



**ACS Athens**  
American Community Schools

*Empowering individuals to become architects of their own learning and thrive as conscious global citizens to improve life and living on the planet.*

# **Fostering Collaboration and Confidence:** Inclusive Strategies for Differentiated Learning in the Math Classroom

*Scan me!*



Aristotelis Thymianos  
ACS Athens

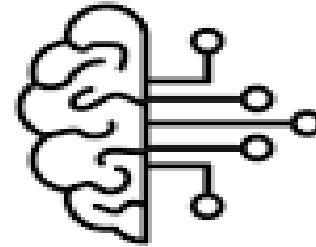
Athens Inclusive Education Project  
September 2024

- **Introduction** to Inclusive Education
- **Collaborative Learning:** Peer-to-peer Model
- Differentiated Instruction **Strategies**
- Classroom Implementation & **Results**
- **Q&A** and Closing Remarks



# AGENDA

# What is Inclusive Education?



1

Go to [Wooclap.com](https://www.wooclap.com)

2

Enter the event code in the top banner

Event code

**AIFSSG**

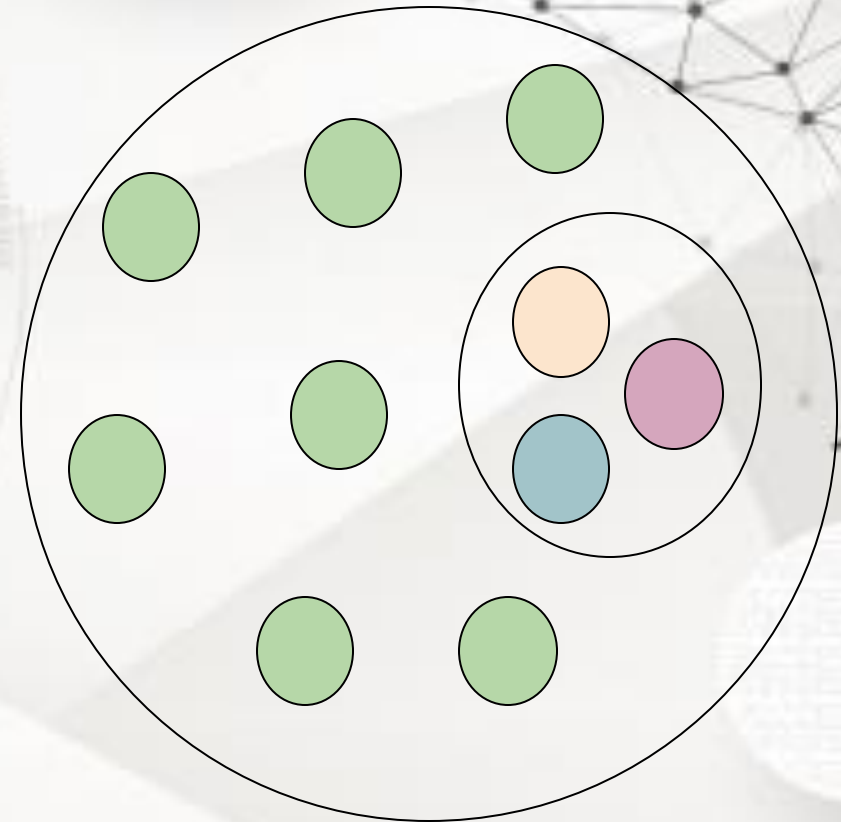


