

Supporting Multilingual Learners with Zearn: A Core Curriculum Approach

Introduction

Language learners of all levels can and should engage with grade-level math content that is scaffolded with the appropriate amount of linguistic support. The Zearn Math approach to teaching and learning fosters the side-by-side development of math understanding and language competence, as students are provided with opportunities to both access mathematics using existing language skills and extend their language development in the context of mathematical sense-making. Each day with Zearn Math, students learn in a classroom model designed for daily differentiation, experience inclusive environments of social belonging, and receive linguistic support across whole-group, small-group, and individual learning formats. Thoughtfully designed curricular materials and Curriculum Study, Zearn Math's pedagogical content PD, help teachers build expertise that empowers them to support students' language development as they learn math and encounter areas of struggle. While these features of Zearn Math support all students in building a deep understanding of grade-level mathematics, they are particularly critical for meeting the needs of English Learners, who are simultaneously learning math and acquiring language.

Features of Zearn Math that support English Learners and foster language development **include**:

Curriculum Approach

→ FLEXIBLE LEARNING ENVIRONMENTS

Zearn Math is built on the Universal Design for Learning (UDL) framework, a set of research-based guidelines designed to create flexible learning environments that accommodate individual learning differences and ensure all students can access and participate in learning opportunities. Zearn Math aligns with UDL principles by providing students with multiple ways to engage in learning, acquire knowledge, and demonstrate understanding. Each day with Zearn Math, students learn independently on software-based lessons and in small groups with their teacher and peers. Across these learning experiences, students have opportunities to engage with the same math content in multiple ways using multiple modalities. As students work through Independent Digital Lessons, they learn and practice new concepts at their own pace with concrete and digital manipulatives, interactive videos, pictorial representations, paper-and-pencil transfer, and precise digital feedback at the moment of misconception. During Small Group Lessons, students model math with concrete manipulatives, represent their work on paper, discuss their reasoning aloud, and receive direct feedback from their teacher and classmates. All students build a deep understanding of grade-level content through this multimodality learning, as they engage with math ideas through words, texts, pictures, discussions, and concrete examples.

This approach also ensures English Learners have daily development opportunities across all language domains—writing, speaking, listening, and reading—that Zearn Math scaffolds with temporary supports. Students have repeated and supported ways to make meaning of math concepts and articulate them into written and spoken words, sentences, and paragraphs. During software-based lessons, students watch and hear on-screen teachers model math and math language and problem solve using paper-and-pencil notes and digital manipulatives such as word tiles. At each step, students are supported with digital remediation that breaks down complex problems, so

students can make sense of what is being asked of them and organize their thinking. During Small Group Lessons, English Learners have repeated opportunities to talk about their mathematical thinking, negotiate meaning with others, and collaboratively solve problems with direct feedback from their teacher. Zearn Math scaffolds this small group instruction for English Learners with concrete manipulatives that support sense-making and guidance for teachers on how to model math and create structured peer interactions.

→ CONCRETE TO PICTORIAL TO ABSTRACT (CPA)

As students learn new concepts with Zearn Math, they progress from using concrete materials to pictorial representations to abstract symbols, and they move back and forth between each stage to ensure concepts are reinforced. Through this approach, all students build a deep and sustainable understanding of math as new, abstract concepts are introduced in tangible and concrete ways. This approach also supports students' language development, as students make connections across representations and describe their thinking aloud during each phase of math learning. Zearn Math includes supports that scaffold and foster this language development for students who are learning English. Materials for Small Group Lessons provide teachers with sentence frames they can use to support English Learners as students describe connections across representations during partner talks and small group discussions. For example, the sentence frame, "I partitioned into ____ (fractional unit). I shaded ____ (number of) ____ (fractional unit)," helps students verbalize their thinking as they concretely model their math with fraction strips. Additionally, during Math Chats, the guided practice portion of Independent Digital Lessons, on-screen teachers lead "think alouds" where they point out connections across representations while modeling the math with digital manipulatives and concrete objects.

