Mathematics Language Index

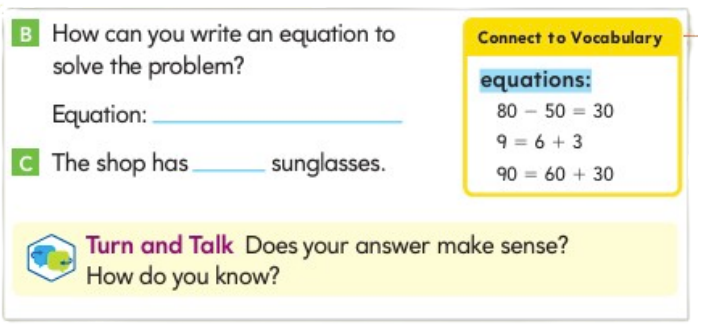
Overview	Language Design Principles	Language Development Page - Module	Lesson Language Objective
5 Language Routines	Tabletop Flipcharts	Anchor Charts	Mathematics Vocabulary
K-2 Professional Learning Cards	3-5 Professional Learning Cards	Establishing Math Talk	Language of Learning Toolkit

Overview

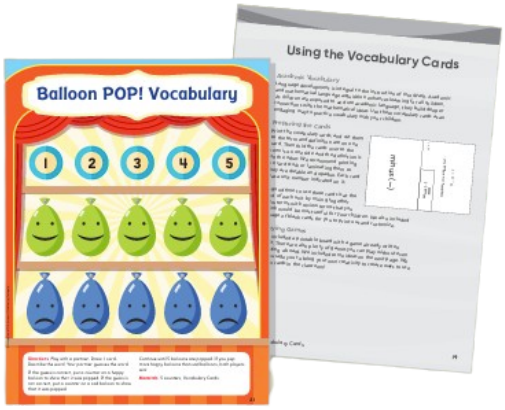
Rigorous Tasks
There is little argument that students need to learn to persevere. Where the struggle exists is in determining the pathway to this important outcome. It begins with a good task. Good tasks are rigorous. Providing rigorous tasks sets the stage for students to engage in worthwhile activity around learning mathematics. Good tasks have “low floors” and “high ceilings” so that students have access to the content regardless of their prior achievement. A rigorous task is one that supports students to do the sense-making. A goal might be to make connections between concepts and procedures, or possibly to determine a solution process when a procedure for the solution has not yet been introduced. Students are expected to explain and justify their thinking. Rigorous tasks afford students the opportunities to develop productive habits of mind around mathematical problem solving.

Just-in-Time Scaffolding
All too often, with best intentions, teachers or resources undermine the value of a good task by providing scaffolding too early. It is tempting to provide scaffolding to students at the first sign of struggle or even in anticipation of student struggle. However, if the struggle is productive, this scaffolding should be withheld. Instead of providing scaffolding just in case students might need it, scaffolding should be offered just in time, when there is evidence that a student’s struggle is no longer productive. While the opportunity to develop perseverance is reliant on access to good tasks, it is supported during instruction by effective teaching. For students to develop perseverance, they must engage in productive struggle. This means that scaffolding, on the student page or from the teacher, needs to be managed in a way that supports students to do the sense-making. Scaffolding should be provided when students’ engagement with the task is no longer productive or when the students’ work is not leading to the learning objective. A key to effective teaching is to know when to provide the scaffolding and when to step aside to allow students to persevere.

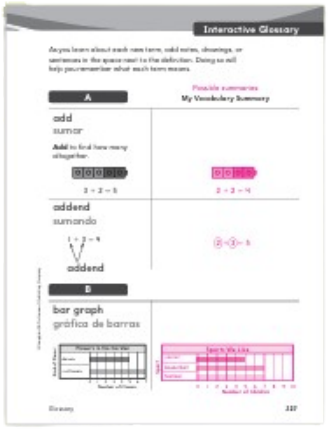
Language Development
Language development and the development of mathematical understanding are interdependent. All students must be able to listen, speak, read, write, and converse to meet the rigorous expectations of standards and become proficient problem solvers.



