

COURSE TITLE: UNCOVER THE LANGUAGE OF MATH (Grades 6-12)

WA CLOCK HRS: 30

NO. OF CREDITS: 3 QUARTER CREDITS
[semester equivalent = 2.00 credits]

OREGON PDUs: 30

PENNSYLVANIA ACT 48: 30

INSTRUCTOR: Ann DeChenne
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COURSE DESCRIPTION:

Math is a universal language; it transcends cultural, economic, and social barriers. Learning the language of math involves more than a list of vocabulary words; it requires us to delve into evidence-based math practices to build competency and proficiency for our students to overcome achievement gaps and gain long-term mathematical success. This course will cover how to work with your math students to implement a math language that focuses on aiding all students in learning math. Participants in the course will gain tips and tools to identify the language functions of math standards, assignments, mathematical academic language, and general language to support students in your math classroom.

This course will benefit educators, coaches, and mentors working with grades 6-12.

Text: No text is required; all reading is online.

LEARNING OUTCOMES: Upon completion of this course, participants will have:

- Learned how to identify a language function and explain why it is important.
- Learned how to identify language functions of math standards.
- Familiarized themselves with academic language and how it supports learning.
- Learned how to identify mathematical academic and general language to support students in the math classroom.
- Gained tips and tools to work with evidence-based math practices that teachers, coaches, and mentors can use in the classroom.

COURSE REQUIREMENTS:

Completion of all specified assignments is required for issuance of hours or credit. The Heritage Institute does not award partial credit.

The use of artificial intelligence is not permitted. Assignment responses found to be generated by AI will not be accepted.

HOURS EARNED:

Completing the basic assignments (Section A. Information Acquisition) for this course automatically earns participants their choice of CEUs (Continuing Education Units), Washington State Clock Hours, Oregon PDUs, or Pennsylvania ACT 48 Hours. The Heritage Institute offers CEUs and is an approved provider of Washington State Clock Hours, Oregon PDUs, and Pennsylvania ACT 48 Hours.

UNIVERSITY QUARTER CREDIT INFORMATION

REQUIREMENTS FOR UNIVERSITY QUARTER CREDIT

Continuing Education Quarter credits are awarded by Antioch University Seattle (AUS). AUS requires 75% or better for credit at the 400 level and 85% or better to issue credit at the 500 level. These criteria refer both to the amount and quality of work submitted.

1. Completion of Information Acquisition assignments 30%
 2. Completion of Learning Application assignments 40%
 3. Completion of Integration Paper assignment 30%
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CREDIT/NO CREDIT (No Letter Grades or Numeric Equivalents on Transcripts)

Antioch University Seattle (AUS) Continuing Education Quarter credit is offered on a Credit/No Credit basis; neither letter grades nor numeric equivalents are on a transcript. 400 level credit is equal to a "C" or better, 500 level credit is equal to a "B" or better. This information is on the back of the transcript.

AUS Continuing Education quarter credits may or may not be accepted into degree programs. Prior to registering, determine with your district personnel, department head, or state education office the acceptability of these credits for your purpose.

ADDITIONAL COURSE INFORMATION

REQUIRED TEXT

None. All reading is online.

None. All reading is online.

MATERIALS FEE

None

ASSIGNMENTS REQUIRED FOR HOURS OR UNIVERSITY QUARTER CREDIT

A. INFORMATION ACQUISITION

Assignments done in a course forum will show responses from all educators who have or are taking the course independently. Feel free to read and respond to others' comments.

Group participants can only view and respond to their group members in the Forum.

Assignment #1: Introduction & Overview

Review the [PowerPoint](#) presentation for this lesson.

Please briefly introduce yourself and explain why you decided to take this course (1 to 2 pages).

Assignment #2: Identify a Language Function

Learn how to identify a language function and explain why it is important.

- Review the [PDF](#) presentation for this lesson.
- Read the following article: [Language Function Forms](#).
- Please reflect on the presentation and the reading. Was anything a surprise or an "aha" moment?
Write at least 1-2 paragraphs and no more than three (3) paragraphs.

Assignment #3: Language fo Math Standards

Learn how to identify language functions of math standards.

Review the [PDF](#) presentation for this lesson.

Students will choose a standard (Common Core State Standards (math) or Oregon Math Standards). Please note that some standards (usually technology-driven) don't lend themselves to a language function.