→ APPROACH TO PROBLEM SOLVING

Three pumpkins and two squash weigh 27.5 pounds. Four pumpkins and three squash weigh 37.5 pounds. Each pumpkin weighs the same as the other pumpkins, and each squash weighs the same as the other squash.

How much does each pumpkin weigh? How much does each squash weigh?

0:55 3:34 CC

Zearn Math teaches students to problem solve by first drawing a picture that models their understanding of the mathematics after they read a problem. Drawing a picture helps students make meaning of problems and understand which models or operations may or may not work for problem solving. This approach, which emphasizes careful reading and visualization, helps all students build flexible and accurate solving skills that they can apply across different problem contexts. Students are also introduced to the language used in mathematics and exposed to grade-appropriate, complex texts as they problem solve.

Zearn Math supports English Learners as they experience challenging texts by scaffolding problem solving rather than by simplifying language. This approach broadens students' exposure to English, while simultaneously providing support, so that they can expand their vocabularies, navigate increasingly complex texts, and communicate their thinking orally and in writing.

Across each part of the daily Zearn Math student experience, complex language is broken down through scaffolded supports to ensure students can make meaning of the text. For example, during Independent Digital Lessons, students view problems with rich animations and are supported in constructing their own model of the problem using high-quality digital manipulatives. If students struggle, they receive precise, in-the-moment digital feedback that highlights the relevant part of the word problem, provides further scaffolding, and allows the student to try again. As students work through word problems, they are also taught to answer in complete sentences. During software-



based lessons, this sentence construction is often scaffolded with sentence frames. Students also have un-scaffolded opportunities to write their own answer sentences and receive feedback from their teacher while completing Student Notes and working through problems during Whole Group Word Problems and Small Group Lessons.

Elements of Language

Students are exposed to many elements of language during their daily learning with Zearn Math, such as mathematics vocabulary and discourse patterns of spoken language. Zearn Math’s intentional design ensures that students are supported as they develop skills across these different elements.

→ ESSENTIAL VOCABULARY

Students are not expected to have prior knowledge of essential math vocabulary, and language critical to student learning is thoughtfully introduced, taught, and repeated frequently. This progression helps all students gain familiarity with new terminology and practice using it as they move through the curriculum. Zearn Math also provides specific supports that can further scaffold this development for English Learners as they learn new vocabulary in a new language. Teacher materials for small-group instruction highlight the significant terminology introduced in each lesson and include activities and discussion questions that encourage students to reflect as they encounter new vocabulary. For example, in a 2nd grade lesson on measurement, students are prompted to share and discuss new words they have learned—such as “length,” “height,” and “meter”—as their teacher records their responses.

→ PATTERNS OF DISCOURSE

As students engage in rich math discussions during whole-group and small-group time, they have opportunities to organize their language in discourse patterns such as “compare and contrast” or “question and answer.” Teachers facilitate these structured conversations through activities like pair shares, which allow students to make claims, provide evidence, make conjectures, communicate thinking, and critique others’ reasoning. Zearn Math provides scaffolding to support English Learners as they encounter and practice these discourse patterns. Teacher materials for Small Group Lessons include specific notes with conversation starters, sentence frames, or modeling guidance that help enhance discussion quality for all students and ensure English Learners are supported in participating. Examples of conversation starters in Zearn Math materials include, “I noticed that you...,” “I agree/disagree because...,” and “Your solution is different from/the same as mine because...”

Teacher-Led Instruction: Whole Group Warm-Up and Small Group Instruction

→ CLASSROOM LEARNING COMMUNITY

A sense of belonging in the math classroom and community is a precursor to engagement and learning. Zearn Math’s commitment to inclusion and emphasis on positive math mindsets helps teachers create learning environments where all students feel welcome and mistakes are viewed as opportunities for reflection and growth. The balance of whole-group and small-group learning built into the Zearn Math classroom model creates numerous opportunities for all students to participate in math discussions, shifting math dialogue from answer-getting to a participatory discussion. Daily Small Group Lessons also provide teachers with opportunities to build a deep understanding of each student and facilitate math discussions where students can

bring their own learnings and frames of reference into the classroom. A strong classroom community enhances collective learning possibilities and ensures each and every student is able to engage in meaningful learning.

