

Methods for Teaching Early Childhood through Elementary Math Annotated Syllabus

This resource aims to provide an example of how high-quality instructional materials (HQIM) might be embedded into an early childhood through elementary math methods course. This resource is organized into four sections, as outlined below, progressing from broad overarching goals and decisions to the more specific weekly course schedule. While this example is at the elementary level and math-specific, the decisions and manner in which HQIMs have been embedded can be applied to any content area and grade level.

- I. Assumptions
 - This section includes the specific assumptions the course was built around.
 - II. Design Decisions
 - This section includes a table that provides how the four design questions below were answered for this course and the rationale for those decisions.
 - What are the overarching learning goals?
 - Which high-leverage practice(s) do you want to focus on?
 - Which HQIMs will you use?
 - What content do you want to reinforce in the course?
 - III. Assignment Connections to HQIM Competencies
 - This section includes a list of major assignments in this course and how those assignments are connected to HQIM competencies.
 - IV. Annotated Course Schedule
 - This section includes the course schedule that details the weekly topics and assignments. Comments are included as annotations to provide additional context and rationale for HQIM-related components.
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I. Assumptions

- 16-week course
- Students are not in field placements.
- Class meetings are 1 hour 50 minutes, one time per week.
- An additional 1 hour 50 minutes per week is allocated for asynchronous lab time.
- 1-2 hours per week is anticipated for homework.

II. Design Decisions

Decision	Focus for this course	Rationale
What are the overarching learning goal(s)?	<ul style="list-style-type: none">● Understanding what conceptual understanding and procedural fluency each are and how we teach toward both.● Be able to facilitate fluency and concept development activities to support conceptual understanding and procedural fluency.● Understand why using HQIM and internalizing curriculum are important from an equity perspective.● Be able to internalize a math lesson.	<ul style="list-style-type: none">● Our program prepares students to teach in EC-6 classrooms. The majority of our students come with the mindset that math is about teaching algorithms and with little to no understanding of what it looks like to teach for conceptual understanding.● Many of our students also come with the mindset that teaching is about creating lessons from scratch as opposed to using the district-provided HQIM. They often have anxiety around teaching math and we believe that practicing both internalization and facilitating instruction while working on content will help alleviate some of that anxiety.● We want students to be equipped to use the HQIM they are provided once they are in the classroom.

Which high-leverage practice(s) do you want to focus on?	<p>Explaining and Modeling Content with a focus on:</p> <ul style="list-style-type: none"> ● emphasizing thinking and key elements ● using language and representations carefully 	<p>Internalization involves making sense of the common early conceptions, different strategies, various potential representations, and procedures used as well as the relevant academic language, and potential applications of the tasks in the HQIM. By focusing on this HLP, we are reinforcing the need to internalize lessons while providing students opportunities to practice facilitating instruction where they must use the strategies, representations, procedures, and academic language.</p>
Which HQIM will you use?	<p>Eureka Math with an understanding that the internalization process is not specific to this HQIM; rather, it can be applied to any HQIM.</p>	<p>This is identified in the state of Texas as HQIM and has been adopted by many of the school system partners we work with.</p>
What content do you want to reinforce throughout the course?	<ul style="list-style-type: none"> ● Early number concepts ● Place value connected to algorithms ● Geometry & Measurement concepts ● Fraction concepts 	<ul style="list-style-type: none"> ● The program is EC-6, so we need to cover a range of content. The progression basically starts with EC and goes through upper elementary providing exposure to topics at the various phases. ● Given the math anxiety we see in many of our students, starting with early number concepts eases students into math content and allows us to reinforce the importance of foundational work as it relates to building conceptual understanding and procedural fluency. ● Place value and algorithms for the operations are a major focus in the elementary grades. Our students have little to no experience with strategies used to build conceptual understanding or how those strategies connect to the algorithms.

		<ul style="list-style-type: none"> • Geometry and measurement provide opportunities to make some connections to some whole number concepts. • Many of our students struggle with basic fraction concepts so this is an opportunity for them to work on strengthening that content knowledge.
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III. Assignments & Connections to HQIM Competencies

Assignment	Brief Description	Connection to HQIM Competencies
HQIM Module 1 & 2	These are modules created by Deans for Impact . They are in Nearpod and students work through them asynchronously. Each module has three parts and each part is meant to take approximately 90-120 minutes to complete. An overview of the content for each of the two modules is included in the comments with the course schedule below.	Competency 1
Internalization of Lessons (6)	The internalization process exposes students to the work teachers need to do to be prepared to teach. It is introduced in class and expanded on in HQIM module 2. Students then apply their learning by internalizing six lessons over the course of the semester. The concept development piece of these lessons is modeled in class. These lessons were chosen intentionally to reinforce different strategies that students may not have been exposed to in their mathematics education and to build their understanding of how to teach math for conceptual understanding.	Competency 2
Fluency Video (1)	Students select one PreK/Kindergarten fluency activity from an identified set of fluency activities pulled from the Eureka curriculum. They enact their chosen activity with an elementary-aged student or a mock student. Fluency activities are modeled during class and students get the opportunity to role play/rehearse prior to completing their video.	Competencies 2 & 3