# Segregation in Education

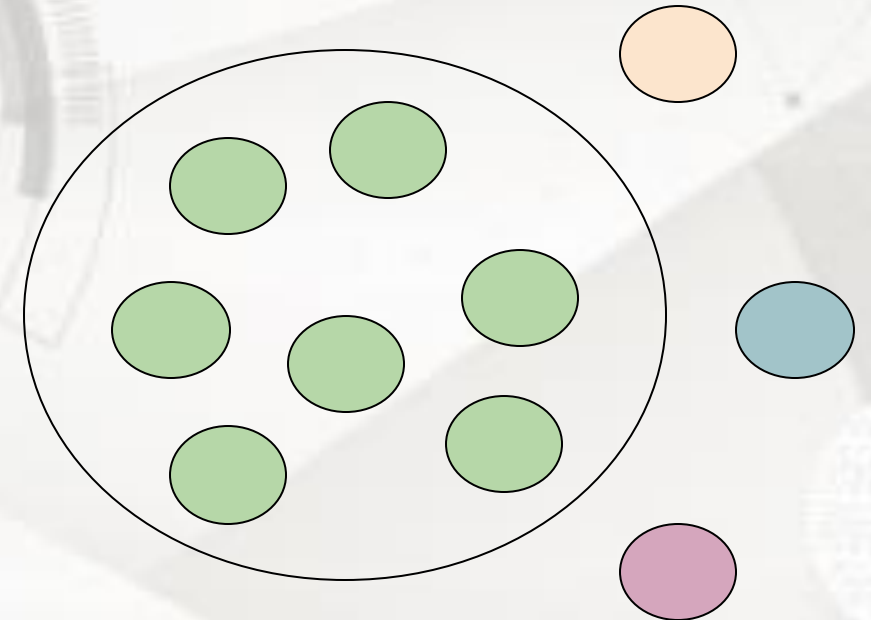
- Separating students based on characteristics
- Unequal access to resources
- Formal and informal
- contrasts with Inclusive Education



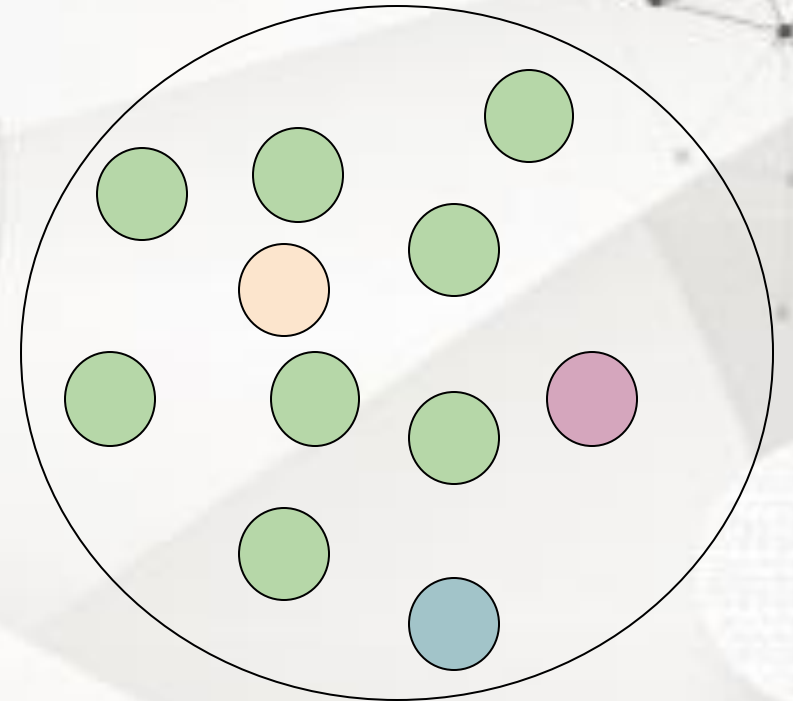
- Students from different backgrounds into the same educational setting
- Adaptation to a standard curriculum and school environment
- Integration doesn't always ensure full inclusion



- Denying students access to educational opportunities
- Exclusion limits their participation in the broader school community
- Not provided education at all.
- Lack of access to quality education



- All students, are given equal opportunities to participate and succeed in the same learning environment.
- Supportive, flexible, and responsive classroom.
- Sense of belonging, mutual respect, and equal participation.