→ MATH DISCUSSION

Students share their own thinking aloud and discuss classmates' problem-solving strategies throughout daily whole-group problem solving and Small Group Lessons. Teachers facilitate thoughtful mathematical discussions between students that allow learners to refer to and build on each others' ideas. As students share their reasoning, are exposed to other perspectives, and engage in mathematical sense-making, they are able to deepen their own understanding and become more creative and effective problem solvers. Zearn Math's small-group format, in conjunction with the personalized learning students experience in Independent Digital Lessons, enables daily math discussions to shift from "answer-getting" focused to rich, ongoing, conversations.

NOTES		
Debrief Questions <ul style="list-style-type: none"> Do you think that paper clips are a reliable measurement tool? Is a ruler a better measurement tool? Why? What did you notice about the relationship between the unit of length (e.g., paper clips, centimeters) and the number of units needed to measure the lines? Use comparative words (<i>bigger, smaller, greater, fewer</i>) in your response. 	Multiple Means of Representation <p>Extend thinking by connecting to real-world experiences. Ask students, "What are some other items you might use to measure your straw?" Students will identify objects that are easy to use as a measure (e.g., erasers, fingers, crayons) either by using mark and move forward or by laying multiple copies.</p>	Multiple Means of Engagement <p>Inverse relationships require thoughtful consideration because they seem to challenge logic and reasoning.</p> <p>Post sentence frames for English language learners for reference during Debrief Questions:</p> <p>"The _____ the unit, the _____ number of units in a given measurement."</p>

Daily math discussion is a critical part of the daily math block for English Learners who are developing mathematical language because it provides opportunities for students to simultaneously make meaning and communicate that meaning. Rich back-and-forth math conversations also allow students to hear and respond to how other students express their understandings. Zearn Math teacher materials for whole- and small group instruction provide guidance on instructional routines that foster these math discussions for all students, with additional notes on supporting English Learners. For example, teachers are prompted to facilitate "Turn and Talks" where pairs of students discuss their math thinking and are encouraged in some situations to let students with limited English fluency choose the language they wish to use. English Learners may benefit from using their first language in these discussions because processing math in their first language can create a safe space for deeper thinking.

Additional strategies included in teacher materials that educators can use to support English Learners include sentence frames, choral response, specific concrete manipulatives, and information about cognates between English and other languages (e.g., numerator / numerador). All of these supports help English Learners develop their understanding of the language used in math questions and problems while they participate in discussion with classmates, actively listen, and make connections between prior learning in their first language and new learning in English.

→ DIRECT FEEDBACK

During Small Group Lessons, students have more opportunities to receive direct feedback from their teacher during moments of misconception. In the small-group format, teachers can better assess individual student understanding as students model their math using concrete manipulatives, share their reasoning aloud, and problem solve. These moments of feedback provide all students with valuable, in-the-moment support and remediation from their teacher, allowing them to correct misconceptions so students can continue learning. The small-group format also allows teachers to gain a specific understanding of English Learners' content learning in conjunction with their language use. As students make claims, justify their claims with evidence, communicate their reasoning, and critique the reasoning of others, teachers have continual formative assessment opportunities, which they can use to differentiate instruction for English Learners in order to more effectively develop students' English skills as they learn math.

→ EXPOSURE TO RANGE OF LEARNERS

Zearn Math recommends that student groupings during Whole Group Warm-Ups and Small Group Lessons vary over

time in order to create opportunities for students to work with classmates with a range of skill levels in mathematics and English language competence. This exposure to a range of learners, whether during partner turn-and-talk time or discussion during Small Group Lessons, allows all students to learn from and work with students with different problem-solving and communication approaches. For English Learners, mixing groups ensures they have multiple exposures to the key uses of language in mathematics, in varied forms, modeled by different speakers.