Concept Development Videos (3)	For each unit after unit 2, students select one of the strategies modeled in class. They create a problem similar to the one in the Eureka lesson that they internalized and they create a video demonstrating/modeling the problem using the strategy in the lesson. The focus is on using representations and language appropriately and accurately.	Competencies 2 & 3
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IV. Course Schedule

Week	Unit	Class Topic	Readings & Assignments <i>(Complete after class for the week)</i> Exit tickets are due by 11:59 the day of class. All other assignments are due by 11:59 pm the night before the next week's class. <i>Reading and assignments must be completed before coming to class so that you can fully engage in class activities and discussions.</i>
1	Unit 1 Foundations for Teaching & Learning Math	Welcome & Overview	<p>Read before 1st Class Meeting:</p> <ul style="list-style-type: none"> The Opportunity Myth Executive Summary Boaler Intro & Chapter 1 <p>Complete before 1st Class Meeting: Discussion Board Post (Intro & Boaler Question)</p> <p>AFTER 1st Class Meeting: Read:</p> <ul style="list-style-type: none"> VanDeWalle, Chapter 2 Procedural Fluency What is Conceptual Understanding? <p>Complete & Submit:</p> <ul style="list-style-type: none"> Exit Ticket Notetaking guide for the reading. HQIM Pre-assessment (Submit acknowledgment when completed.) HQIM: Module 1, Part 1 (Submit acknowledgment when completed.)
2		Exploring What It Means to Know and Do Mathematics	<p>Read:</p> <ul style="list-style-type: none"> Problem Types <p>Complete & Submit:</p> <ul style="list-style-type: none"> Exit Ticket Problem Type Sort HQIM: Module 1, Part 2 (Submit acknowledgment when completed.)

Commented [1]: Students read this prior to the first class so they have some background information on why HQIM is important to use. Some discussion around this is facilitated during the first class meeting.

Commented [2]: HQIM module 1 is an introduction to high-quality instructional materials. This module gives teacher-candidates a foundational understanding of what high-quality instructional materials are and how HQIM can support equitable learning for P-12 students. It also supports teacher-candidates in determining the cognitive demands of standards, determining whether instructional materials are aligned to them, and determining whether particular instructional decisions are aligned to the design principles of HQIM. Students complete this module during the first three weeks of the course to set the purpose for learning around internalization. Internalization represents a big shift for most students as they typically enter this class believing that a main task in teaching is creating engaging lessons from materials they find.

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3		Intro to Eureka Math and the Internalization Process	Read: <ul style="list-style-type: none"> VanDeWalle, Chapter 7 Pages 48-53 of the Texas PreK Guidelines (Stop at C. Geometry and Spatial Sense.) Complete & Submit: <ul style="list-style-type: none"> Exit Ticket Notetaking Guide for the reading HQIM: Module 1, Part 3 (Submit acknowledgment when completed.)
4	Unit 2 Early Number Concepts	Developing Early Number Concepts	Read: <ul style="list-style-type: none"> VanDeWalle, Chapter 9 (pages 184-189, 208-210) Complete & Submit: <ul style="list-style-type: none"> Exit Ticket Notetaking Guide for the reading HQIM: Module 2, Part 1 (Submit acknowledgment when completed.)
5		Fluency Activities	Read: <ul style="list-style-type: none"> VanDeWalle, Chapters 10 (all) & 11 (pages 246-251 & 261-264) Complete & Submit: <ul style="list-style-type: none"> Exit Ticket Notetaking Guide for reading HQIM: Module 2, Part 2 (Submit acknowledgment when completed.)
6	Unit 3 Whole Number & Place Value Concepts	Place Value & Problem Solving with Addition & Subtraction	Read: <ul style="list-style-type: none"> VanDeWalle, Chapter 12 (Pages 273-283) Complete & Submit: <ul style="list-style-type: none"> Exit Ticket Notetaking Guide for reading Lesson Internalization for Grade 3, Module 1, Lesson 18 & Assessment Fluency Video & Analysis/Reflection
7		Arrays, Number Bonds, & the Distributive Property	Read: <ul style="list-style-type: none"> Multi-Digit Multiplication and Division (Grade 4, Module 3 Overview) Complete & Submit:

Commented [3]: Class time is used to introduce students to the internalization process ahead of when HQIM module 2 is assigned. Given the newness of this process to students, they tend to struggle a bit initially, and this introduction provides some scaffolding.

Commented [4]: This module introduces the process of internalization, or, the preparation a teacher engages in to make sense of a unit and prepare to teach a particular lesson. Candidates learn how curricula are structured, how to navigate curricular resources, and how HQIM can support the development of content knowledge and pedagogical content knowledge of teachers. It introduces strategies for doing so including lesson annotation and doing the "work" required of students.