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**4** **QUALITY  
EDUCATION**



**CONVENTION**  
ON THE RIGHTS OF THE CHILD

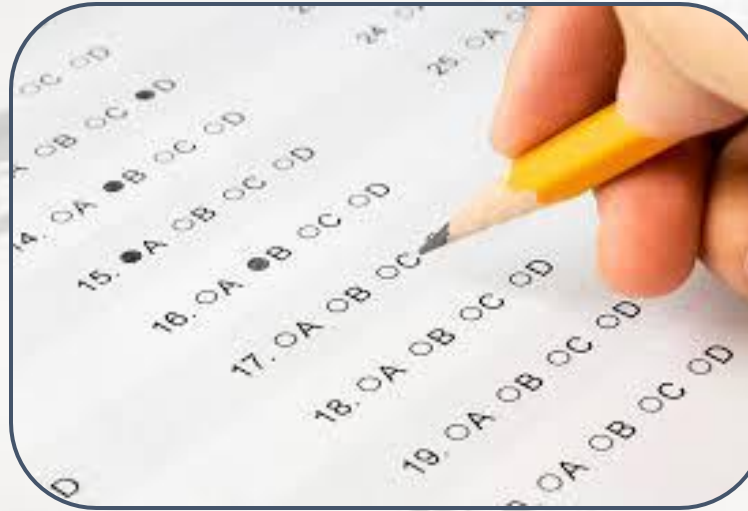


**CR  
PID**

CONVENTION  
ON THE RIGHTS  
OF PERSONS  
WITH DISABILITIES

## Academic Inclusion

- Differentiated Instruction
- Accessibility
- Collaborative Learning



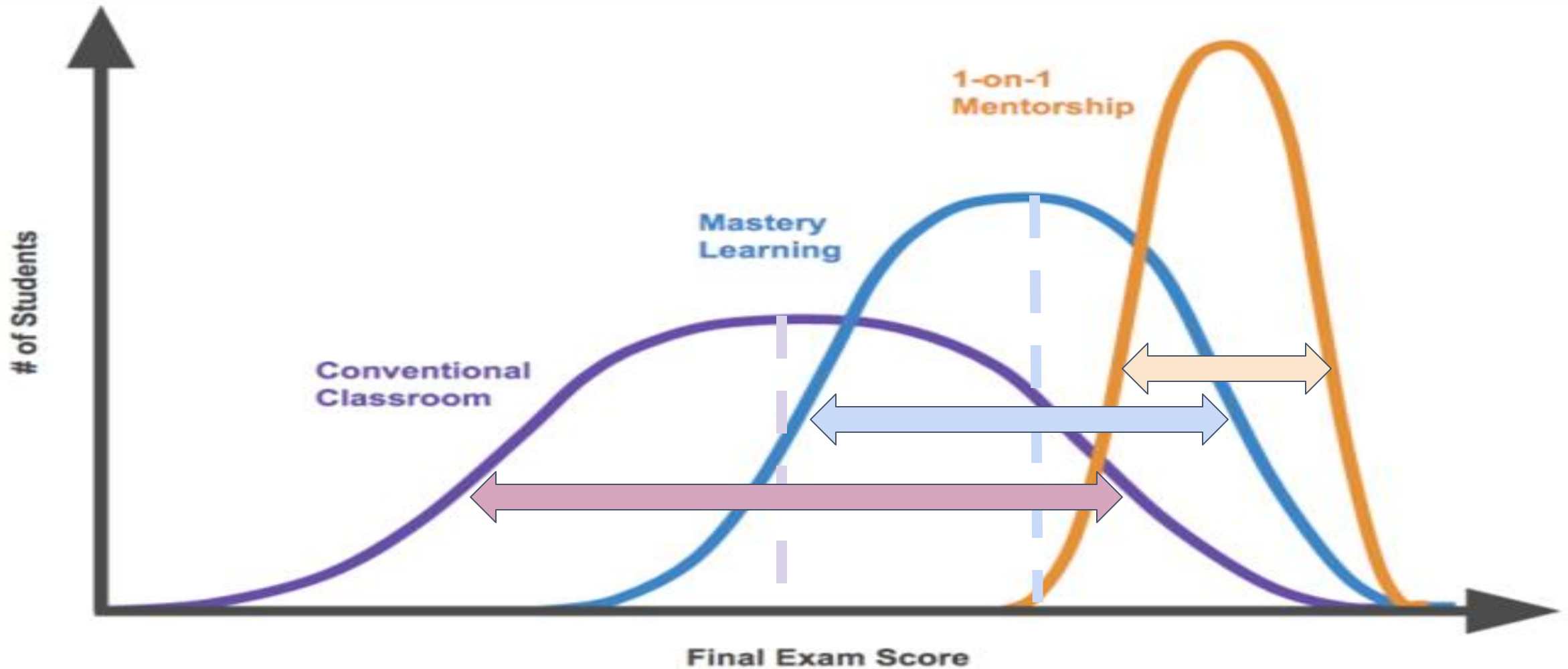
## Emotional and Social Inclusion

- Sense of Belonging
- Supportive Relationships
- Social Skills Development





# 2 $\sigma$ Problem



Bloom, B. S. (1984). *The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring*. Educational Researcher, 13(6), 4-16.

# Intervention

## Learner Characteristics & Barriers

- **Grade Level:** 9th-10th, Subject: Algebra I, Students: 16
- **Strengths:**
  - Strong problem-solving skills and collaboration.
  - Interest in hands-on learning and practical math applications.
- **Weaknesses:**
  - Struggles with abstract concepts.
  - Varied prior knowledge, low math confidence, poor time management



- Groups of 4 students.
- 2 sets of exercises with predefined goals.
- Second set is to be determined by the level of the students.
- Self-paced.
- All students meet the same standards via a challenging formative assessment.

SECTION A  
(20 marks)

Choose the best answer to complete the sentence.  
Pik paragon ping berfakh atnah malinggapan qut berfakh.

1. \_\_\_\_\_ like those I were yesterday in my sister's  
A. The  
B. These  
C. That  
D. These
2. We passed the examination \_\_\_\_\_ because we were well-prepared.  
A. easily  
B. surely  
C. cheaply  
D. suddenly
3. Shuffy was not paying attention \_\_\_\_\_ the lesson as the teacher avoided him.  
A. across  
B. during  
C. under  
D. with
4. Mrs. Actio bought the tickets \_\_\_\_\_.  
A. itself  
B. herself  
C. herself  
D. herself
5. The old man used to \_\_\_\_\_ to get water from the well.  
A. well  
B. up  
C. put  
D. pull

Choose the most suitable preverb.  
Pik perbendah ping atnah.

**A**

Foundational

Expanding

Challenging

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(20 marks)

