GVC Companion Guide: Kinder

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

Kinder Focus and Tips

- Start the school year with growth mindset work doing Inspirational Week of Math tasks doing Inspirational Week of Math tasks from YouCubed.org at Stanford (listed as weeks but is actually year 1, 2, 3, 4… of its existence). Set classroom norms and excitement for a great year of mathematics ahead! 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.

- Consider the Cognitively Guided Instruction Formative Assessment Tasks to gauge where students are in their thinking at the start of the year. Can be administered in parts (e.g. 1-2 problems at a time) and it can also be given multiple times a year to show progression and progress.

- Establish structures and norms through sense-making routines. Sense-making routines/warm-ups are powerful structures to create student agency and access.
  - Downey CGI resources by grade
  - learningfromchildren.org/listening-to-childrens-thinking/resources
  - Dot Talks http://ntimages.weebly.com/

- Number Strings https://numberstrings.com/
- Choral Counting
- Multiple Representations (Frayer Model: sample images consider application quadrant)
- 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
- Number Routines
- Counting Collections
- Data Talks

❖ Intentional Talk. Let's remember the **all-important share out opportunities**: variety of share outs and their templates

❖ Padlet of Sense Making Routines and Supports thanks to SMMUSD MTLs–mathematics teacher leaders

- Consider using kid lit books as part of math warm ups = a way to talk about shapes/positions (supporting concepts) Maths from Stories and Describe-Draw-Describe (DDD)

Throughout the Year:

❖ Counting! Shapes and Space!!
❖ Trimesters' skills will spiral back by way of math warm ups and while working on other skills. Counting and Cardinality are part of a balanced year of mathematics. Keep it moving!
❖ This companion guide and one-pager provides supplemental tasks, all vetted items by team of kinder math teachers. Use if you find that the core curriculum is not enough to support your students' learning.
❖ Review each MyMath chapter prior to teaching to choose what activities best support the goal. Not all activities in the lessons are crucial or need to be taught. Not all are aligned with the guiding philosophy/best practices.
❖ Problem solving is done throughout the school year using all problem types.
❖ Use Number Talks/Number Strings to reinforce computation strategies and relationships between operations. (This can include: true/false number sentences, equalities and inequalities, open number sentences, a sequence of equations that demonstrate specific consistencies, etc.)
❖ Illustrative Mathematics is a common core aligned resource. It is OpenUp Resources' base.
❖ Reference Math Milestones as examples of tasks that promote student thinking around the grade's big ideas.

Think Smart for Smarter Balance–MyMath assessments **Spanish Versions**

TRIMESTER 1:

- Keep counting collections at the forefront; do more hands-on activities than MyMath workbook
- Model join and separate word problems using manipulatives as well as drawings—see CA Kinder Math Framework chapter pg 15 and/or CGI assessment resources noted in detailed guide.
- For numbers past 10, in trimester 1, need to identify, count, and write; no need to know that teens are a ten and ones (will be part of trimester 3)

Students should build on **prior knowledge** of…	Students should be close to proficiency…	Students should be **developing** and will continue to work on…
Consider the Cognitively Guided Instruction Assessment to gauge where students are in their thinking at the start of the year. Can be administered in parts e.g. 1-2 problems at a time.	Given a number of objects students can begin the process of counting the amount of objects Can orally count to 20 starting at 1	Name, recognize, count and write numbers to 10 Work towards cardinality, one-to-one correspondence and reciting the correct number sequence to 20 Solve a variety of problem types using tools (join result unknown, separate-result unknown) Compose and decompose numbers

In trimester 1, the following should be introduced via counting collections and/or kid lit:

- addition/subtraction (join/separate/partitive division or fair share)
- compose decompose numbers
- classify/sort objects
- position
- 2D shapes

TRIMESTER 2:

- Continue to do join and separate word problems while beginning to add in part-part-whole (keep spiraling)
- Consider using kid lit books as part of math warm ups = a way to talk about shapes/positions (supporting concepts) Maths from Stories and Describe-Draw-Describe (DDD)
- Bump up expectations for counting collections by having students group in many ways, can also start joining two collections or doing subtraction (grab some and take, count how many are left)
- Make decomposing numbers (number partners/fact families) a big focus of math warm ups. Students need a solid understanding of this for an easier transition into addition and subtraction.

