Creating Early Math Environments

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Agenda

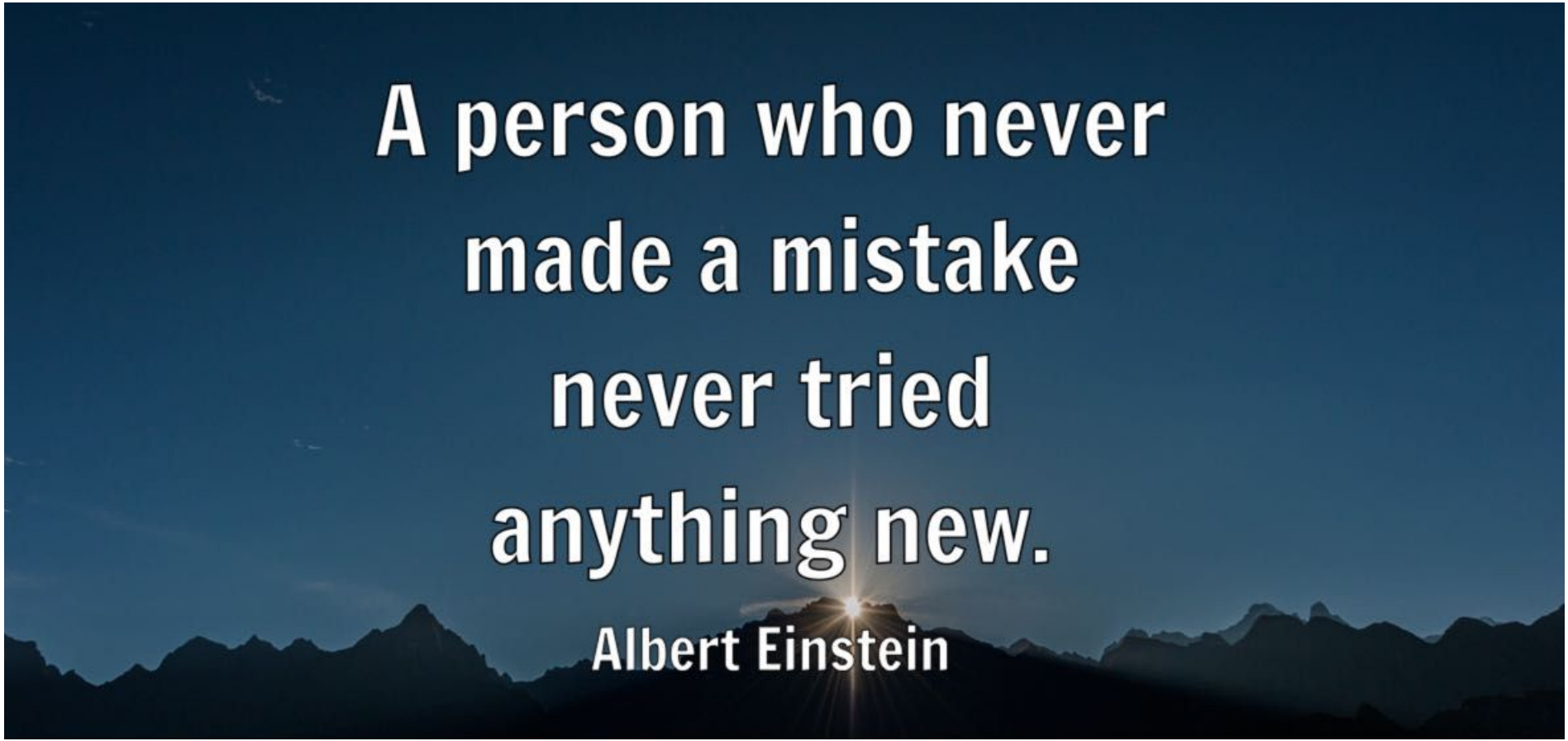
- How Does an Environment Affect Our Lives?
- Environment- The Impact On Learning
- Intentional Teaching- The Why
- Art of Questioning
- Calendar/Whole Group Time
- Center Time
- Project-Based Learning/Independent Learning
- Relationship-Driven Environments
- Developing a Love for Learning!

How have you created a relaxing environment in your home?

What is the impact of intentional environmental design?

“healthy living and work spaces that support health, well-being and higher consciousness.”

