Mathematics Common Core State Standards and Indiana Academic Standards Analysis

This document can be used to assist educators in analyzing the commonalities and differences between the Common Core State Standards (CCSS) and the Indiana Academic Standards (IAS). In particular, for schools teaching the CCSS, this document can be used to help identify IAS that do not align or only partially align with the CCSS. Students must be given the opportunity to learn the IAS as they will be assessed on these standards through the 2013-14 school year.

The first column states the CCSS. The second column states the IAS that partially align to the CCSS. The third column provides notes, usually highlighting differences between the standards. Please note that in most cases there are not complete matches between the two sets of standards, and it should not be assumed that either the content or skills found in one set of standards will match completely with those of the other set.

At the end of this document, we have listed the IAS Grade 3 indicators that are not aligned to the Grade 3 CCSS. These are presented in two ways: (1) IAS Grade 3 indicators that align to CCSS at a different grade level, with the best match indicated in the first column; and (2) IAS Grade 3 indicators that do not match any CCSS.

Grade 3 Common Core State Standards (CCSS)	Grade 3 Indiana Academic Standards (IAS)	Comment
Operations and Algebraic Thinking		
Represent and solve problems involving multiplication and division.		
3.OA.1 Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 × 7.*	***NEW***	Extension of IAS 3.2.2, which requires students to represent multiplication as repeated addition.
3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.	***NEW***	CCSS interprets division as partitioning
3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (Footnote: See Glossary, Table 2.)	**3.2.2** Represent the concept of multiplication as repeated addition. **3.2.3** Represent the concept of division as repeated subtraction, equal sharing, and forming equal groups.	CCCS 3.OA.3 requires students to fluently multiply and divide within 100. CCSS emphasizes word problems associated with this content.
3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = __ ÷ 3, 6 × 6 = ?.*	***NEW***	
Understand properties of multiplication and the relationship between multiplication and division.		
3.OA.5 Apply properties of operations as strategies to multiply and divide. *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15 then 15 × 2 = 30, or by 5 × 2 = 10 then 3 × 10 = 30. (Associative property of multiplication.) K*nowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. *(Distributive property.) (Footnote: Students need not use formal terms for these properties.)*	**3.3.4** Understand and use the commutative and associative properties of multiplication.	CCSS 3.OA.5 includes the distributive property and includes division as well as multiplication. Students do not need to use formal terms for these properties.
3.OA.6 Understand division as an unknown-factor problem. *For example, divide 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*	**3.2.4** Know and use the inverse relationship between multiplication and division facts, such as 6 x 7= 42, 42 ÷ 7 = 6, 7 x 6 = 42, 42 ÷ 6 = 7.	CCSS 3.OA.6 approaches division as unknown factor problems

Grade 3 Common Core State Standards (CCSS)	Grade 3 Indiana Academic Standards (IAS)	Comment
Multiply and divide within 100.		
3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of one-digit numbers.	**3.2.5** Show mastery of multiplication facts for 2, 5, and 10.	By the end of grade 3, CCCS 3.OA.7 requires students know from memory all products of two one-digit numbers (facts within 100).
	3.2.4 Know and use the inverse relationship between multiplication and division facts, such as 6 x 7= 42, 42 ÷ 7 = 6, 7 x 6 = 42, 42 ÷ 6 = 7.	
	3.3.4 Understand and use the commutative and associative properties of multiplication.	
Solve problems involving the four operations, and identify and explain patterns in arithmetic.		
3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. *[Footnote: This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations).]*	**3.2.7** Use estimation to decide whether answers are reasonable in addition and subtraction problems.	CCSS 3.OA.8 requires students to represent problems using equations with a letter standing for the unknown quantity. CCSS 3.OA.8 specifies two-step word problems and their representation using equations, and includes properties of operations.
	3.3.1 Represent relationships of quantities in the form of a numeric expression or equation.	
	3.3.2 Solve problems involving numeric equations.	
	3.3.3 Choose appropriate symbols for operations and relations to make a number sentence true.	
3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*	**3.3.5** Create, describe, and extend number patterns using multiplication.	CCSS 3.OA.9 requires explanation of patterns using properties of operations.
	3.3.6 Solve simple problems involving a functional relationship between two quantities.	
	3.6.4 Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.	
Number and Operations in Base Ten		
Use place value understanding and properties of operations to perform multi-digit arithmetic. *(Footnote: A range of algorithms may be used.)*		
3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100.	**3.1.6** Round numbers less than 1,000 to the nearest ten and the nearest hundred.	
3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. *(Footnote: A range of algorithms may be used.)*	**3.2.1** Add and subtract whole numbers up to 1,000 with or without regrouping, using relevant properties of the number system.	CCSS 3.NBT.2 includes a range of algorithms for addition and subtraction
3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations. *(Footnote: A range of algorithms may be used.)*	***NEW***	

