GVC Companion Guide: Math Core 7-8

Guiding Philosophy, CGI, Cognitively Guided Instruction:

- We invite you to consider the following:
  - Students need space and time to make sense of mathematics.
  - Students need time to explain their thinking.
  - Take time to notice, strategically share, and celebrate diverse student thinking.
  - Use questioning to elicit, support, and extend thinking.
  - Facilitate student-centered discussions to deepen understanding and create spaces for sense-making.

Seven Guiding Principles of Cognitively Guided Instruction, CGI:

We tie these principles to the Social Justice Standards, learning for justice anti-bias framework - Learning for Justice Website

1. Every student comes to math class knowing some mathematics
2. Every student is capable of extending their mathematical ideas
3. Knowing the development of children's thinking helps you know how to support learning– "What am I working toward?"
4. Details of children's thinking support instructional decision making
5. Must challenge our assumptions about what students know and are able to do
6. Must create space for the participation of each and honor the different ways in which students are participating
7. Identity shapes participation, so want to position students competently

- Start the school year with growth mindset work doing Inspirational Week of Math tasks Start the school year with growth mindset work doing Inspirational Week of Math tasks from YouCubed.org at Stanford. Set classroom norms and excitement for a great year of mathematics ahead! Under Tasks & More https://www.youcubed.org/week-inspirational-math/ (listed as weeks but is actually year 1, 2, 3, 4… of its existence) Consider using throughout the year with a big kick off week one using parts of any of the "weeks" provided. Work with your PLC to collaborate together on which to use when. Site offers numerous resources to support differentiation/enrichment and community communication.
- Use number talks/sense making routines and mini lessons to bring back past math knowledge. Things to think about including:
  - Number Strings https://numberstrings.com/
  - Choral Counting
  - Multiple Representations (Frayer Model: sample images consider application quadrant)
  - Graphing Stories: Blog-why-how-samples; Desmos Stories; STEMlearning; sample search
  - Always, Sometimes, or Never | True-False … and why? | Give example(s) and/or counter-example(s) nrich.maths-ASN | true/false routine
  - Same but Different
  - Number-Math Talks |Making Number Talks Matter
  - Error Analysis "My Favorite No" – My favorite wrong answer/Error Analysis
  - Which one doesn't belong? (WODB) Which one doesn't belong?
  - Academic Talk protocol(English learners++) | Partner A/Partner B (Academic Talk protocol)
  - Estimation 180 | Estimysteries | Splat
  - Open Middle (open-ended questions)
  - Would You Rather
  - Data Talks
  - Silent Board Games How-To
  - Claims-Evidence Writing (graphic organizer support) Problem-Evidence-Reasoning-Claim (PERC)
  - Mathematical Mindsets by Jo Boaler (Appendix A pgs. 217-268) Appendix

- **Note "Critical Areas of Instruction" also aligned to content standards for seventh grade AND for eighth grade ~ "Critical Areas of Instruction" . Math CORE 7-8 Critical Areas**

  - **OpenUp Resources** *Math Milestones (7th grade) (8th grade)**UNIT IABS for core 6 & 7

- Problem solving is done throughout the course and used to launch/explore/summarize and to engage with and apply mathematical concepts.
- With 8th grade content, Functions and Transformation are to be embedded and used.
- There has been an effort to ensure that we are aligned with the CA State Mathematics Standards and that the concepts are organized in a logical, fluid way, and that we have coherence in the course.

SEMESTER 1

Students should build on **prior knowledge** of…	Students should **master**…	Students should be **developing** and will continue to work on…
Solve operations and rational numbers Solve equations/inequalities, word problems, and distributive property Scale factors, angle relationships, area, perimeter, and similarity Ratios and proportions, percents, proportional relationships, unit rates Liner equations Geometry	Performing arithmetic operations with rational numbers Representing and interpreting equations and inequalities using word problems. Students are able to solve expression and linear equations using rational numbers. Develop an understanding of and applying proportional relationships. Students graph proportional relationships and understand the unit rate informally as measure of the steepness of the related line.	Data analyzation, sampling methods, and probability. Measuring surface area, volume, and area (including circumference of circles). Pythagorean theorem and roots Exponential relationships Symbolic representations in context Systems of equations Transformations

District FIAB in October will be Dividing Fractions by Fractions for 6th graders AND FIAB The Number System IAB for 7th graders.

SEMESTER 2

Students should build on **prior knowledge** of…	Students should **master**…	Students should be **developing** and will continue to work on…
Exponents, square roots, and cube roots. Decimal multiplication and division Equivalent expressions, linear equations	Pythagorean theorem Scientific notation Identify functions Create and analyze graphs and proportional relationships. Transformations Applying volume formulas to solve problems.	Recognizing and applying transformations. Understanding congruence and similarity.

District FIAB in February will be The Number System IAB for 6th graders AND FIAB Ratios and Proportions for 7th graders.

- **Note "Critical Areas of Instruction" also aligned to content standards for seventh grade AND for eighth grade ~ "Critical Areas of Instruction" . Math CORE 7-8 Critical Areas**
- **OpenUp Resources** *Math Milestones (7th grade) (8th grade)**UNIT IABS for core 6 & 7

For Grade Seven Mathematics, instructional time should focus on four critical areas:

(1) Developing understanding of an applying proportional relationships.

(2) Developing understanding of operations with rational numbers and working with expressions and linear equations.

