Locally Developed Courses

ESL Introduction to Mathematics

For the 2024-2025 School Year

Introduction to the ESL Introduction to Mathematics Course Sequence

Subject: Mathematics - Discipline: General Mathematics

In ESL Introduction to Math; language outcomes are derived directly from Alberta K-12 ESL proficiency Benchmarks (1.0), Grades 10-12.

ESL Introduction to Mathematics develops students' academic English language proficiency through mathematical numeracy and literacy, mathematical reasoning, and ways of communicating mathematically. This goal is achieved through the implementation of the English Language Development (ELD) framework, an instructional approach to explicit language instruction within content area learning. Students will use their growing proficiency with language functions, forms, and vocabulary to explore and develop a range of mathematical concepts and skills. Targeted language functions in this course are drawn from and connected to Alberta's Mathematics Programs of Study.

Student Need

Mathematics is not a universal language. ELLs face language-related barriers to achievement in mathematics. Some barriers may include the extensive use of technical terms, including homonyms and synonyms (e.g., the many different ways to say "add" such as plus, combine, and, sum, increase by); words whose mathematical meaning is vastly different from their everyday meanings (e.g., fix, plane); and logical connectors used in mathematical problems (e.g., therefore, consequently, if, however, because). ELLs may also face content-related barriers due to limited mathematical knowledge or western ways of doing mathematics (e.g., the use of manipulatives or the process for long division).

ESL Introduction to Mathematics supports ELLs who are attempting to catch up to a moving target, namely, to native-English speakers whose academic language, numeracy, and literacy skills are continuing to increase significantly from one grade level to the next.

Courses in the ESL Introduction to Mathematics Course Sequence

ESL Introduction to Mathematics 15 (LDC1350)

ESL Introduction to Mathematics 15 focuses on multiple approaches to learning language functions, forms, and vocabulary specific to mathematics and challenges students to increase their receptive and expressive language skills. Developing communicative competence supports students in developing their academic English language proficiency as well as their mathematics-related knowledge, skills, literacy, attitudes, understanding, critical thinking, and reasoning thereby empowering students to make informed decisions, solve problems, and critically address mathematics-related societal, economic, ethical and environmental issues.
The primary goal of ESL Introduction to Mathematics 15 is to provide English Language Learners (ELLs) with the opportunity to build communicative competence with academic English language while developing key foundational mathematical ideas and basic math content (numeracy) necessary for entry into grade-level mathematics classes.
This course is appropriate for those English Language Learners who enter high school without the pre-requisite skills necessary for entry into Math 10-3, Math 10-4, or Math 10C.

Prerequisites: None

Versions Available: (Each version must be locally approved by Board Motion prior to offering to students.)

Credit Level	First School Year	Last School Year
5	2024-2025	2027-2028

Curriculum Outline

	Curriculum Elements	ESL Intro to Math 15-5
1	**Topic** Receptive Language	✓
1.1	**General Outcome** How does development of receptive language skills (listening and reading) enable students to comprehend information and ideas related to course content?	✓
1.1.1	**Specific Outcome** LP1 – Linguistic Vocabulary | L – Understand some words, approximately 5000, including utility words, descriptive words, subject-specific words, and academic words with visual support	✓
1.1.2	**Specific Outcome** LP1 – Linguistic Vocabulary | R – Understand some words, approximately 5000, including utility words, descriptive words, and subject-specific vocabulary	✓
1.1.3	**Specific Outcome** **LP2 – Linguistic Vocabulary | L – Understand** more words, approximately 15,000, including utility words, descriptive words, subject-specific words, and academic words.	✓
1.1.4	**Specific Outcome** LP2 – Linguistic Vocabulary | R – Understand more words, approximately 15,000, including utility words, descriptive words, and subject-specific vocabulary	✓
1.1.5	**Specific Outcome** LP1 – Linguistic Syntax | L – Understand subject–verb–object sentence structure in familiar contexts.	✓
1.1.6	**Specific Outcome** LP1 – Linguistic Syntax | R – Understand simple sentences	✓
1.1.7	**Specific Outcome** LP2 – Linguistic Syntax | L – Understand compound sentences in familiar contexts.	✓
1.1.8	**Specific Outcome** LP2 – Linguistic Syntax | R – Understand compound sentences and simple detailed sentences.	✓
1.1.9	**Specific Outcome** LP1 – Strategic | L – Respond to literal questions with "what," "where," "when," "who" and "how many."	✓
1.1.10	**Specific Outcome** LP1 – Strategic | R – Decode familiar words and sight words.	✓
1.1.11	**Specific Outcome** LP1 – Strategic | L – Seek clarification by using familiar expressions.	✓