INDEPENDENT DIGITAL LESSONS

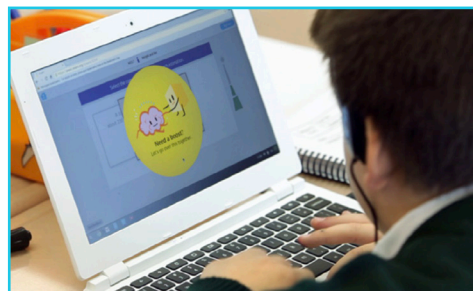
→ INCLUSIVE LEARNING ENVIRONMENT

Zearn Math Independent Digital Lessons aim to represent the diversity found in classrooms across the country, so all students can see someone similar to themselves doing math and persevering through challenges. Students and teachers of all genders and races, as well as students with disabilities, appear on-screen during Independent Digital Lessons. Names used throughout all software and paper materials are thoughtfully selected so that no one group is over- or underrepresented or stereotyped within the context of a particular problem. These features of Zearn Math help all students engage in deep learning and feel they are an equal part of the classroom math community.

→ PRECISE, TIMELY, AND SUPPORTIVE REMEDIATION

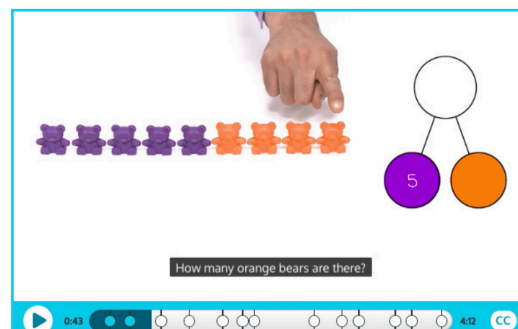
When students make a mistake in the Tower of Power, they receive remediation support in the form of a Boost. The Boost breaks down the question into smaller steps with different visuals and more supportive manipulatives. Students then have a chance to demonstrate their understanding with a new problem. This real-time remediation precisely addresses student misconceptions and gives all students opportunities to visualize problems in multiple ways and try again.

This in-the-moment feedback can be particularly helpful for English Learners by providing scaffolding that helps them make meaning of the text and understand what is being asked of them. If students struggle with a problem during a software-based lesson, they receive precise remediation that highlights the relevant part of the word problem, provides additional scaffolding by breaking down the problem further, and allows them to try again.



→ CLOSED CAPTIONING

Closed captioning for all interactive student videos is available for all Missions for all grades. Zearn closed captioning allows students to turn on an English text transcription of all dialogue and other relevant audio information in the Zearn video player. This feature allows English Learners to access language in multiple modalities—reading and listening—which helps retention and the development of reading skills in mathematics.

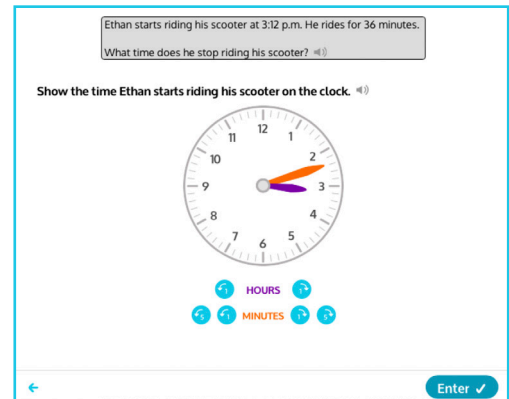


ZEARN MATH TIP

Instructions for enabling closed captioning are available in the Zearn Help Center.

→ **AUDIO SUPPORT**

All instructional prompts students see in Independent Digital Lessons have audio support through either recorded audio or Zearn Math's text-to-speech feature. Students can click on the audio button next to text questions or prompts to hear the words spoken aloud. All math expressions in Zearn Math software-based lessons are read correctly with Zearn Math's text-to-speech tool. Additional audio support, if needed, can be accessed using supported browser text-to-speech tools.



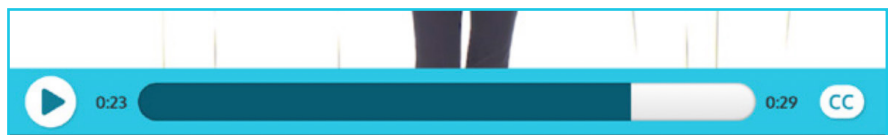
ZEARN MATH TIP

Instructions for enabling browser text-to-speech tools are available in the Zearn Help Center.