Damon & Cathy Coyne


A person who never
made a mistake
never tried
anything new.
Albert Einstein

Young children continually construct mathematical ideas based on their experiences with the environment, their interactions with adults and other children, and their daily observations.

J.V. Copley

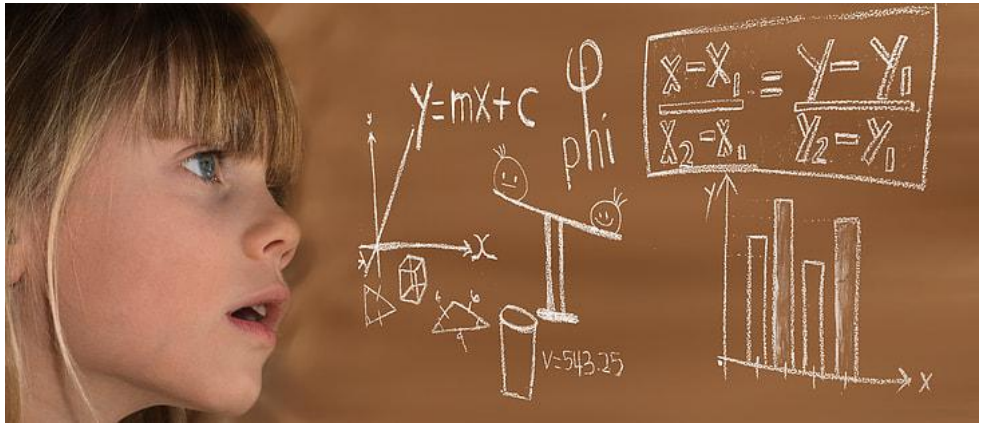
How can we develop mathematical thinking?

Child's First Teacher- parents!

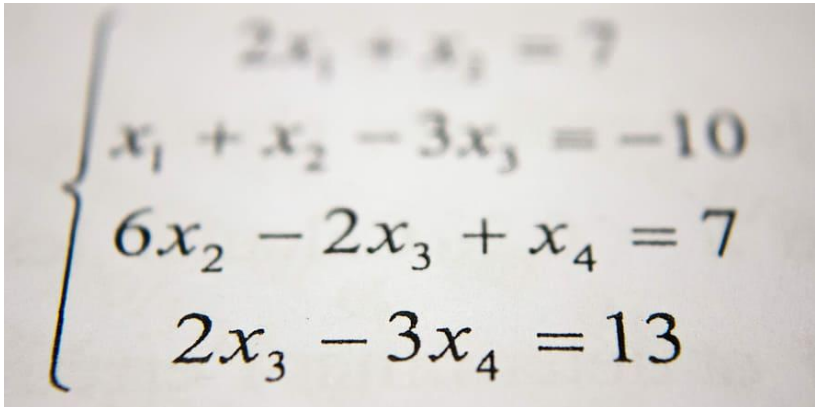
High Quality Early Education
"Intentional Teaching"

Evidence suggests that early mathematics may be an even better predictor of school achievement than early literacy.

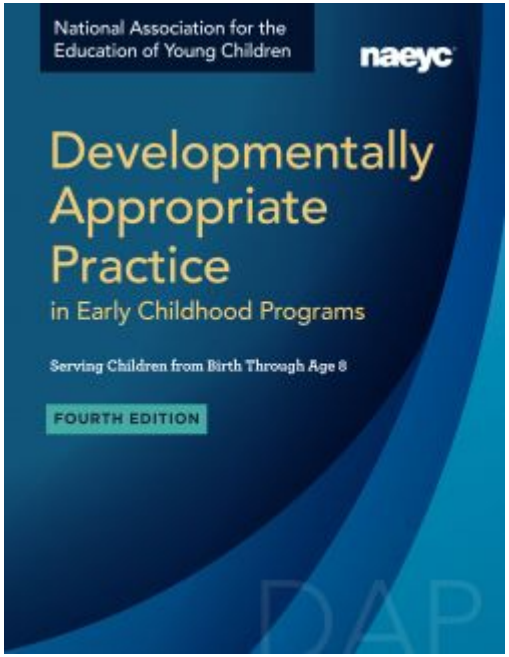
Stipek, Shoenfeld, & Gomby



College algebra has been called “the single most failed course in community colleges,” with various researchers and practitioners estimating failure rates for the course around 50 percent.