(3) Solve problems involving scale drawings and informal geometric constructions, and working with two- and three- dimensional shapes to solve problems involving area, surface area, and volume.

(4) Drawing inferences about populations based on samples.

For Grade Eight Mathematics, instructional time should focus on three critical areas:

(1) Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of equations.

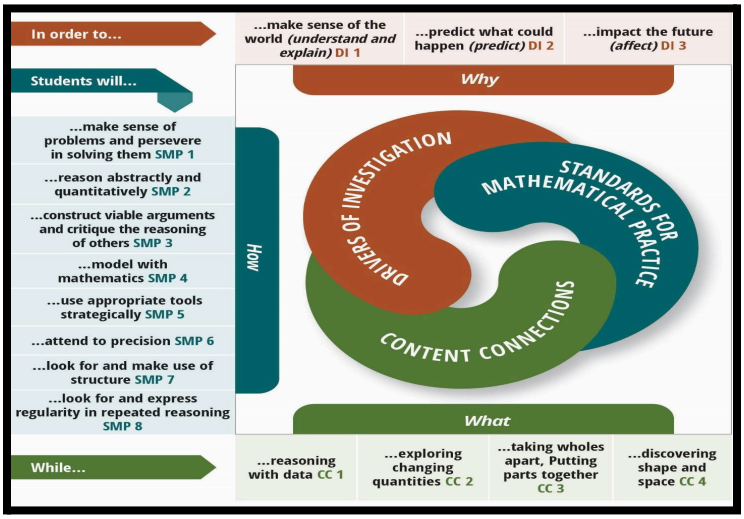
(2) Grasping the concept of a function and using functions to describe quantitative relationships.

(3) Analyzing two- and three- dimensional space figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.

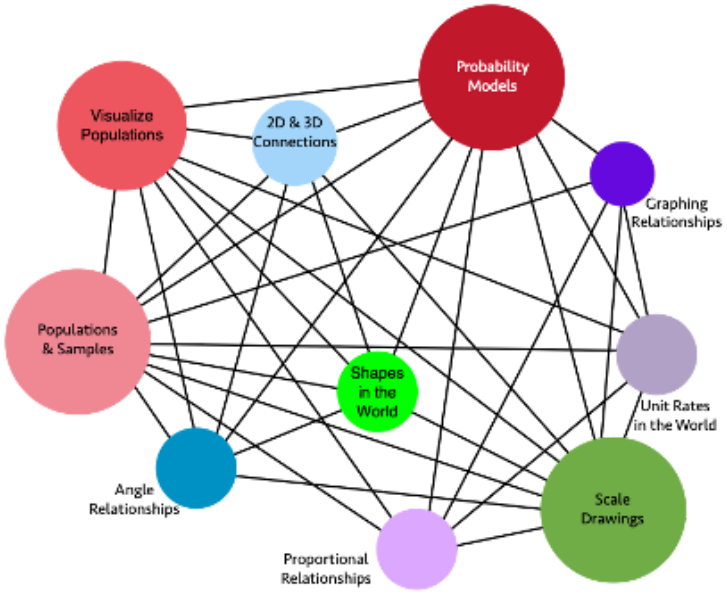
Standards for Mathematical Practices = the how-to of the content standards

MP1: Make sense of problems and persevere in solving them
MP2: Reason abstractly and quantitatively
MP3: Construct viable arguments and critique the reasoning of others
MP4: Model with mathematics
MP5: Use appropriate tools
MP6: Attend to precision
MP7: Look for and make use of structure
MP8: Look for and express regularity in repeated reasoning

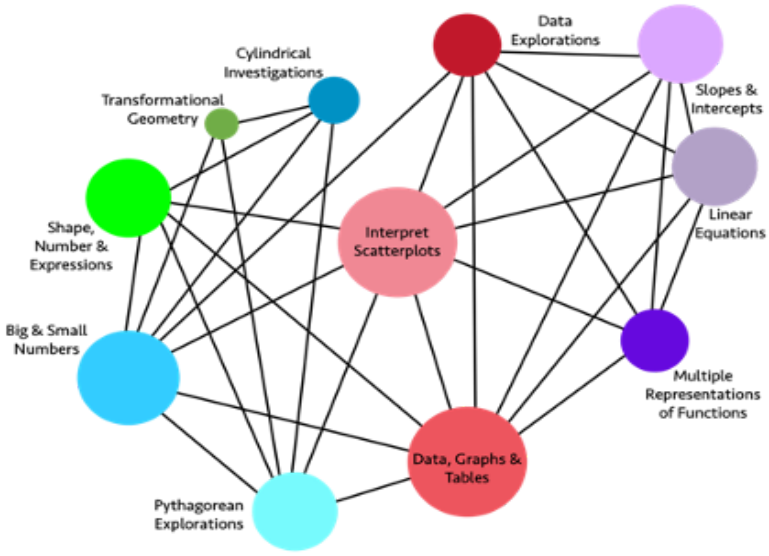
Mathematical Practices 1-3-6 = connections to EL/ELD and NGSS standards



MATH CORE SEVEN BIG IDEAS from 2023 CA MATH FRAMEWORK chapter 7



MATH CORE EIGHT BIG IDEAS from 2023 CA MATH FRAMEWORK chapter 7



See Grade Level Critical Areas Docs linked on One-Page Grade Level Math Guides for details

*Math Milestones (7th grade) (8th grade) **UNIT IABS for core 6 and core 7

2023 Mathematics Framework: Full Version Ch. 2 - Teaching for Equity and Engagement