THE UNIVERSITY OF BRITISH COLUMBIA

MATH 335:10S, Introduction to Mathematics
Winter Term 1 - 2025

Instructor:
Dr. Johana Thomas Zapata (she/her) (You can call me "Johana" or "Dr. Zapata")
Email: jthomaszapata@math.ubc.ca
Class Times: Wednesday and Friday, 10:30 – 12:00. Class Location: LSK Room 310
Office Hours: Neville Scarfe Building, 2125 Main Mall, 3rd floor, Monday 3:00 – 5:00 pm.

Land Acknowledgment

We acknowledge that this course is held on the traditional, ancestral, and unceded territory of the **xʷməθkʷəy̓əm (Musqueam) people**. As a learning community, we are grateful for the opportunity to study and teach on this land, and we recognize our responsibility to learn from and alongside Indigenous peoples as part of our shared commitment to reconciliation and ethical engagement.

Online Course Platform and Materials: Assignment guidelines, course readings, and other materials will be available on **Canvas**. Students are responsible for checking Canvas and UBC email regularly for updates on assignments, course readings, and other pertinent materials and activities.

Textbook: Van de Walle, J. A., Karp, K. S., Bay-Williams, J. M., & Dougherty, B. J. (2019). Elementary and middle school mathematics: Teaching developmentally (10th ed.). Pearson.

- B.C. Mathematics Curriculum: https://curriculum.gov.bc.ca/curriculum/mathematics
- Illustrative Mathematics Website: htLGs://illustrativemathematics.org/

Course Description: This course invites students to explore and make sense of important mathematical ideas in number, algebra, and modeling. Together, we'll work through problems, talk about our thinking, and learn from one another's strategies and insights. The goal is to build strong conceptual understanding and procedural fluency by engaging deeply with mathematical relationships and structures.
We'll also think about how to support all students by creating math spaces where their ways of thinking are seen, valued, and connected to classroom learning. Along the way, we'll reflect on our own experiences with math and what it means to teach in ways that are thoughtful, inclusive, and grounded in real understanding.

Course Goals:

- Engage deeply with mathematical concepts related to number, operations, algebraic reasoning, and modeling.
- Use mathematical language and representations precisely.
- Work collaboratively to construct understanding and critique the reasoning of others.

- Explore how mathematics instruction can be equitable and inclusive, especially for multilingual learners.
- Reflect on mathematics teaching practices and student thinking.

Course Structure (14 Weeks): ***Van de Walle et al., (2019) (VdW)***

Week(s)	Module & Title	Mathematical Focus
1–2	**Module 1:** Introduction to the course. Teaching Mathematics in the 21st Century. Developing Early Number Concepts and Number Sense (VdW et al., Chapters 1, 7, 8, 9)	Deepening understanding of the base-ten system, operations with whole numbers, number properties, and flexible strategies for computation. Explore how structure supports fluency.
3–4	**Module 2:** Developing Whole-Number Place-Value Concepts. Developing Strategies for Addition and Subtraction Computation (VdW et al., Chapters 10, 11)	Investigating patterns, generalizations, and expressions. Introduction to variables, equations, and relational thinking grounded in real-world and visual contexts.
5–6	**Module 3:** Developing Strategies for Multiplication and Division. Algebraic thinking, equations, and functions. (VdW et al., Chapters 12,13)	Understanding fractions as numbers and relationships. Equivalence, operations with fractions, and connections to ratios and rates. Emphasis on visual models and reasoning.
7	Midterm Week – Mathematical Investigation & Reflection. (VdW et al., Chapters 3 & 4)	A collaborative problem-solving assessment focused on connecting concepts across Modules 1–3. Includes a reflection on mathematical practices and reasoning.
8–9	**Module 4:** Developing fraction concepts & operations (VdW et al., Chapters 14, 15)	Exploring ratios, rates, percents, and scaling through local, real-world examples. Students will engage in place-based tasks to model and analyze proportional relationships.
10–11	**Module 5:** Developing Decimal and Percent Concepts and Decimal Computation. Developing Measurement Concepts (VdW et al., Chapters 16, 18)	Engaging in full modeling cycles: posing questions, making assumptions, building models, and refining solutions. Emphasis on how math helps us understand and respond to real-world situations in our communities.
12–13	**Module 6:** Developing Geometric Thinking. Developing Concepts of Data and Statistics.	Analyzing multiple ways of solving problems and the mathematical practices involved (reasoning, precision, modeling, structure, etc.). Focus on student thinking and mathematical discourse.

Week(s)	Module & Title	Mathematical Focus
14	**Module 7:** Developing Concepts of Exponents, Integers, and Real Numbers. (VdW et al., Chapters 22)	
	Final Week – Math Fair, group presentations.	Group presentations of final tasks or math investigations. Reflection on personal mathematical growth and how math connects to our lives and local communities. No formal exam.

INSTRUCTIONAL APPROACH

A variety of teaching methods will be used in this course, including brief lectures, demonstrations, small and large group discussions, cooperative work, impromptu 'practice' workshops, and video presentations. An emphasis will be placed on active student participation in discussions and activities.