→ **PAUSING AND REWINDING**

Students can pause or rewind the video player at any time during Independent Digital Lessons. This feature creates a low risk

setting for all students because students can choose to rewatch specific content or entire lessons while learning independently. It also provides English Learners with repeated opportunities to develop, refine, and extend their understanding of the language used in mathematics over time.



→ **PAPER-AND-PENCIL TRANSFER**

During the guided practice portion of Independent Digital Lessons, students are prompted to complete problems in their paper Student Notes. This transfer of software-based learning to paper deepens understanding for all students by strengthening knowledge retention. Student Notes provide English Learners with safe opportunities to deepen and extend writing skills. Students are exposed to words, expressions, and sentences, not just math symbols and numbers, as they label diagrams, write answer sentences, and explain their solutions. After completing their notes, students are able to view correct and complete versions in the guided practice video and take as much time as needed to correct or update their paper-and-pencil notes. Finally, by checking Student Notes, teachers may be able to provide more targeted feedback when working with English Learners one-on-one or in small-group time.



CLASSROOM MODEL

→ DAILY MIX OF WHOLE-GROUP, SMALL-GROUP, AND INDEPENDENT LEARNING

Each day with Zearn Math, students experience a balance of learning across multiple formats as they participate in a Whole Class Warm-Up and then learn new content in a Small Group with their teacher and peers and at their own pace in Independent Digital Lessons. This rotational model provides all students with daily opportunities to learn, practice, and reflect on their learning in a variety of instructional settings with a variety of different learners. For English Learners specifically, the daily mix of formats ensures they are exposed to a diverse range of thoughts and have chances to hear their teacher and a variety of classmates, as well as on-screen characters, model the language of math in English.

→ WEEKLY SCHEDULE WITH CORE INSTRUCTIONAL TIME AND FLEXIBLE TIME

The Zearn Math pacing guide supports a weekly schedule consisting of four “Core Days” when students learn gradelevel content and one “Flex Day” that can be tailored to meet students’ needs. This schedule ensures students have sufficient time each week to work through grade-level content and built-in weekly time educators can use to differentiate instruction to meet student needs. During Flex Days, teachers can plan targeted mini-lessons that provide enrichment or support or allocate additional time for students to meet weekly lesson completion goals. For English Learners, weekly flex time provides important opportunities for targeted instruction with their teacher or other activities that extend language development beyond linguistic remediation. During a Flex Day, students may participate in structured pair work, where they can share their math thinking aloud and respond to their partner, or undertake writing work that involves explaining their strategies, making a mathematical argument, and providing evidence. Flex Days can provide important weekly time for English Learners to continue to expand their skills at navigating language and writing tasks in the math setting.

ZEARN PROFESSIONAL DEVELOPMENT

→ CURRICULUM STUDY PD

Curriculum Study PD is year-long professional learning that builds deep pedagogical content expertise for teachers on the Zearn Math curriculum. This professional development includes forty one-hour sessions, one for each Mission of every grade, and supports teachers in understanding multiple means of engaging students in learning for each concept and the range of ways students can demonstrate their learning. In grade-level teams each month, teachers collaboratively explore the fluency, application, and conceptual content of each Mission, the student work they should expect to see, and the specific instructional materials they will use in the classroom. Each session dives into key teaching activities, such as modeling how teachers can use scaffolded questioning during word-problem work to help students make meaning of math texts and draw visual representations of problems. Curriculum Study PD helps teachers plan their daily instruction and ensure all students have opportunities to learn, grow, and share their math knowledge over the course of the school year.

→ CLASSROOM IMPLEMENTATION PD

Classroom Implementation PD supports teachers in using Zearn Math in their classrooms. This three-session professional development series provides training on the curricular resources and reports available for instruction, the rotational classroom model, and classroom routines and systems that support independent learning.



It also includes specific guidance on how and when teachers can support productive struggle that allows students to persevere through challenges and receive the remediation they need to be successful. This PD helps teachers prepare to meet the needs of all students, including English Learners, in their classroom.