

ST Math, Emergent Bilingual Learners, and the English Language Proficiency Standards (ELPS)



ST Math’s patented visual learning approach—where students manipulate objects in space and time—activates spatial-temporal reasoning skills. This game-based method increases access for students at all proficiency levels, especially Emergent Bilinguals (EBs), by providing visual models that support conceptual understanding without language.

ST Math games are intended to be used both individually and collaboratively, and when students get excited about games, they are naturally drawn to sharing, discussing, and comparing their observations, questions, and strategies. This provides a meaningful foundation for connecting increasingly sophisticated mathematical language to students’ developing mathematical schemas as they share ideas, listen to others’ ideas, and reflect on their learning in discussions and in writing.

ST Math Puzzle Talks enhance language learning through short, teacher-led mini-lessons that use an ST Math puzzle to spark student problem-solving and encourage rich mathematical discussion. They offer a powerful and engaging way for EBs to strengthen both their math and language skills within a meaningful and rigorous learning experience.

The guide below outlines key English Language Proficiency Standards (ELPS) with explanations and resources for supporting students in developing these skills through ST Math games and Puzzle Talks.

Domain	GK–3 ELPS	G4–12 ELPS	ST Math Implementation	Examples and Resources
Listening	1.B - demonstrate an understanding of content-area vocabulary when heard during formal and informal classroom interactions by responding with gestures or images, orally, or in writing	1.B - use contextual factors or word analysis such as cognates, Greek and Latin prefixes, suffixes, and roots to comprehend content-specific vocabulary when heard during formal and informal classroom interactions by responding with gestures or images, orally, or in writing	ST Math game discussions and Puzzle Talks support key academic and language development standards by engaging students in meaningful mathematical conversations grounded in visual problem-solving. Using a shared, language-free visual	<ul style="list-style-type: none"> Language Learning in ST Math: From Spatial-Temporal Learning to Academic Language, Introducing Academic Vocabulary, and Guiding Students to Use Increasingly Sophisticated Academic Language - These

	1.D - use context to construct the meaning of descriptive language, words with multiple meanings, register, or figurative language such as idiomatic expressions heard during formal and informal classroom interactions	1.D - use context to construct the meaning of descriptive language, words with multiple meanings, register, or figurative language such as idiomatic expressions heard during formal and informal classroom interactions	puzzle, students are encouraged to communicate their thinking, listen to others, and build collective understanding.	strategies support EB students in acquiring new academic language and demonstrating understanding in context.
	1.E - demonstrate listening comprehension from information presented orally during formal and informal classroom interactions by recalling, retelling, responding, or asking for clarification or additional details	1.E - demonstrate listening comprehension from information presented orally during formal and informal classroom interactions by restating, responding, paraphrasing, summarizing, or asking for clarification or additional details	Multiple resources (see next column) support teachers in facilitating discussions around key mathematical ideas while students play ST Math games. Each Puzzle Talk follows a consistent structure and uses intentional questioning strategies to intertwine development of mathematical concepts with academic language acquisition.	<ul style="list-style-type: none"> • Vocabulary - Each Puzzle Talk includes suggested vocabulary that can be incorporated throughout the lesson. • Multilingual Vocabulary Tools support students in exploring, recording, and recalling mathematical vocabulary using multiple languages. • Students demonstrate listening comprehension by showing their thinking using Game Mats or Math Mats included with some Puzzle Talks. • Problem Solving Process Questioning Strategy
Speaking	2.B - speak using content-area vocabulary during formal and informal classroom interactions to demonstrate acquisition of new words and high-frequency words	2.B - speak using content-area vocabulary during formal and informal classroom interactions to demonstrate acquisition of new words and high-frequency words	During ST Math game discussions and Puzzle Talks, the emphasis is on student voice. While teachers facilitate a discussion, students are the ones doing the majority of the talking—explaining their thinking, engaging in peer conversations, and sharing ideas with the class. Teachers guide the process by posing purposeful questions and prompting students to think	<ul style="list-style-type: none"> • Language Learning in ST Math: From Spatial-Temporal Learning to Academic Language, Supporting Academic Vocabulary, Supporting Oral and Written Discourse, and Guiding Students to Use Increasingly Sophisticated Academic Language - These strategies support EB students using academic language in formal
	2.E - narrate, describe, or explain information or persuade orally with increasing specificity and detail during formal and informal classroom interactions	2.E - narrate, describe, explain, justify, discuss, elaborate, or evaluate orally with increasing specificity and detail in academic context or discourse		
	2.F - restate, ask questions about,	2.F - restate, ask questions about,		

