

American University
Master of Arts in Teaching: Elementary Education
(Program(s): Elementary Education, Division: Graduate)

Response to NCTQ Common Core Elementary Mathematics Standard 5

Overview

This response addresses the NCTQ Common Core Elementary Mathematics Standard. American University's Master of Arts in Teaching program received 0/4 stars for this standard. Given that course syllabi and required textbooks address a number of the NCTQ indicators related to this standard, a review of this score is requested.

Data to support NCTQ Common Core Elementary Mathematics Standard

Included in this document is the Program of Study for the Master of Arts in Teaching program and redacted syllabi for the courses that attend to this standard. The courses that align to this standard are EDU 603: Teaching Mathematics in Elementary Education¹.

Syllabi and Textbook Information, and university requirements that support how the program addresses the NCTQ Common Core Elementary Methods Standard

The NCTQ methodological statement for this standard indicates that scores of teacher education programs are based on course descriptions, credit information, examination of syllabi and required textbooks, and, for graduate students, the requirement of the GRE. Course syllabi indicate the number of credit hours and course descriptions. The syllabus for the EDU 603 course appears to be the most relevant to the NCTQ Common Core Elementary Mathematics Standard. Several days of lecture address these components of math, and students are required to complete assessments (including lesson plans, article responses, class discussions, and observations) that address the development of this knowledge. In addition, the university requires the GRE of all students in the MAT: Elementary Education program, as listed in our catalog and on the university's website at <http://www.american.edu/cas/seth/mat-applying.cfm>.

The following textbooks are required for the relevant courses:

| Course | Textbooks | NCTQ Rating |
|---------|---|-------------|
| EDU 603 | Van de Walle, John. <i>Elementary and Middle School Mathematics: Teaching Developmentally</i> . 7 th edition, White Plains, New York: Longman, 2010. | 34/166 |
| | Articles, as assigned. | Not Rated |

¹ We note that only one copy of a syllabus for one course (EDU 603) was submitted in the previous submission. That syllabus may or may not have indicated the required readings that are provided to students via American University's course management system (Blackboard). Given that access to the previous submission system is no longer available, we are unable to confirm which syllabus was submitted.

Summary

Given that the course syllabi presented below address several of the indicators of the NCTQ Common Core Mathematics Standard and the fact that the MAT in Elementary Education is selective relative to applicants knowledge of mathematics content as measured by the GRE and our transcript review process, we believe American University's score for the Masters of Arts in Teaching: Elementary Education on this standard should be reviewed.

Attachments:

MAT in Elementary Education, Program of Study
Syllabus for EDU 603

AMERICAN UNIVERSITY
School of Education, Teaching, and Health
MASTERS OF ARTS IN TEACHING ELEMENTARY EDUCATION
PROGRAM OF STUDY

Courses are usually offered in semester indicated. Any waivers or substitutions must be submitted to the Dean for approval. Request for practicum and student teaching placement must be made in Spring for Fall and in Fall for Spring. You must take and receive a passing score (as set by the District of Columbia teacher Licensing agency) on the PRAXIS I: (Academic skills assessment) before program admission and take PRAXIS II before program completion.

Program of Study: _____

Year Entered: _____

TOTAL
39 Credit Hours

Career Switcher: YES NO BA/MA: YES NO

Name: _____

ID#: _____

Address: _____

Cell Phone: _____

Email: _____

Transcript Review: Completed by: _____ Number of Missing Courses: _____ Met requirement: _____

Needs: _____

EDUCATION COURSES

| | Credit Hours | Term/ Year | Completed |
|--|--------------|------------|-----------|
| EDU 519 Uses of Technology in Education (Every Semester) | 3 | _____ | _____ |
| EDU 521 Foundations of Education (Every Semester) | 3 | _____ | _____ |
| EDU 541 Foundations of Special Education (Spring/ Summer) | 3 | _____ | _____ |
| OR | | | |
| EDU 545 Overall of all Exceptionalities: Arts in Special Education (Fall Only) | | _____ | _____ |
| EDU 619 Children's Literature: A Multi-Cultural and International Perspective (Fall Only) | 3 | _____ | _____ |
| EDU 620 Theories of Educational Psychology and Human Growth And Development (Every Semester) | 3 | _____ | _____ |
| ELEMENTARY TRACK | | | |
| EDU 601/555 Teaching Reading in the Elementary School (Fall) | 3 | _____ | _____ |
| EDU 602/553 Teaching Language Arts and Writing in Elementary School (Fall) | 3 | _____ | _____ |
| EDU 603/552 Teaching Mathematics in Elementary School (Spring) | 3 | _____ | _____ |
| EDU 604/556 Teaching Science in the Elementary School (Spring) | 3 | _____ | _____ |
| EDU 608/554 Teaching Social Studies in the Elementary School (Fall) | 3 | _____ | _____ |
| EDU 609 Effective Teaching for Diverse Learners (Fall) | 3 | _____ | _____ |
| EDU 699 Student Teaching with Required Seminar (Fall and Spring Only) -Form D & Form F | 6 | _____ | _____ |

Comprehensive Examination (Traditional Candidates Only):

COMPLETION DATE: _____ (No credit)

PORTFOLIO & IMPACT ON STUDENT LEARNING:

COMPLETION DATE: _____ (No credit)

PRAXIS I : _____ PRAXIS II : _____

GRADUATION DATE : _____

Student: _____ Date: _____

Advisor : _____ Date: _____

**American University
College of Arts and Sciences
School of Education, Teaching and Health
Syllabus EDU 603
Teaching Math in Elementary Education
Spring 2013**

Course Description

In this course we will be focusing on both the teaching of mathematics to elementary school age children as well as your personal understanding of elementary mathematics. You will reflect on your learning as a tool for thinking about how learning happens. The teaching in this course is designed to serve as an opportunity for pedagogical investigation.

