

**GEORGE MASON UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT
PROFESSIONAL DEVELOPMENT STUDIES**

EDPD 502.6R1 : Supporting English Language Learners in Developing Number Sense in Grades
6-8

1 Credits, Fall 2014

September 11th and 25th, October 9th and 23rd, November 6th, 2014 Location – Edward L. Kelly
Leadership Center, Room 3011 Prince William County Schools

PROFESSOR(S):

Name: Cynthia L. Cooper

Office hours: By Appointment

Office phone: 703-670-6166

Email address: coopercl@pwcs.edu

COURSE DESCRIPTION:

In this course, teachers will deepen their own understanding about what fluency with rational numbers means, what it looks like, and how they can help their students to attain it. Strategies for helping students to achieve conceptual as well as procedural fluency with rational numbers and operations will be explored. Teachers will study the role of language in the mathematics classroom and the effects it has on English Language Learners. Strategies that enable English Language Learners to become active, engaged participants will be investigated. Teachers will utilize these strategies within their classrooms to experience first-hand how helpful these approaches can be in helping English Language Learners to attain mathematical proficiency.

LEARNER OUTCOMES or OBJECTIVES:

This course is designed to enable students to:

- Develop a deeper understanding of how the base ten number system affects performing operations with rational numbers and recognizing algebraic patterns.
- Develop a deeper understanding of the properties of the operations and the connections within and across the operations with rational numbers.
- Develop the knowledge and skills to support middle school students in developing number sense.
- Incorporate specific structures into lesson plans to support English Language Learners.
- Tailor support structures to ESOL students of different levels
- Evaluate lesson plans through the lens of the mathematical ideas embedded
- Evaluate lesson plans through the lens of access and growth for ESOL students

PROFESSIONAL STANDARDS (TESOL Standards):

- 3.a.3.** Plan differentiated learning experiences based on assessment of students' English and L1 proficiency, learning styles, and prior formal educational experiences and knowledge.
- 3.a.5** Plan for instruction that embeds assessment, includes scaffolding, and provides reteaching when necessary for students to successfully meet learning objectives.
- 3.b.1.** Organize learning around standards-based subject matter and language learning objectives.
- 3.b.2.** Incorporate activities, tasks, and assignments that develop authentic uses of language as students learn academic vocabulary and content-area material.
- 3.b.3.** Provide activities and materials that integrate listening, speaking, reading, and writing.
- 3.b.6.** Provide standards-based instruction that builds on students' oral English to support learning to read and write.

REQUIRED TEXTS:

(Provided free of charge to enrolled participants)

Melanese, K., Chung, L. and Forbes, C. (2011). *Supporting English Language Learners in Math Class*. Sausalito, CA: Math Solutions Publishing.

Van de Walle, et. al. (2014). *Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades 6-8*. Boston, MA. Pearson Education, Inc.

For Further Reading:

Carr, J. et. al. (2009). *Making Mathematics Accessible to English Learners: a Guidebook for Teachers*. San Francisco, CA. WestEd.

Coggins, D. et al. (2007). *English Language Learners in the Mathematics Classroom*. Thousand Oaks, CA. Corwin Press.

Fosnot, C. and Dolk, M. (2002). *Young Mathematicians at Work; Constructing Fractions, Decimals, and Percents*. Portsmouth, NH. Heinemann.

Harris, P. (2011). *Building Powerful Numeracy for Middle and High School Students*. Portsmouth, NH. Heinemann.

Johnson, A. (2010). *Teaching Mathematics to Culturally and Linguistically Diverse Learners*. Boston, MA. Pearson Education, Inc.

Kersaint, G., Thompson, D. and Petkova, M. (2009). *Teaching Mathematics to English Language Learners*. New York, NY. Routledge.

McCoy, A., Barnett, J. and Combs, E. (2013). *High Yield Routines*. Reston, VA. NCTM.

