



THE OHIO STATE UNIVERSITY

COLLEGE OF ARTS AND SCIENCES

Syllabus: Math 1125 Mathematics for Elementary Teachers I

Course Overview

Instructor Information

Please check the syllabus section on Carmen for instructor information!

Course description and expectations

Math 1125 is the first in a two-course sequence of math courses for undergraduates intending to be elementary or special education teachers. This course covers number systems, operations, number theory, expressions, and equations.

The course will emphasize problem-solving processes and their application to the learning of the listed content areas. Knowing mathematics for oneself is not the same as knowing math for teaching. To that end, explanations of mathematical ideas are emphasized. Full credit will NOT be given for correct mathematical answers without a reasoned explanation that is clear and complete.

Engagement in course activities 5 days a week is critical to your success in this class.

Each class will consist of doing an activity in a small group and discussing it with the whole class. You are expected to participate actively in all phases. Please plan to write your answers to activity questions and any notes you take, whether you use digital ink or traditional pen and paper. You will be expected to explain your thinking in small and large groups in preparation for explaining mathematics to your future students. If you cannot attend a class meeting, you are expected to complete the class activity and any participation assignments showing your engagement with the problems and with your classmates.

Reading is crucial.

Our time together will not follow a traditional lecture format. The calendar will list reading assignments corresponding to each class period. These reading assignments are designed to help you expand and clarify your notes from class. The textbook also contains

helpful practice problems and solutions with explanations. Plan to read the related section in the textbook after each class.

We are here to help you learn.

We will have regularly scheduled drop-in office hours both in person (in Cockins Hall, room 142) as well as on Zoom (link on Carmen). We will post the office hours schedule on Carmen during the first week of the semester. We encourage you to make use of these hours in any way that would be helpful for your learning. Stop by to discuss your explanation, to ask a question about a problem, or to talk through an idea! The office hours room is available at any time for group study. Please feel free to meet your peers there, whether there is an office hour scheduled or not.

Course materials

The textbook for this course is being provided via CarmenBooks. The fee for this material is included as part of tuition and is listed as *CarmenBooks fee* on your Statement of Account. In addition to cost-savings, materials provided through CarmenBooks are available immediately on or before the first day of class throughout your student career at Ohio State. There is no need to wait for financial aid or scholarship money to purchase your textbook. You can access this eBook through the CarmenBooks reader link in Carmen.

Mathematics for Elementary and Middle School Teachers with Activities,
6th edition. Author: Sybilla Beckmann. e-text ISBN: 9780136937609,
0136937608

This textbook will also be used for Math 1126, but you will only pay this fee once.

Unless you opt out of the program, you do NOT need to purchase any additional materials for this course at the bookstore. You will access your textbook from a link in Carmen. For information on the program or how to opt out, [please visit the CarmenBooks website](#).

- If you would like to add the textbook to your professional library, to have access to it after you become a teacher, you can opt out of CarmenBooks and purchase a digital edition with lifetime access from sites like [Vitalsource](#) or [RedShelf](#).
- If you prefer a physical copy of the textbook, you can opt out of CarmenBooks and order a copy online, for example directly from [Pearson's website](#).

If you wish to opt out, you will see a button to do so when you launch the materials. You have until the second Friday of the term to opt-out. However, please note that the textbook is a necessary tool for the course. We will expect you to have easy access to it!

If you rely on assistive technology or need an accessibility accommodation for the digital materials provided via CarmenBooks, please contact the Alternative Media team in Student Life Disability Services at slds-altmedia@osu.edu.

We will also frequently use the Math 1125 Student Activities Packet (posted on Carmen).

Course technology

For help with your password, university e-mail, Carmen, or other technology questions or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours>, and support for urgent issues is available 24/7.