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**B**

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**B**

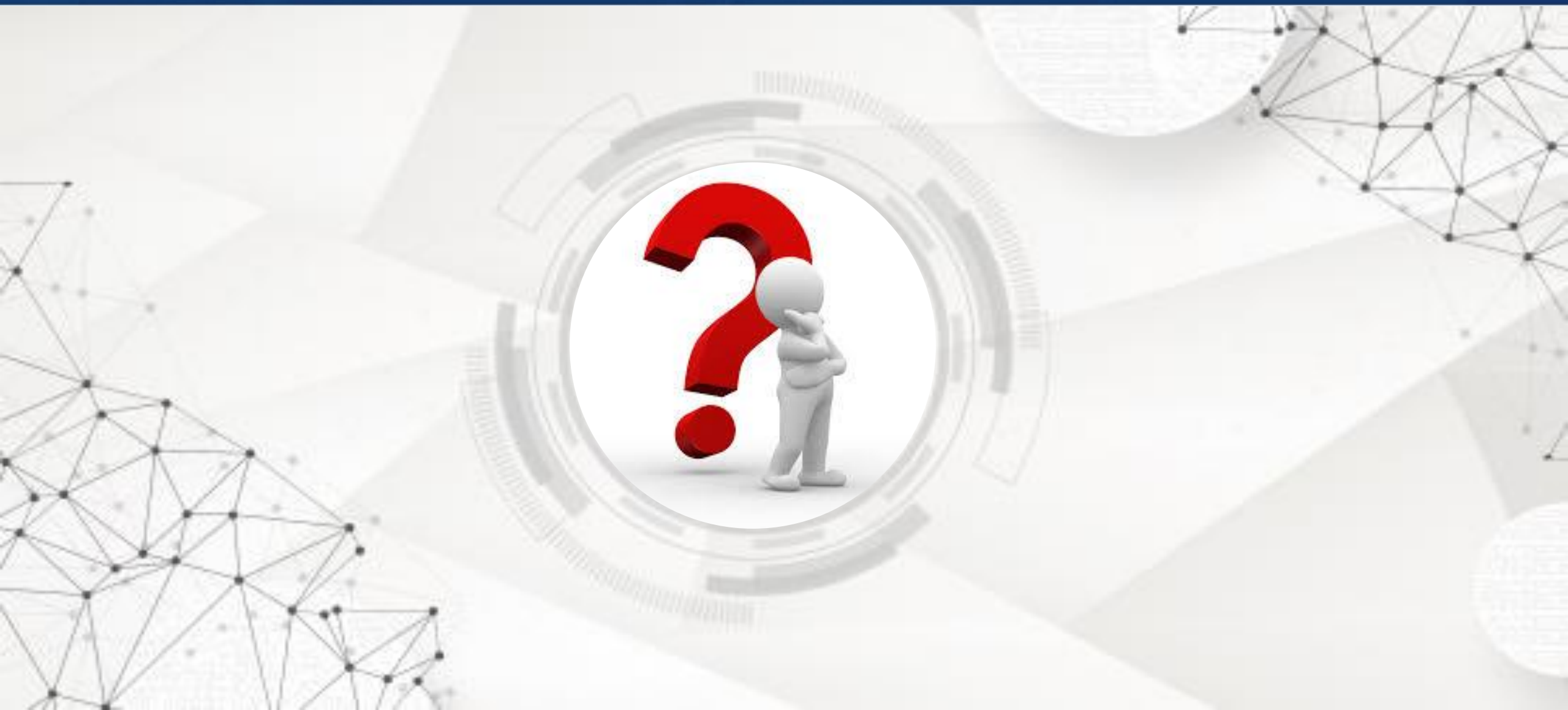
- **Class Structure:**

- Introduction with step-by-step exercises.
- Group work with tasks adjusted based on performance and complexity.
- Goals set collaboratively by students for engagement.

- **Learning Objectives:**

- Solve multi-step math problems collaboratively.
- Use peer feedback to improve problem-solving strategies.
- Foster positive attitudes towards math in a supportive environment.





## Information sender

- Fulfillment of teaching.
- Friendly level.
- Solidifies their understanding by teaching others.



## Information receiver

- Feels comfortable sharing their questions.
- Not placed in the spotlight.
- Feel involved in the learning process.

## Peer Learning (Sender-Receiver Model)

- Collaborative Learning
- Comfort and Inclusivity



## Shared Responsibility

- Shared Goals
- Reduction of Teacher Dependency



## Differentiated Instruction

- Tailored Pace and Difficulty
- Real-Time Feedback



## Balanced Assessment

- Formative Focus



## Pre-assessment:

- Diagnostic test on math concepts.
- Wooclap survey on attitudes towards math and group work.

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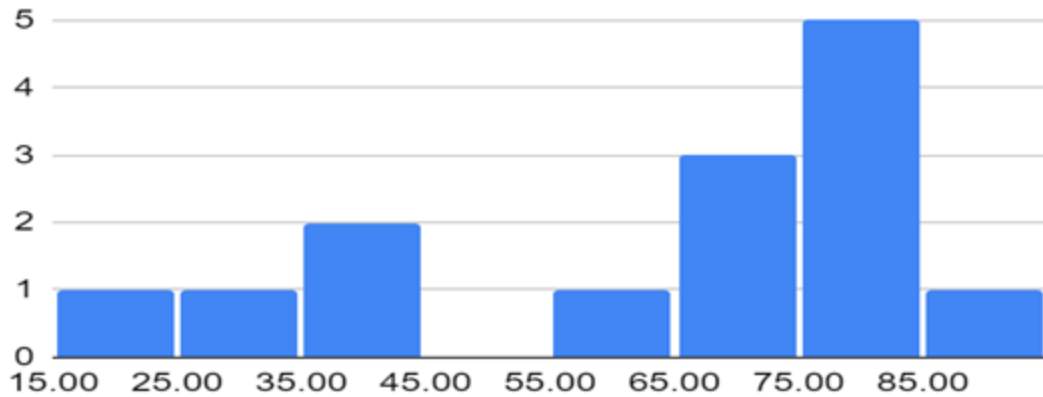
## Formative:

- Observational checklists during group activities.
- Exercise sets and student reflections.