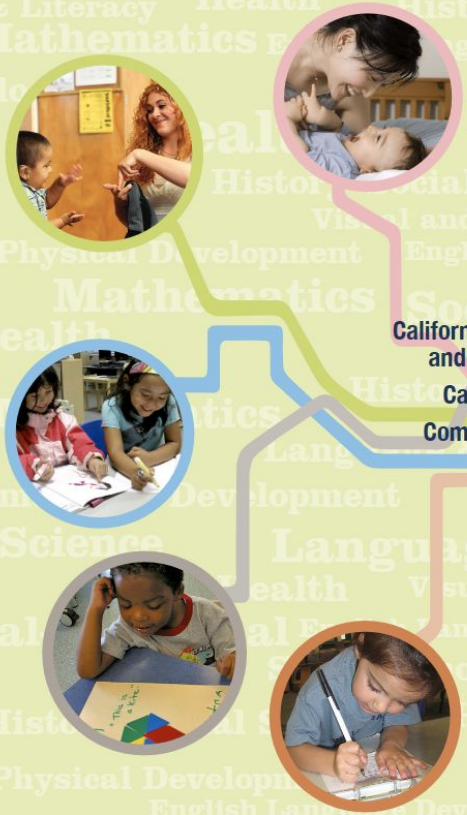
Developmentally Appropriate Practice (DAP)



The Alignment of

the California Preschool Learning Foundations with Key Early Education Resources

Second Edition



California Infant/Toddler Learning and Development Foundations

California Content Standards

Common Core State Standards

Head Start Early Learning Outcomes Framework

California Department of Education, Sacramento 2019

TABLE 1.8 *continued*

Strand: Algebra and Functions (Classification and Patterning)		Measurement and Data
At around 48 months of age	**At around 60 months of age**	**By the end of kindergarten**
1.0 Children begin to sort and classify objects in their everyday environment.	**1.0 Children expand their understanding of sorting and classifying objects in their everyday environment.**	**Measurement and Data** • Classify objects and count the number of objects in each category.
1.1 Sort and classify objects by one attribute into two or more groups, with increasing accuracy.	1.1 Sort and classify objects by one or more attributes, into two or more groups, with increasing accuracy (e.g., may sort first by one attribute and then by another attribute).[2]	**Measurement and Data** • Classify objects and count the number of objects in each category. 3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
2.0 Children begin to recognize simple, repeating patterns.	**2.0 Children expand their understanding of simple, repeating patterns.**	**Mathematical Practices**
2.1 Begin to identify or recognize a simple, repeating pattern.	2.1 Recognize and duplicate simple, repeating patterns.	**Mathematical Practices** 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.
2.2 Attempt to create a simple, repeating pattern or participate in making one.	2.2 Begin to extend and create simple, repeating patterns.	

"When is a Pattern a Caterpillar?" Vignette

Patterns have long been a part of preschool curricula. They exist in most early learning standards and are featured in many classroom materials (for example, beads, patterning trays, and pattern blocks). But, what is a pattern? How do we go beyond simple ABAB patterns? And how do we keep children engaged? Georgia takes on these issues, with the help of little Aline.

by Linda M. Platas

Teacher Georgia had laid out the materials for the math center early in the morning. She had pattern cards and beads and strings. The children seemed to like stringing beads, but they often seemed uninterested in stringing beads according to the pattern cards. Instead, they liked to fill up the strings until there was no room for additional beads, make necklaces, or fill the string up and then quickly slide the beads off into the bead container—none of which involved using the pattern cards. Maybe they were tiring of patterning activities? She decided to stand back and watch to see if she could figure out what was going on.