Grade 3 Common Core State Standards (CCSS)	Grade 3 Indiana Academic Standards (IAS)	Comment
Number and Operations - Fractions *(Footnote: Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)*		
Develop understanding of fractions as numbers.		
3.NF.1 Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.	***NEW***	IAS 3.1.9 (Identify and use correct names for numerators and denominators) should be taught as a part of CCSS 3NF.1. Denominators are limited to 2, 3, 4, 6, and 8 in Grade 3 CCSS.
3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.	***NEW***	Denominators are limited to 2, 3, 4, 6, and 8 in Grade 3 CCSS.
3.NF.2a Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.	***NEW***	Denominators are limited to 2, 3, 4, 6, and 8 in Grade 3 CCSS.
3.NF.2b Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.	***NEW***	Denominators are limited to 2, 3, 4, 6, and 8 in Grade 3 CCSS.
3.NF.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.	**3.1.10** Given a pair of fractions, decide which is larger or smaller by using objects or pictures.	Denominators are limited to 2, 3, 4, 6, and 8 in Grade 3 CCSS.
3.NF.3a Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.	**3.1.8** Show equivalent fractions using equal parts.	CCSS 3.NF.3 requires students to plot fractions on a number line and use their position to determine equivalence.
3.NF.3b Recognize and generate simple equivalent fractions (e.g., $^1/_2 = {}^2/_4, {}^4/_6 = {}^2/_3$). Explain why the fractions are equivalent, e.g., by using a visual fraction model.	**3.1.8** Show equivalent fractions using equal parts.	CCSS 3.NF.3 requires students to generate equivalent fractions and to explain the equivalence.
3.NF.3c Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = $^3/_1$; recognize that $^6/_1 = 6$; locate $^4/_4$ and 1 at the same point of a number line diagram.*	***NEW***	
3.NF.3d Compare two fractions with the same numerator or the same denominator, by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	**3.1.10** Given a pair of fractions, decide which is larger or smaller by using objects or pictures.	CCSS 3.NF.3 requires students to record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Grade 3 Common Core State Standards (CCSS)	Grade 3 Indiana Academic Standards (IAS)	Comment
Measurement and Data		
Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.		
3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	**3.5.9** Tell time to the nearest minute and find how much time has elapsed.	CCSS 3.MD.1 emphasizes solving word problems involving the addition and subtraction of time intervals in minutes.
3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). *(Footnote: Excludes compound units such as cm ^{3} and finding the geometric volume of a container.)* Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. *(Footnote: Excludes multiplicative comparison problems (problems involving notions of "times as much." See Glossary, Table 2).)*	**3.5.6** Estimate and measure capacity using quarts, gallons, and liters. **3.5.7** Estimate and measure weight using pounds and kilograms.	CCSS does not specify using US Customary units in this standard; CCSS does refer to inches in 3.MD.4 and pounds and ounces in Grade 4 (4.MD.1). CCSS uses the term "mass" instead of "weight."
Represent and interpret data.		
3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*	***NEW***	
3.MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.	**3.5.1** Measure line segments to the nearest half-inch.	CCSS specifies using rulers marked in halves and fourths of an inch; Measuring to a quarter inch moves from IAS Grade 4 (4.5.1). CCSS specifies creating a line plot using horizontal scales in whole numbers, halves and quarters.
Geometric measurement: understand concepts of area and relate area to multiplication and to addition.		
3.MD.5 Recognize area as an attribute of plane figures and understand concepts of area measurement.	***NEW***	
3.MD.5a A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.	***NEW***	CCSS explicitly requires teaching of square units
3.MD.5b A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of *n* square units.	***NEW***	
3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	**3.5.4** Estimate or find the area of shapes by covering them with squares.	CCSS explicitly requires teaching of square units; this moves from IAS Grade 4 (4.5.5)
3.MD.7 Relate area to the operations of multiplication and addition.	***NEW***	
3.MD.7a Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.	***NEW***	
3.MD.7b Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.	***NEW***	Using a formula to find area is moved from IAS Grade 4 (4.5.4)