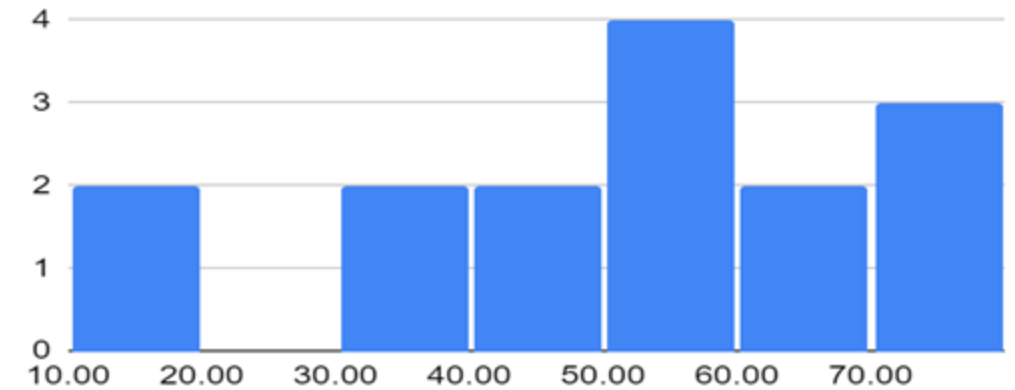
## Summative:

- Post-test to measure understanding.
- Follow-up survey on attitudes and group work experiences.