The philosophy of this course is that people of all ages and many learning styles learn in an environment where they explore topics, engage in discourse, think about their ideas, experience disequilibrium, and come to their own understanding. This environment includes working respectfully, supportively, and cooperatively with others.

Philosophy of the School of Education, Teaching and Health (SETH)

The mission of SETH is the professional development of dedicated and proficient teachers, educational leaders, health professionals, and researchers. Graduates should be equipped to accommodate the needs of learners, to nurture the strengths and talents of those they serve, and to provide leadership in large and small organizations, classrooms, educational institutions, and public policy arenas. In partial fulfillment of that mission, SETH offers programs that prepare teachers, educational leaders and managers, education specialists, health promotion specialists, and researchers for careers in schools, colleges and universities, federal, state and local government agencies, business, and community and professional organizations. These programs provide candidates with opportunities to collaborate with professionals in public schools, educational organizations, and federal agencies through internships, practica, and research. Graduates are equipped to meet individual needs, to nurture the strengths and talents of those individuals, and to initiate and provide leadership in classrooms, educational institutions, and in the public policy arena. The mission of the SETH is derived from the faculty's shared conviction that the fundamental task preparing effective professionals who understand and model a commitment to excellence, equity, community and diversity.

The School of Education, Teaching and Health faculty and staff are committed to celebrating diversity and building a community of learners. As we work in collaboration in and out of the classroom, we believe that:

- respecting each other's differences and opinions leads to a positive and open environment,
- open discourse promotes reflective and thoughtful educators,
- equitable treatment of each other is necessary for a positive, sustained, and working community, and
- each and every member of the community can make a valuable contribution to the community.

These beliefs in action provide for all students, staff, and faculty a safe, productive, and positive educational community.

Objectives/Outcomes

- To develop/enhance a positive attitude towards mathematics and stronger skills as mathematicians
- To have a stronger and deeper understanding of several important topics in mathematics (place value, factoring, whole number computation, fractions to name a few)
- To experience being a learner in a constructivist approach
- To learn to understand students' mathematical thinking and plan/adjust instruction accordingly
- To learn how to design and implement appropriate lessons in mathematics for elementary age students
- To see mathematics as an aid to better understanding in history, geography, social studies, science, and literature and to learn to design interdisciplinary lessons which take advantage of this
- To improve skills in communicating mathematical thinking and understanding

- To learn about current practice and changes in the field of mathematics education, including, but not limited to, the National Council of Teachers of Mathematics (NCTM) Standards and the Common Core State Standards.

Course Readings

Required:

- Van de Walle, John. *Elementary and Middle School Mathematics: Teaching Developmentally*. 7th edition, White Plains, New York: Longman, 2010.
- Articles, as assigned.

Course Requirements:

Assigned readings are indicated in the course schedule. The assigned readings are designed to serve as reference materials for issues and specific technical information with regard to teaching mathematics. It is expected that all students will read the course readings prior to class. Additional readings may be assigned.

Course Supplies

-Three-ring notebook so you can insert class handouts

-Supply kit to include a pencil, eraser, colored pencils, pair of scissors, glue stick, tape, protractor, compass, and ruler. Please bring this supply kit to every class.

Course Attendance

Your attendance is critical for your success in this course, and you are expected to attend all sessions. Students who miss 2 class sessions will receive a "one-half letter grade" (i.e. A- > B+) deduction from the final grade in the course. Students who miss 3 class sessions will receive a "one letter grade" (i.e. A > B) deduction from the final grade in the course. Students who miss more than 3 class sessions will receive an "F" in the course.

Final Grades

| | | | | | |
|-----------|----|----------|----|---------------|---|
| 100 - 94% | A | 86 - 82% | B | 74 - 71% | C |
| 93 - 90% | A- | 81 - 78% | B- | 70 - 67% | D |
| 89 - 87% | B+ | 77 - 75% | C+ | 66% and below | F |

Your final grade in this course will be based on the following criteria:

| | |
|--|----------------------|
| Class attendance and participation (professionalism) | 30 points |
| Interleaving problems (due January 24) | 10 points |
| Fib (due January 31) | 15 points |
| Math and literature lesson plan (due February 7) | 25 points |
| Book review (due February 21) | 10 points |
| Website (to be done February 14 and emailed) | 20 points |
| Classroom Observation (due February 28) | 10 points |
| Chapter questions (due weekly) | 1 point per chapter |
| Article questions (due weekly) | 2 points per article |
| Activity presentation (due as assigned) | 50 points |
| Observation (due March 7) | 40 points |
| Creation of a game (due April 25) | 40 points |
| Final exam (due no later than May 3, 5 pm) | 40 points |
| Common Core lesson (due March 28) | 30 points |
| 2-day lesson plan (due April 11) | 35 points |