- Self-Service and Chat support: <http://ocio.osu.edu/selfservice>
- Phone: 614-688-HELP (4357) or TDD: 614-688-8743
- Email: 8help@osu.edu

Technology equipment and skills necessary for this specific course

- Ability to adequately scan or photograph written mathematical work for uploading to Carmen or sharing in class.
- Basic computer skills and web-browsing
- Navigating Carmen/Canvas
- A device capable of accessing Zoom on a high-speed internet connection with audio, video, and chat participation (if needed for a class emergency).

Necessary software

- [Microsoft 365](#) All Ohio State students have free access to Microsoft software through Microsoft's Student Advantage program.
- You can access Word, Excel, PowerPoint, Outlook, and other Microsoft programs. You will receive 1 TB of OneDrive for Business storage.
- Office 365 is installed within your BuckeyeMail account. Full instructions for downloading and installation can be found <https://ocio.osu.edu/kb04733>.
- We will make use of Microsoft OneNote during class.

Course schedule

See full details in the calendar posted on our Carmen site.

Types of Assessments

Daily Participation

As previously stated, your success in this course depends on daily participation in the course activities. To demonstrate your participation, you will submit various assignments related to the daily work. These may consist of discussion board posts, submitting work done with a group, journal entries, or other. We will provide details on these assignments during class and on the announcements page in Carmen.

Weekly Homework and Content Checks (Untimed Assessments)

There will be weekly homework assignments consisting of problems related to the material discussed in class. Some of these problems will be for practice and not collected, while others will be submitted and graded as untimed assessments based on our learning outcomes. Assignments will be posted on Carmen with due dates indicated on the Carmen calendar and on the homework sheet. Assignments should be uploaded to Carmen by the due date. Information will be provided at the start of the class about how this is done.

There will also be about 10 Content Checks over the semester. These content checks will be given as untimed quizzes on Carmen. These assignments are designed to help you practice the outcomes and get immediate feedback on your work. You will have multiple attempts for the Content Checks, and you can earn untimed outcomes for this work.

Monthly Timed Assessments

There will be four days devoted to timed assessments during the semester (one of which is during finals week). Each timed assessment will be given online and will be one hour in length plus time for scanning and uploading your work. You will have some flexibility around when the one-hour time window occurs. The intent of a timed assessment will be to assess 1) your individual understanding of course concepts without the assistance of classmates or instructor, and 2) your ability to give comprehensive and coherent explanations of the reasoning behind the concepts in a limited time window. Both skills are necessary as teachers!

Final Portfolio

You will be expected to assemble a collection of your work over the course of the semester to demonstrate 1) your growth and mastery of the course outcomes, 2) areas where your content understanding still needs improvement, and 3) reflection over your own changes in attitude toward mathematics and thinking about mathematics teaching. Instructions will be posted on Carmen around the middle of the semester.

Grades

How will I get a grade for this course?

Your final grade will be assigned based on demonstrating your understanding of specific learning outcomes found at the end of this document. Our system reflects our belief that it is more important that you learn ideas fully than that you learn them quickly. Thus, one important feature of our system is that demonstrating your understanding is not tied to a specific assignment or a certain point in the course. Instead, if you have not demonstrated your understanding on the first try, you will have the opportunity to try again. Said

differently, this grading system helps you to have some flexibility on *when* during the semester your learning occurs.

Please read the separate document about grading on Carmen carefully and ask any questions you have! We will do things differently than your previous courses, and it is okay to be confused at first. The most important thing to remember is that we are here to help.

Why are we using this system?

Our system of grading puts the emphasis on achieving full understanding of the material, not on earning points. At the end of the course, you will have a list of items that you have fully understood, and a list of items where you could still make improvements. You will have a clear picture of the gains you have made during the semester, and a clear understanding of how your achievements are related to your final grade. Our intent is that this system of grading will, among other things, give you control over your grade in the course. Please carefully read the section about reassessments in the grading document for more details.

We hope this system will let us give you more specific and helpful feedback about your work. Understanding and acting on our feedback will be an essential part of your work in this course.

How will my final grade be determined?

Final grades will be determined according to the following chart and the list of learning outcomes which you can find at the end of this document and on Carmen. See the grading supplement on Carmen for specific details about how your assignments will be assessed.

