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English Language Learner Instruction *(cont.)*

Skills for Math *(cont.)*

Clarifying

Teach students this skill so they can clarify meaning in math directions and problems. Encourage ELLs to stop and clarify when they read something they don't understand.

Tips for Teaching the Skill

- ✦ Ask questions and have students ask questions to help them clarify their thinking.
- ✦ Give students feedback on their responses to help students clarify their thinking.
- ✦ Invite students to explain to the class the math concept they just learned.
- ✦ Do comprehension checks to make sure that students understand the process for solving the problem.
- ✦ Help students distinguish the sounds and meanings between math words that sound similar (e.g., many, money; than, then).
- ✦ Create a poster or other visual reminder to help students understand math concepts, directions, and problems. Consider highlighting the following tips on your poster:

- ✓ Re-read.
- ✓ Look for visual cues.
- ✓ Check any unknown words.
- ✓ Read the context.

- ✦ Check in with individual English language learners after the lesson has been presented. Have them repeat back the assignment or review how to do the problem.

Sample Activity

Discuss with students and have them identify the steps needed to solve a problem; do not solve the problem, just focus on the language and meaning.



English Language Learner Instruction *(cont.)*

Teaching Strategies

Teachers use a variety of techniques, methods, and materials to help their ELLs meet learning goals and objectives. The strategies provided in this section may help students feel at ease in the classroom, participate in lessons, and learn new content at the same time they are learning a new language. Incorporate a variety of teaching strategies into lesson plans and classroom activities to address students' needs.

Asking Questions

Use this strategy to help students identify specific information. Questions engage students as they take ownership of their learning. Asking questions, such as “why” or “how,” helps students to develop their critical-thinking skills. Model how to ask questions so that students understand question structure and question-word meaning. Encourage students to ask questions when solving problems. Then relate those questions to the main math concept in the lesson.

Examples

gesture-eliciting questions—Show me which pile of seeds has more seeds.

yes/no questions—Do you have any green seeds?

short-answer questions—Are there more smooth seeds or rough seeds?

sentence frames—You found the number of brown seeds by _____.

Tips for Teaching the Strategy

- ★ Structure questions so that students will respond.
- ★ Begin with questions that students can respond to with gestures.
- ★ Break questions into parts. Use shorter sentences.
- ★ Ask questions to engage students and help them take the next step in their thinking as they explore a math topic.
- ★ Ask questions that require students to explain their thinking.
- ★ Offer questions at various proficiency levels for English language learners.
- ★ Practice wait time. Students need time for the following:
 - to process questions.
 - to solve problems and answer questions.
 - to complete assignments.

Sample Activity

Have students graph a variety of seeds that might be used to plant a garden. Ask students questions at different levels of English proficiency that are similar to the examples above. Differentiate questions based on students' abilities, progressing from simple questions about numbers of different colors of seeds to comparing categories of seeds and solving problems based on the data they compile about their seeds.



Math Language Connections *(cont.)*

Glossary: Math Terms

Math has its own jargon—a vocabulary that can be tricky for struggling ELLs who are still learning the fundamentals of English. ELLs may confuse the word meanings of multiple-meaning words (e.g., *face*, *side*) or become frustrated when more than one math term is used in a sentence. (e.g., **Measure** the **height**, **width**, and **length** of the **object** below.) To help them overcome these obstacles, copy the following glossary pages for each student in your class. Consider adding the “Glossary: Math Verbs” on pp. 61–62 for additional vocabulary help. Your students will feel more comfortable with this challenging subject if they have a math resource to consult.

addend: any of the numbers that are added together (Example: In $9 + 4 = 13$, both 9 and 4 are addends.)

addition: finding the sum, or total, by combining two or more numbers

analog clock: uses moving hour and minute hands to show the time



angle: the space between two straight lines or surfaces that touch or cross each other, measured in degrees

array: an arrangement of objects, pictures, or numbers in columns and rows

attribute: a characteristic that describes an object, such as size, shape, color, etc.

calendar: a chart that shows all the days, weeks, and months in a year

FEBRUARY						
SUN	MON	TUE	WED	THUR	FRI	SAT
	1	2	3	4	5	
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

capacity: the amount that something can hold

cardinal number: a number used to show the amount of something; also called a counting number (Examples: 1, 2, 3)

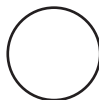
Celsius (C): a measurement of temperature; water boils at 100°C and freezes at 0°C.

cent (¢): a unit of money used in the United States; 100 cents is equal to one dollar.

centimeter (cm): a measure of length in the metric system, equal to $\frac{1}{100}$ of a meter; 2.54 cm = 1 inch

chart: a drawing, graph, or table that shows information

circle: a flat, round shape





Practical Classroom Applications *(cont.)*

Sample Lesson: Exact Estimates

Objective

Given estimation experiences, students will estimate amounts, record data, and evaluate the accuracy of their estimates.

Vocabulary

check: to look at something carefully

guess: to give an answer that may be right but you are not completely sure

estimate: to make an informed guess about an amount, distance, or cost of something

evaluate: to look at something and think about its value

examine: to look at something carefully in order to learn more about it

record: to write down information or facts

Materials

- ★ “Estimation Station Cards” (pg. 84), one set per student
- ★ supplies for estimation stations: rulers, coins, a container, small items to be counted, a clear jar, a stopwatch
- ★ “Estimate, Examine, Evaluate!” (pg. 85), one per student

Preparation

1. Photocopy the “Estimation Station Cards” and cut the cards apart. Make sure you have enough copies so that each student has one set of cards.
2. Set up a variety of “estimation stations” around the room. Each station should focus on a different math concept, such as the following:
 - ★ *distance*—Students will estimate the distance across a desk.
 - ★ *value of coins*—Students will estimate the value of coins in a container.
 - ★ *amount*—Students will estimate the number of items in a jar.
 - ★ *size*—Students will estimate the length and width of a math, science, or social studies textbook.
 - ★ *time*—Students will estimate how long it will take to write their full names.

Opening

1. Have students tell about a time when they guessed about something. Perhaps they guessed about how long it would take to get somewhere or about how many crackers to take out of a box so that each person could have the same amount.
2. Discuss the strategies they used to make their guesses as correct as possible.

Directions

1. Have two volunteers role-play a situation in which they estimate how much an apple weighs. Each person can guess the weight using standard or nonstandard units of measurement and write down an estimate. Have partners work together to check the actual weight by weighing and verifying the amount. Have students write down the actual weight. Together, the partners will decide which person’s estimate was closer to the actual amount.