| Date assigned (to be read by next class session) | Chapter(s) and Article(s) |
|---|---|
| Jan. 17 | <p>Welcome! Introduction to the course. Van de Walle: Ch. 1: Teaching Mathematics in the Era of the NCTM Standards Ch. 2: Exploring What It Means to Know and Do Mathematics Ch. 3: Teaching Through Problem Solving Ch. 4: Planning in the Problem-Based Classroom Ch. 5: Building Assessment into Instruction</p> <p><i>Glass, Bug, Mud</i>, Phi Delta Kappan, May 2009, pp. 677-680.</p> |
| Jan. 24 | <p>Van de Walle: Ch. 6: Teaching Mathematics Equitably to All Children Ch. 7: Using Technology to Teach Mathematics</p> <p><i>Learning 21st-century Skills Requires 21st-century Teaching</i>, Kappan, October 2012, pp 8-12.</p> |
| Jan. 31 | <p>Van de Walle: Ch. 8: Developing Early Number Concepts and Number Sense Ch. 9: Developing Meanings for the Operations</p> <p><i>Reflecting on PEMDAS</i>, Teaching children mathematics, February 2012, pp. 371-377.</p> |
| Feb. 7 | <p>Van de Walle: Ch. 10: Helping Children Master the Basic Facts Ch. 11: Developing Whole-Number Place-Value Concepts</p> <p><i>Promoting Problem-Posing Explorations</i>; teaching children mathematics, Nov. 2004, pp. 180-186.</p> |
| Feb. 14 | NO Class; use class time to visit website related to ; review three lesson plans, and create your own lesson plan based on the website |
| Feb. 21 | <p>Van de Walle: Ch. 12: Developing Strategies for Whole-Number Computation Ch. 13: Using Computational Estimation with Whole Numbers</p> <p><i>Seeing beyond counting</i>, teaching children mathematics, November 2012, Vol. 19, No. 4, pp254-262.</p> |
| Feb. 28 | <p>Van de Walle: Ch. 14: Algebraic Thinking: Generalizations, Patterns, and Functions</p> <p><i>Conceptualizing Division with Remainders</i>, teaching children mathematics, March 2012, p 427-433.</p> |
| Mar. 7 | <p>Van de Walle: Ch. 15: Developing Fraction Concepts Ch. 16: Developing Strategies for Fraction Computation</p> |
| | Ch. 17: Developing Concepts of Decimals and Percents |

| Date assigned (to be read by next class session) | Chapter(s) and Article(s) |
|---|--|
| | Ch. 18:Proportional Reasoning <i>Developing Elementary Teachers' "Algebra Eyes and Ears",</i> teaching children mathematics, October 2003, pp. 70-77. |
| Mar. 14 | No class – AU's spring break |
| March 21 | Special guest presenter Location to be determined |
| Mar. 28 | Van de Walle: Ch. 19: Developing Measurement Concepts <i>It's the Teaching, Stupid!</i> , Phi Delta Kappan, Jan. 2006, pp. 356-363. |
| April 11 | Van de Walle: Ch. 20: Geometric Thinking and Geometric Concepts Ch. 23: Developing Concepts of Exponents, Integers, and Real Numbers <i>CCSSM: Teaching in Grades 3 and 4</i> , teaching children mathematics, April 2012, pp. 498-507. |
| April 4 | No class – DCPS Spring break |
| Apr. 18 | Van de Walle: Ch. 21: Developing Concepts of Data Analysis Ch. 22: Exploring Concepts of Probability <i>Building Algebra Readiness in the Lower Grades</i> , Virginia Mathematics Teacher, Richard Kalman, pp. 29-32. |
| | |
| Apr. 25 | Game night |
| May 2 | Final exam due |
| | |

Question for the final exam

This is the final exam. You will have two hours to write your response. You may use notes to compose your answers. You must cite at least three references that support your answer.

How do we teach young children about an abstract concept when they are at the concrete stage of their development?

Late Assignments:

Students are strongly encouraged to turn in all assignments on time. Points will be deducted from all assignments that are turned in after the due date listed in this syllabus. Please note there is no penalty for assignments turned in early.

Books

98, 99, 100! Ready or Not, Here I Come!