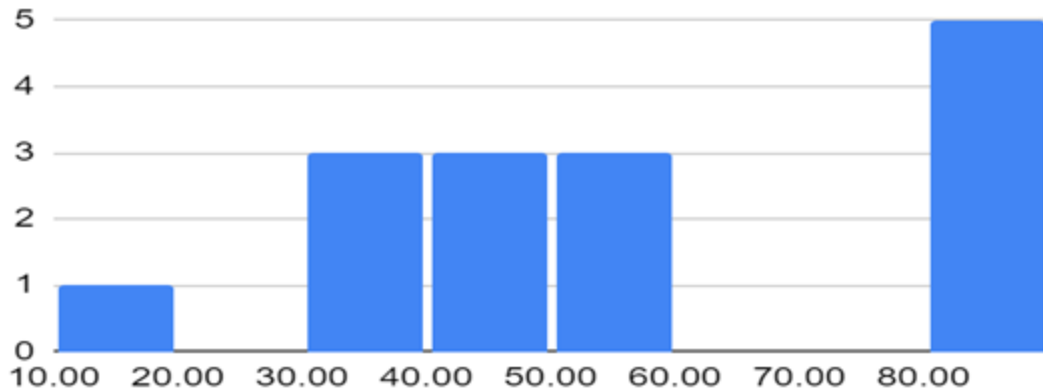
Exponents & Radicals



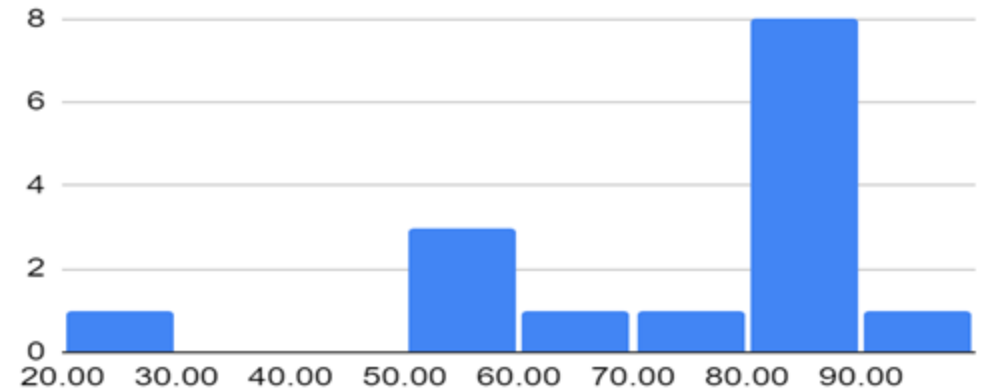
Lines

