

Course Title: Making Math Accessible: Inclusion Strategies	
Number of Content Modules: 5	Grade Levels: K-12
Questions: 1-855-498-4400 PD@TeachnKidsLearn.com	TKL Catalog: https://teachingknowledgeloop.com/external-catalog

Course Description

This course on enriching math instruction for neurodiverse learners will provide educators with the knowledge and skills necessary to design and implement inclusive, rigorous instruction that supports students' development of math skills and knowledge. Neurodiverse learners include students with ADHD, students on the autism spectrum, and students diagnosed with learning disabilities.

The course will cover explicit techniques to teach math concepts and skills to support the understanding and retention of math content. Educators will learn how to provide rigorous and culturally responsive instruction and feedback that considers the unique strengths and needs of neurodiverse learners.

In addition, the course will examine the role of the teacher in developing students' math reasoning, problem-solving, critical thinking, and logic.

Throughout the course, educators reflect on their teaching practices and develop rigorous, equitable, and inclusive math instruction. The goal of the course is to empower educators to become confident and competent teachers prepared to teach complex math skills to neurodiverse students.

Course Objectives

- CO.1** Attribute disparities in mathematics performance for students with learning exceptionalities to diminished exposure to evidence-based instruction. (Danielson Component 3e)
- CO.2** Understand how mathematical proficiency develops in students diagnosed with math learning disabilities. (Danielson Component 1a)
- CO.3** Reflect on their own perspectives, experiences, feelings, and beliefs about math and compare them to those of the students they teach. (Danielson Component 3e)
- CO.4** Evaluate math lessons for evidence-based, culturally responsive practices that create equitable learning opportunities in mathematics for students diagnosed with learning disabilities. (Danielson Component 1a, 1e, 3b)
- CO.5** Apply cognitively considerate, evidence-based principles of explicit instruction and task analysis in lesson design and delivery to build conceptual understanding of mathematics. (Danielson Component 1a, 1e, 3e)
- CO.6** Apply cognitively considerate, culturally responsive feedback to acknowledge student assets and clarify misconceptions. (Danielson Component 1a, 1f, 3b, 3e)
- CO.7** Discriminate culturally responsive strategies for teaching math to multilingual learners diagnosed with math learning disabilities. (Danielson Component 1a, 1e, 3e)
- CO.8** Reflect on the ways deviating from evidence-based instructional practices excludes students from historically underserved and marginalized groups from the field of mathematics. (Danielson Component 1a)
- CO.9** Implement evidence-based practices for facilitating meaningful math discourse with multilingual learners. (Danielson Component 1a, 1e, 3e)
- CO.10** Reflect on the way different norms, expectations, and structures for collaboration and dialogue advantage or disadvantage different groups of students. (Component 3b, 3e)
- CO.11** Understand how exposure to multicultural mathematics helps students develop a sense of belonging in the classroom and within the field of mathematics. (Danielson Component #b, 2a, 3e, 4a)
- CO.12** Understand how culturally responsive assessment practices lead to student-centered approaches that generate equitable outcomes for students from historically underserved and marginalized groups. (Danielson Component 1a, 1f)
- CO.13** Attribute valid and reliable classroom assessment practices to more equitable instructional opportunities and learning outcomes for students diagnosed with math learning disabilities. (Danielson Component 1a, 1f)

CO.14 Design and implement a set of mathematics lessons that incorporate the evidence-based practices from the course. (Danielson Component 1a, 1e, 1f, 3e)

CO.15 Reflect in brave learning spaces to a) center experiences and perspectives of non-dominant groups, b) surface and interrogate beliefs, norms, assumptions, and practices that contribute to inequity, and c) reflect on the influence of socialization, identity, and culture on teaching and learning. (Danielson Component 4a)

CO.16 Rehumanize and reframe research findings about achievement gaps to include sociocultural and sociopolitical perspectives. (Danielson Component 4a)

CO.17 Attribute causes of “achievement gaps” to racism, negation, and devaluation of students at the margins, and constrained, White-centric definitions and measures of “achievement”. (Danielson Component 4a)

Course Outline

Course Introduction Module

Course available completely online
(24/7 and Self-Paced)

Assignments due by the end of the term.

Module Topics

In this module, you will learn about the course set-up, expectations for learning and collaborating, meet your colleagues, and reflect on your prior knowledge about teaching with artificial intelligence.

- Course Navigation & Methodology
- Course Description
- A Transformative Approach to Education
- Expectations and Community Agreements for Engaging in Brave Dialogue
- Community Building Circle: Course Story
- Course Objectives

Module 1: Math Proficiency Unmasked

Module Topics

In this module, educators learn how students develop mathematical proficiency, visual pathways of math-brain development, and components of effective instruction for neurodiverse students.

Section 1: Beliefs about Teaching and Learning Math

- Reflect on It! Institutional Beliefs about Who Can Learn Math (15 min)
- Learn about It! Belief Systems about the Nature and Teaching of Math (15 min)
- Reflect on It! Reflecting on Personal Beliefs about Teaching and Learning Math (15 min)
- Reflect on It! Special Education and Math Education Orientations to Teaching Math (30 min)

Section 2: Neurodiversity and Learning Mathematics

- Learn about It! Defining Neurodiversity [20min]
- Reflect on It! Critical Disability Theory and the Social Model of Disability [20min]
- Reflect on It! The Problematic Practice of Gap Gazing [40min]
- Practice It! Data Analysis through a Lens of Equity and Inclusion [30min]
- Reflect on It! Bias in Data Analysis [30min]
- Reflect on It! Student Perspectives on Math Learning Difficulties [20min]
- Learn about It! Characteristics of Mathematics Learning Difficulties and Disabilities [20min]
- Learn about It! Dyscalculia [20min]
- Learn about It! Assets and Challenges: Variable Attention [20min]
- Learn about It! Math and Autism [20min]
- Reflect on It! Neuroplasticity and Learning Math [20min]
- Practice It! Mathematical Learning Profile [30min]