\$1.00 Word Riddle Book

Ten for Dinner

10 Minutes till Bedtime

12 Ways to Get to 11

100 Days of School, Harris, 1999

100th Day Worries, Cuyler, 2000

1001 Animals to Spot

1001 Things to Spot in the Sea
A Light in the Attic, Silverstein, 1981
A Million Fish ... More or Less, McKissack, 1992
A Remainder of One by Elinor J. Pinczes; ISBN-13: 978-0-618-25077-6
A Quarter from the Tooth Fairy
A Three Hat Day
Alexander, Who Used to Be Rich Last Sunday
Alice Ramsey's Grand Adventure, Brown, 1997
Alice's Adventures in Wonderland, Carroll
Amanda Bean's Amazing Dream
Amazing Optical Illusions by Illusion Works; ISBN:1-55297-961-X
Among the 4 Odds and Evens
Annabelle Swift, Kindergartner
Anno's Counting House, Anno, 1982
Anno's Magic Seeds, Anno, 1994
Anno's Mysterious Multiplying Jar
Arithmetickle by J. Patrick Lewis; ISBN: 978-0-15-205848-7
Bats on Parade
Bein' with You This Way
Biggest, Strongest, Fastest
Bits and Pieces I: Understanding Rational Numbers; Connected Mathematics;
Cats Add Up
Chasing Vermeer
Chrysanthemum
Cloak for the Dreamer
Count to a Million
Counting Crocodiles
Counting on Frank, Clement, 1991
Cut Down to Size at High Noon
Divide and Ride by Stuart J. Murphy; ISBN-13: 978-0-06-446710-0
Each Orange Had 8 Slices by Paul Giganti, Jr.; ISBN-13: 978-0-688-13985-8
Eating Fractions
Elevator Magic by Stuart J. Murphy; ISBN-13: 978-0-06-446709-4
Every Minute on Earth: Fun Facts That Happen Every 60 Seconds, Murrie & Murrie, 2007
Fat Frogs on a Skinny Log
Feast for 10
Fraction Action by Loreen Leedy
Fractions, Decimals and Percents by David A. Adler
Frog and Toad Are Friends, Lobel, 1970
From One to One Hundred
George Shrinks
Give Me Half!
Growing Goods in a Growing Country: Number and Operations; Connected Mathematics; ISBN: 978-0-02-106239-3
Growing Patterns by Sarah C. Campbell
Hershey's Weights and Measures by Jerry Pallotta; ISBN: 0-439-38877-5
Holes, Sachar, 2000
How Big is a Foot?, Myller, 1990
How Big Were the Dinosaurs? by Bernard Most; ISBN: 978-0-15-200852-9
How Many Feet in the Bed?
How Many Snails? by Giganti, 1988
How Much, How Many, How Far, How Heavy, How Long, How Tall is 1000?
How Much is a Million? by David M. Schwartz; ISBN: 978-0-688-09933-6

If You Hopped Like a Frog, Schwartz, 1999
If You Made a Million, Schwartz, 1989
Inch by Inch
Inchworm and a Half, Pinczes, 2001
Is a Blue Whale the Biggest Thing There is?, Wells, 2005
Jelly Beans for Sale
Jim and the Beanstalk
Just a Little Bit
Less Than Zero by Stuart J. Murphy
Life in the United States: Number and Operations; ISBN: 978-0-02-106238-6
Magic of a Million Activity Book - Grades 2-5
Martha Blah Blah
Math and Non-Fiction: Grades 6-8, Bay-Williams and Martinie, 2008
Math Appeal
Math Fables
Math for All Seasons
Math for Smarty Pants
Math Potatoes
Max's Money
Me and the Measure of Things by Joan Sweeney; ISBN: 0-440-41756-2
Moir's Birthday, Munsch, 1987
More Than One
Mouse Count
My Monster Mama Loves Me So
Night Noises
NumbersAlive! Books for Young Travelers Washington, DC
On Beyond a Million: An Amazing Math Journey, Schwartz, 1999
One Duck Stuck
One Grain of Rice
One Hundred Hungry Ants by Elinor J. Pinczes; ISBN-13: 978-0-395-97123-9
One Hundred Ways to Get to 100
One Hungry Cat
One Less Fish, Toft, 1998
One Monday Morning
One More Bunny
One Tiny Turtle
One, Two, Skip a Few
Only One
Piece=Part=Portion: Fraction = Decimal=Percent, Gifford & Thaler 2008
Pigs will be Pigs by Amy Axelrod; ISBN: 978-0-689-81219-4
Pizza Pizzaz
Quack and Count
Ready or Not, Here I Come! By Teddy Slater
Remainder of One, Pinczes, 1995
Roman Numerals I to MM
Round is a Mooncake
Sea Shapes
Sea Squares
Seven Blind Mice
Shape Space
Snowflake Bentley, Martin, 1998
So You Want to Be President?
Spaghetti and Meatballs for All

Splash!
Spunky Monkeys on Parade
Stay in Line
Ten Apples on Top! By Theo Leseig
Ten Black Dots
Ten Red Apples
Ten Sly Piranhas
The Amazing Book of Mammal Records
The 512 Ants on Sullivan Street
The Best of Times
The Breakfast Cereal Gourmet, Hoffman, 2005
The Calder Game
The Doorbell Rang, Hutchins, 1986
 The Dot by Peter H. Reynolds
The Fly on the Ceiling
The Grapes of Math
The Greedy Triangle by Marilyn Burns; ISBN -13: 978-0-545-04220-8
The History of Everyday Life, Landau, 2006
The I Hate Mathematics! Book
The Icky Bug Counting Book
The King's Chessboard by David Birch; ISBN: 0-14-054880-7
The King's Commissioners by Aileen Friedman; ISBN: 0-590-48989-5
The Man who Counted: A Collection of Mathematical Adventures, Tahan, 1993
The Man Who Made Parks, Wishinsky, 1999
The Napping House
The Number Devil, Enzensberger, 1997
The Penny Pot by Stuart J. Murphy; ISBN-13: 978-0-06-446717-9
The Phantom Tollbooth, Juster, 1961
The Secret Birthday Message by Eric Carle' ISBN-13: 978-0-06-443099-9
The Shape of Things
The Twelve Days of Summer, Andrews, 2005
The Very Hungry Caterpillar, Carle, 1969
The Pop Corn Book, de Poola, 1978
The Wright 3
Tiger Math
Tikki Tikki Tembo
Trick-or-Treat
Two Eyes, a Nose, and a Mouth!
Two of Everything by Lily Toy Hong; ISBN-13: 978-0-8075-8157-5
Two Ways to Count to Ten, Dee
Underwater Counting
What Comes in 2's, 3's, & 4's?
When a Line Bends ... a Shape Begins
Where the Sidewalk Ends, Silverstein, 1973
Wilma Unlimited, Krull, 1996

Questions for each chapter:

Chapter

- 1: Describe two results from NAEP data. What are the implications?
- 2: Read the following problem and respond to the listed items:
 - Solve it.
 - Explain in words how you solved it.
 - Justify that your solution is correct.