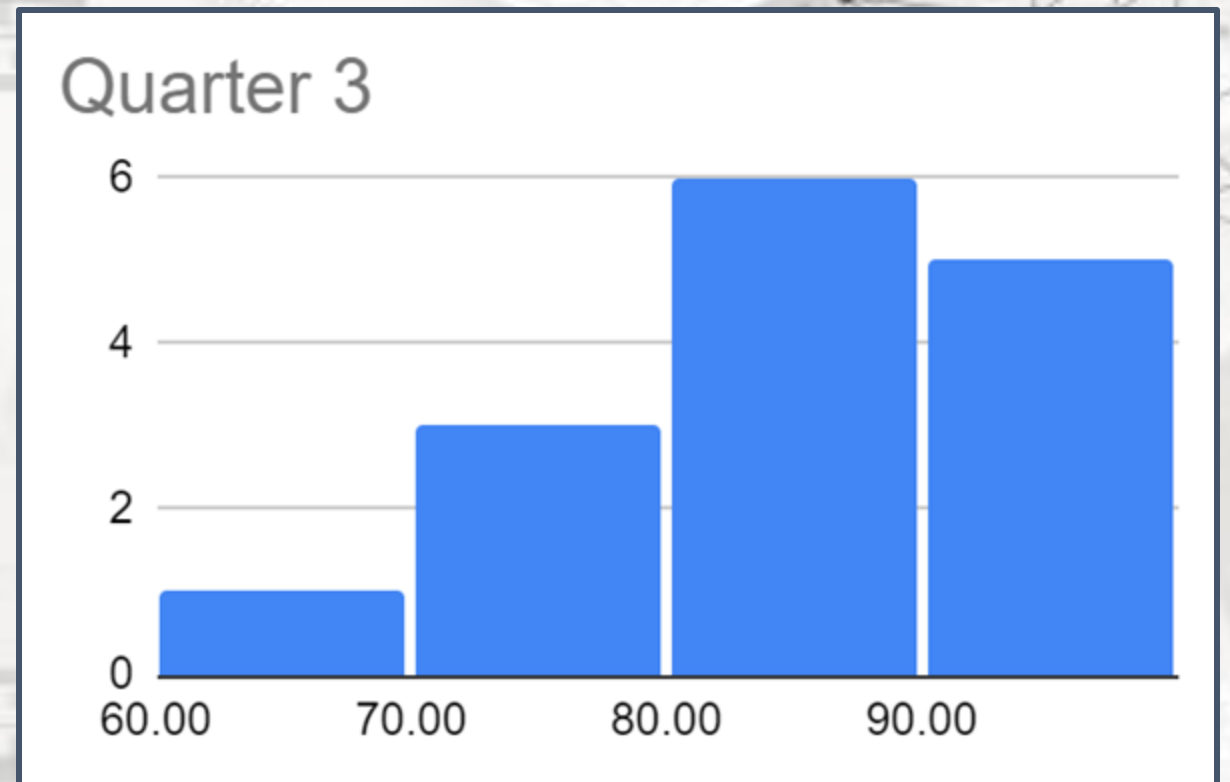
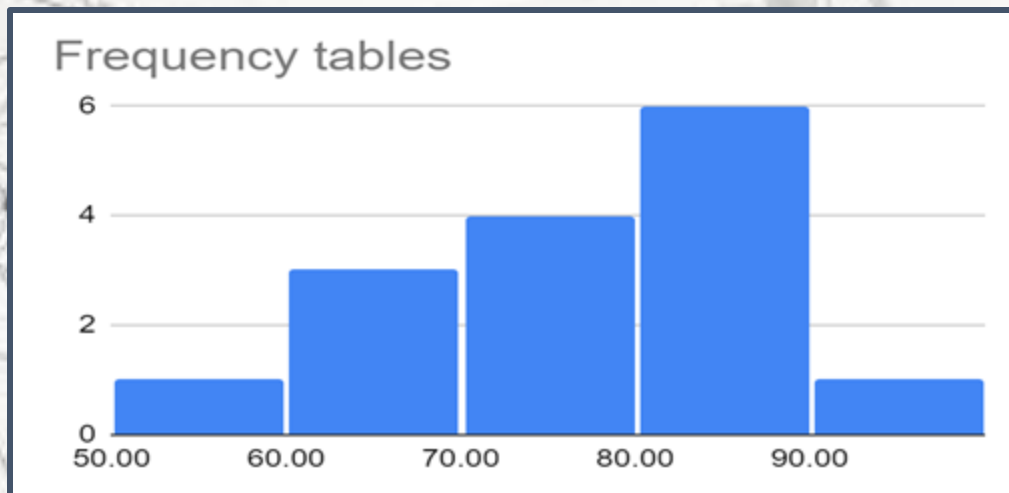
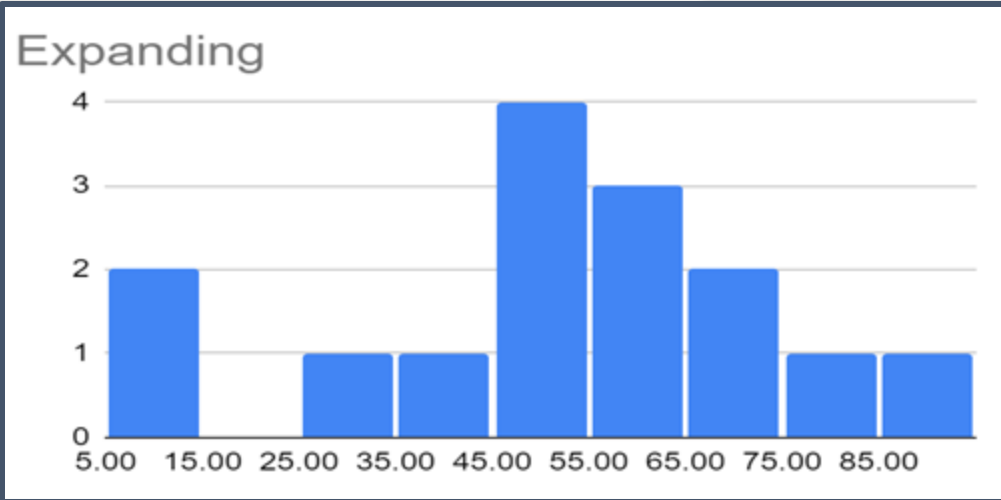