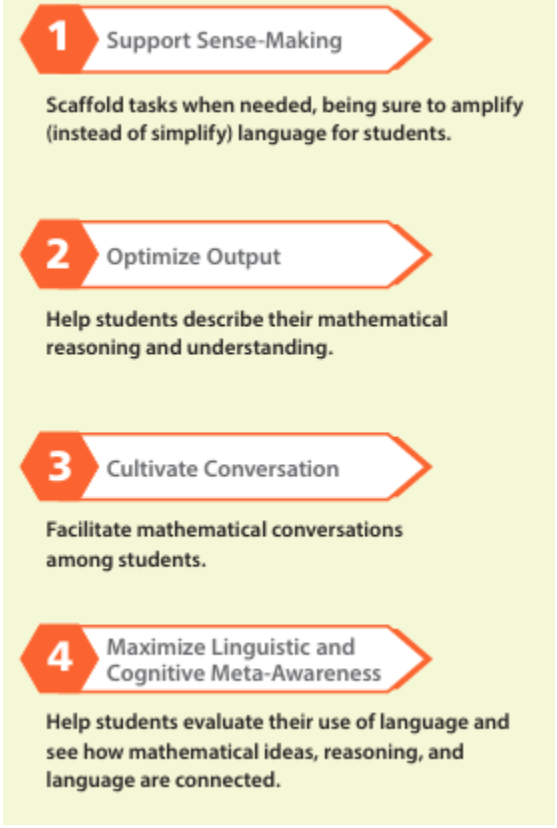
Before teaching new vocabulary, Into Math ensures that students have an opportunity to first build a foundation of conceptual understanding. Vocabulary emerges once students have the conceptual foundation on which to build meaning.



Vocabulary cards can be used with vocabulary games. The eGlossary includes vocabulary terms and definitions translated into ten different languages.



The Interactive Glossary provides space for students to make graphic organizers or drawings for each new vocabulary
term.



“We must explicitly teach the language of mathematics in order to give students—especially English learners— access to mathematics.”

Math is a second language for ALL students. Into Math is built on four design principles from the **Stanford Center for Assessment, Learning, and Equity (SCALE)**. These four design principles promote the use and development of language as an integral part of instruction.

The Language Routines as well as new and review vocabulary words are summarized on the Language Development page at the beginning of each module.

LANGUAGE DEVELOPMENT • Planning for Instruction

By giving all children regular exposure to language routines in context, you will provide opportunities for children to **listen for**, **speak**, **read**, and **write** about mathematical situations. You will also give children the opportunity to develop understanding of both mathematical language and concepts.

Using Language Routines to Develop Understanding

Use the Professional Learning Cards for the following routines to plan for effective instruction.

Three Reads Lessons 2.1, 2.3

Children read a problem or the teacher reads the problem three times with a specific focus each time.

1st Read What is the problem about?
2nd Read What do each of the numbers describe?
3rd Read What math questions could you ask about the problem?

Stronger and Clearer Each Time Lessons 2.3, 2.4, 2.5

Children write their reasoning about a problem, share that reasoning, explain it, listen to feedback, respond to feedback, and then refine their reasoning by writing again.

Compare and Connect Lessons 2.1, 2.2, 2.4

Children listen to a partner's solution strategy, identify it, and then compare it to and contrast it with their own.

Critique, Correct, and Clarify

Children connect the work in a flawed explanation, argument, or solution method; share with a partner; and refine the sample work.

Linguistic Note

Many classroom commands use words that are familiar in isolation, but as phrases may be misunderstood. To help English Language Learners be successful with the lesson, provide additional assistance with phrases such as *make pairs*, *count by twos*, and *equal groups*.

Connecting Language to Understanding Equal Groups

Watch for children's use of review and new terms listed below as they explain their reasoning and make connections with new concepts.

Key Academic Vocabulary

Current Development • Review and New Vocabulary

addends The numbers added together to find the sum	**even** Numbers show pairs with no objects left over
addition equation Number sentence that uses the equal sign and plus sign to show two amounts are equal	**odd** Numbers show pairs with 1 object left over

Lesson Language Objective

Learning Objective
Classify numbers up to 20 as even or odd.