	Curriculum Elements	ESL Intro to Math 15-5
1.1.12	**Specific Outcome** LP1 – Strategic | R – Rely on pictures, familiar phrases, patterned sentences, context, shared experiences, and first language and culture to comprehend simple texts on familiar topics.	✓
1.1.13	**Specific Outcome** LP2 – Strategic | L – Respond to open-ended questions.	✓
1.1.14	**Specific Outcome** LP2 – Strategic | R – Decode word families, consonant blends, and long- and short-vowel sounds.	✓
1.1.15	**Specific Outcome** LP2 – Strategic | L – Seek clarification by restating, paraphrasing	✓
1.1.16	**Specific Outcome** LP2 – Strategic | R – Use rereading, reading on, contextual cues, and root-word recognition to comprehend texts on familiar topics.	✓
1.1.17	**Specific Outcome** LP1 – Socio-Linguistic | L – Respond appropriately to common social expressions in formal and informal contexts.	✓
1.1.18	**Specific Outcome** LP1 – Socio-Linguistic | R – Understand the literal meaning of simple texts on familiar topics.	✓
1.1.19	**Specific Outcome** LP2 – Socio-Linguistic | L – Respond appropriately to common social expressions, intonation, idiomatic expressions in formal and informal contexts.	✓
1.1.20	**Specific Outcome** LP2 – Socio-Linguistic | R – Understand common social expressions and figurative language in texts on familiar topics.	✓
1.1.21	**Specific Outcome** LP1 – Discourse | L – Understand familiar commands, two-step instructions, the gist of discussions and presentations containing phrases and simple related sentences connected with "and" and "then" on familiar topics with visual support.	✓
1.1.22	**Specific Outcome** LP1 – Discourse | R – Understand simple narratives and descriptive texts containing common conjunctions.	✓
1.1.23	**Specific Outcome** LP2 – Discourse | L – Understand the gist of discussions and presentations containing simple related sentences connected with common conjunctions, time markers, and sequence markers on familiar topics	✓
1.1.24	**Specific Outcome** LP2 – Discourse | R – Understand ideas in simple explanations and procedural texts connected with conjunctions, time markers, and sequence markers.	✓

	Curriculum Elements	ESL Intro to Math 15-5
1.1.25	**Specific Outcome** LP1 – Auditory Discrimination | L – Recognize common contractions and distinguish minimal pairs in speech spoken at a slower rate.	✓
1.1.26	**Specific Outcome** LP2 – Auditory Discrimination | L – Understand contractions and familiar reduced speech.	✓
1.1.27	**Specific Outcome** LP1 – Fluency | R – Read word-by-word with some phrasing.	✓
1.1.28	**Specific Outcome** LP2 – Fluency | R – Read with some phrasing, rereading, sounding out of words, pausing to refer to visuals; substitution of unknown words with familiar words.	✓
2	**Topic** Expressive Language	✓
2.1	**General Outcome** How does development of expressive language skills (speaking and writing) enable students to communicate information and ideas related to course content?	✓
2.1.1	**Specific Outcome** LP1 – Linguistic Vocabulary | S – Use some words, approximately 5000, including utility words, descriptive words, and subject-specific words to express needs, express feelings, express preferences and respond to questions.	✓
2.1.2	**Specific Outcome** LP1 – Linguistic Vocabulary | W – Use some words, approximately 5000, including utility words, descriptive words and subject-specific words.	✓
2.1.3	**Specific Outcome** LP2 – Linguistic Vocabulary | S – Use more words, approximately 15,000, including utility words, descriptive words, subject-specific words to express ideas, ask and answers questions and make statements.	✓
2.1.4	**Specific Outcome** LP2 – Linguistic Vocabulary | W – Use more words, approximately 15,000, including utility words, descriptive words and subject-specific words.	✓
2.1.5	**Specific Outcome** LP1 – Linguistic Grammar | S – Use common pronouns, adjectives, nouns, and verbs in present tense with errors and omissions.	✓
2.1.6	**Specific Outcome** LP1 – Linguistic Grammar | W – Use familiar nouns, pronouns, adjectives, adverbs, prepositions, articles and verbs with tense errors and omissions	✓