Problem: Some people say that to add four consecutive numbers, you add the first and the last numbers and multiply by 2. Is this always true? How do you know?

3. What are some of the benefits of having students write in mathematics class? When should the writing take place? How can very young students “write”?
4. This chapter suggests a distinction between drill and practice. Explain the difference and what each can provide.
5. Describe the essential features of a rubric. What are performance indicators?
6. What are some of the specific difficulties English language learners may encounter in the mathematics class?
7. Among the software kept at the school at which you are doing your practicum/teaching, find one example of instructional software for mathematics. Try it and decide how it would be used in your classroom (if at all). Be sure to check the documentation for grade levels.
8. You’ve noticed that a student you are working with is counting items with an accurate sequence of the numbers in our system, but is not attaching one number to each item. Therefore, the final count is inconsistent and inaccurate. What would you plan to help this student develop a better grasp of one-to-one correspondence?
9. Create two different story problems for 36 divided by 9. Create one problem as a measurement problem and one as a partition problem.
10. Describe three key ideas you could use in working with students to remediate basic fact mastery.
11. Describe five patterns that can be found on the hundreds chart.
12. Why is some form of assessment that gets at student’ understanding so important when teaching traditional algorithms?
13. What are some important considerations for teaching computational estimation?
14. What is a recursive relationship? Where in a table for a growing pattern would you look for a recursive relationship? What would it mean in terms of the pattern itself?
15. Describe two ways to compare $\frac{5}{12}$ and $\frac{5}{8}$. (Not common denominator or cross-product methods).
16. A student adds $\frac{4}{5}$ and $\frac{2}{3}$ and gets $\frac{6}{8}$. How would you help this student understand that this is incorrect? And how would you redirect him or her to do it correctly?
17. For addition and subtraction of decimals, the *line-up-the-decimal* rule can be reasonably developed through practice with estimation. Explain.
18. Consider the problem: If 50 gallons of fuel cost \$56.95, how much can be purchased for \$100.00? Draw a sketch to illustrate this proportion, and set up the equation in two different ways. One equation should equate within ratios and the other between ratios.
19. Explain what it means to measure something. Does your explanation work equally well for length, area, weight, volume, and time?
20. What can you do when the students in your class are at different van Hiele levels of thought?
21. What is meant by the “shape of data”?
22. Explain what is meant by this statement, “Chance has no memory.”
23. What strategies can you use to help students understand and appropriately use the order of operations?

General Information for School of Education Courses

Information about the University

There are three University publications you will need to refer to for various academic issues:

The University Catalog, 2012-2013

The Academic Regulations, 2009(Nineteenth Edition)

The Student Handbook

Registration (Regulations 25.00.00 and 75.00.00)

Faculty members are expected to deny a place in the class to any person who has not been formally registered, unless that student is attending a portion of a course for valid academic reasons with the

permission of the instructor and the dean or teaching unit head. Discontinuation of attendance at class or notification to the instructor does not constitute an official withdrawal. This means only formally registered students can attend classes. Children and other family members of students are not permitted in class. Formal registration can be verified through the "Academics" section on the student's <myAU.american.edu> portal account. Class participation on Blackboard (without formal enrollment in the course) does NOT equal formal registration.

Incomplete Grades **[Regulations, p. 21]**

Faculty members may approve student requests for an incomplete grade in rare and extreme classes, and must do so before the end of the semester. Only students who are passing a course (with a C or better) are eligible for a grade of incomplete. Students must complete and submit an Incomplete Contract Form to the faculty member.

Academic Integrity Code **[Regulations, pp. 93-96]**

Students are expected to conform to the regulations of the University in regard to academic integrity, especially in regard to plagiarism, inappropriate collaboration, dishonesty in examinations, dishonesty in papers, work for one course and submitted to another, deliberate falsification of data, interference with other students' work, and copyright violation.

Services for Students with Disabilities **[Handbook, pp. 81-88]**

Appropriate modifications to academic requirements may be necessary on a case-by-case basis to ensure educational opportunity for students with disabilities, and individual faculty members may need to modify specific course requirements to permit equal participation by students with disabilities.

Protection of Human Subjects **Catalog, pp. 34-35**

Any research involving interviewing, surveying, or observing human beings is subject to review and approval by the University Institutional Review Board (IRB) and information about the university's IRB process is outlined at <http://american.edu/provost/osp/IRB.cfm>. The university IRB liaison is Matthew Zembrzuski and his email is zembrzus@american.edu

Using Appropriate Documentation Formats

The School of Education, Teaching & Health permits the use of two formats for research citations, footnotes, list of references, and layout, and all written work must adhere to those guidelines:

Publication Manual of the American Psychological Association, Sixth Edition, Washington, D.C.: American Psychological Association, 2009. Online guide at <http://www.apastyle.org/manual/index.aspx>

OR

The MLA Handbook for Writers of Research Papers (7th edition) Modern Language Association of America (2009). Online guide at http://www.mlahandbook.org/fragment/public_index

Failure to use the format selected appropriately and accurately will result in a grade penalty.

