Developing Language Objectives for the Mathematics Classroom
From Theory to Practice

Session Objectives

Content Objectives:
Participants will develop background knowledge of why Language Objectives are an essential part of lesson delivery for Limited English Proficient (LEP) students.

Participants will be able to describe how Language Objectives differ from Content Objectives.

Language Objectives:
Participants will orally discuss and categorize Content and Language Objectives.

Participants will create and record Language Objectives using TEKS Skills for Mathematics.

Participants will demonstrate their knowledge of Language Objectives by sharing with the group.

Content and Language Objectives

Content Objectives:

Language Objectives:
Activity #1
Round-the-Room and Back Again
1) On a note card write one response to the following question:
   - Who are ELL students in Texas classrooms?
2) On facilitator’s direction move around the room and share your response with colleagues, carefully listening to their responses (take 2 minutes). The challenge is to rely on auditory memory.
3) When the facilitator calls “time” return to your seat. On the Who Are ELL Students in Texas Classrooms? response sheets create a list of as many responses you can recall.
4) Groups then pool your examples and extend your lists.
5) Be prepared to share table responses (15 minutes).

Who Are ELL Students in Texas Classrooms?

- Immigrant Children:
  - may have strong academic backgrounds
  - may have limited formal schooling
  - may have no schooling experience
  - may not be literate in their first language

- U.S.-Born Children:
  - may speak a language other than English at home
  - may be caught in the state of possessing limited speaking skills in the English language
  - may speak social English but struggle with academic language tasks

Second Language Acquisition and Language Learning

- Language Acquisition is a subconscious, effortless process that occurs without people actually realizing it is occurring. The information acquired is then stored in the subconscious for later use. It is what children do when learning to speak their first language.

- Basic Interpersonal Communication Skills (BICS) are the language skills necessary to communicate basic needs and wants; they do not guarantee academic success. (There may be students who have ‘acquired’ native-like fluency in oral speech, who are still unprepared to face the academic challenges of school). Krashen, 1992 & Cummins, 1996
Second Language Acquisition and Language Learning

- Language learning is what usually occurs in school. It is an overt and conscious process.
- When people are learning, they are aware they are learning because they are participating in the process. Therefore, it must be explicitly taught.
- Once the information (knowledge) is learned, it is consciously stored in the brain, for later use.
- This learned academic language is the kind of language needed for tasks such as comprehension of text, analysis, and synthesis.
- For students learning English as a second language, this is what we refer to as Cognitive Academic Language Proficiency (CALP).

Echevarria & Graves, 2006

Academic Language

- It is essential for teachers of ELL/LEP students to be aware of the differences between BICS and CALP.
- It is the only way to understand the distinction between social oral language development and the demanding academic language necessary for learning content.
- We remind ourselves: Just because students can speak English like a 'native' doesn't necessarily mean they are ready for the academic language challenges encountered in the content areas.

Writing Language Objectives

- Language objectives emphasize vocabulary necessary for students to master the content objectives.
- The vocabulary tends to be directly from the lesson and content objective; however, there may be some background vocabulary or background vocabulary that need also be addressed in the lesson.
  - Think carefully about everything you will expect of the student, and be sure all key vocabulary is included.
  - Assume, for instance, you are teaching about the characteristics of polyhedra and other three-dimensional figures and their component parts based on explorations and concrete models (§111.34. Geometry from TESL).
  - The students need to know what you mean by characteristics, compare, contrast, describe, etc. How will you teach the concept? How will you assess understanding?
Writing Language Objectives

• Language Objectives are the HOW of the lesson. Your language objectives should include instruction in the form of discussion (paired and/or cooperative learning activities). Think about specific language skills you want students to develop; include them as language objectives. Then plan the lesson accordingly.