Section 3: Mathematical Proficiency

- Learn about It! Overarching Components for Building Proficiency [20min]
- Practice It! What Does It Mean to be Mathematically Proficient [30min]
- Practice It! Strands of Math Proficiency and Math Learning Difficulties [30 min]
- Practice It! Analyzing Math Misconceptions of Neurodiverse Learners [60min]
- Master It! Critiquing a Math Lesson [90 min]

Module 2: Explicit Instruction and Culturally Responsive Feedback

Module Topics

During this module, you will learn how a framework of systematic and explicit instruction supports mathematical proficiency for neurodiverse students.

Section 1: Systematic, Explicit Instruction

- Learn about It! Cognitive Theories Learning [30min]
- Practice It! Managing Cognitive Load [30min]
- Learn about It! Systematic, Explicit Instruction [30min]
- Learn about It! Components of Explicit Instruction Lessons [30min]
- Practice It! Lesson Critique [60min]
- Learn about It! Process of Task Analysis [30min]
- Master It! Performing a Task Analysis [90min]

Section 2: Effective Techniques for Providing Feedback

- Learn about It! Keys to Effective Feedback [30min]
- Reflect on It! Effective Questioning and Feedback Techniques for Neurodiverse Learners [30min]
- Reflect on It! Defining Cultural Responsiveness [30min]
- Practice It! Culturally Responsive Feedback [45min]
- Master it! Crafting Effective Feedback [90min]
- Reflect on It! Reflect on Culturally Responsive Feedback [30min]
- Learn about It! Effects of Math Microaggressions and Stereotype Threat on Performance [30min]
- Practice It! High-Leverage Instructional Strategies [30min]

Module 3: High-Leverage Instructional Strategies to Build Mathematical Comprehension

Module Topics

During this module, you will learn about both teacher-centered and student-centered high-leverage strategies that build mathematical comprehension and reasoning.

Section 1: Instructional Sequences (Concrete, Representational, Abstract)

- Learn about It! High-Leverage Instructional Strategies [30min]
- Learn about It! Concrete-Representational-Abstract Instruction [30min]
- Learn about It! Planning for the Concrete-Representational- Abstract Sequence [45min]
- Reflect on It! Types of Knowledge [30min]
- Learn About It! Strategies for Teaching Neurodiverse and Multilingual Learners [45min]

Section 2: Word Problem Structures

- Learn about It! Word Problem Structure [45min]
- Learn about It! Effective Word Problem Instruction in Action [30min]
- Practice It! Identifying Problem Structure [60min]
- Learn About It! Metacognitive Strategies [45min]
- Practice It! Creating a Systematic and Explicit Sequence Outline [60min]

Module 4: Math Reasoning: Connections, Communication, Collaboration, and Confidence

Module Topics

In Module 4, you will examine NCTM practices 4, 5, and 6 to learn high-leverage strategies to build math reasoning in neurodiverse students.

Section 1: Reasoning through Discourse

- Learn about It! Connections, Communication, Collaboration, and Confidence [10min]
- Learn about It! Accessing Meaningful Math Discourse: Perspectives on Disability [20min]
- Reflect on It! Stimulating and Sustaining Math Discourse [30min]
- Practice It! Number Talks [30min]

Section 2: Creating a Collaborative Culture

- Learn about It! The Role of Collaboration [30min]
- Learn about It! Teaching Students to Collaborate [30min]
- Learn about It! Peer Tutoring [30min]
- Practice It! Sketchnote: Creating an Anti-Bias Classroom Culture [45min]
- Reflect on It! Classroom Culture [30min]
- Reflect on It! Reflect on your Experiences as a Learner [30min]
- Practice It! Perceiving Possible Selves: Multicultural and Neurodiverse Mathematicians

[60min]

- Learn about It! (Re) Humanizing Math: Students at the Center [60min]
- Learn about It! Math Identity [60min]
- Reflect on It! (Re) Humanizing Math Education for Neurodiverse Students [60min]
- Practice It! Asset-Focused Approaches [45min]

Module 5: The Role of Assessment

Module Topics

During this module, we will look at using assessment to determine the support, content, and strategies neurodiverse students need to experience success. We will discuss the different assessment types, purposes, and formats, examining the reciprocal relationship between assessment and instruction in Dynamic Math Assessments.

Section 1: Culturally Responsive Assessment Practices

- *Reflect on It!* Culturally Responsive Assessment Practices [45min]
- *Learn About It!* Overidentification of English Learners with Specific Learning Disabilities [30min]

Section 2: Types of Math Assessments

- *Learn about It!* Types of Assessment [45min]
- *Learn about It!* Learning Progressions for Neurodiverse Students [30min]
- *Reflect on It!* Evaluating Your Current Assessment Approach [60min]
- *Reflect on It!* Strategies for Formative Assessment [60min]
- *Reflect on It!* Dynamic Assessment [60min]

Course Wrap-Up Module

Module Topics

In the Course Wrap-Up Module, you will reflect on your self-efficacy for mastering the course objectives.

Section 1: Summative Course Reflection

- Master It! Summative Course Reflection [30min]
- Reflect on It! Course Evaluation and Feedback [30min]
- Learn about It! Course Reference List