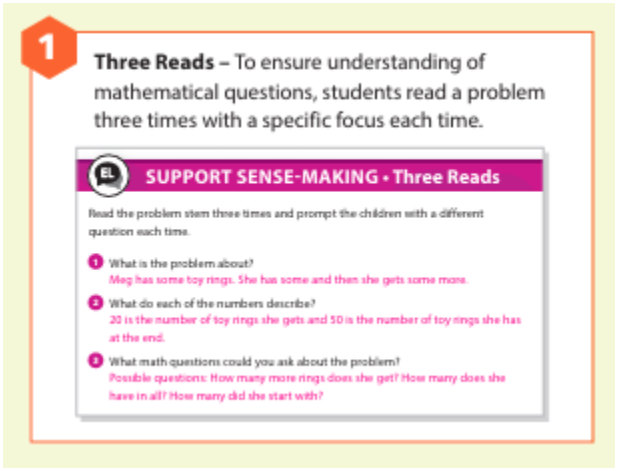
Language Objective
- Explain what even and odd numbers are.
- Tell how even numbers and odd numbers are different.

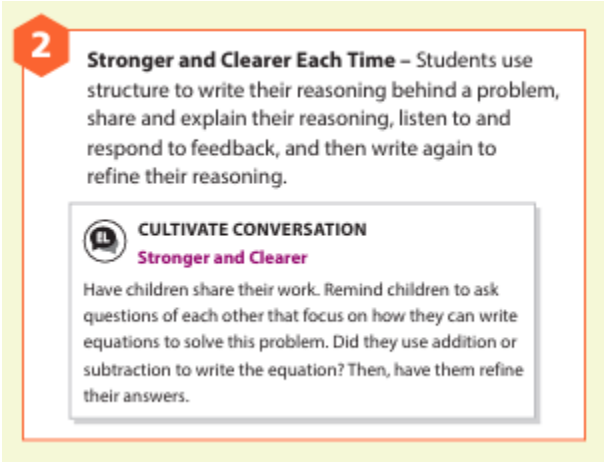
Vocabulary
New: even, odd

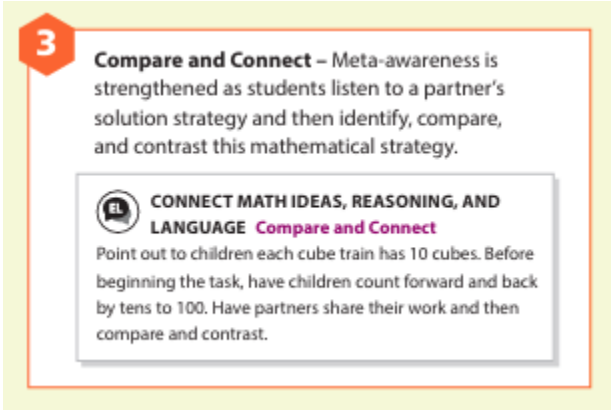
Lesson Materials: counters, connecting cubes

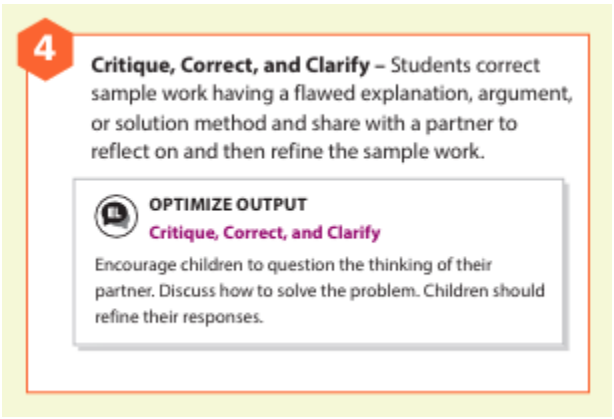
Each lesson has a language objective.

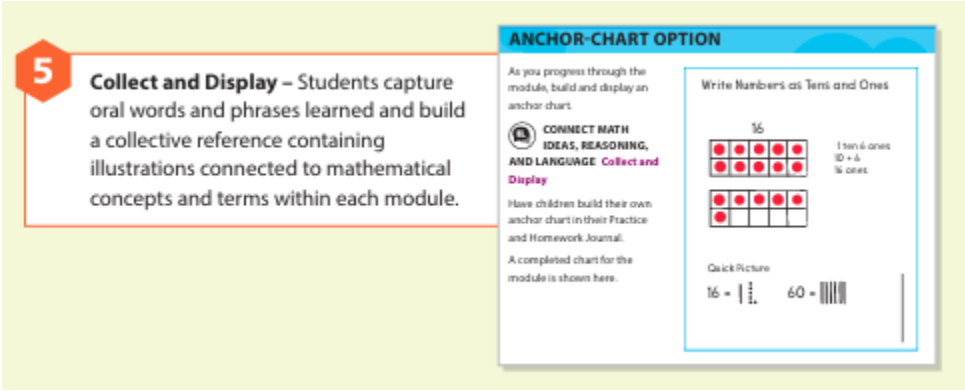
The 5 Routines for Language Development help teachers promote the design principles during instruction with routines that are structured, but adaptable, in a format for amplifying, assessing, and developing students' language. These Routines provide opportunities for students to listen, speak, and write about mathematical situations with practices that are appropriate and effective for **all language proficiency levels**.