It is likely that you will encounter new ideas about mathematics and teaching and learning in this course, and that some of the instructional approaches we discuss will be quite a bit different from those you experienced as a K-12 student. This class begins with the following premises:

1. We all have beliefs about how mathematics should be taught in schools, and these beliefs are often based on our own experiences as students.
2. These experiences should not necessarily be regarded as examples of effective practice.
3. Important research has informed changes in what is known about the learning and teaching of mathematics. Holding a stance of being on-going learners in the profession of teaching is important for continual improvement of practice.
4. We must think critically about our own mathematics learning to design appropriate experiences for our students.

You will learn the most from this class if you bring an **open mind, humility of spirit, and a willingness** to examine, re-examine, question, experiment with, and be curious about approaches to mathematics teaching, including approaches to mathematics instruction that feel challenging for you.

EXPECTATIONS FOR STUDENTS

Your preparation for and participation in the class discussion is an essential part of your work on the course. Teaching is a profession that requires respect, humility, effort, honesty, and genuine engagement. You can demonstrate strong professionalism by preparing for and attending each class session in its entirety, offering and listening to ideas, being courteous and engaged verbally, physically, and listening closely during class discussions without dominating the conversation or engaging in frequent side conversations or other inappropriate behavior. This includes bringing your textbook and other relevant materials and work to class each week. Professionalism also entails doing your very best to assure that your written work adheres to scholarly writing standards, including correct grammar, spelling, and clear organization and presentation. Use the last edition of APA style to cite any reference in your assignment.

Class Format: Each class will include:

- Interactive lecture with slides and problem-based worksheets
- Time for group collaboration
- Whole-class discussion focused on mathematical reasoning
- Occasional video or student work analysis

Materials:

- Course readings (provided digitally or through the library)
- Access to course platform [e.g., Canvas]
- Calculator (basic functions only)
- Notebook and writing utensils

Academic Integrity and Use of AI Tools

As a student at the University of British Columbia, you are expected to uphold the highest standards of academic honesty and integrity. This includes completing your own work, properly citing sources, and avoiding plagiarism in all forms.

Please note that AI platforms and tools (e.g., ChatGPT, OpenAI, Gemini, Copilot) are not considered reliable or scholarly sources. These tools are not peer-reviewed, often generate fabricated or incorrect information, and may include made-up citations. While you are not prohibited from using AI tools to support your thinking (e.g., brainstorming or asking clarifying questions), you may not use them as cited sources in your assignments—unless explicitly stated otherwise in the assignment instructions.

For example, some assignments (such as the *Reflection and Alternative Lesson* task) may allow the use of AI for exploration. In such cases, this will be clearly outlined in the assignment description. For all other tasks, submitting content copied from an AI platform, even if cited, will be considered plagiarism. UBC reserves the right to use detection tools to identify plagiarism, including work generated by AI.

If you are ever unsure about what is allowed, please ask. In sum:
→ Do your own thinking and writing.
→ Use scholarly, high-quality sources.
→ Cite all resources properly using APA format.

Group Work and Collaboration

Collaboration is an important part of the learning process in this course, especially through group activities and projects. However, unless an assignment is specifically designated as a group task, all submitted work must be your own. You are encouraged to discuss course content with peers, but copying answers or text from others (or from group work when submitting individual work) violates academic integrity policies.

You are responsible for understanding the UBC Student Code of Conduct and adhering to university-wide expectations regarding academic honesty and ethical scholarship.

Workload Expectation

In accordance with UBC academic policy, students should expect to spend approximately 2 to 3 hours outside of class for every hour of scheduled instruction. This means you should plan for an average of 8 to 10 hours per week of independent work, including reading, reflection,

assignments, and project preparation. The workload may vary slightly depending on the week and your background knowledge.

Materials

- Calculator, compass, protractor, ruler, scissors, ruler.

Assessment Breakdown

Component	Weight	Description
Math Autobiography	10%	A reflective task where you share your experiences with learning mathematics, focusing on your math identity, past challenges, successes, and goals for this course. You may complete this as a 2–3 page written reflection or a 5–7 minute video.
Canvas readings response	15%	Written reflections on assigned readings related to elementary math concepts, teaching strategies, and student thinking. Emphasizes connections between mathematics theories and classroom practice.
Midterm Collaborative Task	15%	A group-based problem-solving task that synthesizes key concepts from the first half of the course. The task includes both mathematical reasoning and discussion of pedagogical implications.
Worksheets, quizzes	20%	Ongoing individual and group work completed during class. Online assessment (WebWork). Problem-solving, use of manipulatives, exploring multiple representations, and making sense of elementary math content.
In-Class practice	15%	Based on consistent attendance, active participation in class discussions, thoughtful engagement with group work, and respectful collaboration in a learning community.
Final Group Presentation + Summary Report	25%	A culminating group project exploring a real-world or classroom-based mathematics investigation. Includes a class presentation and a written summary that highlights mathematical thinking, instructional relevance, and reflections on group learning.

Grading Scale

Final grades will be reported as letter grades, based on the following scale:

A+	90–100%	C+	64–67%
A	85–89%	C	60–63%
A–	80–84%	C–	55–59%
B+	76–79%	D	50–54%
B	72–75%	F	0–49%
B–	68–71%		