	Curriculum Elements	ESL Intro to Math 15-5
2.1.7	**Specific Outcome** LP2 – Linguistic Grammar | S – Use regular plurals, possessives, prepositions, and verbs in continuous and simple past tenses with agreement and tense errors	✓
2.1.8	**Specific Outcome** LP2 – Linguistic Grammar | W – Use regular plurals, possessive pronouns, prepositional phrases, regular verbs in continuous and simple past tenses, and irregular verbs in continuous and simple past tenses with tense and usage errors.	✓
2.1.9	**Specific Outcome** LP1 – Linguistic Syntax | S – Follow patterned sentences, phrases and subject–verb–object sentences.	✓
2.1.10	**Specific Outcome** LP1 – Linguistic Syntax | W – Write simple declarative sentences, negative sentences and question sentences using sentence frames.	✓
2.1.11	**Specific Outcome** LP2 – Linguistic Syntax | S – Use patterned and predictable affirmative and negative statements, questions and commands.	✓
2.1.12	**Specific Outcome** LP2 – Linguistic Syntax | W – Write simple compound sentences and simple detailed sentences.	✓
2.1.13	**Specific Outcome** LP1 – Strategic | S – Use known phrases, simple questions and first-language translation.	✓
2.1.14	**Specific Outcome** LP1 – Strategic | W – Use copying, spelling from memory, words with similar sounds, sentence frames to spell familiar words, write ideas, complete patterned sentences and use basic punctuation.	✓
2.1.15	**Specific Outcome** LP2 – Strategic | S – Use message replacement, everyday expressions and everyday questions.	✓
2.1.16	**Specific Outcome** LP2 – Strategic | W – Use familiar vocabulary, known phrases, common expressions, cognates, word lists, templates and models, and personal dictionary to find appropriate words, spell irregularly spelled words, distinguish homophones and homonyms and increase use of punctuation.	✓
2.1.17	**Specific Outcome** LP1 – Socio-Linguistic | S – Use greetings, common courtesy expressions, and familiar social expressions to participate in social and classroom situations.	✓
2.1.18	**Specific Outcome** LP1 – Socio-Linguistic | W – Produce texts using familiar words, familiar phrases, sentence frames to complete forms, create graphic organizers and label diagrams.	✓
2.1.19	**Specific Outcome** LP2 – Socio-Linguistic | S – Use common expressions, slang, idioms and gestures to communicate with peers.	✓

	Curriculum Elements	ESL Intro to Math 15-5
2.1.20	**Specific Outcome** LP2 – Socio-Linguistic | W – Produce texts for specific purposes using templates, samples, story plans or graphic organizers.	✓
2.1.21	**Specific Outcome** LP1 – Discourse | S – Connect familiar phrases and simple sentences with "and" to express needs, feelings and opinions.	✓
2.1.22	**Specific Outcome** LP1 – Discourse | W – Connect ideas in simple sentences using common conjunctions, common time markers and common sequence markers.	✓
2.1.23	**Specific Outcome** LP2 – Discourse | S – Connect ideas using common conjunctions, time markers, and sequence markers to share ideas, ask questions, describe and explain.	✓
2.1.24	**Specific Outcome** LP2 – Discourse | W – Connect ideas in a basic paragraph using common conjunctions, time markers and sequence markers.	✓
2.1.25	**Specific Outcome** LP1 – Pronunciation | S – Approximate English rhythm and intonation in familiar and rehearsed activities, although pronunciation errors may interfere with meaning.	✓
2.1.26	**Specific Outcome** LP2 – Pronunciation | S – Demonstrate comprehensible pronunciation and appropriate intonation in familiar and rehearsed activities, although pronunciation errors may still occur.	✓
2.1.27	**Specific Outcome** LP1 – Editing | W – Edit sentences for capitalization of names and words at the beginning of sentences, periods and regular spelling of familiar words.	✓
2.1.28	**Specific Outcome** **LP2 – Editing | W – Edit** and revise paragraphs for regular spelling, end punctuation, commas in lists and addition of detail.	✓
3	**Topic** Number Sense	✓
3.1	**General Outcome** How does having number sense (flexible thinking and intuition about numbers) help us understand and interact with our environment?	✓
3.1.1	**Specific Outcome** Describe order or relative position using ordinal numbers.	✓
3.1.2	**Specific Outcome** Describe, represent, and compare quantities from 0.01 to 10 000, as whole numbers, fractions, and decimals.	✓