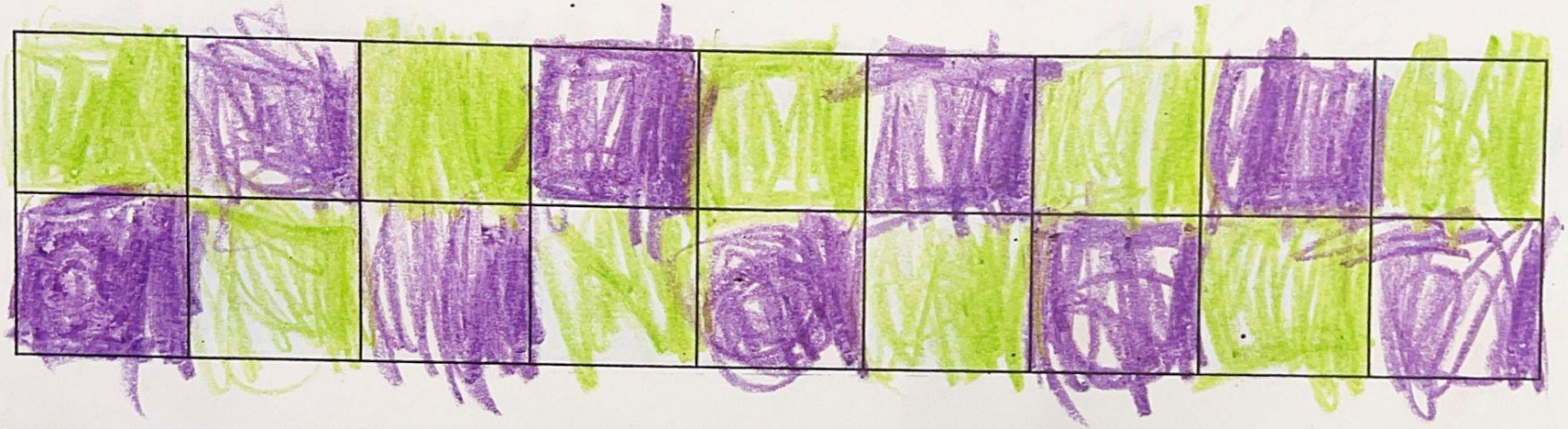
Later, during center time, children stopped at the math center, but ultimately moved on after a few minutes. Georgia sighed. "I guess I won't figure this out today," she thought. She moved onto the science center and watched as children leafed through the insect books she had on display and rifled through the photos of caterpillars and butterflies. They seemed very engaged. She had just started the insect theme last week.

As Georgia watched, Aline picked up a picture of a monarch butterfly caterpillar and looked closely. A smile spread across her face. "Look!" she called to Teacher Georgia, "a pattern!" Georgia went over and looked closely as well. Although she hadn't noticed before, there was indeed a pattern! Yellow–black–white–black–white–black–yellow–black, and then yellow–black–white–black–white–black–yellow–black again. Georgia replied, "you're right, Aline! Can you describe the pattern?" Aline started to say the colors as she pointed to the stripes, but Georgia could see that it would be almost impossible to remember because it was so complicated. Suddenly she had idea. "Maybe we can model them with beads?"