1. Identify the standard by the numeric identifier
2. Provide the text of the standard
3. List identified language functions for the standard chosen.

* <https://learning.ccsso.org/wp-content/uploads/2022/11/ADA-Compliant-Math-Standards.pdf>

* <https://www.oregon.gov/ode/educator-resources/standards/mathematics/pages/mathstandards.aspx>

Assignment #4: Academic Language To Support Learning

Students will familiarize themselves with academic language and how it supports learning.

- Review the [PowerPoint](#) presentation for this lesson.
- Write a 1-2 page paper reflecting on what you have learned from this presentation. Include anything you found surprising and thoughts on what this may mean for your teaching. This is a good place to pose questions you haven't expressed, things you wonder about or find confusing.

Assignment #5: Academic & General Language

Learn how to identify mathematical academic and general language to support students in the math classroom.

- Review the [PowerPoint](#) presentation for this lesson
- Students will choose a standard (Common Core State Standards for math or Oregon Math Standards). Some standards (usually technology-driven) do not lend themselves to a language function. (It can be the same standard chosen from lesson 3)
- An example will be provided in the presentation.

1. Identify the standard by the numeric identifier
2. Provide the text of the standard
3. List identified academic language for the standard chosen.

- <https://learning.ccsso.org/wp-content/uploads/2022/11/ADA-Compliant-Math-Standards.pdf>
- <https://www.oregon.gov/ode/educator-resources/standards/mathematics/pages/mathstandards.aspx>

Assignment #6: Tips & Tools

Gain tips and tools to work with evidence-based math practices that teachers, coaches, and mentors can use in the classroom.

- Review the [PowerPoint](#) presentation for this lesson.
 - Reflect on your practice. (1-2 pages)
1. Do you use any of the strategies and best practices mentioned in the presentations?
 2. If you do, which practices do you use, and how are they working for you?
 3. If you don't, how will you implement them into your teaching toolbox?

ADDITIONAL ASSIGNMENTS REQUIRED FOR UNIVERSITY QUARTER CREDIT

B. LEARNING APPLICATION

In this section, you will apply your learning to your professional situation. This course assumes that most participants are classroom teachers who have access to students. If you do not have a classroom available to you, please contact the instructor for course modifications. Assignments done in a course forum will show responses from all educators who have or are taking the course independently. ?Feel free to read and respond to others' comments. Group participants can only view and respond to their group members in the Forum.

Assignment #7: Lesson Plan

Complete **two (2)** of the following options:

Option A)

Complete a lesson plan using what you have learned in this course.

Create a single lesson demonstrating your understanding of the language functions of the standards and what language is needed, both academic and daily, to aid students' comprehension and learning.

Your lesson plan should include, but not be limited to, the following:

- Grade Level.
- Lesson Objectives/goals

- Lesson Materials and resources
- Discussion questions
- Activities for multiple group sizes.
- Resources (multiple print and/or digital sources)
- Evaluation of students' math language/literacy development.
- Include any student feedback or noteworthy student products.
- View THI's [Lesson Plan Design](#) as a suggested layout.
- Submit your lesson to your instructor via the lesson tab below.
- Share what you've learned with other teachers taking our courses by checking the [lesson library box](#) when you submit your lesson.

AND/OR

Option B)

Find graphics (check for usage rights - Creative Commons) for the lesson plan you created. The graphics should represent academic language or other math concepts the students should know and understand to learn. The graphics can also be of uncommon daily language (ex: die/dice or lighthouse).

The graphic should include, but not be limited to, the following:

- A compelling title for your graphic
- The differences between academic and daily math language usage by splitting the layout into two columns
- A timeline
- What are the language functions and demands? (Consider the key content standards.)
- Incorporate different design elements.

In 2-3 pages, discuss your findings by evaluating students' understanding and comprehension of your graphic.

AND/OR

Option C)

Choose three (3) standards you will be teaching soon, and write a 2-3 page paper.

- Identify standards by number and text,
- Identify the language function(s) of the standards,
- Identify the academic language of the standards,
- Suggest any daily language that might need to be identified and/or clarified for the lesson.
- Refer to Common Core State Standards for Mathematics.
<https://learning.ccsso.org/wp-content/uploads/2022/11/ADA-Compliant-Math-Standards.pdf>
- Refer to Oregon Department of Education: Mathematics Standards
<https://www.oregon.gov/ode/educator-resources/standards/mathematics/pages/mathstandards.aspx>

Assignment #8: (500 Level ONLY)

In addition to the 400-level assignments, complete **two (2)** of the following:

Option A)

Teach a lesson and reflect in a 3-4 page paper on the results of the lesson plan.