	Curriculum Elements	ESL Intro to Math 15-5
3.1.3	**Specific Outcome** Compare quantities from 0.01 to 10 000 using the terms more, fewer, as many as, and the same as, using whole numbers, fractions, and decimals.	✓
3.1.4	**Specific Outcome** Express, construct, and deconstruct numbers based on their place value from 0.01 to 10 000.	✓
3.1.5	**Specific Outcome** Describe, represent, and compare integers.	✓
3.1.6	**Specific Outcome** Express numerals as found in addresses, phone numbers, dates, prices, temperature, and time using the appropriate vocabulary and in the correct context.	✓
3.1.7	**Specific Outcome** Identify the monetary values of Canadian currency and solve problems involving currency.	✓
3.1.8	**Specific Outcome** Identify when GST should be applied and calculate GST in various situations.	✓
3.1.9	**Specific Outcome** Demonstrate addition with answers to 10 000 and corresponding subtraction to solve problems.	✓
3.1.10	**Specific Outcome** Demonstrate multiplication, up to 2-digit by 2-digit, and division, up to 3 digit by 1-digit, using strategies to solve problems.	✓
4	**Topic** Patterns and Relations	✓
4.1	**General Outcome** How does the ability to recognize, describe, and work with numerical and non-numerical patterns contribute to our understanding of and interaction with our environment?	✓
4.1.1	**Specific Outcome** Identify, reproduce, extend, and create repeating patterns from daily experiences.	✓
4.1.2	**Specific Outcome** Demonstrate an understanding of increasing and decreasing numerical and non-numerical patterns.	✓
4.1.3	**Specific Outcome** Describe equality and record using symbols.	✓
4.1.4	**Specific Outcome** Explore numerical and non-numerical patterns in daily experience.	✓

Curriculum Elements		ESL Intro to Math 15-5
4.1.5	**Specific Outcome** Represent, describe, and extend patterns and relationships using charts and tables.	✓
4.1.6	**Specific Outcome** Determine the pattern rule to make predictions about subsequent elements.	✓
4.1.7	**Specific Outcome** Demonstrate and explain the meaning of equality concretely, pictorially, and symbolically.	✓
4.1.8	**Specific Outcome** Express problems in one-step equations with a single variable and solve.	✓
5	**Topic** Shape and Space	✓
5.1	**General Outcome** How does having spatial sense and spatial reasoning help us understand mathematics as well as our environment?	✓
5.1.1	**Specific Outcome** Use direct measurement to compare two objects based on a single attribute.	✓
5.1.2	**Specific Outcome** Sort, build, and classify real-world objects.	✓
5.1.3	**Specific Outcome** Demonstrate an understanding of measurement.	✓
5.1.4	**Specific Outcome** Sort 2-D shapes and 3-D objects using one attribute.	✓
5.1.5	**Specific Outcome** Estimate, measure, compare, and order using referents and nonstandard units of measurement.	✓
5.1.6	**Specific Outcome** Describe, compare, and construct 2-D shapes and 3-D objects.	✓
5.1.7	**Specific Outcome** Relate the passage of time to common activities.	✓
5.1.8	**Specific Outcome** Estimate, measure, and record using whole numbers and standard measurement units.	✓
5.1.9	**Specific Outcome** Describe 3-D objects according to faces, edges, and vertices.	✓

