

**MELL**

Mathematics for English Language Learners

**Best Practices Framework for  
Preservice Math Education  
Angelo State University**

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# Groundwork for Best Practices Framework



**Review of research suggests these methods for reaching ELL students:**

- Raise awareness of language used in the classroom.
- Encourage empathy for learning language.
- Use synonyms and avoid homonyms.
- Employ consistent math vocabulary.
- Avoid more than three phrases for basic operations.
- Speak slowly, enunciate clearly, repeat often.

# Groundwork for Best Practices Framework



**Review of research suggests these methods for reaching ELL students:**

- Use short sentences
- Employ active voice and present tense
- Require journaling
- Encourage student-to-student interaction
- Provide explicit guidance in grammar and pronunciation
- Use clear, legible handwriting

# Groundwork for Best Practices Framework



**Review of research suggests the following strategies:**

- Emphasize problem solving in authentic contexts
- Encourage development of critical thinking skills
- Teach the language of mathematics (vocabulary and syntax)
- Create language supportive classrooms

# Groundwork for Best Practices Framework



**Review of research suggests these strategies:**

- Teach reading skills specifically for mathematics content
- Connect mathematics to students' background and experiences
- Vary instructional methods
- Utilize an authentic and meaningful assessment plan

# Groundwork for Best Practices Framework



**Review of research suggests helping teachers of ELL students to:**

- Develop cultural understanding
- Develop a repertoire of methods and skills for adapting instruction
- Distinguish between language difficulties and learning problems
- Utilize cooperative learning strategies to encourage interaction between ELL's and native English-speaking students

# Checklist of Guiding Principles

**An instrument designed to be used by:**

- **Students preparing to become teachers**  
**\*\*\* To help find strengths and weaknesses \*\*\***
  
- **Teachers preparing preservice teachers**  
**\*\*\* To see what experiences they are providing  
in their courses and field requirements \*\*\***
  
- **Administrators employing new teachers**  
**\*\*\* To determine what content areas and techniques  
the new teacher has come in contact with \*\*\***

# Checklist of Guiding Principles

## Preservice Preparation Components

- **Content: Mathematics Courses**
- **Instructional Methods and Field Experiences: Mathematics Courses**
- **Instructional Methods and Field Experiences: Education Courses**
- **Special Populations Modifications**



# Checklist of Guiding Principles

## Content: Mathematics Courses

### Algebra

- Abstract Algebra
- College Algebra
- Linear Algebra

### Pre-Calculus

- Trigonometry
- Analytic Geometry

### Calculus

- Calculus I
- Calculus II
- Calculus III
- Advanced Calculus (Analysis)

# Checklist of Guiding Principles

## Content: Mathematics Courses

### Foundations of Mathematics

- Elementary Math I
- Elementary Math II
- Elementary Math III

### Geometry

- Euclidean
- Informal

### Other

- Probability - Statistics
- Problem Solving
- Number Theory
- Math Modeling
- History of Mathematics



# Checklist of Guiding Principles

## Instructional Methods: Mathematics Content Courses

### Modeling

- hands-on manipulatives
- technology
- visual demonstrations
- kinesthetic activities
- real-life (authentic) problems
- discovery learning
- observation

### Communicating

- lecturing
- writing
- reading
- vocabulary building and translating (syntax)



# Checklist of Guiding Principles

## **Instructional Methods: Mathematics Content Courses**

### **Teaching/Learning Techniques**

- independent learning**
- peer-to-peer**
- small groups**
- whole class**

### **Assessment Techniques**

- written**
- portfolios**
- journaling**
- oral**
- rubrics**
- alternative assessments**

# Checklist of Guiding Principles

## Field Experience: Mathematics Content Courses

observing

lesson planning

teacher mentoring

working with students

teaching lessons

# Checklist of Guiding Principles

## Instructional Methods: Education Courses

### Modeling

- hands-on manipulatives
- technology
- visual demonstrations
- kinesthetic activities
- real-life (authentic) problems
- discovery learning
- observation

### Communicating

- lecturing
- writing
- reading
- vocabulary building and translating

# Checklist of Guiding Principles

## Instructional Methods: Education Courses

### Teaching/Learning Techniques

- independent learning
- peer-to-peer
- small groups
- whole class

### Assessment Techniques

- written
- portfolios
- journaling
- oral
- rubrics
- alternative assessments

# Checklist of Guiding Principles

## Field Experience: Education Courses

observing

lesson planning

teacher mentoring

working with students

teaching lessons





# Checklist of Guiding Principles

**Field Experience: Special Population Courses**  
(ELL, LEP, Bilingual, Special Ed)

**observing**

**lesson planning**

**teacher mentoring**

**working with students**

**teaching lessons**

# Checklist of Guiding Principles

## Support Systems

classroom management

discipline management

parental involvement/communicating

working with administrators

grading procedures

# Checklist of Guiding Principles

## Special Populations Modifications

**diagnostics**

**assessment**

**lesson plan adaptations**

**cultural understanding**

**student interactions**

# Best Practices Framework

## Fall 2006 Plans:

- Pilot the checklist with students and teachers in math content courses and pedagogy courses
- Pilot the checklist with local administrators / employers
- Align the Preservice Best Practices Framework with the Classroom Practices Framework