

SUPPORT GEOMETRY, PATTERNS, MEASUREMENT, AND DATA ANALYSIS USING A DEVELOPMENTAL PROGRESSION¹

This recommendation and the supporting strategies are excerpted from the What Works Clearinghouse practice guide for *Teaching Math to Young Children*. This resource is part of a series of instructional briefs designed to help families, afterschool providers, and other caregivers support their students' early mathematics instruction while learning at home or in a hybrid learning environment.²

Learning skills beyond number and operations creates a foundation for future mathematics instruction, and children with strong backgrounds in these areas are more likely to succeed in later grades.³

When children's understanding extends across a range of math content areas, including geometry, patterns, measurement, and data analysis, they have the tools they need to explore and explain their world.⁴

- 1 Help children recognize, name, and compare shapes. Then teach them to combine and separate shapes.



Geometry

Young children use their developing knowledge about shapes and their features in their everyday activities (for example, when they build with blocks, draw, and work puzzles).

- **Teach** children the names of different shapes—circles, triangles, squares, and rectangles—then **see** how many of them they can find in books and what they see around them.
- **Encourage** children to explore how shapes can be combined and separated to form new shapes.
- **Use** words such as “on,” “under,” and “next to” to help children learn about spatial relationships between objects.

Two identical squares can be combined to form a rectangle.



A square can be cut along the diagonal to form two triangles.



A square can be cut across the middle to form two rectangles.



2 Encourage children to look for and identify patterns. Then teach them to extend, correct, and create patterns.



Patterns provide order and predictability. They help children learn, remember, and anticipate what comes next. Learning about patterns sets the stage for later understanding of algebraic concepts.

- **Help** children find patterns in their environment, such as stripes on their clothes, designs in rugs, or bricks on the sides of buildings.

- **Ask** children what patterns they notice in their day, such as the predictability of a bedtime routine or mealtime. **Talk** about what parts of their day repeat.
- **Share** songs and stories that have repetitive rhythms and words.

For more ideas, click [here](#).

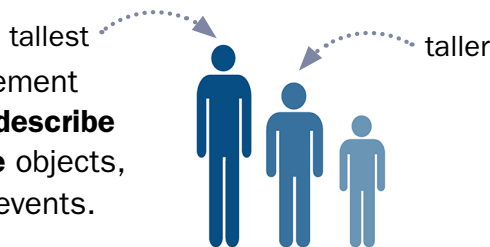
3 Promote children’s understanding of measurement by teaching them to make direct comparisons and to use a variety of units and tools.



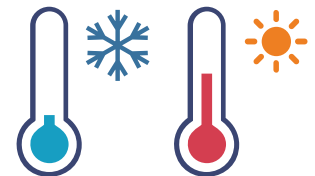
Measurement helps children explore and compare measurable dimensions—such as length or weight—in the world around them.

- **Provide** opportunities for children to make direct comparisons, by directing them to hold two different objects and **asking**, “Which is heavier?”

- **Use** measurement language to **describe and compare** objects, people, and events.



- **Practice** using both nonstandard measurement tools (for example, hands, paper clips, blocks) and standard measurement tools (for example, rulers and measuring cups).
- **Practice** measurement by monitoring changes in temperature through different seasons (“Today is warmer than yesterday”), as well as differences in time (“We eat breakfast in the morning and dinner at night”).



4 Help children collect and organize information. Then teach them to represent that information graphically.



Graphs help children associate number concepts, vocabulary, quantities, and written numerals in meaningful ways.

- **Provide** children with opportunities to count and sort familiar items (for example, favorite snacks or animals) to **introduce** them to the concept of organizing and displaying information.

- **Introduce** graphing using simple tally marks or picture graphs before moving on to more complex representations.

Favorite Pets		
		7
		10

1 See https://ies.ed.gov/ncee/wcc/Docs/PracticeGuide/early_math_pg_111313.pdf#page=31. The recommendation reflects a systematic review of the available literature along with the expertise of a panel of specialists. The supporting research provides a *minimal* level of evidence for the recommendation.

2 Some examples reflect modified versions of the examples included in <https://ies.ed.gov/ncee/edlabs/regions/central/resources/teachingearlymath/2-geometry.asp>.

3 Sarama, J., & Clements, D. H. (2009). *Learning and teaching early math: The learning trajectories approach*. New York, NY: Routledge.

4 National Association for the Education of Young Children & National Council of Teachers of Mathematics. (2010). *Early childhood mathematics: Promoting good beginnings*. Retrieved from <http://www.naeyc.org/files/naeyc/file/positions/psmath.pdf>