



School of Education  
THE CITY COLLEGE of NEW YORK  
City University of New York



The City College School of Education prepares knowledgeable, reflective and caring educators who are qualified and committed to teaching and leading in diverse communities.

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Semester:	Spring 2015	Office Hours:	By appointment only
Section:	Thurs 7:30-10:00 & Hybrid	Email:	mathiskey@yahoo.com
Instructor:	Shana Elizabeth Henry, Ph.D.	Blackboard:	

### Part I: Syllabus

#### 1. Name, number, and course description

EDSE 2700E: *Middle and Secondary School Mathematics: Teaching Developmentally* (3 credits)

This course is designed to help Teaching Fellows better understand the types of mathematical misconceptions students may have developed by the time they reach middle and early high school. It will identify a variety of research-based strategies for developing a better understanding of the mathematical procedures and concepts related to those misconceptions. In addition Fellows will learn to differentiate instruction to help all learners meet and exceed appropriate New York State Learning Standards.

Developing this understanding and pedagogy will be built through exploration, inquiry, discovery, collaboration, and reflection in carefully selected learning situations. In these situations Fellows will examine mathematical tasks, methodology, curricula, students' work, and relevant research and theories.

#### 2. Working themes of the Conceptual Framework of the School of Education and how addressed in the course:

##### A. *Developing in-depth knowledge about the world*

- Connecting content to real world applications
- Engaging in a variety of activities that promote dispositions to be a life-long learner

##### B. *Becoming skillful, reflective practitioners*

Exploring a variety of educational experiences that:

- Facilitate construction of in-depth understanding of mathematics
- Encourage critical thinking and problem-solving
- Provide support to question assumptions and develop habits of reflection

##### C. *Education for and about diversity*

- Furthering awareness, knowledge, skills, and dispositions towards a variety of problem-solving strategies
- Using candidates' diversity as a resource

##### D. *Building caring communities*

- Creating a supportive environment that promotes interaction, inquiry, and respect in our classroom as a model for candidates' classrooms
- Making connections to other courses, events, and/or speakers in the college and the world at large

#### 3. Teacher candidate outcomes expected upon completion of course

The teacher candidates will

- demonstrate an understanding of common misconceptions and errors students make in middle and early high school mathematics classrooms.
- describe strategies for developing a better understanding of basic mathematics concepts and procedures

- demonstrate the ability to effectively use manipulative materials, real world examples and technology to improve mathematics skills and dispositions
4. Instructional methods implemented in the course
- Class discussions and reading/writing assignments that promote inquiry, critical thinking, reflection, and connections between theory and classroom practice
  - Problem posing and problem solving activities that facilitate candidates' development of knowledge and understanding of mathematics and effective pedagogy, with formative instructor feedback throughout
  - Use of a variety of learning formats, such as exploration with concrete materials and multimedia presentations
5. Policies and Procedures

#### *Attendance*

Attendance is required. This is an activity-based course so “getting notes from a friend” will not replicate the learning experience of a missed session. If you miss, for whatever reason, more than two sessions, you will be withdrawn from the course. The expectation is that you will be present, on time, and prepared for every class. In the event of an emergency or other special circumstances, please contact me if you will not be present in class. Those who are more than 5 minutes late to class will be counted as late. Three late marks will count as an absence. Consult the CCNY academic calendar when planning vacations or travel. Please note that CCNY classes *do* meet in the spring during Presidents' Week and we *do* meet May 21<sup>st</sup>, 2015.

#### *Studentship*

Studentship is your eagerness to learn, reflected in a positive, searching attitude and in your full, purposeful, and meaningful participation in coursework and class discussions. Studentship necessitates your taking responsibility for your educational experience. You will be a member of a mathematics learning community; thus you will also be assessed on how well you work with others. Your studentship is 15% of your grade in this course. A rubric for assessing your studentship is provided in this syllabus.