	or respond to information during formal and informal classroom interactions	or respond to information during formal and informal classroom interactions	critically, turn and talk with a partner, or contribute to whole-class discussions. Lesson notes in Puzzle Talks include suggested questions, extension ideas, and resources designed to foster rich mathematical discourse among students and create a collaborative learning environment.	and informal mathematical discussions about ST Math games and Puzzle Talks. <ul style="list-style-type: none"> • Sentence Stems - Students are encouraged to respond to open ended problem solving questions, using sentence stems as supports <ul style="list-style-type: none"> ○ K-1 (English Spanish) ○ 2-8 (English Spanish) • Math Discourse Facilitation Strategies - Engagement and communication are suggested throughout Puzzle Talks. • Vocabulary - Each Puzzle Talk includes suggested vocabulary that can be incorporated throughout the lesson. • Multilingual Vocabulary Tools support students in exploring, recording, and recalling mathematical vocabulary using multiple languages.
Reading	3.C - use high-frequency words, cognates, and content-area vocabulary to comprehend written classroom materials	3.C - use high-frequency words, contextual factors, and word analysis such as Greek and Latin prefixes, suffixes, and roots and cognates to comprehend content-area vocabulary in text	Some Puzzle Talks include paired slides that present a word problem followed by a puzzle where students can model and solve the problem. Discussion questions support the student in making meaning of the word problem, connecting the context to the	<ul style="list-style-type: none"> • Language Learning in ST Math: Supporting Word Problems - These strategies support EB students in making sense of and solving word problems as their language skills grow.
	3.E - use pre-reading strategies, including previewing text features, connecting to prior	3.E - use pre-reading strategies, including previewing text features, connecting to prior		

	knowledge, organizing ideas, and making predictions, to develop comprehension	knowledge, organizing ideas, and making predictions, to develop comprehension	mathematical ideas from the Puzzle Talk, and explaining how their models and solutions relate to the original context. These word problem puzzles provide students with supported opportunities to make sense of mathematical and contextual language and connect it with spatial-temporal reasoning.	
	3.F - derive meaning from and demonstrate comprehension of content-area texts using visual, contextual, and linguistic supports	3.F - derive meaning from and demonstrate comprehension of content-area texts using visual, contextual, and linguistic supports		
	3.G - demonstrate reading comprehension of content-area texts by making connections, retelling, or responding to questions	3.G - demonstrate reading comprehension of content-area texts by retelling, paraphrasing, summarizing, and responding to questions		
Writing	4.C - write using high-frequency words and content-area vocabulary	4.C write using a combination of high-frequency words and content-area vocabulary	ST Math Journals and Puzzle Talks provide a rich set of opportunities for students to explain their thinking and reflect on their learning orally and through writing.	<ul style="list-style-type: none"> • Language Learning in ST Math: Supporting Academic Vocabulary, Supporting Oral and Written Discourse, and Guiding Students to Use Increasingly Sophisticated Academic Language - These strategies support EB students using academic language in writing as part of their ongoing ST Math routines and in Puzzle Talks. • Journal Pages provide opportunities for students to reflect on their learning, describe their strategies in writing, and record key vocabulary.
	4.D - write using a variety of grade-appropriate sentence lengths and types and connecting words	4.D write content-area texts using a variety of sentence lengths and types and transition words		
	4.F - write to narrate, describe, explain, respond, or persuade with detail in the content areas	4.F - write to narrate, describe, explain, respond, or justify with supporting details and evidence using appropriate content, style, register, and conventions for specific purpose and audience		

Incorporating ST Math into Texas Bilingual/ESL Programs

The Texas Education Agency (TEA) has approved six models for supporting emergent bilingual students:

- Dual Language Immersion with a goal of supporting students in attaining bilingualism and biliteracy through offering at least 50% of instruction in a non-English language
 - One-Way with classrooms where EB learners learn equally in two languages)
 - Two-Way with classrooms where native English speakers and ELLs learn together in two languages
- Transitional Bilingual models where EB learners utilize their home language as a resource while acquiring full proficiency in English, so that the percentage of instruction offered in their home language decreases over time
 - Early Exit with full transition to English-only education in 2-5 years
 - Late Exit with full transition to English-only education in 6-7 years
- English as a Second Language models where EB are taught in English by an ESL-certified educator who uses linguistically-sustaining practices that leverage students' knowledge in their home language and cultural practices to support acquiring English
 - ESL Content Based where students have an ESL-certified teacher for all subject areas
 - ESL Pull-Out where students have an ESL-certified teacher for all subject areas in ELA and reading only

ST Math is designed to invite students into meaningful problem solving and build their mathematical schemas without language, which makes it appropriate for use in any bilingual or ESL program model. All students can learn from—and get excited about—ST Math games without any language barriers hindering content learning, which makes ST Math games a solid jumping-off point for rich language instruction in any language and at any level of language proficiency.

The [Language Learning in ST Math](#) guide provides tools that teachers can use in any of the six models to plan instruction for introducing and supporting academic vocabulary, supporting oral and written discourse, and guiding students to use increasingly sophisticated academic language in both English and their home language or as they transition to English-only instruction. These activities, strategies, and suggestions for adaptations support teachers in using ST Math and Puzzle Talks to flexibly meet students' linguistic and academic needs based on the needs of their students and the program model.

For dual-language, transitional, and ESL models supporting Spanish speakers, many ST Math resources for oral and written discourse are available in both English and Spanish. In addition, several [vocabulary resources](#) support students in recording vocabulary in two languages and then describing the vocabulary in whatever languages make sense to them, which can help students make connections between multiple languages or use their home language as a transition into English.