Rubric for Game

This assignment is worth 40 points. Each aspect is worth 5 points.

5 = Excellent, done thoroughly

4 = Good, done well

3 = Fair

2 = Poor

1 = Missing, not done at all

_____ The game reinforces the skills students have learned about mathematics. It is ready for all to play on April 26, 2012.

_____ The game is designed so that the designer shows he/she understands completely the skills needed for the grade/age of the children.

_____ When the game is played, it is engaging and fun, while reinforcing math skills.

_____ Multiple strategies to reinforce math skills are incorporated in the game.

_____ Scoring for the game is clear and promotes additional skill practice in mathematics.

_____ The game is appealing to play. Aesthetics were considered.

_____ The rules are understandable.

_____ The age level(s) and grade level(s) are indicated and supported as is the number of players.

Your name _____ Date of observation _____ Grade level observed _____

Observation Guide

Students

| Focus Question | Evidence from Classroom |
|--|-------------------------|
| Math Content | |
| -What mathematical ideas are embedded in the lesson? | |
| -What makes this worthwhile mathematics? | |

| | |
|--|--|
| Learning | |
| -What kinds of mathematics sense-making are students doing? | |
| -What mathematical ideas seem to be confusing to students? | |
| -In what ways can you see that the students are developing their mathematical ideas over time? | |
| Intellectual Community | |
| -How are students showing respect for one another's ideas? | |
| -How do students use each other as resources as they make sense of mathematical ideas? | |
| -What evidence beyond raised hands do you have that students are engaged? | |
| -How willing are students to share their ideas even if they know they are not correct? | |
| -Are students building on each other's | |

| | |
|---------------------|--|
| mathematical ideas? | |
|---------------------|--|

Teacher

| Focus Question | Evidence from Classroom |
|--|-------------------------|
| -What does the teacher seem to understand about the mathematics? | |
| -What is the teacher's long-term mathematical agenda? | |
| What does the teacher seem to understand about the development of children's ideas in this topic? | |
| Pedagogy | |
| How does the teacher work productively with students' confusion? | |
| How does the teacher attend to all students? | |
| How does the teacher adjust his/her teaching based on the ideas heard from students? | |
| Facilitating Intellectual Community | |
| How does the teacher set the tone so students see each other as resources for mathematical thinking? | |

| | |
|---|--|
| | |
| What interventions does the teacher make to ensure that students' engagement has a focus on mathematical ideas? | |
| Does the teacher invite students to build on one another's ideas? | |
| Does the teacher invite students' tentative thinking? | |

Form D Lesson Plan Template

Situating the Lesson:

[Describe where this lesson fits in to a larger curricular unit and how prior knowledge was assessed to inform this lesson plan. This description should include what students have been learning in terms of content, skills, and attitudes, as well as where they will go after this particular lesson .]

Methods of Inquiry:

[Inquiry methods are the primary means through which research is conducted; these tend to vary by discipline. They relate to the types of questions, activities and sources that are used with specific content. Methods of investigation often frame how evidence and data are collected, examined, and reported within a given field. For example, literary critics may perform critical textual analysis, historians may conduct document analysis and triangulate evidence; political scientists may analyze public opinion polls. Inquiry methods can also be cross-disciplinary.]

Instructional Goals:

[Instructional goals indicate what students will know and be able to do as a result of this lesson (or sequence of lessons). These goals include specific content material, skills, and dispositions you expect the students to learn and practice. These are the kernels you want students to come away with. If you get lost in the middle of a lesson, these goals should help you refocus. Within a curricular unit, instructional goals build upon each other, usually culminating in the formal unit assessment. Instructional goals can be listed in bulleted form.]

Essential Questions:

[These include the central questions that help you organize and formulate your lesson within a curricular unit. These should include a range of questions that include recall, descriptive, explanatory, analytic, synthesis, and evaluative thought processes. Please note that higher order questions will not be that useful or instructive if students' factual knowledge is not in place.]

State and/or Content Standards (indicate source):

[Applicable state and/or content standards should be listed by number and include the actual text of the standard. State standards include content and skills criteria. Be sure to indicate which state's standards you are using.]

Instructional Materials:

[Here, you should include a list of materials you will be using in the class. Attach all handouts and readings you will use for this lesson to the lesson plan.]

Set Induction:

[The set induction refers to how you are going to introduce your lesson to the students you are teaching. While you can include administrative tasks here, you should primarily think about how you can prompt your students to begin thinking about the content and skills you will be teaching them. This can range from telling them your instructional goals to asking them to respond to a question which engages their prior knowledge and experience with a major concept you will be teaching. Set inductions can vary quite a bit from day to day, but should reflect the instructional goals of the daily lesson plan and the curricular unit.]

Procedures (Lesson Content/Skills/Teaching & Learning Strategies):

[The lesson content addresses both the substantive material you will be using and the big ideas you want students to take away from the lesson. In order to learn this content, you will use differentiated teaching and learning strategies to help students employ and develop specific skills needed to learn the content. Full descriptions of each activity and the materials to be used during that activity need to be included. Often times, the content, strategies, and skills are discussed in tandem and do not need to be separated from one another. When you do move from one content point to another or one skill to another, you need to include transitions.]