Equations


















Q1 Assessment







Correct Design	Correct Place			
1	0			
2	0			
1	1			
0	0			
2	0			

- Was it easy?
- Was it productive?
- How did you feel?



## Social Inclusion - Results

- **Successes:** High engagement, improved collaboration and problem-solving skills, positive attitude shifts towards math.
- Observational checklists showed steady **progress in engagement**.

## Academic Inclusion - Results

- Better and more concrete understanding.
- Improved results during the summative assessment.



**Improvements:** More time for individual reflection, varied digital tools, group work strategy training, change roles.

## Any questions?



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Aristotelis Thimianos



Feedback form:



## Set 1: Basic Exercise Set (For All Students)

Goal: Create a basic exercise set that can be easily done by all students, regardless of ability level.

Task: Create 3 simple exercises that are accessible to everyone based on your syllabus.

## Set 2: Differentiated Exercise Set (By Ability Levels)

Goal: Create a set of exercises with 3 levels of difficulty.

Task: Create **3 sets of 3 exercises**.

Fountational: Design exercises that are accessible to students who may need more support. Keep it basic and clear.

Expanding: These exercises should provide moderate challenge, appropriate for students with average proficiency.

Challenging: Design tasks that are more complex, requiring higher-order thinking and skills.

Bloom, B. S. (1984). \*The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring\*. Educational Researcher, 13(6), 4-16.

**Inclusive Education Planning. (n.d.).** *What is inclusive education?* . YouTube. Retrieved from <https://www.youtube.com/watch?v=yHE3Lklix3I>

**GEM Report UNESCO. (n.d.).** *Inclusion and Education: #AllmeansALL.* YouTube. Retrieved from <https://www.youtube.com/watch?v=kEyjlqixq9c>