• Most of the language verbs lend themselves to language objectives:
  - define (vocabulary is most important)
  - describe
  - identify
  - label
  - name
  - spell

• Others are more related to language skills:
  - compare
  - contrast
  - explain
  - summarize
  - rephrase
  - interview
  - discuss (peer/group work)
  - elaborate
  - imagine
  - predict
  - compose
  - draft

More Procedural Language for ELLs and to Navigate

<table>
<thead>
<tr>
<th>Classify</th>
<th>Collect</th>
<th>Distinguish</th>
<th>Categorize</th>
<th>Match</th>
<th>Show</th>
<th>Select</th>
<th>Construct</th>
<th>Assemble</th>
<th>Arrange</th>
<th>Recall</th>
<th>Give examples</th>
<th>Draw</th>
<th>Organize</th>
<th>Decide</th>
<th>Suppose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locate</td>
<td>List</td>
<td>Underline</td>
<td>Review</td>
<td>Compose</td>
<td>Dictate</td>
<td>point out</td>
<td>Report</td>
<td>Predict</td>
<td>Express</td>
<td>Plan and evaluate</td>
<td>Relate</td>
<td>Generalize</td>
<td>Demonstrate</td>
<td>Outline</td>
<td></td>
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<tr>
<td>Estimate</td>
<td>Judge</td>
<td>Debate</td>
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</table>
Activity #2
Let’s Practice: Sentence Sort

• Work in pairs
• Sort sentences into three categories:
  – Big Idea (1), Content Objective (1) and Language Objectives (4)
• The Big Idea is the statement of essential learning that explores the relationship among key concepts within a topic.
  – Comes from the Content Standards TEKS
  – Provides the focus for all planning and instruction

Review of Big Ideas

<table>
<thead>
<tr>
<th>Big Ideas are Not...</th>
<th>Incorrect Example</th>
<th>Correct Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOPICS</td>
<td>Sound</td>
<td>Sound is a kind of energy.</td>
</tr>
<tr>
<td>DETAILS</td>
<td>When people talk their vocal cords vibrate.</td>
<td>All sound comes from objects that vibrate.</td>
</tr>
<tr>
<td>OBJECTIVES</td>
<td>Students will explain the relationship between pitch and frequency.</td>
<td>The frequency of sound vibrations determines pitch.</td>
</tr>
<tr>
<td>QUESTIONS</td>
<td>How do people measure sound?</td>
<td>The intensity of sounds is measured in decibels.</td>
</tr>
<tr>
<td>FRAGMENTS</td>
<td>How people hear</td>
<td>The parts of the ear work together with the brain to enable people to hear.</td>
</tr>
<tr>
<td>VALUE JUDGEMENTS</td>
<td>Hearing people should respect the deaf.</td>
<td>Perceptions of the deaf have changed through time, but prejudices still exist.</td>
</tr>
</tbody>
</table>

Activity #3
Let’s Discuss: Talking Chips

1) Each group member gets 2 Talking Chips.
2) Each group member shares 1 response to each of the following discussion questions:
   1. How do language objectives differ from content objectives?
   2. Are the language objectives observable student behaviors?
3) Be prepared to share collective thoughts with the group.
Let's Write Language Objectives

Consider the Texas Essential Knowledge and Skills for Mathematics for High School:

(G.2) Geometric Structure. The student analyzes geometric relationships in order to make and verify conjectures.

The student is expected to

− (A) use constructions to explore attributes of geometric figures and to make conjectures about geometric relationships and
− (B) make conjectures about angles, lines, polygons, circles, and three-dimensional figures and determine the validity of the conjectures, choosing from a variety of approaches such as coordinate, transformational, or axiomatic.

Let's Write Language Objectives

• Content Objective:
The students will be able to use constructions to explore attributes of geometric figures and to make conjectures about geometric relationships.

• Language Objectives:
The student will be able to use mathematical vocabulary to explain orally or in writing the attributes of geometric figures.

Students will construct a Venn Diagram to contrast and compare one geometric figure to another.

Students will work in pairs to create a list of construction methodologies related to the significant attributes of each figure.

Activity #4: Writing Language Objectives

Your Turn

Writing Content and Language Objectives:

• Work in pairs (Math/ELL Specialists).
• Select a TEKS Standard for High School Mathematics.
• Write both a content objective and a language objective.
• Be prepared to share your work with the group.
Final Thoughts or Questions

[Blank space for notes]