANS

Players 1-4



Ages 5+



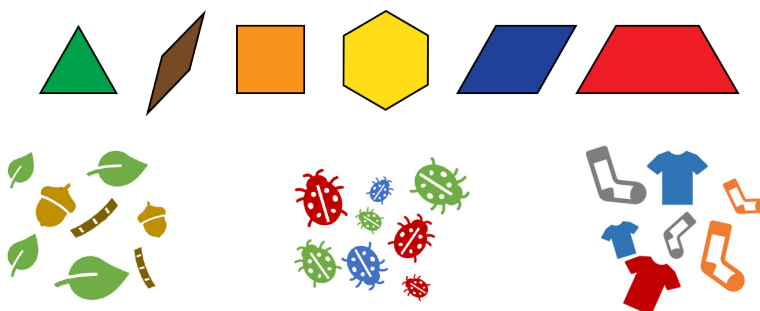
5-10 min

## GOAL

Copy a pattern using different materials.

## MATERIALS

Any materials you have enough of to make a pattern



## VOCABULARY

Pattern: a design that repeats in a predictable way so that you know what comes next

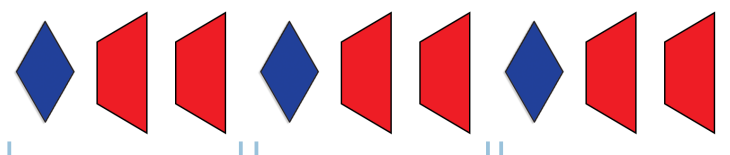
## QUESTIONS

Can you make the same pattern that I made but using different materials?

What is repeating in this pattern?

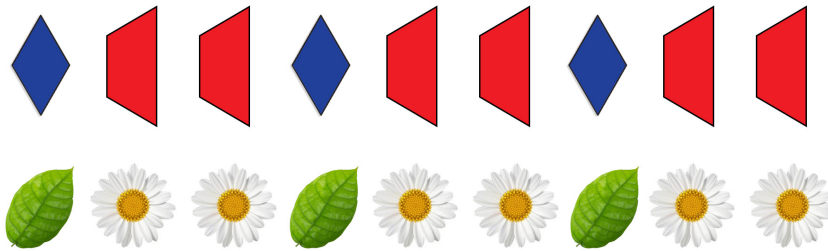
## HOW TO PLAY

1. Create a pattern with at least two repeating units.



**What is a repeating unit?** Patterns repeat in predictable ways. One type of pattern is the “red, white” pattern of stripes on the United States flag: red, white, red, white, red, white... In this case the repeating unit is “red, white.” A repeating unit is the part of the pattern that repeats over and over again.

2. Ask, “Can you make the pattern like mine but using different materials?”
3. Ask children, “What is repeating in this pattern?”



### TIPS FOR PLAYING

- This is an advanced patterning skill for young children, so give them a lot of practice with it.
- For an extra challenge, you can show children only one repeating unit and ask them to build a pattern by repeating that unit with similar or different materials.

### WHAT CHILDREN ARE LEARNING

- To copy a pattern structure using different materials, children need to be able to recognize the repeating unit of a pattern. For example, if you have rock, stick, rock, stick, you can think about it as something, then something else, then the first thing again. If you take some other materials, like colored bears, you can transfer the pattern by putting red bear, blue bear, red bear, blue bear. The mathematical term for this is *transfer* because it focuses on transferring the structure of a pattern, not copying the pattern exactly.

- In elementary school, children may learn to use letters to represent a repeating pattern. Each unique item in the pattern's repeating unit can be assigned a letter. A triangle, square, square pattern, could be called an ABB pattern, where the triangle is represented by A and the square is represented by B. Using letters makes it a lot easier to talk about different pattern structures and describe them to others.

## 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 Same Rule, Different Stuff.

# Make It From Memory

**YM** | YOUNG  
MATHEMATICIANS

Players 1-4



Ages 5+



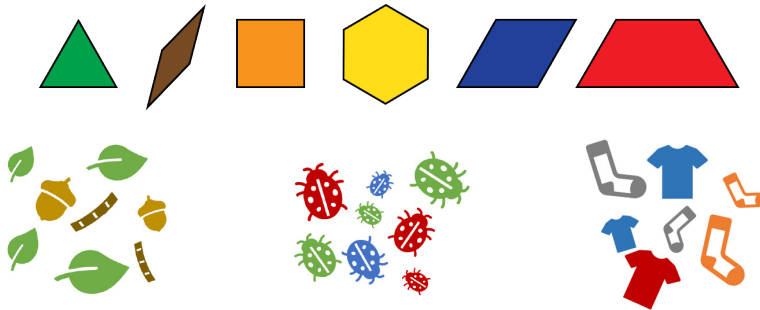
5-10 min

## GOAL

To copy a pattern from memory.

## MATERIALS

Any materials you have enough of to make a pattern.



1 cloth, piece of paper, or other covering



## VOCABULARY

Pattern: a design that repeats in a predictable way so that you know what comes next

Repeat

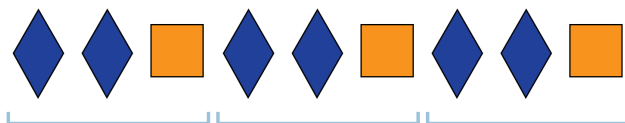
## QUESTIONS

What is the part that repeats in this pattern?

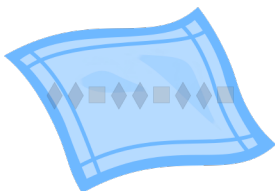
How did you remember how to make the pattern?

## HOW TO PLAY

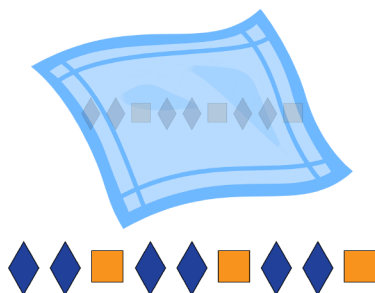
1. Create a pattern with at least two repeating units.



2. Hide the pattern under something so no one can see it.



3. Give children the same materials you used to make the pattern.
4. Say, "I'm going to show you a pattern for just a short time, then I'm going to hide it. Then you can try to make the same pattern from memory."
5. Show the pattern for a few seconds. For children just learning, show it for longer. You can reduce the time you show the pattern as children get more practice.
6. Give children time to make the pattern.



7. Ask, "How did you remember how to make the pattern?" Talk about how they remembered.

### TIPS FOR PLAYING

- This game is challenging! Make sure children have lots of experience with patterns before you play.
- Let children peek if they want to. Over time, they will peek less and less.

## WHAT CHILDREN ARE LEARNING

- Children are practicing both their patterning and memory skills. The more complex a pattern is, the more challenging it is to remember! Once children are able to recreate simple AB patterns, like red-blue, red-blue, from memory, challenge them to try to remember patterns with other structures, like ABC (red-blue-green), or even ABCA (square-triangle-circle-square) from memory!
- Encourage children to name the part of the pattern that is repeating. When children are ready, you can challenge them to copy the same pattern structure using different materials. (See **Same Rule, Different Stuff** for more).

## 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 Make It From Memory.