03_Language of Mathematics

Content Area: **English Language Services**
Course(s):
Time Period: **Full Year**
Length: **6-8 weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

Students identified as limited English proficient, will receive pull-out services in individual or small groups settings for a minimum of 120 minutes per week of instruction. *This course is designed for English Language Learners in* ***grades 9-12****.* Throughout the school year the students will investigate the following global themes: school culture, holidays, immigration, challenges, growing & changing, communicating for academia & social skills. This enables the students to focus & progress on their skills in listening, reading, speaking & writing as they progress through English language proficiency levels. Students will learn content and be assessed through various performance tasks using many different methodologies that are scaffolded to meet the ever-changing needs of English language learners. The goal of the ELS program is to help students develop language skills necessary to be successful students and members of society.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Narrate -Interpret and construct narratives with complex plots, themes, and developments

Identify perspectives in historical narratives and discern authors' intent in presenting history in a particular light

Develop characters in their own stories and connect themes to issues in past and present

Inform - Manage information about entities according to their composition, taxonomies, and classifications

Identify and describe various relationships among ideas and information

Use available new information to construct and revise research reports that incorporate multiple sources of information

Explain - Analyze and evaluate data in explanations

Identify multilayered causal or consequential relationships in social or scientific phenomena

Apply reasoning or theory to link evidence to the claims in explanations

Construct and revise explanations based on evidence from multiple sources

Argue -Construct claims that offer objective stance using less polarized language so that claims appear more "balanced"

Anticipate what evidence audiences will need and adjust evidence and reasoning accordingly

Adjust arguments based on new data from experiments

Discern what types of arguments are needed, when they are needed, and what purposes they meet in different content areas

Essential Questions:

- How do we introduce mathematical concept or entity?
- How do we share solutions with others?
- How do we describe data and/or approach used to solve a problem?
- How do we state reasoning used to generate own or alternate solutions?
- How do we create precise conjecture, using definitions, previously established results, and stated assumptions?
- How do we generalize logical relationships across cases?
- How do we justify conclusions with evidence and mathematical principles?
- How do we evaluate and extend others' arguments?

Enduring Understandings:

- English language learners engage in oral communication in a variety of situations for a variety of purposes and audiences.
- English language learners engage in written communication in a variety of forms for a variety of purposes and audiences.
- English language learners process, interpret, and evaluate written language, symbols, and text with understanding and fluency.
- English language learners process, understand, interpret, and evaluate spoken language in a variety of situations.

CONTENT AREA STANDARDS

WIDA Standard 3: Language for mathematics

English language learners communicate information, ideas, and concepts necessary for

academic success in the content area of Mathematics

ELL.9-12.3	The Language of Mathematics
ELL.9-12.3.L.1.1	Identify properties of geometric figures based on visual representations and oral descriptions
ELL.9-12.3.L.2.1	Visualize, draw or construct geometric figures based on visual representations and oral descriptions
ELL.9-12.3.L.3.1	Locate intersections of geometric figures based on visual representations and oral descriptions (e.g., points, lines or planes)
ELL.9-12.3.L.4.1	Compare two- and three-dimensional figures based on visual representations and oral descriptions
ELL.9-12.3.L.5.1	Transform geometric figures (e.g., rotations, reflections or enlargements) by following oral directions
ELL.9-12.3.S.1.1	Exchange key words involved in problem solving from models and visual support in L1 or L2 with a partner
ELL.9-12.3.S.4.1	Describe two or more approaches to solve problems using visual support and share with a partner
ELL.9-12.3.S.5.1	Explain to peers, with details, strategies for solving problems

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

21st. Century Life & Careers

Creativity & Innovation

Critical Thinking

Communication

Collaboration

Life & Career Skills

Information Literacy

Media Literacy

Chronological Thinking

Spatial Thinking

Presentational Skills

Problem Solving

Decision Making

	Comprehension and Collaboration
	Comprehension and Collaboration
LA.SL.11-12.6	Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.
LA.SL.9-10.6	Adapt speech to a variety of contexts and tasks, demonstrating command of formal English.
LA.L.11-12	Language
LA.L.9-10	Language
LA.L.9-10.1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
LA.L.11-12.1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
LA.L.11-12.6	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
LA.L.9-10.6	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

STUDENT LEARNING TARGETS

Refer to the 'Declarative Knowledge' and 'Procedural Knowledge sections.