Letter Grade	Requirements
A	<ul style="list-style-type: none"> · Daily Participation assignments: At least 95% complete. · Outcomes: At least 25/28 DFU, timed or untimed. · Combined score of at least 16 on timed assessments. · Portfolio: 100% satisfactory.
A-	<ul style="list-style-type: none"> · Daily Participation assignments: at least 93% complete. · Outcomes: At least 24/28 DFU, timed or untimed. · Combined score of at least 15 on timed assessments. · Portfolio: 100% satisfactory.
B+	<ul style="list-style-type: none"> · Daily Participation assignments: at least 90% complete. · Outcomes: At least 22/28 DFU, timed or untimed. · Combined score of at least 13 on timed assessments. · Portfolio: 100% satisfactory.
B	<ul style="list-style-type: none"> · Daily Participation assignments: at least 85% complete. · Outcomes: At least 21/28 DFU, timed or untimed. · Combined score of at least 12 on timed assessments. · Portfolio: 100% satisfactory.
B-	<ul style="list-style-type: none"> · Daily Participation assignments: at least 83% complete.

	<ul style="list-style-type: none"> · Outcomes: At least 20/28 DFU, timed or untimed. · Combined score of at least 11 on timed assessments. · Portfolio: 100% satisfactory.
C+	<ul style="list-style-type: none"> · Daily Participation assignments: at least 78% complete. · Outcomes: At least 18/28 DFU, timed or untimed. · Combined score of at least 9 on timed assessments. · Portfolio: 100% satisfactory.
C	<ul style="list-style-type: none"> · Daily Participation assignments: at least 74% complete. · Outcomes: At least 17/28 DFU, timed or untimed. · Combined score of at least 8 on timed assessments. · Portfolio: 100% satisfactory.
C-	<ul style="list-style-type: none"> · Daily Participation assignments: at least 70% complete. · Outcomes: At least 16/28 DFU, timed or untimed. · Combined score of at least 7 on timed assessments. · Portfolio: 100% satisfactory.
D	<ul style="list-style-type: none"> · Daily Participation assignments: at least 60% complete. · Outcomes: At least 12/28 DFU, timed or untimed. · Portfolio: 50% satisfactory.
E	D-level requirements are not met.

Expectations for response times

We will always be available during office hours, no need to make an appointment – just drop by or join the zoom meeting (as applicable). If you wish to speak with us privately, please send an email to set up a time.

You can expect us to reply to email within 24 hours on a school day, or by the end of the day Monday if your email was sent over the weekend.

For homework assignments, you can expect feedback within 7 days. Exams will be returned within 5-7 days.

Attendance, participation, and discussions

Student participation requirements

The following is a summary of everyone's expected participation.

- Attend class and participate in your learning. You are expected to attend each class session and fully participate during class. There will be participation assignments designed to help you demonstrate your participation and begin your studying of the relevant material. If you have a situation which prevents you from attending one class meeting, consult Carmen for the day's activities and participation assignment, and plan to discuss the activities with a classmate. If you have a situation which prevents

you from attending multiple class meetings, please contact your lecturer. Keep in mind that it is easier for us to be flexible when we know about situations in advance! You are not required to share personal details about your situation with us, but we may require documentation for extended absences.

- Practice outside of class. Set aside time each week to practice both the content and your explanations. Reading the textbook and working through the suggested practice problems is a good place to begin, and then you should add problems related to the content you find most challenging.
- Engage with other learners. We strongly suggest making use of office hours as well as group study.

Discussion and communication guidelines

The following are our expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- Tone and civility: Please maintain a supportive learning community where everyone feels safe. No student should be marginalized in any form for questions or contributions made in class, during office hours, or online. Students should cooperate to help each other's understanding of the mathematical concepts discussed in lecture regardless of their background.
- Backing up your work: Consider how to back up your work. This includes homework documents you submit and posts on discussion boards or anything else graded. Consider screen shots!

