

Mathematics Order Of Operations Act of 2018

Author: John Walker Vice President Modesto City Schools Board of Education

Date: April 16, 2018

Introduction:

All grade levels:

First and foremost, the standard algorithm for solving problems is moved from the end of a topic sequence to the beginning of a topic sequence. The standards require being able to solve problems in multiple ways and the first one needs to be clean, clear, and concise. Doing so means there is only 1 other way necessary to meet the requirements.

Secondly and just as important the terms memorization and drilling are no longer going to be perceived as bad words they will be held up as the primary tools for building up the automaticity required to achieve the desired results at the junior and high school levels.

High School:

Same as what was proposed in May of 2017 with two additional features added.

Math 180, Algebra 1, Geometry, Algebra 2, Statistics (college prep and AP), Pre-Calculus, Calculus,

New: Financial Math & Finite Math are moved so that they can be taken both in a student's junior or senior year.

New: Add the big data course being used in LA as a substitute for Algebra 1 and is available to all students at any grade level.

Timing of High School Sequence Changes:

2018: Incoming 9th grade students move from secondary math 1 to Algebra 1

Incoming 10th grade & 11th grade students continue secondary math pathway. 2018 is the last year a secondary math course is offered which provides current students to get where they need relative to the state testing requirements.

2019: Students now continue moving through the traditional pathway and existing students who are on secondary math pathway complete that sequences and it is then removed from the Modesto City Schools course sequence.

2019 Modesto City Schools begins the offering of the "Big Data Math Course"

Junior High:

The existing 8th grade math course currently being offered is the same although I believe there needs to be a concentrated effort by staff to find a set of curriculum / classroom material that is different than what we are currently using. Based on 4 years of data it is not working.

New Junior High School Change: Just as certain junior high students have access to secondary math 1 they will now have access to Algebra 1 and Geometry if they are so inclined.

Timing of Junior High School Sequence Changes:

These changes go into effect at the beginning of the 2018 school year fall semester.

Elementary:

The California Common Core Math Standards referenced below can be found [here](#).

Grade 7: California Common Core Math Standard 6.RP is moved to 7th grade.

California Common Core Math Standard 7.NS is moved to 6th grade.

A preparatory segment is added to prepare 7th grade students to be able to easily move into the 8th grade Algebra 1 or Geometry class now begin offered in 8th Grade.

Grade 6: California Common Core Math Standard 6.RP is moved to 7th grade.

California Common Core Math Standard 7.NS is moved to 6th grade.

Grades 5: Standard 5.NF has students adding and subtracting fractions with unlike denominators without the benefit of knowing about or using least common multiple (or least common denominator).

In Grade 6 students find greatest common factors (GCF) and least common multiples (LCM). This is work done in isolation with no connection made with what the GCF and LCM might be used for.

There is some important skill development here with no value or utility shown. LCM should be taught in grade 5 along with adding and subtracting fractions with lowest common denominator.

GCF should be taught so that students know how to reduce fractions to lowest terms, which is a skill that is extremely useful later in algebra.

Grades 4 – 2 Eliminate Number Line Quicksand:

There is a philosophical shift away from a constructivism discovery based pedagogy. The number line is an important component, but it is not the driving force behind number sense, visualization, understanding mathematical concepts.

There is a philosophical shift towards working through mathematical problems based on procedural steps known within the standard algorithms. The additional application based visualization is moved to the end of the 2nd semester and builds on the fundamental concepts established during the first semester.

The underlying pedagogical shift here is that confusion is not introduced until mastery and confidence have been achieved.

Timing of Elementary School Sequence Changes:

These changes go into effect at the beginning of the 2018 school year fall semester.

Next Steps:

Get the preparations made to put the 8th / 9th grade Algebra 1 course in place for Fall Semester.

Professional development is focused on bottom up teacher driven in house strategy.

An active search begins to obtain classroom material that is not driven by a NCTM endorsed constructivism discovery based pedagogy.

Work continues to reinforce and build on the Order of Operations Act of 2018.