



This course supports a performance assessment. The course covers 8 competencies.

Introduction

Overview

As a teacher, you want to be an agent for removing students' fears, dislike, and lack of confidence about learning mathematics. If you have been in the classroom already, you will find ways to expand your creativity and enhance your effectiveness as a teacher. Do all that you can to absorb everything in your WGU mathematics education program. Teaching is all about learning.

Getting Started

Welcome to Number Sense and Functions! All of the activity for this course is embedded within two learning resources: a VitalSource electronic textbook, and videos in Mathematics, Yes!. You should go through the course in the order written to prepare for each of the four performance tasks. It is highly recommended that you open the portfolio response sheet that is located within the Assessments tab when you begin the course. Fill it out as you work through the course content.

Teaching Dispositions Statement

Please review the [Statement of Teaching Dispositions](#).

Preparing for Success

The information in this section is provided to detail the resources available for you to use as you complete this course.

Learning Resources

The learning resources listed in this section are required to complete the activities in this course. For many resources, WGU has provided automatic access through the course. However, you may need to manually enroll in or independently acquire other resources. Read the full instructions provided to ensure that you have access to all of your resources in a timely manner.

In the following resources, you may read about No Child Left Behind (NCLB). Please be aware that as of December 2015, President Barack Obama replaced NCLB with the Every Student Succeeds Act (ESSA). This new act reauthorizes the 50-year-old Elementary and Secondary Education Act (ESEA), the nation's national education law and longstanding commitment to equal opportunity for all students. Although not required for this course, you are encouraged to familiarize yourself with the new act. For additional information, please visit the following links from the U.S. Department of Education:



- [Webinar recording](#)
- [Read the ESEA now referred to as the ESSA](#)
- [Fact sheet on ESSA](#)
- [Transition Letter](#)

Electronic Textbook

You will be reading from the following electronic textbook and will be provided direct links to the relevant chapters:

- Van de Walle, J. A., Karp, K. S., & Bay-Williams, J. M. (2009). *Elementary and middle school mathematics: Teaching developmentally*. Boston, MA: Allyn & Bacon. ISBN-13: 978-0136101420.

Note: The e-text references MyEducationLab, which is available as an extra resource. We do not provide this resource because it is not necessary for you to gain the competency needed to complete the assessment. You are welcome to purchase this resource if you feel it would be beneficial to your studies.

Mathematics, YES!

[Mathematics, YES!](#) is the primary learning resource for this course and guides the creation of your tasks.

As you work through the activities throughout Mathematics, Yes!, put yourself in the mindset of a student encountering these concepts for the first time. Consider the following questions:

- What might be confusing?
- What can you, as the teacher, do to make the topics more understandable?
- What prior experiences can you share?
- What hands-on manipulatives can you use to illustrate the concepts?

As you watch the teachers in the videos throughout Mathematics, Yes!, think about which strategies you see working.

- What would you do differently?
- Which games or activities might you modify?
- Are there any educational technologies that might be useful to include in your teaching strategies?

All your lesson plans should be written at a graduate level, including complete sentences and proper spelling and grammar. Be sure to check your spelling and proofread your responses throughout all response sections. Portfolio response sheets and all of your responses will be submitted for grading.

Supplemental Materials



There might be times when you feel like you need more information or practice than what has been provided in the course. In addition to consulting with your Course Instructor when you need help, you can access optional and supplemental activities by using the word "supplemental" in the Course Search box. These activities can be enriching, but they are not essential for becoming competent.

Pacing Guide

The pacing guide suggests a weekly structure to pace your completion of learning activities. It is provided as a suggestion and does not represent a mandatory schedule. Follow the pacing guide carefully to complete the course in the suggested timeframe.

- **Weeks 1, 2, and 3**
 - Introduction to Number Sense
 - Task 1
- **Weeks 3 and 4**
 - Patterns and Functions
 - Task 2
- **Weeks 4 and 5**
 - Integers and Order of Operations
 - Task 3
- **Weeks 5 and 6**
 - Fractions, Decimals, and Percentages
 - Task 4

Contact a Course Instructor

Your Course Instructor is an important resource for you as you progress through your study of Number Sense. Your Course Instructor will help guide your learning, answer questions, and provide valuable information. Be sure to consult your Course Instructor frequently.

Competencies

This course provides guidance to help you demonstrate the following 8 competencies:

- **Competency 201.1.1: Number Sense Knowledge**

The graduate understands whole numbers and performs the four basic arithmetic operations of addition, subtraction, multiplication and division, including mental calculations and estimation using whole numbers.
- **Competency 201.1.2: Number Sense Instructional Strategies**

The graduate analyzes, critiques, modifies, develops and evaluates lessons and instructional strategies concerning number sense, analyzes common student errors and misunderstandings, and determines necessary prerequisite skills required for students to complete given activities concerning number sense.
- **Competency 201.2.1: Patterns and Functions Knowledge**

The graduate understands the nature of both growing and repeating patterns; and understands functions, tables, rules and equations and how they are related.
- **Competency 201.2.2: Patterns and Functions Instructional Strategies**

The graduate analyzes, critiques, modifies, develops and evaluates lessons and instructional strategies concerning patterns and functions, analyzes common student errors and misunderstandings, and determines necessary prerequisite skills required for



students to complete given activities concerning patterns and functions.

- **Competency 201.3.1: Integers and Order of Operations Knowledge**

The graduate understands integers and the order of operations, and performs the four basic operations of addition, subtraction, multiplication and division, including mental arithmetic and estimation, using integers.