Attendance

It is Ohio State's policy to reasonably accommodate the sincerely held religious beliefs and practices of all students. The policy permits a student to be absent for up to three days each academic semester for reasons of faith or religious or spiritual belief. Students planning to use religious beliefs or practices accommodations for course requirements must inform the instructor in writing no later than 14 days after the course begins. The instructor is then responsible for scheduling an alternative time and date for the course requirement, which may be before or after the original time and date of the course requirement. These alternative accommodations will remain confidential. It is the student's responsibility to ensure that all course assignments are completed.

Should in-person classes be canceled, we will notify you via an Announcement on Carmen regarding whether we will meet via Zoom at our regularly scheduled time. Please check the Announcements frequently.

Other course policies

Student academic services

Information on student academic services offered on the OSU Columbus campus is available at this [link](#).

Student support services

Student support services offered on the OSU Columbus campus can be found at this [link](#).

Academic integrity policy

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct [here](#).

Policies for this course

- On timed assessments, you are allowed to use any resources except other people. You must not discuss the assessment with anyone until after the due date. You must submit your own unique work.
- For untimed and participation assignments, you are encouraged to work in groups with your classmates. However, for graded work, you must submit your own unique work unless otherwise specified by the assignment. You are not allowed to copy directly from any online or print resources.
- Reusing past work: In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it.
- If you are unsure about a particular situation, please ask ahead of time!

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational

purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on Title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at [this link](#) or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu

Accessibility accommodations for students with disabilities

The university strives to maintain a healthy and accessible environment to support student learning in and out of the classroom. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let your instructor know immediately so that we can privately discuss options. To establish reasonable accommodations, we may request that you register with Student Life Disability Services. After registration, make arrangements with your instructor as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

If you are isolating while waiting for a COVID-19 test result, please let us know immediately. Those testing positive for COVID-19 should refer to the [Safe and Healthy Buckeyes site](#) for resources. You can connect with them at slds@osu.edu; 614-292-3307; or slds.osu.edu.

Accessibility of course technology

This course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- [Carmen \(Canvas\) accessibility](#)

Your mental health!

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at 614-292-5766, and 24-hour emergency help is also available 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline.

List of Learning Outcomes

The meaning of numbers: place value and fractions [Chapters 1 and 2]

1. [1-1 Correspondence] Give a general definition of one-to-one correspondence and use your definition to explain whether or not one-to-one correspondence is present in examples.
2. [Bundling] Explain what a place value system is, why we use a place value system, and how the places are related to one another in size. For a specific example, explain and draw what is meant by a bundle and a superbundle, and how and why we make these groupings. Explain the meaning of the digits in each place, and what those digits represent.
3. [Basic Fractions] Explain the meaning of the whole, numerator, and denominator of any fraction. Connect the meaning of the whole, numerator, and denominator to a well-labeled math drawing used to solve a fraction problem.
4. [Percent as Fraction] Solve percent problems by using a math drawing which connects percents and fractions. Be sure to explain what a percent means as well as the whole, denominator, and numerator for your fractions.
5. [Equivalent Fractions] Use the meaning of fractions (whole, denominator, and numerator) and, without using multiplication or relying on visual inspection, reason from a picture to explain why two equivalent fractions represent the same quantity.
6. [Representing decimals] Use bundling to extend the ideas of place value to decimals, including what represents a unit, the (un)bundling process, and how the value of the unit determines the values of bundles and superbundles.
7. [Comparing numbers] Determine which of two numbers is larger. Explain your answer by using the concepts we have discussed in class (as requested in the problem's instructions).

Addition and subtraction [Chapter 3]

8. [Modeling addition and subtraction] Use the “add to” meaning of addition and the “take from” meaning of subtraction to draw pictures illustrating these operations. Explain how your drawing correctly models the operation.
9. [Addition and subtraction structures] Identify or write story problems using the “add to/take from (change)”, “put together/take apart”, and “compare” types. Solve the story problem using a picture, explaining how the type is shown in both the story and the physical actions taken with the picture.

