

## Mathematics Education: Grades 1-8

The following chart shows at what grade levels selected topics typically appear in elementary- and middle-school mathematics textbooks. Underlines numbers indicate grades in which the most time is spent on the given topic.

[Source: Mathematics for Teachers, Sonnabend, 2004]

### Mathematical Reasoning

Using inductive reasoning	1, 2, 3, 4, 5, 6, 7, 8
Using deductive reasoning	1, 2, 3, <u>4, 5, 6, 7, 8</u>
Number sequences	1, 2, 3, 4, 5, 6, <u>7, 8</u>
Arithmetic and geometric sequences	7, 8
Finding patterns	1, 2, 3, 4, 5, 6, 7, 8
Problem solving steps	<u>1, 2, 3, 4, 5, 6, 7, 8</u>
Guess and check	2, 3, 4, 5, <u>6, 7, 8</u>
Make a table or list	1, 2, <u>3, 4, 5, 6, 7, 8</u>
Draw a picture	1, 2, 3, 4, 5, 6, 7, 8

### Typical Grade Level in Current Textbooks

### Sets and Functions

One-to-one correspondences	1
Venn diagrams	4, 5, 6, 7, 8
Number sequences	5, 6, 7, 8

### Typical Grade Level in Current Textbooks

### Whole Numbers

Place value	1, <u>2, 3, 4, 5</u>
Addition and subtraction concepts	<u>1, 2</u>
Addition and subtraction algorithms	1, <u>2, 3, 4</u>
Multiplication concepts	2, <u>3, 4</u>
Multiplication algorithm	3, <u>4, 5</u>
Division concepts	<u>3, 4</u>
Division algorithm	3, <u>4, 5, 6</u>
Working backward	3, <u>4, 5, 6, 7, 8</u>
Order of operations	<u>5, 6, 7, 8</u>
Estimation	2, <u>3, 4, 5, 6</u>

### Typical Grade Level in Current Textbooks

### Number Theory

Divisibility tests	5, <u>6, 7</u>
Factors and multiples	<u>4, 5, 6</u>
Prime and composite numbers	4, <u>5, 6</u>
GCF and LCM	<u>5, 6, 7</u>

### Typical Grade Level in Current Textbooks

### Integers

Integer concepts	4, 5, 6
Adding and subtracting integers	5, <u>6, 7, 8</u>
Multiplying and dividing integers	<u>6, 7, 8</u>

### Typical Grade Level in Current Textbooks

### Elementary Fractions

Fraction concepts	1, 2, 3, <u>4, 5, 6</u>
Fraction addition and subtraction	3, 4, <u>5, 6, 7</u>
Fraction multiplication and division	<u>5, 6, 7</u>
Fraction estimation	4, <u>5, 6, 7</u>

### Typical Grade Level in Current Textbooks

### Decimals and Percents

Decimal place value	3, <u>4, 5, 6</u>
Decimal estimation	4, 5, 6, 7
Scientific notation	7, 8
Decimal addition and subtraction	3, <u>4, 5, 6</u>
Decimal multiplication and division	<u>5, 6, 7</u>
Ratio	5, 6, 7
Proportion	6, <u>7, 8</u>
Percents	5, 6, <u>7, 8</u>

### Typical Grade Level in Current Textbooks

## Geometry

Points, lines, and planes	4, <u>5</u> , <u>6</u>
Measuring angles	5, <u>6</u> , 7
Two- and three-dimensional figures	1, 2, 3, 4, 5, 6, 7, 8
Polygons (5 or more sides)	3, 4, 5, 6, 7
Radius, diameter, chord	4, 5, 6
Tessellations	6, 7
Faces, edges, and vertices	4, 5, <u>6</u> , <u>7</u> , 8
Drawing prisms	6, 7

## Typical Grade Level in Current Textbooks

## Congruence, Symmetry, and Similarity

Slides, flips, turns	4, 5, 6, 7, 8
Congruence figures	1, 2, 3, 4, 5, 6, 7, 8
Constructions	6, 7, 8
Line symmetry	2, 3, 4, 5, 6
Rotational symmetry	5, <u>6</u> , 7
Similar figures	4, 5, 6, 7, 8
Dilations	8

## Typical Grade Level in Current Textbooks

## Measurement

Metric measure	1, 2, 3, 4, 5, 6, 7
Perimeter	2, 3, 4, 5, 6
Circumference	4, 5, 6, 7
Rectangle area	4, 5, 6
Parallelogram area	5, 6, 7, 8
Triangle area	5, 6, 7
Trapezoid area	7, 8
Circle area	6, 7, 8
Pythagorean Theorem	7, 8
Surface area	5, 6, 7, 8
Volume	3, 4, 5, 6, 7, 8
Similar solids	7, 8

## Typical Grade Level in Current Textbooks

## Algebra and Coordinate Geometry

Variables	<u>5</u> , <u>6</u> , 7, 8
Translate words into symbols	4, 5, <u>6</u> , <u>7</u> , <u>8</u>
Formulas and equations	4, 5, 6, <u>7</u> , <u>8</u>
Slope, Linear functions	7, 8
Quadratic functions	8
Graphing in the coordinate plane	5, 6, 7, 8

## Typical Grade Level in Current Textbooks

## Statistics

Reading graphs	1, 2, 3, 4, 5, 6, 7, 8
Constructing graphs	2, 3, 4, <u>5</u> , <u>6</u> , 7, 8
Stem-and-leaf plot	4, 5, 6, 7
Misleading graphs	6, 7, 8
Mode	3, 4, 5, 6, 7, 8
Mean and median	4, 5, 6, 7, 8
Range	3, 4, 5, 6, 7, 8
Box-and-whisker plot	6, 7, 8
Surveys	2, 3, 4, 5, 6, 7, 8

## Typical Grade Level in Current Textbooks

## Probability

Basic probability	3, 4, 5, 6, 7
Experimental and theoretical probability	5, 6, 7, 8
Simulations	6, 7, 8
Fundamental Counting Principle	5, 6, 7
Permutations and combinations	7, 8
Independent events	6, 7
Dependent events	7, 8

## Typical Grade Level in Current Textbooks