Assessment/Closure:

[This section illustrates how you will know that your students have learned what you taught them. This usually means that you will have students use the knowledge, skills, and dispositions they have learned in some way. The assessment should directly reflect the instructional goals and be buttressed by the content, skills, and strategies used over the course of the lesson. It can be helpful to figure out how you are going to assess student learning after you develop the instructional goals but before you develop the teaching methods you will use.]

Reflection:

[This is space for your notes about how the lesson went. You should note what worked well, what was problematic, ideas for modifying the lesson for future use, and how this particular lesson ties in with others in the same curricular unit.]

Other Notes:

- *Initially, it is helpful to indicate how much time you are spending on each aspect of the lesson. This helps you maintain momentum and it helps you stay focused (and keep your students focused) during the lesson.*
- *You should include all handouts (guidelines, assessments, worksheets, etc.) and sources in your lesson plan.*

2-day Mathematics Lesson Plan Rubric

Directions: Prepare your lesson plans.

Name: _____

Date: _____

Grade: _____

Subject: _____

AU Course & Semester: _____

Course Instructor: _____

Situating the Lesson (Score ____)

Methods of Inquiry (Score ____)

Instructional Goals (Score ____)

Essential Questions (Score ____)

State and/or Content Standards (indicate source) (Score ____)

Instructional Materials (Score ____)

Set Induction (Score ____)

Procedures (include differentiation strategies) (Score ____)

Assessment (Score ____)

Reflection (Score ____)

Lesson Plan Scoring Rubric

| | Needs Improvement 1 *must be resubmitted* | Acceptable 2 | Distinguished 3 |
|-----------------------------|--|--|--|
| Situating the Lesson | <ul style="list-style-type: none"> Does not describe where lesson fits into larger curricular unit Does not describe how prior knowledge for this lesson was assessed in previous lesson(s). | <ul style="list-style-type: none"> Adequately describes where the lesson fits into larger curricular unit Adequately describes how prior knowledge for this lesson was assessed in previous lesson(s). | <ul style="list-style-type: none"> Thoroughly describes where the lesson fits into larger curricular unit Thoroughly describes how prior knowledge for this lesson was assessed in previous lesson(s). |
| Methods of Inquiry | <ul style="list-style-type: none"> Inquiry methods are minimal and/or are not directly linked to the instructional goals or essential questions Methods of inquiry do not build on students' primary knowledge or engage their interest Methods of inquiry are not linked to state and/or content standards | <ul style="list-style-type: none"> Appropriate inquiry methods are used to investigate the instructional goals and essential questions Methods of inquiry build on students' prior knowledge and engage student interest Linked to appropriate state and/or content standards | <ul style="list-style-type: none"> Inquiry methods focus and frame the pedagogy and content of the lesson as conveyed through the instructional goals and essential questions Methods of inquiry build strong connections to students' prior knowledge and engage student interest Linked to appropriate, multiple state and/or content standards |
| Instructional Goals | <ul style="list-style-type: none"> Appropriate developmental and academic objectives are unclear or inadequately addressed | <ul style="list-style-type: none"> Appropriate developmental and academic objectives are evident as measurable learning outcomes | <ul style="list-style-type: none"> Appropriate developmental and academic objectives are evident as measurable learning outcomes that promote higher levels of thinking |
| Essential Questions | <ul style="list-style-type: none"> Essential questions do not reflect the instructional goals and/or methods of inquiry | <ul style="list-style-type: none"> Essential questions adequately reflect the instructional goals and methods of inquiry for several cognitive levels | <ul style="list-style-type: none"> Essential questions exemplify the instructional goals and methods of inquiry for multiple cognitive levels |

| | Needs Improvement 1 *must be resubmitted* | Acceptable 2 | Distinguished 3 |
|---------------------------------------|--|---|--|
| State and/or Content Standards | <ul style="list-style-type: none"> Lesson is inadequately linked to state and/or content standards | <ul style="list-style-type: none"> Lesson is appropriately linked to state and/or content standards | <ul style="list-style-type: none"> Lesson is appropriately linked to multiple state and/or content standards |
| Instructional Materials | <ul style="list-style-type: none"> Inadequate use of instructional materials | <ul style="list-style-type: none"> Adequate use of instructional materials to support content knowledge and inquiry development | <ul style="list-style-type: none"> Exceptional use of instructional materials to support content knowledge and inquiry development |
| Set Induction | <ul style="list-style-type: none"> Does not prompt students to think about the content and skills that will be taught | <ul style="list-style-type: none"> Adequately prompts students to think about the content and skills that will be taught | <ul style="list-style-type: none"> Thoroughly prompts students to think about the content and skills that will be taught |
| Procedures | <ul style="list-style-type: none"> Procedures lack motivational strategies, differentiation and/or closure Inadequate adjustment of instruction Instructional strategies do not promote engagement of all learners and provide little evidence of differentiation | <ul style="list-style-type: none"> Procedures include motivational strategies, methods of inquiry, differentiation and closure Adequate adjustment of instruction based on ongoing evaluation Instructional strategies promote active engagement of all learners and are differentiated to support learners of differing backgrounds, learning styles, prior knowledge and needs | <ul style="list-style-type: none"> Distinguishable use of procedures which include motivational strategies, methods of inquiry, differentiation and closure Exceptional adjustment of instruction based on ongoing evaluation Instructional strategies promote active engagement of all learners; critical thinking and problem solving skills and are differentiated to support learners of differing backgrounds, learning styles and needs |
| Assessment | <ul style="list-style-type: none"> Assessment does not measure how students use the knowledge, skills and dispositions acquired through the lesson Extremely limited use of assessment | <ul style="list-style-type: none"> Assessment adequately measures how students use the knowledge, skills and dispositions acquired through the lesson | <ul style="list-style-type: none"> Assessment thoroughly measures how students use the knowledge, skills and dispositions acquired through the lesson Assessment; is linked to instructional goals, applicable standards, and methods of |

