

DMT COMPANION

Insight 26 · 2026 · for teachers, coaches, school leaders, and families



THE LASTING IMPACT OF MATH MANIPULATIVES

Choosing and using manipulatives for the mathematics children are learning

How to Use This

This Companion is for teachers, coaches, school leaders, and families working with DMT Insight 26. It explains what common manipulatives can represent, provides activity and question examples, and suggests ways to use math packs at home and school. Start with the three questions that follow.

Key Idea • Manipulatives provide representations of mathematical quantities and relationships. The tasks and questions help children recognize and explain the mathematics.

Three Guiding Questions

Answer these before you read the Insight, then again afterward.

1. What mathematical idea is this activity intended to develop?
2. Which manipulative makes that idea visible, and why?
3. What questions will help children explain the mathematical relationships represented by the materials?

What to Look For

As children work with the materials, notice whether they:

- count each object once and say how many in all without recounting
- make the same quantity in more than one way
- recognize small quantities on dice or cards without counting by ones
- compose a shape from smaller pieces and describe how they fit
- explain the quantities and relationships represented by the materials

Choosing a Manipulative for Mathematics

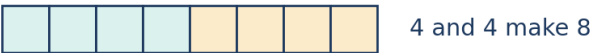
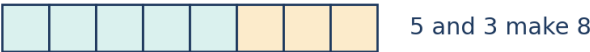
Each material has physical characteristics that fit particular mathematics.

Manipulative	Mathematics it can represent	Why it fits
Connecting cubes	Composing and decomposing quantities, equal groups, measuring length	Equal-sized cubes can be joined into trains and iterated to measure length
Counting chips	One-to-one correspondence, cardinality, comparing, part-total relationships	Chips can be moved and regrouped while the quantity stays the same.
Dice and dot patterns	Subitizing, composing numbers, addition and subtraction	Familiar arrangements can be recognized without counting by ones
Pattern blocks	Composing and decomposing shapes, spatial reasoning, patterns	The shapes have related side lengths and angles, allowing them to be composed into larger shapes
Wooden blocks	Spatial visualization, comparing dimensions, informal measurement	Blocks can be stacked, lined up, and compared directly
Number cards	Recognizing, ordering, and comparing numbers	Numerals can be matched to quantities and other representations

Worked Examples

Example 1 · connecting cubes: composing and decomposing 8

Eight cubes, two ways



The quantity stays 8. The parts change.

Two ways to compose 8 with connecting cubes.

Children build a train of 8 cubes in two colors, then break it apart and make 8 another way. The cubes show that the total quantity remains 8 even when the parts change. Children can use these relationships to reason about addition and subtraction.

Questions to ask:

“How many cubes are in your train? How do you know?”

“Can you make 8 a different way?”

“If 5 are blue, how many are red?”

Example 2 • dice: recognizing and combining quantities

Dot patterns: 5 and 3



“I see 5 and 3.
5 and 3 more is 8.”

Children recognize each quantity without counting by ones, then combine them.

Dot patterns on two dice.

Children roll two dice and say how many they see on each without counting every dot. Then they find the total. Some children count all the dots, some count on from 5, and some know that 5 and 3 make 8. Each strategy shows the teacher or family member something about the child’s reasoning.

Questions to ask:

“How many dots do you see? How did you figure it out?”

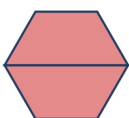
“How many in all? How do you know?”

Example 3 • pattern blocks: composing a hexagon

One hexagon, composed three ways



1 hexagon



2 trapezoids



3 rhombuses



6 triangles

The same shape, composed from different pieces.

Children cover a hexagon with trapezoids, rhombuses, or triangles and compare the results. The task supports composing and decomposing shapes. Using the hexagon as the unit of 1, two trapezoids cover the same area as one hexagon. Each trapezoid represents one-half of the unit of 1. Similarly, each rhombus represents one-third, and each triangle represents one-sixth of the unit of 1.

Questions to ask:

“How many triangles cover the hexagon? How many rhombuses?”

“Can you cover it a different way?”

“How many triangles cover the same area as one rhombus? How do you know?”

Key Idea • In each example, the material keeps a relationship visible: the parts of 8, the quantities on two dice, the pieces of a hexagon.

Using a Math Pack at Home

Math packs provide families with selected manipulatives and activities that support early mathematical development. Connecting cubes, chips, dice, and pattern blocks offer different opportunities for children to investigate quantities, number relationships, measurement, and shapes. Questions and conversations help children explain what they are learning in mathematics. Four questions work with almost any activity:

- “How many?”
- “How do you know?”
- “Can you make that another way?”
- “What do you notice?”

Short, regular activities, such as building a train of cubes, playing a dice game, or covering a shape with pattern blocks, give children repeated opportunities to talk about the mathematics.

For Coaches and School Leaders

Coaches can work with teachers to identify the mathematical ideas students are developing, select manipulatives that represent those ideas, and examine student responses. School leaders can support this work by ensuring teachers have access to appropriate materials and opportunities to learn how to use them. Family mathematics events can demonstrate activities and questions that parents can use at home.

Across the Early Grades

The same materials support more advanced mathematics as children grow.

Grade band	Connecting cubes	Dice and counters	Pattern blocks
Preschool	Count and compare trains	Recognize small quantities	Cover pictures with pieces
Kindergarten	Compose and decompose numbers to 10	Combine two dice; count on	Compose shapes in more than one way
Grades 1–2	Measure length with cube units; equal groups	Make ten; compare differences	Partition the hexagon as the unit of 1 into halves, thirds, and sixths

Continue With DMT Insight 26

Read DMT Insight 26 for the research behind this Companion. Find it at mathsuccess.io/dmtinsights.