

Improving Early Mathematics

Consider using this guide to incorporate routines for math instruction into your schedule. Add a new routine month-by-month until instruction in these key areas of math development is second nature!

MONTH-BY-MONTH



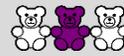
When comparing the characteristics of objects, model and reinforce the use of measurement vocabulary words (e.g. long/short, small/big, warm/cold, early/late, heavy/light). Use this vocabulary to regularly compare objects or changes over time. *Is today warmer or cooler than yesterday?*



Compare groups of objects to determine those that have more, fewer, or the same number of items. Describe changes in sets as items are added or taken away.

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Recognizing the quantity in a set of objects without needing to count is known as subitizing and is an important prerequisite for future math skills like computation. Practice this skill in a fun and meaningful way by incorporating math games using dice into small group and center time. Create your own dice using only one, two, and three dots before progressing to a standard dice.



Provide opportunities for children to create and extend patterns throughout the daily routine. Patterns can be created with tangible items, like block towers with a simple repeating pattern or intangible items, like sounds or actions in repetitive songs. *Let's line up in a boy-girl pattern for recess! Claire, Nathan, and Beth are in line. Who comes next?*



Find an opportunity to graph or tally information weekly. Graph concrete objects like Legos by color (which easily form their own bar graph) or toys from the block center by mode of transportation (air, land, sea). Provide practice graphing intangible items like favorite foods, birth month, or number of family members. Make graphs interactive by asking children to stand in rows based on their selection or consider using their picture before progressing to their name when representing themselves on a graph.



Take shape identification to a new level by embedding it across routines and activities. Use colored tape to create shapes for children to find and sit on during circle time. Attach magnets to colored popsicle sticks and encourage children to build shapes on the chalkboard. Create a shape Go Fish game by printing or drawing shapes on index cards and laminating them for durability. Tape a shape to the classroom door and ask for children to name it as the "password" for entering the room. Engaging and fun instruction is effective!



When discussing the spatial relationship between two objects, model and reinforce the use of positional words (e.g. in, on, under, beside, above, below).



Measuring length, size, temperature, time, and weight taps into children's natural tendency to make comparisons. Introduce measurement using non-standard units like measuring how many unifix cubes, Legos, or sections of egg carton before moving to standard tools like rulers and scales. Make measurement a part of centers by including measuring cups and a clock or wall calendar in dramatic play and adding a tape measure or ruler to blocks. Find ways to incorporate measurement into your day by counting how many steps it takes to reach the bathroom, creating a class growth chart to track and compare the height of children throughout the year, or discussing who has the lightest/heaviest book bag.



Sorting items into groups according to a specific characteristic and being able to describe the differences helps to lay the foundation for recognizing and describing patterns. Make sorting interactive by grouping children by shoe type or shirt color. Collect and sort everyday materials like rocks, bottle caps, shells, buttons, pasta shapes, coins, or food items (e.g. cereal, nuts, candy).

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In addition to counting, children must understand relationships between numbers. Thinking of numbers in terms of their relationship to five and ten (termed *reference points*) develops their understanding of numerical structure and fluency with computation in later grades. Children must first be familiar with basic patterns for numbers one through five, before progressing to ten. Instruction should include ordering numbers one through five, counting with one-to-one correspondence up to five, counting on fingers, creating groups of five, naming groups of five, and exploring multiple ways to make five (adding 3 objects to a set of 2 or adding 1 object to a set of 4). Knowledge of patterns in numbers through five can then be extended to ten.



Geometry



Patterns and Relationships

123 Number and Operations



Data Collection and Statistics



Measurement

LEARN MORE

Available from the T-TAC ODU Lending Library:

Hands-On Standards, Deluxe Edition: The First Source for Introducing Math Manipulatives (PreK-K) by ETA Cuisenaire
This comprehensive handbook shows new and experienced teachers how to successfully integrate research-based manipulatives into math lessons and help students achieve grade-level math standards. It provides more than 50 lesson plans with full-color photos, real-world problems, and practice exercises. Skills include number values, counting up to 10, addition, subtraction, sorting, shape attributes, patterns, non-standard linear measurement, graphs, probability and more.

Teaching Preschool and Kindergarten Math by Ann Carlyle and Brenda Mercado
Create a more focused and successful mathematics program while deepening your understanding of the mathematical ideas that need to be developed at an early age. This resource features lessons, math talk ideas, investigations, formative assessment opportunities, routines, insights into student misconceptions, research-based strategies, and more. The accompanying video contains 27 clips filmed in an actual early childhood classroom.

More Than Counting: Whole Math Activities for Preschool and Kindergarten by Sally Moomaw and Brenda Hieronymus
Math is so easy, a child can do it . . . all we have to do is let them! Help children build a solid active-learning foundation in math with *More Than Counting*. The book, a vital part of any comprehensive curriculum, features more than 100 ideas, including unusual new manipulatives, collections, grid games, path games, graphing, and gross-motor play -- in short, a complete math experience for any child.

Available online:

U.S. Department of Education: What Works Clearinghouse
Teaching Math to Young Children: Practice Guide and Related Resources
<http://ies.ed.gov/ncee/wwc/practiceguide.aspx?sid=18>

National Association for the Education of Young Children (NAEYC)
Position Statement on Early Childhood Mathematics: Promoting Good Beginnings
<http://www.naeyc.org/positionstatements/mathematics>

Where We Stand Summary: Early Childhood Mathematics
(Joint statement with the National Council of Teachers of Mathematics)
<http://www.naeyc.org/files/naeyc/file/positions/ecmath.pdf>

REFERENCES

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- Wright, R., Stanger, G., Stafford, A., & Martland, J. (2006). *Teaching number in the classroom with 4-8 year-olds*. Thousand Oaks, CA: Sage Publications.