- What worked, what did you struggle with, and why?
- Is there something you would like to change next time or add to lessons generally?
- Is there an area you still need assistance with?
- Include a copy of the lesson with the assignment to aid with context.

OR

Option B)

Research 3-4 articles online for language and mathematics. Write a 3-4 page summary of what you found. Compare and contrast it with the information you learned in this course. Please provide a text reference with the page number(s) with your summary. The summary may also take the format of an annotated bibliography.

OR

Option C)

Discourse or classroom discussion is not a topic we spend much time on; however, it is part of the best practices toolbox.

- How do you or how would you integrate discussion into your math lessons using the academic and daily language you have identified?
- What would you do differently?
- How will you implement it in future lessons?

Write a 3-4 page reflection responding to the questions. Please provide a reference page for any references cited.

C. INTEGRATION PAPER

Assignment #9: (Required for 400 and 500 Level)

SELF REFLECTION & INTEGRATION PAPER

(Please do not write this paper until you've completed all of your other assignments)

Write a 400-500 word Integration Paper answering these 5 questions:

1. What did you learn vs. what you expected to learn from this course?
 2. What aspects of the course were most helpful and why?
 3. What further knowledge and skills in this general area do you feel you need?
 4. How, when and where will you use what you have learned?
 5. How and with what other school or community members might you share what you learned?
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INSTRUCTOR COMMENTS ON YOUR WORK:

Instructors will comment on each assignment. If you do not hear from the instructor within a few days of posting your assignment, please get in touch with them immediately.

QUALIFICATIONS FOR TEACHING THIS COURSE:

Ann DeChenne, M.Ed, earned a B. A from Portland State University in Social Sciences in 2006 and a Master's Degree in Education through the Bilingual Pathways Program at Portland State University in 2008. Ann is completing a Ph.D. in Curriculum, Instruction, Assessment, and Evaluation from Walden University with a research focus on rural education and language in mathematics. She works in a small rural-fringe high school in Oregon. In addition, Ann is the Founder/Director of Little by Little Education Services, a 501c3 nonprofit working with schools, administration, teachers, and students in the USA, Chile, Mexico, and soon India. The organization's website is www.littlebylittle-education.org

BIBLIOGRAPHY

UNCOVER THE LANGUAGE OF MATH (Grades 6-12)

BOOKS:

Fenner, D. S. & Snyder, S. (2017). *Unlocking English learners; potential: Strategies for making content accessible*. Corwin Press. While language learning is for all students in all content areas, it is only in books designed for teachers of multilingual learners that provide information on language in content areas.

Walqui, A. & Bunch, G. C. (Eds.). (2019). *Amplifying the curriculum: Designing quality learning opportunities for English learners*. Teachers College Press.

Zwiers, J. (2013). *Building academic language: Essential practices for content classrooms, grades 5-12*. John Wiley & Sons.

Zwiers has written many books that provide a superb overview of academic language and how to use it in content areas. This book specifically provides a form and function view of language in the classroom.

ARTICLES:

Scarcella, R. (2003). *Academic English: A Conceptual Framework*.

<https://escholarship.org/uc/item/6pd082d4>

This article provides a framework for academic language, explored recently but still relatively hidden in many K-12 content areas.

REFERENCES:

- High-Quality Mathematics Instruction: What Teachers Should Know www.iris.peabody.vanderbilt.edu/module/math/
- Common Core State Standards for Mathematics <https://learning.ccsso.org/wp-content/uploads/2022/11/ADA-Compliant-Math-Standards.pdf>
- National Council for Teachers of Mathematics <https://www.nctm.org/Standards-and-Positions/Position-Statements/Transforming-Practices-and-Policies-So-Multilingual-Learners-Thrive-in-Mathematics/>
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National Council of Teachers of Mathematics

<https://www.nctm.org/Standards-and-Positions/NCTM-Position-Statements/>

- Oregon Department of Education: Mathematics Standards
<https://www.oregon.gov/ode/educator-resources/standards/mathematics/pages/mathstandards.aspx>
- University of North Alabama: Technology in Motion
Cause & Effect in Mathematics
<https://sites.google.com/site/teachingthinking2010/cause-effect-in-math>