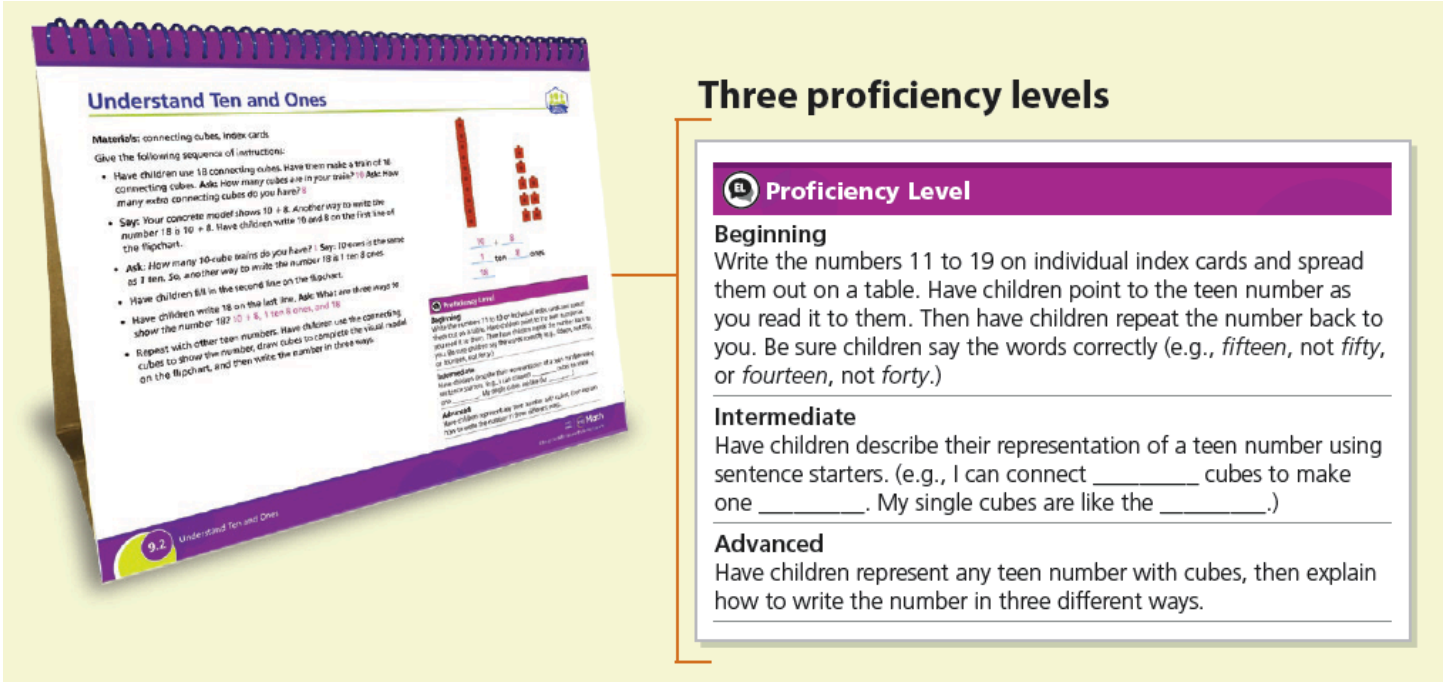








Teacher Tabletop Flipcharts, designed for reteaching and reinforcing each lesson's content with small groups, contain leveled scaffolding and support for English learners. These scaffolding suggestions ensure teachers will maintain the rigor and cognitive complexity level required for mathematical reasoning when supporting English learners.



School Home Letters are available in English, Spanish, Haitian-Creole, and Portuguese.