Commented [5]: For this class, fluency activities are pulled from the PreK and Kindergarten Eureka materials to provide the basis for exploration around the early number concepts discussed in the previous week.

A model of one fluency activity is provided and

Commented [6]: During each of the remaining units, class time is focused on introducing and modeling specific strategies using HQIM as a starting point. The specific lessons were chosen to provide students with a deep understanding of what it means to teach for conceptual understanding by using and connecting different representations and strategies.

Commented [7]: This is an assignment in which students apply their learning by completing the internalization process for a specific lesson which is used in class.

Students initially struggle with the internalization process. Thus, this practice is important to give

Commented [8]: This assignment requires students to enact one fluency activity chosen from the instructor-identified PreK/Kinder fluency activities previously discussed and practiced in class. Students enact the activity with an appropriate-aged child.

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			<ul style="list-style-type: none"> Exit Ticket Summary of Reading HQIM: Module 2, Part 3 (Submit acknowledgment when completed.) Lesson Internalization for Grade 4, Module 3, Lesson 8 & Assessment
8		Using Place Value Disks & Partial Products for Multiplication	Read: <ul style="list-style-type: none"> VanDeWalle, Chapter 19 (Pages 501-515 & 540-541) Complete & Submit: <ul style="list-style-type: none"> Exit Ticket Notetaking Guide for reading Lesson Internalization for Grade 2, Module 8, Lesson 1 & Assessment
9	Unit 4 Geometry & Measurement Concepts	Spatial Reasoning & Attributes of 2D Shapes	Read: <ul style="list-style-type: none"> VanDeWalle, Chapter 18 (Pages 493-494 & 498) Eureka Grade 2, Module 8 Topic D: Application of Fractions to Tell Time Complete & Submit: <ul style="list-style-type: none"> Exit Ticket Notetaking Guide for reading Concept Development Video #1 & Analysis/Reflection
10		Time & Relating Telling Time to a Number Line	Read: <ul style="list-style-type: none"> VanDeWalle, Chapter 18 (Pages 460-482 & 496-498) Eureka Grade 3, Module 4, Topic A: Concepts of Area Measurement Complete & Submit: <ul style="list-style-type: none"> Exit Ticket Notetaking Guide for reading Lesson Internalization for Grade 3, Module 4, Lesson 2 & Assessment
11		Concepts of Area Measurement	Read: <ul style="list-style-type: none"> VanDeWalle, Chapter 14 part 1 (Pages 337 - 359) Eureka Grade 4, Module 5, Topic C: Fraction Comparison Complete & Submit:

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Students initially struggle with the internalization process. Thus, this practice is important to give students opportunity to repeat the process and get feedback from their instructor. Doing so supports developing their ability to internalize lessons and solidify what it means to do so.

Students are required to internalize multiple lessons ...

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Commented [11]: The concept development assignments require students to create a video in which they model/demonstrate one of the strategies in the unit. They use the suggested dialogue included in an HQIM lesson that they previously internalized as a starting point and apply it to a similar problem that they create. Since students are not in field placements and the remaining units are at varying grade levels, they are not enacting this with a student. It is intended to be a rehearsal of how they would model their chosen strategy. This rehearsal allows them to go through th...

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			<ul style="list-style-type: none"> Exit Ticket Notetaking Guide for reading
12	Unit 5 Fraction Concepts	Defining Fractions & Developing Units	Read: <ul style="list-style-type: none"> VanDeWalle, Chapter 14 part 2 (Pages 359 - 371) Eureka Grade 4, Module 5, Topic A: Decomposition and Fraction Equivalence and Topic B: Fraction Equivalence with Multiplication and Division Complete & Submit: <ul style="list-style-type: none"> Exit Ticket Notetaking Guide for reading Concept Development Video #2 & Analysis/Reflection
13		Comparing Fractions and Equivalent Fractions	Read: <ul style="list-style-type: none"> VanDeWalle, Chapter 15 Pages 373 – 384 Eureka Grade 4, Module 5, Topic D: Fraction Addition and Subtraction, Topic F: Addition and Subtraction by Decomposition Complete & Submit: <ul style="list-style-type: none"> Exit Ticket Notetaking Guide for reading Lesson Internalization for Grade 4, Module 5, Lesson 18 & Assessment
14		Addition and Subtraction of Fractions with the same denominator	Read: <ul style="list-style-type: none"> Eureka Grade 5, Module 3, Overview Complete & Submit: <ul style="list-style-type: none"> Exit Ticket Notetaking Guide for reading Lesson Internalization for Grade 5, Module 3, Lesson 3 & Assessment
15		Addition and Subtraction of Fractions with different denominators	Complete & Submit: <ul style="list-style-type: none"> Exit Ticket
16		Course Wrap Up	Complete & Submit:

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Students are required to internalize multiple lessons over the remaining weeks of the course.

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			<ul style="list-style-type: none"> • Concept Development Video #3 & Analysis/Reflection • HQIM Post Assessment (Submit acknowledgment when completed.)