Mathematical Practices	3	4	5
1. Make sense of problems	In third grade, students know that	In fourth grade, students know that doing	Fifth grade students solve problems by
and persevere in solving them.	doing mathematics involves solving	mathematics involves solving problems	applying their understanding of
	problems and discussing how they	and discussing how they solved them.	operations with whole numbers,
	solved them. Students explain to	Students explain to themselves the	decimals, and fractions including mixed
	themselves the meaning of a	meaning of a problem and look for ways	numbers. They solve problems related
	problem and look for ways to solve	to solve it. Fourth graders may use	to volume and measurement
	it. Third graders may use concrete	concrete objects or pictures to help them	conversions. Students seek the
	objects or pictures to help them	conceptualize and solve problems. They	meaning of a problem and look for
	conceptualize and solve problems.	may check their thinking by asking	efficient ways to represent and solve it.
	They may check their thinking by	themselves, "Does this make sense?" They	They may check their thinking by asking
	asking themselves, "Does this make	listen to the strategies of others and will	themselves, "What is the most efficient
	sense?" They listen to the strategies	try different approaches. They often will	way to solve the problem?", "Does this
	of others and will try different	use another method to check their	make sense?", and "Can I solve the
	approaches. They often will use	answers.	problem in a different way?"
	another method to check their		
	answers.		
2. Reason abstractly and	Third graders should recognize that	Fourth graders should recognize that a	Fifth graders should recognize that a
quantitatively.	a number represents a specific	number represents a specific quantity.	number represents a specific quantity.
	quantity. They connect the quantity	They connect the quantity to written	They connect quantities to written
	to written symbols and create a	symbols and create a logical	symbols and create a logical
	logical representation of the	representation of the problem at hand,	representation of the problem at hand,
	problem at hand, considering both	considering both the appropriate units	considering both the appropriate units
	the appropriate units involved and	involved and the meaning of quantities.	involved and the meaning of quantities.
	the meaning of quantities.	They extend this understanding from	They extend this understanding from
		whole numbers to their work with	whole numbers to their work with
		fractions and decimals. Students write	fractions and decimals. Students write
		simple expressions, record calculations	simple expressions that record
		with numbers, and represent or round	calculations with numbers and
		numbers using place value concepts.	represent or round numbers using
			place value concepts.

Mathematical Practices	3	4	5
3. Construct viable arguments	In third grade, students may	In fourth grade, students may construct	In fifth grade, students may construct
and critique the reasoning of	construct arguments using concrete	arguments using concrete referents, such	arguments using concrete referents,
others.	referents, such as objects, pictures,	as objects, pictures, and drawings. They	such as objects, pictures, and drawings.
	and drawings. They refine their	explain their thinking and make	They explain calculations based upon
	mathematical communication skills	connections between models and	models and properties of operations
	as they participate in mathematical	equations. They refine their mathematical	and rules that generate patterns. They
	discussions involving questions like	communication skills as they participate in	demonstrate and explain the
	"How did you get that?" and "Why	mathematical discussions involving	relationship between volume and
	is that true?" They explain their	questions like "How did you get that?" and	multiplication. They refine their
	thinking to others and respond to	"Why is that true?" They explain their	mathematical communication skills as
	others' thinking.	thinking to others and respond to others'	they participate in mathematical
		thinking.	discussions involving questions like
			"How did you get that?" and "Why is
			that true?" They explain their thinking
			to others and respond to others'
			thinking.
4. Model with mathematics.	Students experiment with	Students experiment with representing	Students experiment with representing
	representing problem situations in	problem situations in multiple ways	problem situations in multiple ways
	multiple ways including numbers,	including numbers, words (mathematical	including numbers, words (mathematical language), drawing pictures, using
	words (mathematical language),	language), drawing pictures, using objects,	objects, making a chart, list, or graph,
	drawing pictures, using objects,	making a chart, list, or graph, creating	creating equations, etc. Students need
	acting out, making a chart, list, or	equations, etc. Students need	opportunities to connect the different
	graph, creating equations, etc.	opportunities to connect the different	representations and explain the
	Students need opportunities to	representations and explain the	connections. They should be able to use
	connect the different	connections. They should be able to use all	all of these representations as needed.
	representations and explain the	of these representations as needed.  Fourth graders should evaluate their	Fifth graders should evaluate their results
	connections. They should be able to use all of these representations	results in the context of the situation and	in the context of the situation and
	as needed. Third graders should	reflect on whether the results make sense.	whether the results make sense. They
	evaluate their results in the context	reflect off whether the results make selise.	also evaluate the utility of models to
	of the situation and reflect on		determine which models are most useful
	whether the results make sense.		and efficient to solve problems.
	whether the results make sense.		