National Council of Teachers of Mathematics. (2011). *Reasoning and Sense-Making; Problems and Activities for Grades 5-8*. Reston, VA. NCTM.

National Council of Teachers of Mathematics. (2012). *Rich and Engaging Mathematical Tasks: Grades 5-9*. Reston, VA. NCTM.

Wise, C. (Ed.) (2010). *Making Math Accessible to English Language Learners: Practical Tips and Suggestions, Grades 6-8*. Bloomington, IL. Solution Tree.

COURSE ASSIGNMENTS AND EXAMINATIONS:

1. Class Participation – (25%)

Due to the discussion based nature of the course, students are expected to participate fully with in-class activities. This includes preparing to participate by engaging with the assigned readings prior to class, engaging with mathematical tasks to support a full understanding of the ideas, and contributing meaningful comments in small group discussions. Participants who are fully engaged also help support the learning of those around them.

2. Reflection Journals (2) – (20% total)

Participants will submit 3 written reflections based on assigned readings. These responses will explain how the participant's thinking has been affected by the reading. This might include implications for classroom practice, incorporating a new idea into practice, revisiting ideas to strengthen understanding of content or pedagogy.

3. Adapted Lesson Plan with Rationale – (25%)

Each group of participants will submit one lesson plan in a choice of formats that includes a description of how the participants envision the lesson unfolding, and any supporting documents such as student activity sheets. The attached rationale page should describe the essential mathematical ideas students are intended to understand as a result of the lesson, as well as a description of how various structures or facilitation techniques built into the lesson are intentionally designed to support the English language learner, either through providing access to the content or increasing opportunities for language production and development.

4. Student Interview – (15%)

Each group of participants will create a brief 3 to 4 question formative assessment surrounding a number sense topic. Each participant will then sit down one-on-one with an identified English Language Learner and use the formative assessment tool to interview the student. A summary report will then be written in order to identify the strengths and weaknesses the student has about one particular number sense topic.

5. Classroom Observation of a Collaboratively Taught ELL Mathematics Lesson – (15%)

Each participant will perform a classroom observation of either an ELL self-contained or co-taught mathematics class. The Prince William County ELL "Look-for" observation tool will be used to note successful ELL strategies utilized during the lesson. Participants will submit a summary detailing this experience.

Grading Scale:

90 - 100 = A

80 - 89 = B

70 - 79 = C

Below 70 = F

GMU POLICIES AND RESOURCES FOR STUDENTS

- a. Students must adhere to the guidelines of the George Mason University Honor Code (See <http://oai.gmu.edu/honor-code/>).
- b. Students must follow the university policy for Responsible Use of Computing (See <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>).
- c. Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.
- d. The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance (See <http://caps.gmu.edu/>).
- e. Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester (See <http://ods.gmu.edu/>).
- f. Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.
- g. The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing (See <http://writingcenter.gmu.edu/>).

PROFESSIONAL DISPOSITIONS

Students are expected to exhibit professional behaviors and dispositions at all times.

CORE VALUES COMMITMENT

The College of Education & Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: <http://cehd.gmu.edu/values/>.

For additional information on the College of Education and Human Development, Graduate School of Education, please visit our website <http://gse.gmu.edu/>.

PROPOSED CLASS SCHEDULE:

All classes will take place from 4:30 – 7:30 pm.

*Topics may be adjusted at the discretion of the instructor. Any adjustments will be announced in class.