Grade 3 Common Core State Standards (CCSS)	Grade 3 Indiana Academic Standards (IAS)	Comment
3.MD.7c Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.	***NEW***	CCSS specifies demonstrating the distributive property using area models and recognizing area as additive
3.MD.7d Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.	***NEW***	Finding area by decomposing shapes is moved from IAS Grade 4 (4.5.7)
Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.		
3.MD.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different area or with the same area and different perimeter.	**3.5.3** Find the perimeter of a polygon.	Extension of IAS 3.5.3. CCSS emphasizes connection between area and perimeter; this is moved from IAS Grade 4 (4.5.6).
Geometry		
Reason with shapes and their attributes.		
3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	**3.4.1** Identify quadrilaterals as four-sided shapes.	CCSS includes nested categories, rhombuses; identifying quadrilaterals as 4-sided shapes moves to Grade 2 in CCSS (2.G.1)
3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts with equal area, and describe the area of each part is 1/4 of the area of the shape.*	***NEW***	Dividing shapes into equal parts moved from IAS Grade 2 (2.1.8).
IAS Grade 3 Standards Not Matched by CCSS		
Not matched in CCSS Grade 3.	**3.1.1** Count, read, and write whole numbers up to 1,000.	CCSS Grade 2 (2.NBT.2, 2.NBT.3)
Not matched in CCSS Grade 3.	**3.1.2** Identify and interpret place value in whole numbers up to 1,000.	CCSS Grade 2 (2.NBT.1)
Not matched in CCSS Grade 3.	**3.1.3** Use words, models, and expanded form to represent numbers up to 1,000.	CCSS Grade 2 (2.NBT.3)
Not matched in CCSS Grade 3.	**3.1.4** Identify any number up to 1,000 in various combinations of hundreds, tens, and ones.	CCSS Grade 2 (2.NBT.1, 2.NBT.4)
Not matched in CCSS Grade 3.	**3.1.5** Compare whole numbers up to 1,000 and arrange them in numerical order.	CCSS Grade 2 (2.NBT.4)
Not matched in CCSS Grade 3.	**3.1.7** Identify odd and even numbers up to 1,000 and describe their characteristics	CCSS Grade 2 (2.OA.3); no further mention of odd/even in CCSS.
Not matched in CCSS Grade 3.	**3.1.11** Given a set of objects or a picture, name and write a decimal to represent tenths and hundredths.	CCSS Grade 4 (4.NF.5, 4.NF.6, 4.NF.7)
Not matched in CCSS Grade 3.	**3.1.12** Given a decimal for tenths, show it as a fraction using a place-value model.	CCSS Grade 4 (4.NF.6)
Not matched in CCSS.	**3.1.13** Interpret data displayed in a circle graph and answer questions about the situation.	Circle graphs not specifically mentioned in CCSS.
Not matched in CCSS Grade 3.	**3.1.14** Identify whether everyday events are certain, likely, unlikely, or impossible.	Probability does not begin until Grade 6 in CCSS and is covered in greater depth. Assessed in the classroom, not on ISTEP+.
Not matched in CCSS Grade 3.	**3.1.15** Record the possible outcomes for a simple probability experiment.	Probability does not begin until Grade 6 in CCSS and is covered in greater depth.
Not matched in CCSS Grade 3.	**3.2.6** Add and subtract simple fractions with the same denominator.	CCSS Grade 4 (4.NF.3)
Not matched in CCSS.	**3.2.8** Use mental arithmetic to add or subtract with numbers less than 100.	Assessed in the classroom, not on ISTEP+.
Not matched in CCSS Grade 3.	**3.3.7** Plot and label whole numbers on a number line up to 10.	CCSS Grade 2 (2.MD.6)