Independent Center Activities

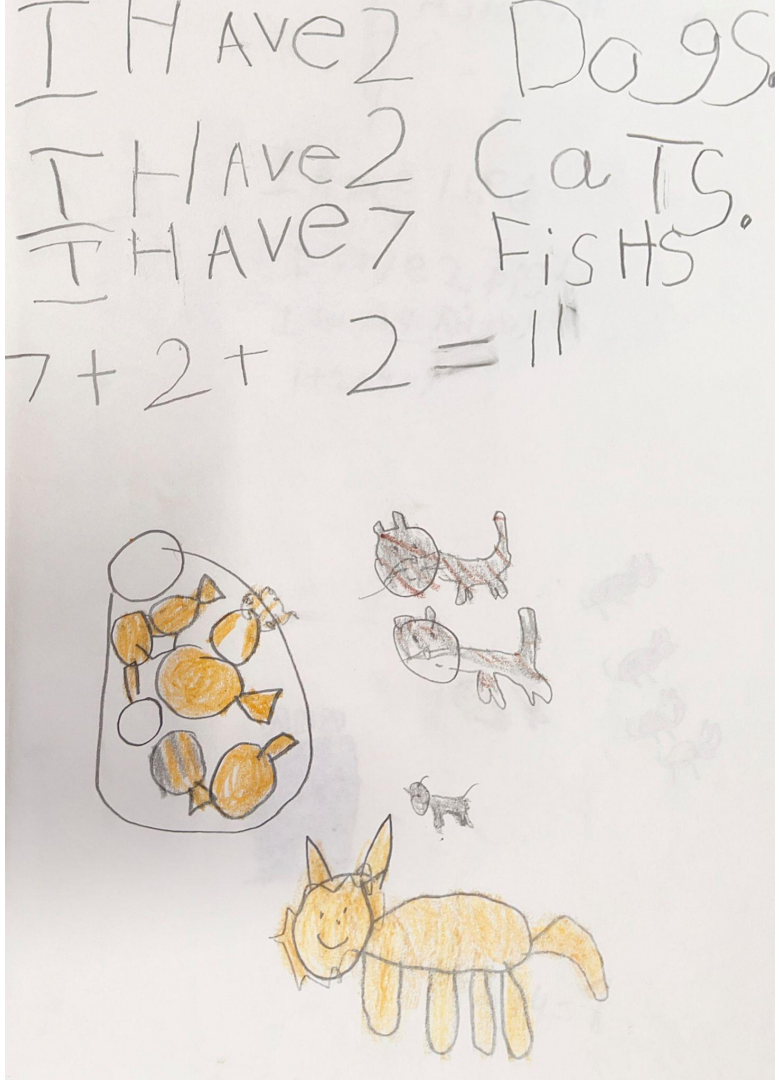
Connecting Home and School

1. The parent is a child's first teacher
2. Classroom teacher is essentially the researcher who is intentionally creating meaningful, differentiated work as the second teacher
3. The environment, or the setting is designed to ignite and reflect the child's learning as the third teacher



My pattern is green and purple. I picked these colors because I like them.

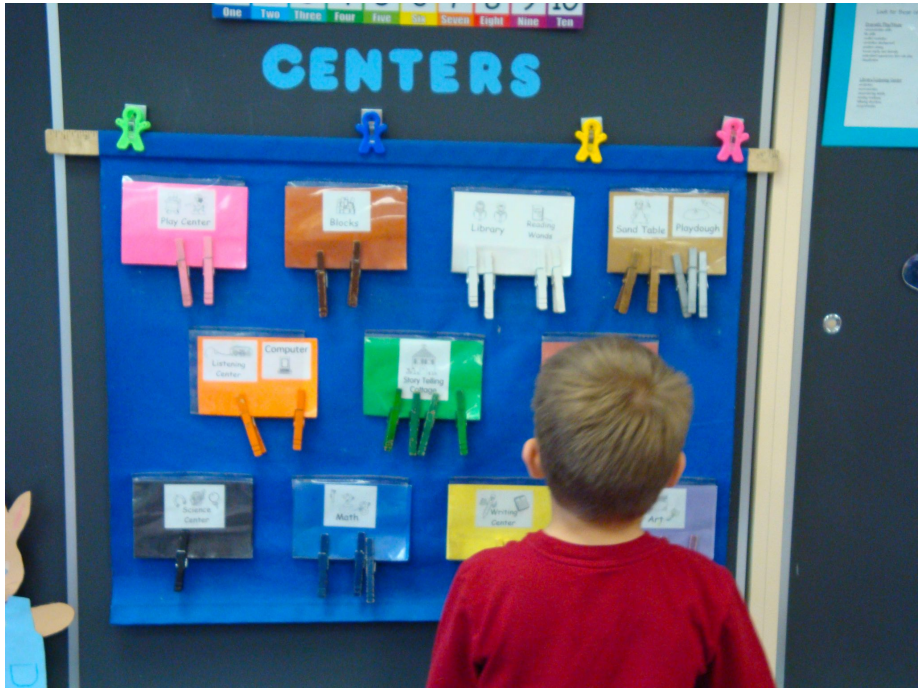
Number Stories Take Home Bag




DAYS WITH GREY
INVITING PLAY INTO YOUR EVERY DAY
7
6
5
4
3
2
1

Independent Math Centers


= Math -
Center +
1
2
3
4
5
6
7
8
9
-RainbowsWithinReach-


CENTERS
One
Two
Three
Four
Five
Six
Seven
Eight
Nine
Ten
Play Center
Blocks
Library
Reading Words
Sand Table
Playdough
Computer
Listening Center
Story Telling
Science Center
Math
Writing Center
Art


BUILD A CITY
5 9 1 2 4 8 6 3 7


1
2
3
4
5

Calendar and Morning Routines


CALENDAR
January
Friday
SUNDAY
MONDAY
TUESDAY
WEDNESDAY
THURSDAY
FRIDAY
SATURDAY
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
SEASON
WEATHER
HOLIDAY
TEMPERATURE
New Years
1

Number Talks

THE ART OF QUESTIONING IN MATHEMATICS

From The NCTM Professional Teaching Standards

HELP STUDENTS WORK TOGETHER TO MAKE SENSE OF MATH

- "What do others think about what_____said?"
- "Do you agree? Disagree? Why or why not?"
- "Does anyone have the same answer but a different way to explain it?"
- "Would you ask the rest of the class that question?"
- "Do you understand what they are saying?"
- "Can you convince the rest of us that that makes sense?"

