

Iowa Core Mathematics Content and Practice Shifts

Grades 6-8

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The purpose of this document is to highlight potential Content and Practice Shifts in the Grades 6-8 curriculum as presented in the Iowa Core. The identified shifts may not apply to all districts. Consideration has been given to the varying course offerings by districts

It should be noted that the Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education. A shift in pedagogy is an important focus of the Iowa Core Standards for Mathematics.

The Learning Progressions are from The Common Core Standards Writing Team

<http://ime.math.arizona.edu/progressions/>

Domain	Content Shift (A shift may reside in more than one domain.)	Contrasting Practice	Examples	Standards	Learning Progressions/ Connections
Statistics and Probability	<p>Shift to understand statistical concepts of center, spread, and variability including arithmetic mean, median, mean absolute deviation (MAD), interquartile range (IQR), and boxplots.</p> <p>Shift to include probability.</p>	Students spend little time on statistics and probability.	<p>Grade 6--Find the mean absolute deviation, arithmetic mean, interquartile range, median, 5-Number Summary</p> <p>Grade 7--Find equally-likely and non-equally-likely probability models,</p>	<p>6.SP.1-5</p> <p>7.SP.1-8</p>	<p>6th Grade Mean absolute deviation (MAD)--p.5²</p> <p>Interquartile range (IQR)--p.4²</p> <p>Arithmetic mean--p.5²</p> <p>Median--p.4²</p>

Domain	Content Shift (A shift may reside in more than one domain.)	Contrasting Practice	Examples	Standards	Learning Progressions/ Connections
Statistics and Probability (con't.)	Shift to include bivariate data, relationship to slope, two-way tables.		<p>work with sample space, compound events, and long-run relative frequency, and design and use simulations.</p> <p>Include using a sample to make inferences about a population and gauge the variation in estimates or predictions. Measure the difference between centers by expressing it as a multiple of a measure of variability.</p> <p>Grade 8--Describe patterns of association in bivariate data, with informal line fitting</p>	8.SP.1-4	<p>5-Number Summary and boxplots--p.4²</p> <p>Bivariate data--p. 11²</p> <p>Shape of data--4-6²</p> <p>Chance processes and probability models--pp. 7-8²</p> <p>Random sampling--pp.8-10²</p>
Ratios and Proportional Relationships & Functions	Shift to developing proportional reasoning through the use of multiple representations like tape diagrams, ratio tables, and double number lines. Extend proportional reasoning to linear functions.	Students set up and solve proportions and use cross multiplication.	<p>Use proportional reasoning and strategies for real world contexts.</p> <p>There is a shift from ratio being a static entity to ratio as a verb.</p>	6.RP.3 7.RP.2	<p>Tape diagrams--p. 7⁴</p> <p>Ratio tables--pp.6-7⁴</p> <p>Double number lines--p. 6⁴</p>
Domain	Content Shift	Contrasting	Examples	Standards	Learning

	(A shift may reside in more than one domain.)	Practice			Progressions/ Connections
Ratios and Proportional Relationships & Functions (con't.)	Shift to understand and use complex fractions.		Understand ratio as slope in a linear equation, as a multiplier.	7.RP.1	Linear functions--pp. 6, 9 ⁴ Connection to random sampling--pp.11-12 ⁴ Connection to scale drawings--pp. 11-12 ⁴
Geometry	Shift of transformational geometry to understand geometrical concepts, planar and coordinate geometry.	Taught in high school geometry course	Describe the effect of translations, dilations, rotations, and reflections. Use composition of transformations to verify similarity.	8.G.1-5	Geometry Progressions document only covers concepts through grade 6. Transformational geometry - (no Progressions reference as of yet) Polygons in the coordinate plane--p. 19 ⁵
Domain	Content Shift (A shift may reside in more	Contrasting Practice	Examples	Standards	Learning Progressions/

	than one domain.)				Connections
Expressions and Equations	<p>Shift to algebraic reasoning and developing understanding of linearity in middle school. This includes equations of lines, solving linear equations, solving linear systems, linear functions, and linear models. Students will also look at non-linear functions as a contrast.</p> <p>Shift to writing and evaluating expressions, generating equivalent expressions, solving equations and inequalities, and making connections to the order of operations.</p>	Select students take Algebra I in middle school and continue to Geometry in high school.	<p>Solve 1-step, 2-step, and multi-step linear equations.</p> <p>Solve systems of linear equations.</p> <p>Interpret the meaning of slope and intercepts.</p>	<p>6.EE.1-9</p> <p>7.EE.1-4</p> <p>8.F.2-5</p> <p>8.SP.2-3</p> <p>8.EE.5-8</p>	<p>Functions 8-12³--pp.5-6</p> <p>Statistics & Probability 6-8²--pp. 11-12</p> <p>Expressions & Equations 6-8¹--pp. 11-13</p> <p>Writing and evaluating expressions--pp. 4-6¹</p> <p>Solving equations and inequalities--pp. 6-7¹</p> <p>Order of operations--p. 6¹</p> <p>Independent and dependent variables--p. 7¹</p> <p>Equivalent expressions--p.8¹</p>
Domain	Content Shift (A shift may reside in more	Contrasting Practice	Examples	Standards	Learning Progressions/

	than one domain.)				Connections
The Number System	Shift to understanding division of a fraction by a fraction using a visual model.	Students learn to divide fractions through the use of a rule or algorithm.	Use of fraction bars to find a common unit, then comparing the two fractions.	6.NS.1	Division of fractions – pp. 5-6 ⁶
	Shift to representing +/- of integers using a visual model.	Students learn to add and subtract integers using a rule.	Students represent +/- of integers as a series of moves on the number line or through the use of colored chips while combining like terms.	7.NS.1	Addition/subtraction of integers – pp.9-10 ⁶
	Shift to relying on the Properties of Operations to explain multiplication and division of integers.	Students learn to multiply and divide integers using a rule.	Students come to understand the role of the Properties of Operations in justifying the multiplication and division of integers	7.NS.2	Multiplication/division of integers – pp. 10-12 ⁶

Middle School Common Core Progressions Documents:

¹ 6-8, *Expressions and Equations*

³ Grade 8, *High School, Functions*

⁵ K-6, *Geometry*

² 6-8, *Statistics and Probability*

⁴ 6-7, *Ratios and Proportional Relationships*

⁶ 6-8, *The Number System*