Curriculum Elements		ESL Intro to Math 15-5
5.1.10	**Specific Outcome** Sort regular and irregular polygons.	✓
5.1.11	**Specific Outcome** Read and record time and dates	✓
5.1.12	**Specific Outcome** Determine area of regular and irregular 2-D shapes.	✓
5.1.13	**Specific Outcome** Demonstrate understanding of measuring length, volume, and capacity. Possible linguistic functions: analyze, solve problems/problem solve	✓
5.1.14	**Specific Outcome** Use formulas to calculate area, surface area, perimeter, circumference, diagonals, and metric conversions.	✓
5.1.15	**Specific Outcome** Identify and create line symmetries on various 2-D shapes.	✓
6	**Topic** Statistics and Probability	✓
6.1	**General Outcome** How do having knowledge of and skills in statistics and probability help us deal with uncertainty, predictability, and interpretation of data in our lives?	✓
6.1.1	**Specific Outcome** Gather and record data about self and others.	✓
6.1.2	**Specific Outcome** Construct and interpret concrete graphs and pictographs.	✓
6.1.3	**Specific Outcome** Collect first-hand data and organize it to answer questions.	✓
6.1.4	**Specific Outcome** Construct, label, and interpret bar graphs to solve problems	✓
6.1.5	**Specific Outcome** Construct and interpret pictographs.	✓
6.1.6	**Specific Outcome** Represent, display, and interpret double bar graphs to draw conclusions.	✓

Curriculum Elements			ESL Intro to Math 15-5
7	**Topic** Technology		✓
7.1	**General Outcome** How does technology enhance our understanding of mathematics and our understanding of and interaction with our environment?		✓
7.1.1	**Specific Outcome** Effectively use common measuring devices such rulers, measuring tapes, and thermometers.		✓
7.1.2	**Specific Outcome** Effectively use calculators, simple to scientific, to solve problems.		✓

Statement of Overlap with Existing Programs

Similar / Overlapping Courses	Description of Similarity / Overlap - Rationale
ESL Introduction to Canadian Studies 15	The language learning outcomes in this course overlap with ESL Introduction to Canadian Studies 15, 25 and ESL Introduction to Science 15, 25 because the language learning outcomes are based on the Alberta K-12 ESL Proficiency Benchmarks, which apply to all these courses.
	The language skills, conceptual understandings, and procedural knowledge acquired in ESL Introduction to Math 15 bridge the gap for ELLs and form the foundation for success in future math courses. Once knowledge of mathematical language, concepts, and procedures have been established through this course, students will be better able to enter into Alberta Education Math programming. Students will continue to require differentiated instruction focused on academic language development in future math courses.
ESL Introduction to Canadian Studies 25	The language learning outcomes in this course overlap with ESL Introduction to Canadian Studies 15, 25 and ESL Introduction to Science 15, 25 because the language learning outcomes are based on the Alberta K-12 ESL Proficiency Benchmarks, which apply to all these courses.
	The language skills, conceptual understandings, and procedural knowledge acquired in ESL Introduction to Math 15 bridge the gap for ELLs and form the foundation for success in future math courses. Once knowledge of mathematical language, concepts, and procedures have been established through this course, students will be better able to enter into Alberta Education Math programming. Students will continue to require differentiated instruction focused on academic language development in future math courses.
ESL Introduction to Science 15	The language learning outcomes in this course overlap with ESL Introduction to Canadian Studies 15, 25 and ESL Introduction to Science 15, 25 because the language learning outcomes are based on the Alberta K-12 ESL Proficiency Benchmarks, which apply to all these courses.
	The language skills, conceptual understandings, and procedural knowledge acquired in ESL Introduction to Math 15 bridge the gap for ELLs and form the foundation for success in future math courses. Once knowledge of mathematical language, concepts, and procedures have been established through this course, students will be better able to enter into Alberta Education Math programming. Students will continue to require differentiated instruction focused on academic language development in future math courses.
ESL Introduction to Science 25	The language learning outcomes in this course overlap with ESL Introduction to Canadian Studies 15, 25 and ESL Introduction to Science 15, 25 because the language learning outcomes are based on the Alberta K-12 ESL Proficiency Benchmarks, which apply to all these courses.
	Students with limited formal schooling and students at beginner levels of English language proficiency require time and explicit instruction to help them develop academic language skills and to learn basic mathematical skills, concepts, reasoning, and communication in preparation for entry into high school-level Mathematics courses.