Students should build on **prior knowledge** of…	Students should **master**…	Students should be **developing** and will continue to work on…
Have counted objects Can orally count to 20 starting at 1 In trimester 1, the following	Add and subtract numbers to 5 Name, recognize, count and write numbers to 10 Give number partners (fact families)	Solve addition and subtraction word problems within 10 using objects or drawings In trimester 2, the following

should be introduced via counting collections and/or kid lit: o addition/subtraction (join/separate/partitive division or fair share) o compose decompose numbers o classify/sort objects o position o 2D shapes	up to 10 (ex. 5 and 5 are 10; 3 and 7 are 10)—compose and decompose to 10 Work towards cardinality, one-to-one correspondence and reciting the correct number sequence to 20 Solve a variety of problem types using tools (join result unknown, separate-result unknown)	should be introduced: o Classify and sort objects o Position o 2D shapes o Length/Height/Weight o Composing into tens and ones (11-19)—if students are ready Continue using counting collections and children's literature

SMMUSD Winter Interim Assessment (January-February)

SMMUSD Spring Interim (May)

TRIMESTER 3:

- **C**ontinue to spiral back to all word problem types while doing multiplication and measurement division types
- Continue math warm ups using a variety of sense making routines such as DDD (shapes/position), decomposing numbers to 10, continual spiraling!
- Keep teen numbers as the main focus in order to reach understanding

Students should build on **prior knowledge** of…	Students should **master**…	Students should be **developing** and will continue to work on…
Add and subtract numbers to 5 Name, recognize, count and write numbers to 10 Give number partners (fact families) up to 10 (ex. 5 and 5 are 10; 3 and 7 are 10)—compose and decompose to 10 Work towards cardinality, one-to-one correspondence and reciting the correct number sequence to 20 Solve a variety of problem types using tools (join result unknown, separate-result unknown)	Solve addition and subtraction word problems within 10 using objects or drawings Position 2D shapes Length/Height/Weight Compose into tens and ones (11-19) ***Plus trimester one and two concepts***	Spiral kinder content throughout the year to become proficient in kinder process and content standards. First grade will build from this kinder understanding of both content and how to be a mathematician!!

For Kinder Mathematics, instructional time should focus on two critical areas:

(1) Representing, relating, and operating on whole numbers, initially with sets of objects.

(2) Describing shapes and space.

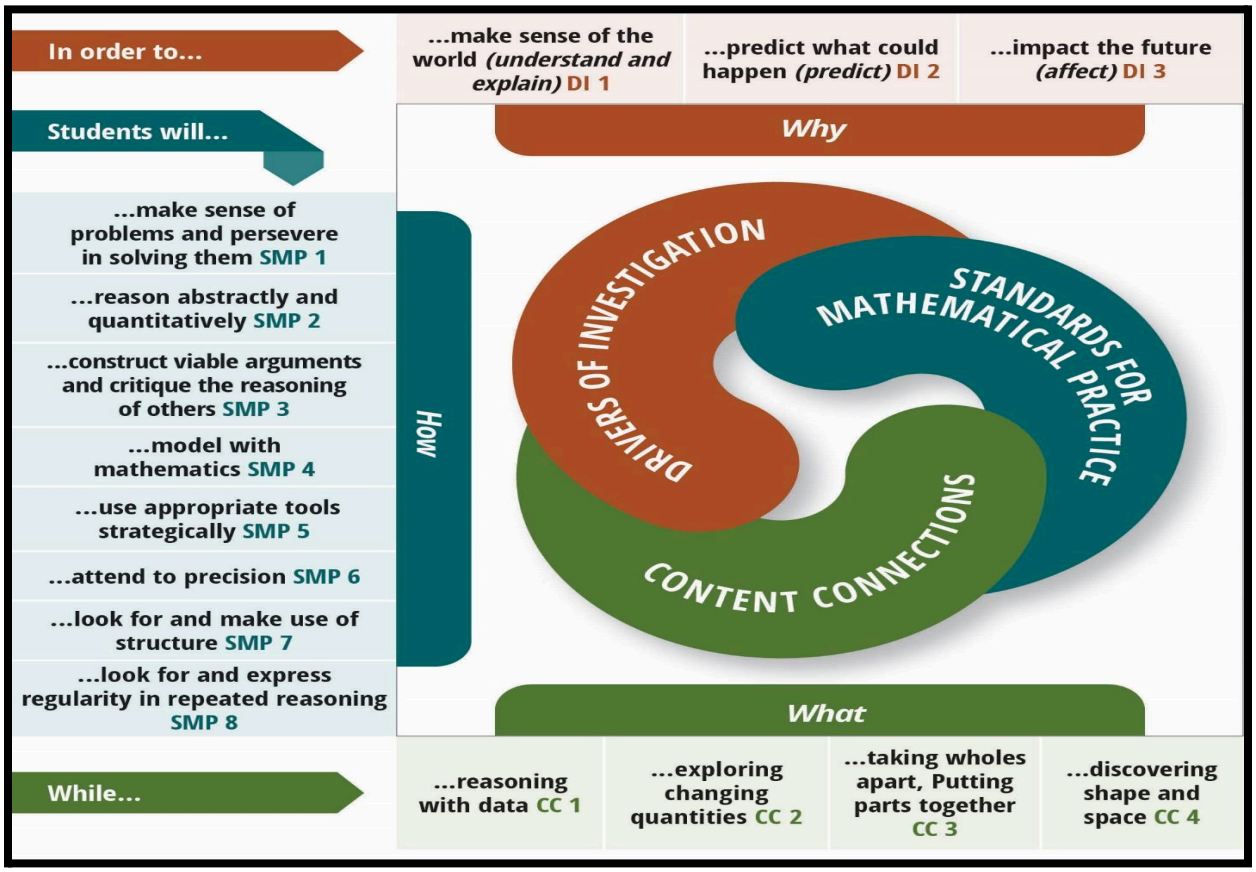
More learning time in kindergarten should be devoted to numbers than to other topics.