Not matched in CCSS Grade 3.	**3.4.2** Identify right angles in shapes and objects and decide whether other angles are greater or less than a right angle.	CCSS Grade 4 (4.MD.4 a&b, 4.MD.5, 4.MD.6, 4.MD.7)
Not matched in CCSS Grade 3.	**3.4.3** Identify, describe, and classify: cube, sphere, prism, pyramid, cone, and cylinder.	CCSS Grade K (K.G.3)
Not matched in CCSS Grade 3.	**3.4.4** Identify common solid objects that are the parts needed to make a more complex solid object.	CCSS Grade 1(1.G.2) Assessed in the classroom, not on ISTEP+.
Not matched in CCSS Grade 3.	**3.4.5** Draw a shape that is congruent to another shape.	These concepts are moved to Grade 8 at a more complex level.
Not matched in CCSS Grade 3.	**3.4.6** Use the terms point, line, and line segment in describing two-dimensional shapes.	CCSS Grade 4 (4.G.1)
Not matched in CCSS Grade 3.	**3.4.7** Draw line segments and lines.	CCSS Grade 4 (4.G.1)
Not matched in CCSS Grade 3.	**3.4.8** Identify and draw lines of symmetry in geometric shapes (by hand or using technology).	CCSS Grade 4 (4.G.3)
Not matched in CCSS Grade 3.	**3.4.9** Sketch the mirror image reflections of shapes.	These concepts are moved to Grade 8 at a more complex level. Assessed in the classroom, not on ISTEP+.
Not matched in CCSS.	3.4.10 Recognize geometric shapes and their properties in the environment and specify their locations.	Assessed in the classroom, not on ISTEP+.
Not matched in CCSS Grade 3.	3.5.2 Add units of length that may require regrouping of inches to feet or centimeters to meters.	CCSS Grade 4 (4.MD.2)
	3.5.3 Find the perimeter of a polygon.	
Not matched in CCSS Grade 3.	3.5.5 Estimate or find the volumes of objects by counting the number of cubes that would fill them.	CCSS Grade 5 (5.MD.4) Assessed in the classroom, not on ISTEP+.

IAS Grade 3 Standards Not Matched by CCSS		
Not matched in CCSS.	3.5.8 Compare temperatures in Celsius and Fahrenheit.	Temperature is not part of the CCSS. Assessed in the classroom, not on ISTEP+.
Not matched in CCSS Grade 3.	3.5.10 Find the value of any collection of coins and bills. Write amounts less than a dollar using the ¢ symbol and write larger amounts in decimal notation using the $ symbol.	CCSS Grade 2 (2.MD.8)
Not matched in CCSS Grade 3.	3.5.11 Use play or real money to decide whether there is enough money to make a purchase.	CCSS Grade 2 (2.MD.8)
Not matched in CCSS Grade 3.	3.5.12 Carry out simple unit conversions within a measurement system (e.g., centimeters to meters, hours to minutes).	CCSS Grade 4 (4.MD.1)