Declarative Knowledge

Students will understand that:

- mathematical terms and phrases describe concept, process, or purpose.
- relating verbs (belong to, are part of, be, have) define or describe concept.
- language choices reflect on completed and on-going process (we should have done this, we might be able to, what if we try).
- modality (verbs, adverbs, nouns, adjectives) express opinions, degrees of certainty, or temper disagreement (it’s a possibility, that’s definitely wrong, we need to).
- connectors link sentences and longer stretches of text signaling details of time (next, at the same time), causality (therefore, consequently, as a result), clarification (for example, as seen in the model).
- conditional conjunctions propose future options (if/so, if/then) and generalized relationships (if/will; if a transversal crosses parallel lines, then the alternate interior angles are congruent).

- verb groups and sequential connectors (first, then) recount and explain steps in solving problems assumed to be solvable.
- relating verbs (have, belong to, be) define principles, operational theorems and properties (an inscribed angle is the angle formed when… A rhombus is a parallelogram with perpendicular diagonals.).
- verbs apply mathematical principles, as in commands (use, do, apply) across cases (We need to rewrite the equation to see if we can use factors to solve it.).
- models, drawings, graphs demonstrate principles.
- questions (what, how, why, do), requests (could, would) ask for information, clarification, procedure (Could you show me how you got that answer? Why did you do…instead of…?).

Procedural Knowledge

Students will be able to:

- identify concept or entity.
- describe two or more approaches by using visuals to solve problems.
- explain to peers, detailed methods for finding solutions.
- analyze data and owning problem-solving approaches.
- evaluate rationales, models, and/or interpretations based on evidence and mathematical principles.
- compare conjectures with previously established results and stated assumptions.
- distinguish correct from flawed logic.
- evaluate relationships among evidence and mathematical principles to create generalizations.

EVIDENCE OF LEARNING

Refer to the 'Formative Assessments' and 'Summative Assessments' sections.

Formative Assessments

- quizzes/tests
- analyzing variety of student work
- strategic questioning
- listening comprehension tasks
- exit tickets

- class participation/ discussions
- daily communication activities via the 3 modes of communication
- online mini-assessments
- partner activities
- individual/group response
- worksheets
- homework
- retell
- list
- sorting
- following directions
- answer comprehension questions
- fluency
- practice and successfully completing activities and exercises with little assistance
- exit tickets

Summative Assessments

- final interpersonal or speaking presentations
- completing projects or assignments
- end-of unit projects or assignments
- portfolio (multiple formats)
- completion of "Can-Do" statements for interpersonal speaking, presentational speaking, presentational writing, interpretive listening, and interpretive reading
- role playing
- tests/quizzes
- research papers
- culminating communicative activity
- student assessment through authentic interpretive, interpersonal and presentational activities

RESOURCES (Instructional, Supplemental, Intervention Materials)

https://www.eslcafe.com/resources/lesson-plans/math

https://www.thoughtco.com/math-vocabulary-1210098

https://www.hoodamath.com/games/highschool.html

https://www.brainpop.com/

worksheets

YouTube videos

activities

https://www.kidzone.ws/math/grade1.htm

INTERDISCIPLINARY CONNECTIONS

WIDA Standard 1: Language for Social and Instructional Purposes English language learners communicate for social and instructional purposes within the school setting.
WIDA Standard 2: Language for Language Arts English language learners communicate information, ideas and concepts necessary for academic success in the content area of language arts.
WIDA Standard 3: Language for Mathematics English language learners communicate information, ideas and concepts necessary for academic success in the content area of mathematics.

Career Ready Practices:

CRP2. Apply appropriate academic and technical skills. Career readiness.

CRP4. Communicate clearly and effectively and with reason. Life readiness & key skills.

CRP11. Use technology to enhance productivity.

Technology Operations & Concepts/ Interdisciplinary Connections:

Data collection/analysis
Computations
Statistics
Financial/Economic/Business/Entrepreneurial Literacy

Google
Media Literacy
Educational tech applications

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.

- teacher modeling
- repetitions
- simplify written and verbal instructions
- use teaching strategies and learning resources that that make content comprehensible
- cultural responsiveness
- total Physical Response (TPR) - direct action to internalize new language learning concepts
- provide leveled or guided reading
- provide regular and/or picture dictionaries
- couple new vocabulary with visual references
- simplify written and verbal instructions
- modify activities & assessments
- scaffolding
- graphic organizers
- modify lesson pacing and/or structure
- word banks
- provide extended time
- providing examples
- provide additional instruction including reviews, & drills
- alternate responses such as, drawing a series of pictures with captions, oral responses, etc.
- frequent breaks
- rephrase questions, directions & explanations
- shorten reading assignments
- adapt homework to reflect language proficiency and home support
- use story retellings to assess comprehension