

# △ MATHEMATICS KNOWLEDGE & SKILLS

**Mathematics Knowledge & Skills** refers to the conceptual understanding of numbers, their relationships, combinations, and operations. Mathematics also includes shapes and their structure; reasoning; measurement; classification; and patterns. Because math is also about generalizations and abstractions, math skills during the early years help children to connect ideas, develop logical and abstract thinking, and to question, analyze, and understand the world around them. Math knowledge, interest, and skills are basic to children's success in school and later life. Early math skills are highly predictive of later academic achievement in multiple subject areas. In the domain of Mathematics Knowledge & Skills, programs need to ensure that children who are dual language learners can demonstrate their abilities, skills, and knowledge in any language, including their home language.

**KEY** △ = Domain ▶ = Domain Element • = Example

The domain elements for **Mathematics Knowledge & Skills for 3 to 5 year-olds** are:

## ▶ **NUMBER CONCEPTS & QUANTITIES**

The understanding that numbers represent quantities and have ordinal properties (number words represent a rank order, particular size, or position in a list).

- Recognizes numbers and quantities in the everyday environment.
- Recites numbers in the correct order and understands that numbers come "before" or "after" one another.
- Associates quantities and the names of numbers with written numerals.
- Uses one-to-one counting and subitizing (identifying the number of objects without counting) to determine quantity.
- Uses the number name of the last object counted to represent the number of objects in the set.

## ▶ **NUMBER RELATIONSHIPS & OPERATIONS**

The use of numbers to describe relationships and solve problems.

- Uses a range of strategies, such as counting, subitizing, or matching, to compare quantity in two sets of objects and describes the comparison with terms, such as more, less, greater than, fewer, or equal to.
- Recognizes that numbers (or sets of objects) can be combined or separated to make another number through the grouping of objects.
- Identifies the new number created when numbers are combined or separated.

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## ► GEOMETRY & SPATIAL SENSE

The understanding of shapes, their properties, and how objects are related to one another.

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- Recognizes and names common shapes, their parts, and attributes.
- Combines and separates shapes to make other shapes.
- Compares objects in size and shape.
- Understands directionality, order, and position of objects, such as up, down, in front, behind.

## ► PATTERNS

The recognition of patterns, sequencing, and critical thinking skills necessary to predict and classify objects in a pattern.

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- Sorts, classifies, and serializes (puts in a pattern) objects using attributes, such as color, shape, or size.
- Recognizes, duplicates, and extends simple patterns.
- Creates patterns through the repetition of a unit.

## ► MEASUREMENT & COMPARISON

The understanding of attributes and relative properties of objects as related to size, capacity, and area.

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- Compares objects using attributes of length, weight and size (bigger, longer, taller, heavier).
- Orders objects by size or length.
- Uses nonstandard and standard techniques and tools to measure and compare.