| <i>Session</i> | <i>Date</i> | <i>Topic/ Learning Experience</i> | <i>Follow-Up Assignments</i> |
|----------------|-------------|---|---|
| 1 | Sept. 11 | <ol style="list-style-type: none">1. Learning about the ELL experience2. What do we mean by “number sense”?3. Routines for comparing rational numbers | <ul style="list-style-type: none">• Read Chapter 1 in ELL book• Read Van de Walle p.104-120• <u>Reflection #1</u> |
| 2 | Sept. 25 | <ol style="list-style-type: none">1. Making content accessible for ELLs2. Teaching vocabulary explicitly3. Operating with Rational Numbers | <ul style="list-style-type: none">• Read Chapter 8 in ELL book• Read Van de Walle p.120-140• <u>Reflection #2</u> |
| 3 | Oct. 9 | <ol style="list-style-type: none">1. Incorporating word charts and sentence frames2. Properties and Relationships3. Student Interview Assessment Tool | <ul style="list-style-type: none">• Find a lesson• Read Chapter 2 in ELL book• <u>Student Interview</u> |
| 4 | Octo. 23 | <ol style="list-style-type: none">1. Utilizing group and partner work2. Lesson Preparation | <ul style="list-style-type: none">• Classroom Observation• <u>Adapted lesson plan</u> |
| 5 | Nov. 6 | <ol style="list-style-type: none">1. Sharing lesson plans2. Successful strategies with ELLs | |

ASSESSMENT RUBRIC(S):

Participation – 5 points per day

| | |
|-------------------|---|
| 5 points | <ul style="list-style-type: none">• Participant is on time.• Participant willingly engages with class activities.• Participant engages in productive group discussions. |
| 3-4 points | Participant does not accomplish one of the above (Ex, works on math activity, but then checks email while partners discuss.) |
| 2 points or below | Participant is not actively engaged with course activities. |

Written Reflections – 10 points each

| | |
|-------------------|--|
| 9-10 points | <ul style="list-style-type: none">• Reflection shows connection to personal practice or current thinking• Reflection includes quotes or informal references to reading passages• Writing mechanics do not interfere with content |
| 7-8 points | Writing shows some thought, but may not be grounded in the readings, or may not show evidence of personal reflection. |
| 5-6 points | Writing may be off topic, or merely a summary of the reading. |
| 4 points or below | Little evidence of personal reflection or that passage was read. |

Adapted Lesson plan* – 25 points

| | |
|--------------------|---|
| 22 – 25 points | <ul style="list-style-type: none">• Lesson plan is detailed enough to allow the reader to facilitate the lesson.• All ancillary materials included/listed.• Both math and language goals are clearly articulated and appropriate for the task.• Rationale page shows intentionality behind decisions, and gives insight into the group's thinking/ planning process. |
| 18-21 points | One aspect from above is lacking: <ul style="list-style-type: none">• Lesson plan may be somewhat detailed, but does not give enough information for a colleague to use it 'as is'.• Group may not be clear on math or language goals, or goals do not seem to align to the task chosen.• Rationale page does not provide clarity as to why certain strategies or structures were chosen. |
| 14-17 points | More than one aspect mentioned above is not fully satisfied. |
| 13 points or below | Adapted lesson plan does not meet requirements. |

Student Interview* – 15 points

| | |
|-------------------|---|
| 14 – 15 points | <ul style="list-style-type: none">• Written summary clearly articulates math idea being assessed.• Questions well aligned to math idea being assessed.• Summary includes transcript of student responses or copy of student work• Summary includes analysis of student thinking. |
| 12-13 points | One aspect from above is not completely satisfied. |
| 10-11 points | Two aspects from above are not completely satisfied. |
| 9 points or below | Interview does not meet requirements. |

Classroom Observation – 15 points

| | |
|-------------------|---|
| 14 – 15 points | <ul style="list-style-type: none">• Summary includes factual observations (direct quotes, etc)• Evidence from lesson used to support claims and conclusions.• Specific ELL strategies are mentioned and their effect on students analyzed.• Summary includes connection to participant's own practice. |
| 11-13 points | Summary shows evidence of some thinking about what was observed, but may include broad statements made without support, or reflect a lack in thinking about connections and implications of observed strategies. |
| 9 –10 points | Summary very brief and general, demonstrating a limited understanding of the intended purpose of the assignment. |
| 8 points or below | Summary does not show evidence of classroom observation or analysis/reflection of the experience. |

*Indicates activity planned with a partner