HELP STUDENTS TO RELY MORE ON THEMSELVES TO DETERMINE WHETHER SOMETHING IS MATHEMATICALLY CORRECT

- "Why do you think that?"
- "Why is that true?"
- "How did you reach that conclusion?"
- "Does that make sense?"
- "Can you make a model and show that?"

HELP STUDENTS TO LEARN TO REASON MATHEMATICALLY

- "Does that always work? Why or why not?"
- "Is that true for all cases? Explain?"
- "Can you think of a counter example?"
- "How could you prove that?"
- "What assumptions are you making?"

HELP STUDENTS LEARN TO ANALYZE, INVENT, AND SOLVE PROBLEMS

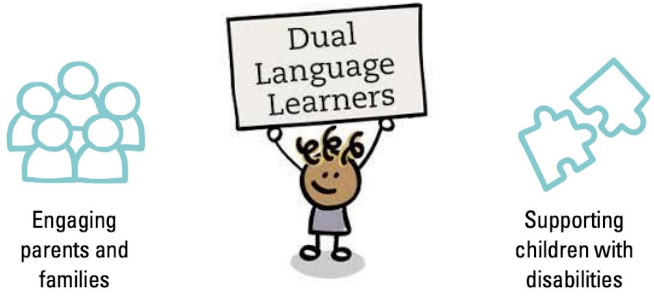
- "What would happen if _____? What if not?"
- "Do you see a pattern? Explain?"
- "What are some possibilities here?"
- "Can you predict the next one? What about the last one?"
- "How did you think about the problem?"
- "What decision do you think he/she should make?"
- "What is alike and what is different about your method of solution and his/hers?"

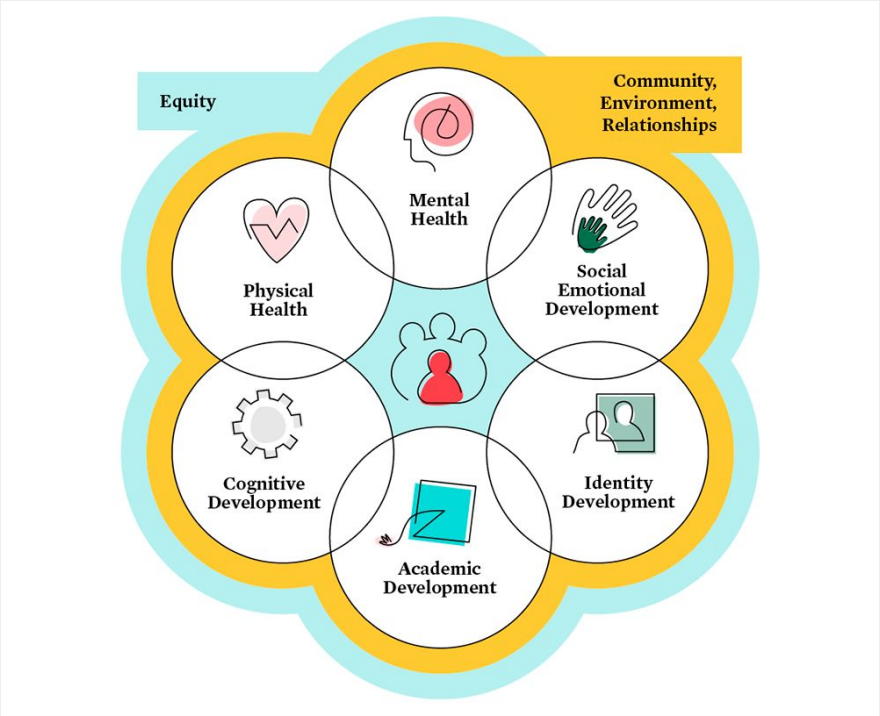
HELP STUDENT CONNECT MATHEMATICAL IDEAS AND APPLICATIONS

- "How does this relate to _____?"
- "What ideas that we have learned before were useful in solving this problem?"
- "Have we ever solved a problem like this one before?"
- "What uses of mathematics did you find in the newspaper last night?"
- "Can you give me an example of _____?"

Teaching the Whole Child

https://www.wholechildpolicy.org/





Teaching the Whole Child

A whole child approach to education is **one that honors the humanity of each teacher and student, and is critical to equitably preparing each student to reach their full potential**. This starts by creating environments of belonging and connection for students and adults to engage and thrive.


Thank you!