- **Competency 201.3.2: Integers and Order of Operations Instructional Strategies**

The graduate analyzes, critiques, modifies, develops and evaluates lessons and instructional strategies concerning integers and order of operations, analyzes common student errors and misunderstandings, and determines necessary prerequisite skills required for students to complete given activities concerning integers and order of operations.

- **Competency 201.4.1: Fractions, Decimals, and Percentages Knowledge**

The graduate understands fractions, decimals and percentages and uses this knowledge to perform the basic arithmetic algorithms, estimate, and decide upon the equivalence of rational numbers.

- **Competency 201.4.2: Fractions, Decimals, and Percentages Instructional Strategies**

The graduate analyzes, critiques, modifies, develops and evaluates lessons and instructional strategies concerning fractions, decimals and percentages, analyzes common student errors and misunderstandings, and determines necessary prerequisite skills required for students to complete given activities concerning fractions, decimals and percentages.

Introduction to Number Sense

In this unit, you will learn key number sense concepts and how to teach them effectively. The goal for the first unit is to help you develop and expand your understanding of number sense while expanding your awareness of effective instructional strategies for teaching number sense.

Introduction to Number Sense

Number sense is the foundation that all other mathematical concepts are built around. Without a strong foundation, students often struggle in the higher-order concepts.

Student-Centered Mathematics Instruction

Teaching mathematics using a student-centered approach means recognizing that young children come to school with mathematical thought and ability that can be used to build formal mathematical understanding. You will review the National Council of Teachers of Mathematics (NCTM) standards that were written with research about how children think about mathematics.

Watch the following documentary:

- [Surprises in Mind](#)

Become familiar with the National Council of Teachers of Mathematics (NCTM) national math standards using the [NCTM](#) website. Bookmark this site for future reference.

Spend some time reviewing lessons and activities on the [Illuminations](#) website that are



associated with the topic covered in each of the modules.

Read the following in [Elementary and Middle School Mathematics: Teaching Developmentally](#):

- Chapters 1–7

Introduction to Number Sense

Read the following in [Elementary and Middle School Mathematics: Teaching Developmentally](#):

- Chapters 8–13

Overview of Number Sense

View the following video:

- [Introduction to Number Sense: Overview](#)

View the following video:

- [Introduction to Number Sense: A Lesson on Place Value.](#)

View the following video:

- [Introduction to Number Sense: Place Value and Multi-Digit Addition](#)

Performance Assessment

Complete and submit Task 1: "Introduction to Number Sense Portfolio Response Sheet." This performance assessment is located in Taskstream and can be accessed from the Assessment tab.

If you do not pass, contact your course instructor.

Patterns and Functions

In this unit, you will learn key pattern and function concepts and how to teach them effectively. The goal is to develop content knowledge, explore forms of patterns, and explore instructional strategies for teaching patterns.

Patterns and Functions

The world is full of different types of mathematical patterns. Helping students figure out how to recognize patterns and predict future elements in a pattern will help them become better problem solvers.

Learning Activities for Patterns and Functions

View the following video:

- [Patterns and Functions: Overview](#)

View the following video:



- [Patterns and Functions: A Lesson on Patterns](#)

View the following video:

- [Patterns and Functions: Growing Patterns](#)

Performance Assessment

Complete and submit Task 2: "Patterns and Functions" portfolio response sheet." This performance assessment is located in Taskstream and can be accessed from the Assessment tab.

If you do not pass, contact your course instructor.

Integers and Order of Operations

In this unit, you will learn key integer concepts and the order of operations, and how to teach these concepts effectively. The goal for this module is for you to develop content knowledge and explore instructional strategies for teaching integers and the order of operations.

Integers and Order of Operations

Even though integers and order of operations are taught in the primary grades, it is often these standards that upper elementary students struggle with.

Learning Activities for Integers and Order of Operations

Read the following in [Elementary and Middle School Mathematics: Teaching Developmentally](#):

- [Pages 479–484 in Chapter 23](#)

View the following video:

- [Integers and Order of Operations: Overview.](#)

View the following video:

- [Integers and Order of Operations: A Lesson on Integers](#)

Performance Assessment

Complete and submit Task 3: Integers and Order of Operations portfolio response sheet. This performance assessment is located in Taskstream and can be accessed from the Assessment tab.

If you do not pass, contact your course instructor.

Fractions, Decimals, and Percentages

In this unit, you will learn key concepts related to fractions, decimals, and percentages and how to teach them effectively. The goal for this module is for you to develop content knowledge, expand content understanding, and explore instructional strategies for teaching fractions, decimals, and percentages.



Fractions, Decimals, and Percentages

Fractions are one of the first difficult concepts that primary children must endeavor to understand. The more opportunities you give students to use concrete representations of a part of the whole, the more successful the students will be.

Learning Activities for Fractions, Decimals, and Percentages

Read the following in [*Elementary and Middle School Mathematics: Teaching Developmentally*](#):

- Chapters 15–17

View the following video:

- [Fractions, Decimals, and Percentages: A Lesson on Fractions](#)

View the following video:

- [Fractions, Decimals, and Percentages: A Further Lesson on Fractions](#)

Performance Assessment

Complete and submit Task 4: Fractions, Decimals, and Percentages portfolio response sheet. This performance assessment is located in Taskstream and can be accessed from the Assessment tab.

If you do not pass, contact your course instructor.

Final Steps

Congratulations on completing the activities in this course! If you have not already completed the assessments, schedule and complete them now.