| | Needs Improvement 1 *must be resubmitted* | Acceptable 2 | Distinguished 3 |
|-------------------|---|---|---|
| | strategies and/or relevance to instructional goals, standards, and methods of inquiry | <ul style="list-style-type: none"> Assessment is linked to instructional goals, applicable standards, and methods of inquiry Assessment is differentiated based on needs and occurs throughout the lesson | inquiry <ul style="list-style-type: none"> Assessment is differentiated based on needs and naturally integrated into the lesson |
| Reflection | <ul style="list-style-type: none"> Limited analysis on the effect of actions on student learning Limited reflection on lesson successes, challenges and data-based decisions for future instruction Does not discuss how lesson connects with others in the same curricular unit | <ul style="list-style-type: none"> Analysis of the effects of actions on student learning Reflection on lesson successes, challenges and data-based decisions for future instruction Adequately discusses how this lesson connects with others in the same curricular unit | <ul style="list-style-type: none"> Insightful analysis of the effects of actions on student learning Insightful reflection on lesson successes, challenges and data-based decisions for future instruction Thoroughly discusses how this lesson connects with others in the same curricular unit |

-Your goals should be stated clearly in measurable terms.

-Your lesson should include an opening that activates prior knowledge and motivates new learning. Engagement of students should be evident with multiple levels of questioning, opportunities for relevant discourse, differentiated modes of learning, and opportunities for students to be active learners and/or to be engaged in meaningful reflection. The closure should promote student reflection, opportunities for students to share their understanding of the task, and highlights salient points of the lesson to guide understanding.

Your assessment should align with the objectives, include multiple opportunities for assessing work, and provide constructive feedback to promote learning.

Because this is a 2-day lesson plan it should connect students' new learning from the first day to the second day.

| | Beginning 1 | Developing 2 | Accomplished 3 | Exemplary 4 | Score |
|---|--|---|--|--|--------------|
| Instruction Goals and Objectives | Instructional goals and objectives are not stated. Learners can not tell what is | Instructional goals and objectives are stated but are not easy to understand. | Instructional goals and objectives are stated. Learners have an understanding of | Instructional goals and objectives clearly stated. Learners have a clear understanding | |

| | | | | | |
|--------------------------|---|---|---|---|--|
| | expected of them. Learners can not determine what they should know and be able to do as a result of learning and instruction. | Learners are given some information regarding what is expected of them. Learners are not given enough information to determine what they should know and be able to do as a result of learning and instruction. | what is expected of them. Learners can determine what they should know and be able to do as a result of learning and instruction. | of what is expected of them. Learners can determine what they should know and be able to do as a result of learning and instruction. | |
| Instructional Strategies | Instructional strategies are missing or strategies used are inappropriate. | Some instructional strategies are appropriate for learning outcome(s). Some strategies are based on a combination of practical experience, theory, research and documented best practice. | Most instructional strategies are appropriate for learning outcome(s). Most strategies are based on a combination of practical experience, theory, research and documented best practice. | Instructional strategies appropriate for learning outcome(s). Strategy based on a combination of practical experience, theory, research and documented best practice. | |
| Assessment | Method for assessing student learning and evaluating instruction is missing. | Method for assessing student learning and evaluating instruction is vaguely stated. Assessment is teacher dependent. | Method for assessing student learning and evaluating instruction is present. Can be readily used for expert, peer, and/or self-evaluation. | Method for assessing student learning and evaluating instruction is clearly delineated and authentic. Can be readily used for expert, peer, and/or self-evaluation. | |
| Technology Used | Selection and application of technologies is inappropriate (or nonexistent) for learning environment and outcomes. | Selection and application of technologies is beginning to be appropriate for learning environment and outcomes. Technologies applied do not affect learning. | Selection and application of technologies is basically appropriate for learning environment and outcomes. Some technologies applied enhance learning. | Selection and application of technologies is appropriate for learning environment and outcomes. Technologies applied to enhance learning. | |
| Materials Needed | Material list is missing. | Some materials necessary for student and teacher to complete lesson are listed, but list is incomplete. | Most materials necessary for student and teacher to complete lesson are listed. | All materials necessary for student and teacher to complete lesson clearly listed. | |
| Organization and | Lesson plan is unorganized and not | Lesson plan is organized, but not | Lesson plan is organized and neatly | Complete package presented in well | |

| | | | | | |
|--------------|-----------------------------|---------------------------|------------|-------------------------------------|--|
| Presentation | presented in a neat manner. | professionally presented. | presented. | organized and professional fashion. | |
| | | | | Total Points | |

Book Review

The book review should be two to five pages in length, double spaced. It should contain the following information:

- The name of the book and the author
- The reason you chose the book
- The highlights of the book
- How you could use the information from the book to teach mathematics
- Whether you would recommend the book to a colleague or not and why
- What you learned from this assignment

An example of a book you might choose is **Teach Like a Champion: 49 Techniques that Put Students on the Path to College** by Doug Lemov.