10. [Addition or Subtraction Algorithm] Using bundling/base ten block pictures, demonstrate the physical actions of an addition or subtraction algorithm, explaining each step's relationship to the meaning of the operation and place value. Explain why the algorithm produces the overall correct answer.

Multiplication [Chapters 4 and 5]

11. [Meaning of Multiplication] Apply the meaning of multiplication in terms of groups, objects per group, and the total, in order to solve problems.
12. [Properties] Recognize when the properties of addition or multiplication are being used in equations or justify examples of the properties using a picture. For a given example, be sure to explain how to see each side of the equation in your picture in terms of the meanings of the operations involved, and why the picture shows you that the two sides are equal.
13. [Multiplication Algorithm] Using an array, demonstrate the physical actions of the partial products algorithm, explaining each step's (written or implied) relationship to the meaning of the groups, objects, and objects per group in multiplication or the add-to meaning of addition.
14. [Fraction Multiplication] Starting with a story problem involving fractions, explain why the story can be solved with multiplication by identifying the groups and objects per group. Then, use the meaning of fractions as well as a picture or sequence of pictures to justify the solution to the story problem.
15. [Fraction multiplication algorithm] Justify why we multiply fractions by multiplying the numerators and multiplying the denominators. Use math drawings, the meaning of fractions, and the meaning of multiplication in your explanation.

Division [Chapter 6]

16. [Meaning of Division] Apply both meanings of division in terms of groups, objects per group, and the total number of objects, in order to solve problems. Be sure to identify which type of division problem you are working with and how you know from the actions you take while solving.
17. [Division Algorithm] Using base ten block pictures, demonstrate the physical actions of the division algorithm, explaining each step's (written or implied) relationship to the meaning of the groups, objects per group, and objects in division. Be sure to explain why we divide, multiply, subtract, then "bring down" as we solve.
18. [Fraction Division] Starting with a story problem involving fractions, explain why the story can be solved with division by identifying the groups and objects per group as well

as which type of division is involved. Then, use the meaning of fractions as well as a picture or sequence of pictures to justify the solution to the story problem.

19. [Fraction division algorithm] Justify why we divide fractions by inverting and multiplying. Use math drawings, the meaning of fractions, and one of the meanings of division in your explanation.

Ratios [Chapter 7]

20. [Meaning of Ratios] Identify ratio situations by giving a definition for a ratio and explaining why that definition does or does not hold. For ratio situations, identify what attributes in the problem stay the same and what changes.
21. [Solving Ratio Problems] Use a picture or reasoning about operations to solve ratio problems, explaining the steps involved in terms of the meanings of any operations used and any fractions which appear.
22. [Unit Rates] Identify unit rates that correspond with ratios and discuss why we can use a fraction (in terms of the meaning of fractions and the whole for your fraction) to describe a ratio.
23. [Fractions and Decimals] Use bundling and the meaning of fractions to explain why 0.1 and $\frac{1}{10}$ are the same. Use this connection, potentially extended to other place values, to convert between fractions and decimals.
24. [Fractions and Division] Use the meaning of fractions and the meaning of division to explain why we can use long division to find the decimal equivalent for a fraction.
25. [Percent Increase and Decrease] Solve percent increase and decrease problems by any method of your choosing. Be sure to explain why all of your steps make sense, potentially including the meaning of fractions, the meaning of decimals, ratios, the meaning of multiplication, or whatever else you use to solve the problem.

Putting it all together [Integer reading, Chapters 8 and 9]

26. [Integers] Use at least two models for integers to illustrate why the rules for operations with negative whole numbers are consistent with the meaning of operations for whole numbers.
27. [Factors and Multiples] Give a general definition for factors or multiples. Use your definition to explain whether a given example fits these categories and solve related problems.
28. [Solving Equations] Use a picture to solve an equation. If the equation is made from a story problem, explain how the equation is connected to the story. For each step in solving the equation, explain how to see that step in the picture.