Reference Math Milestones as examples of tasks that promote student thinking around the grade's big ideas.

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: See 2013 Critical Areas for details of grade expectations

Strategies	Tools
● Direct Modeling o Concrete representation for each object that must be counted o Rote counting, cardinality, one-to-one correspondence ● Counting o Starts with one number and uses a concrete representation for the second value o Number Conservation ● Invented Algorithms (Relational Thinking) o More abstract thinking: concrete representations are not usually seen in these strategies o Using what I know to help me figure out what I don't know o Eg: Combining like units, incrementing, compensation UCLA Mathematic Project, 2020	● Fingers ● Counters ● Tally Marks ● Hundreds Chart ● Number Line ● Ten Frames ● Base-10 Blocks ● Paper and Pencil ● Number Bonds ● Arrays ● Calculators ● Tape Models ● Etc.



CONTENT CONNECTIONS ~ BIG IDEAS ~ CONTENT STANDARDS

CC1~reasoning with data CC2~exploring changing quantities
CC3~taking wholes apart, putting parts together CC4~discovering shape and space

Content Connections	Big Ideas	Kindergarten Content Standards
Reasoning with Data	**Sort and Describe Data**	**MD.1, MD.2, MD.3, CC.4, CC.5, G.4:** Sort, count, classify, compare, and describe objects using numbers for length, weight, or other attributes.
Exploring Changing Quantities	**How Many?**	**CC.1, CC.2, CC.3, CC.4, CC.5, CC.6, CC.7, MD.3:** Know number names and the count sequence to determine how many are in a group of objects arranged in a line, array, or circle. Fingers are important representations of numbers. Use words and drawings to make convincing arguments to justify work.

Content Connections	Big Ideas	Kindergarten Content Standards
Exploring Changing Quantities	**Bigger or Equal?**	**CC.4, CC.5, CC.6, MD.2, G.4:** Identify a number of objects as greater than, less than, or equal to the number of objects in another group. Justify or prove your findings with number sentences and other representations.
Taking Wholes Apart, Putting Parts Together	**Being Flexible within 10**	**OA.1, OA.2, OA.3, OA.4, OA.5, CC.6, G.6:** Make 10, add and subtract within 10, compose and decompose within 10 (find two numbers to make 10). Fingers are important.
Taking Wholes Apart, Putting Parts Together	**Place and position of numbers**	**CC.3, CC.5, NBT.1:** Get to know numbers between 11 and 19 by name and expanded notation to become familiar with place value, for example: 14 = 10 + 4.
Taking Wholes Apart, Putting Parts Together	**Model with numbers**	**OA.1, OA.2, OA.5, NBT.1, MD.2:** Add, subtract, and model abstract problems with fingers, other manipulatives, sounds, movement, words, and models.
Discovering Shape and Space	**Shapes in the World**	**G.1, G.2, G.3, G.4, G.5, G.6, MD.1, MD.2, MD.3:** Describe the physical world using shapes. Create 2-D and 3-D shapes, and analyze and compare them.
Discovering Shape and Space	**Making shapes from parts**	**MD.1, MD.2, G.4, G.5, G.6:** Compose larger shapes by combining known shapes. Explore similarities and differences of shapes using numbers and measurements.

Drivers of Investigation. Unifying reasons that both elicit curiosity and provide the motivation for deeply engaging with authentic mathematics.

D1~make sense of the world (understand and explain)

D2~predict what could happen (predict)

D3~impact the future (affect)