Mathematical Practices	3	4	5
5. Use appropriate tools	Third graders consider the available	Fourth graders consider the available tools	Fifth graders consider the available
strategically.	tools (including estimation) when	(including estimation) when solving a	tools (including estimation) when
	solving a mathematical problem	mathematical problem and decide when	solving a mathematical problem and
	and decide when certain tools	certain tools might be helpful. For	decide when certain tools might be
	might be helpful. For instance, they	instance, they may use graph paper or a	helpful. For instance, they may use unit
	may use graph paper to find all the	number line to represent and compare	cubes to fill a rectangular prism and
	possible rectangles that have a	decimals and protractors to measure	then use a ruler to measure the
	given perimeter. They compile the	angles. They use other measurement tools	dimensions. They use graph paper to
	possibilities into an organized list or	to understand the relative size of units	accurately create graphs and solve
	a table, and determine whether	within a system and express	problems or make predictions from real
	they have all the possible rectangles	measurements given in larger units in	world data.
		terms of smaller units.	
6. Attend to precision.	As third graders develop their	As fourth graders develop their	Students continue to refine their
	mathematical communication skills,	mathematical communication skills, they	mathematical communication skills by
	they try to use clear and precise	try to use clear and precise language in	using clear and precise language in
	language in their discussions with	their discussions with others and in their	their discussions with others and in
	others and in their own reasoning.	own reasoning. They are careful about	their own reasoning. Students use
	They are careful about specifying	specifying units of measure and state the	appropriate terminology when
	units of measure and state the	meaning of the symbols they choose. For	referring to expressions, fractions,
	meaning of the symbols they	instance, they use appropriate labels	geometric figures, and coordinate
	choose. For instance, when figuring	when creating a line plot.	grids. They are careful about specifying
	out the area of a rectangle they		units of measure and state the meaning
	record their answers in square		of the symbols they choose. For
	units.		instance, when figuring out the volume
			of a rectangular prism they record their
			answers in cubic units.

Mathematical Practices	3	4	5
7. Look for and make use of structure.	In third grade, students look closely to discover a pattern or structure. For instance, students use properties of operations as strategies to multiply and divide (commutative and distributive properties).	In fourth grade, students look closely to discover a pattern or structure. For instance, students use properties of operations to explain calculations (partial products model). They relate representations of counting problems such as tree diagrams and arrays to the multiplication principal of counting. They generate number or shape patterns that follow a given rule.	In fifth grade, students look closely to discover a pattern or structure. For instance, students use properties of operations as strategies to add, subtract, multiply and divide with whole numbers, fractions, and decimals. They examine numerical patterns and relate them to a rule or a graphical representation.
8. Look for and express regularity in repeated reasoning.	Students in third grade should notice repetitive actions in computation and look for more shortcut methods. For example, students may use the distributive property as a strategy for using products they know to solve products that they don't know. For example, if students are asked to find the product of 7 x 8, they might decompose 7 into 5 and 2 and then multiply 5 x 8 and 2 x 8 to arrive at 40 + 16 or 56. In addition, third graders continually evaluate their work by asking themselves, "Does this make sense?"	Students in fourth grade should notice repetitive actions in computation to make generalizations Students use models to explain calculations and understand how algorithms work. They also use models to examine patterns and generate their own algorithms. For example, students use visual fraction models to write equivalent fractions.	Fifth graders use repeated reasoning to understand algorithms and make generalizations about patterns.  Students connect place value and their prior work with operations to understand algorithms to fluently multiply multi-digit numbers and perform all operations with decimals to hundredths. Students explore operations with fractions with visual models and begin to formulate generalizations.