

Connected Math and the Common Core Standards

C o m m u n i t y H o u s e M i d d l e S c h o o l

Introduction

Special points of interest:

- Math Practices of the Common Core and how they are supported by the Connected Math resource
- Goals of the CHMS Math Dept. for the Common Core State Standards
- Descriptions of how the CCSS Math Practices prepare students for the 21st century college and working world
- Helpful resources and links for further research

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Next year, the State of North Carolina will fully implement the Common Core State Standards (CCSS) in language arts and math, along with 45 other states. There are two main benefits to this.

First, states will begin to standardize curricula and content in these areas, which makes K-12 education common throughout the country. In a nation where people are becoming increasingly mobile as well as increasingly global, common standards give all teachers, students, and parents common goals to reach for each content area and grade level.

Second, the CCSS are designed to prepare students to be proficient in real-world skills of the 21st century. The overarching mission of the CCSS is to prepare students, and therefore communities, to be globally

competitive in the world market of ideas and knowledge.

Charlotte-Mecklenburg Schools is making great strides in fitting course offerings, curricula, and teaching best practices with the



CCSS to make our district the most efficient and productive in the state.

Community House Middle School is at the forefront of progress in aligning standards, curriculum, and teaching practices. With literacy at the core of every curriculum—and with appropriate rigor and real-life application—CHMS is leading the district in preparations and successful benchmarks for this

exciting change.

One of the more pointed changes to come with the new implementation are the new end-of-grade and end-of-course assessments. You can read more about these assessments by following the link on page 4.

The CCSS implementation is a fantastic opportunity to make positive and meaningful strides toward the success of all students as they move toward high school and beyond.

This document is a general statement of how our current program of learning mathematics leads to success against the CCSS and the assessments that will evaluate student progress and proficiency in those standards. It will also point out many ways that the CCSS and Connected Math are the perfect recipe for success.

Math Practice 1: Make sense of problems and persevere in solving them.

Students who are proficient in math are able to approach problems by explaining them and finding the important points that lead to the solution. This includes understanding what the question is, what the important facts are (as well as what facts are not important), organizing a strategic plan, verifying that the plan works, and then evaluating

the solution. An important part of evaluating the solution asking the question, “does this make sense?”

Proficient students can see the connections between text, equations, graphs, and tables. They can easily transfer information from one to the other and see changes within them

that make sense of the process of solving the problem.

Finally, as students work, they constantly evaluate their progress toward the solution and make changes as needed in order to reach a logical conclusion.

2. Reason abstractly and quantitatively

The CCSS uses two verbs to describe the goals of this math practice: *decontextualize* and *contextualize*. The first word of the title above points to a change in middle school math, as students are now expected to *reason* through math problems, instead of simply understand and calculate.

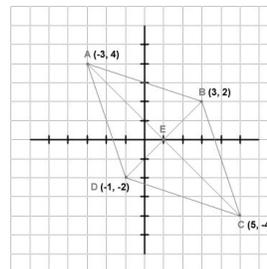
As students decontextualize, they turn a scenario

or situation into a symbolic representation, which they can then manipulate, such as a model or formula. This allows students to move things around and reason abstractly, free from the distractions of the context.

Every once in a while, however, students need to contextualize, where the model is compared to the

original situation to make sure the student is still on track to solving the problem at hand.

Connected Math is a great tool for helping students practice this important skill. In connection with the first practice, students practice abstract and quantitative reasoning every day.



Coordinate graphs are an important example of reasoning abstractly and quantitatively

“CCSS and CMP2 prepare students for higher-level skills in thinking & communication, which is a growing necessity in the 21st century”

3. Construct viable arguments and critique the reasoning of others

The CCSS call for a lot of interdisciplinary learning in middle school, and this is an area where CHMS is a pioneer. The focus of our literacy core is argumentation, where students are given a text or other situation, and they must argue a position in writing.

Connected Math is designed so that students are taught

and prepared to construct arguments that explain and defend their work. Also, the arguments show logical reasoning that led to the solutions.

Additionally, students are expected to read the arguments of their peers and respectfully critique the work. Responses to peer argumentation are made

verbally, textually, and symbolically—using mathematical language, proper conventions, and sound reasoning.

This further prepares students for higher-level skills in communication, which is a growing necessity in the 21st century.

4. Model with mathematics

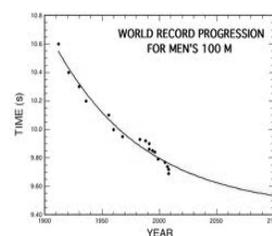
Students who are proficient in math can look at real-world information and data and make mathematical representations of it. Elementary students may use number sentences, middle school students may use proportions and graphs, and high school students

may use functions and geometry to describe change and design.

Connected Mathematics specializes in showing students several different methods of modeling and then offering plenty of practice, where students are expected to use what

they’ve learned and apply it to novel situations.

Technology will be playing a much more meaningful role in this math practice, as more and more applications are available on computers and mobile technology.



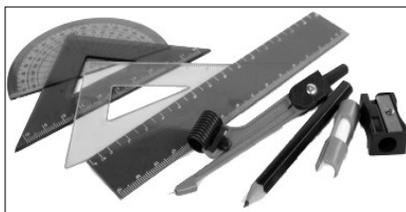
Mathematical models bring graphic learning and creativity to algebra

5. Use appropriate tools strategically

One concern about the way some math education programs have changed is the overuse of calculators. While calculators are a very important tool in middle school math learning, it is not to be used as a failsafe to always getting the right answer.

CCSS and CMP2 both focus on making sure students know when to use tools appropriately to help them reach their goals. Calculators never take the place of basic

skills, but instead serve as an aide to problem solving. Students will learn to use tools like this strategically, meaning that



Strategic use of math tools is a focus of both CCSS and Connected Mathematics

they will know when a calculator will serve their needs, instead of simply doing the work for them.

We all know that tools can't solve problems. Therefore, we teach our students to solve problems with the *assistance* of their tools.

6. Attend to precision.

Contrary to some myths, Connected Mathematics does not incorporate so-called "fuzzy math," where solutions are always open to interpretation. In fact, CMP2 reinforces the position that there may be several different methods of arriving at one precise answer.

When this practice is used in conjunction with Math Practice #3, it creates a powerful frame of mind in students as they solve problems with high precision and are skilled

in defending their work.

Skills such as place value, significant digits, and scientific notation further help students communicate their results with a common language. Mathematics is not a democratic system, and all students should be able to show that their answers are precise and accurate.



Accuracy and precision are two important foci of the Connected Math Program and Common Core State Standards

7 and 8. Look for and make use of structure and repeated reasoning

These two math practices require students to find and create patterns in mathematical reasoning. Structure in math means the patterns that make up general rules and algorithms. These can be used by students to find solutions quickly and even create shortcuts. Also, when students find patterns in data, they can turn it into

equations, where others can follow their work and use their equations and formulas to solve new problems.

Instead of listing formulas for students to memorize and practice, Connected Math requires students to discover rules that can be applied to many scenarios. This is an important skill in

several STEM applications, including physics, engineering, computer science, statistics and calculus.

CMP2 and the CCSS will train students to find and use these rules, rather than attempt to memorize and regurgitate them.



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At Community House Middle School it is our mission to ensure high levels of learning for all students in a supportive and equitable environment.

Our vision at CHMS is for every child to achieve more than one year's growth in one year's time.

Helpful Resources for Further Reading and Research



Michigan State University's
Connected Math Project Page:
<http://connectedmath.msu.edu/>



Common Core State Standards Initiative
<http://www.corestandards.org/>



Community House Middle School
<http://schools.cms.k12.nc.us/communityhouseMS/>



<http://prod2.phschool.com/cmp2/>

Ongoing CMP2 and CCSS updates and discussions:
<http://krisnielsen.cmswiki.wikispaces.net/>

Getting ready for CMP3:
<http://connectedmath.wordpress.com/>

CMP2 Parents Page:
<http://www.connectedmath.msu.edu/parents/welcome.shtml>



Common Core Assessment Consortium
<http://www.k12.wa.us/SMARTER/>