#### *Reading Assignments*

You are expected to complete all reading assignments. Students who do so gain much more from explorations and discussions. Reflect on what you read. In written reflections, do not merely summarize. Make connections among the reading, the class, and the field. It is your responsibility to raise issues that you feel need clarification or elaboration. Your understanding of reading assignments will be assessed through in-class discussion and formal assessments.

#### *Written Assignments*

Detailed descriptions of the expectations for all assignments, as well as the scoring rubrics, are included in this syllabus or posted on Blackboard. Documents submitted electronically must be in Word (not rtf) and have a file name as follows: Last Name\_Assignment Name.doc (Example: Hellman\_Problem-Solving Report #1.doc) Improperly identified files will not be opened.

#### *Writing Standard*

The quality of your ideas as well as your written presentation will be taken into consideration when assigning grades. It is required that all written assignments be typed double spaced, size 12 font (Times), left-justified, one inch margins, page-numbered, proofread and edited, stapled or bound, with identifying information that includes the title of the assignment, your full name (and group members, if applicable), date of submission, and class section on the first page. All work must be of professional quality, using APA style, and should be submitted in a manner that reflects pride in your work. I encourage you to make use of the CCNY Writing Center for help, if needed. The NYC DoE teacher recruitment process includes two essay questions in the application. These questions are reviewed and rated for content, grammar and mechanics.

#### *Late Assignments*

All assignments *must* be submitted on time to receive credit. Assignments are due at the beginning of class on the due date. Work that is not submitted on time will *not* be graded unless prior arrangements have been made in very rare and extenuating circumstances (and will be graded at the convenience of the instructor). Be advised that computer problems will not be accepted as extenuating circumstances.

### *In-class Written Assessments*

There will be no make-up in-class written assessments. In the rare event of serious illness and hospitalization, students may request a make-up assessment, granted only at the discretion of the instructor.

### *Cell Phones and Other Electronic Devices*

Please turn off cell phones before entering class. If you need to receive a call during class (pending an emergency), please let me know ahead of time. The use of cell phones or other devices to send or receive text messages or other electronic communication is not permitted during class.

### *CCNY Email and Blackboard*

Students will be required to use CCNY email and the Internet, including Blackboard, throughout this course. Failure to do so will be reflected in your grade. Internet is available on campus. Internet and the CCNY library should be used outside of class time. For onsite assistance you may go to the Learning and Technology Resource Center, NAC 3/226 or the Multimedia Center, NAC 4/221.

### *CUNY Policy on Academic Integrity* <http://www1.ccny.cuny.edu/upload/academicintegrity.pdf>

As stated in the CUNY Policy on Academic Integrity: Plagiarism is the act of presenting another person's ideas, research, or writings as your own. As a student, you have the responsibility to be honest and to conduct yourself in an ethical manner while pursuing academic studies. A student who plagiarizes may incur academic and disciplinary penalties, including failing grades, suspensions, and expulsion. Should you be accused of a breach of academic integrity, procedural safeguards including provisions of due process have been designed to protect students' rights.

### *Disability Accommodation*

If you have a documented disability and require special classroom modifications or other accommodations, you should notify me early in the semester to discuss your needs. You should also notify the Office of Student Disability Services (SDS), located in NAC 1/218.

## 6. Assessment

### *Methods of Assessment*

A variety of assessment methods are used in this course. All assignments must be submitted **on time** to receive credit. You are expected to demonstrate the professionalism and scholarship of graduate students and educational leaders. Detailed descriptions of the expectations for the assignments, as well as the scoring rubrics, are included in this syllabus, posted on Blackboard, or distributed in class. We will discuss the expectations in class, and I remind you that I am available outside of class during by special arrangement, and by email.

- Studentship . . . . . 15%
- Reading Reflections . . . . . 24%
- Final Project: *Differentiated Learning*, including presentation . . . . . 30%
- In-class Written Assessments (may include unannounced quizzes) . . . . . 31%

<i>Passing Grades:</i>	<u>Points</u>	<u>Grade</u>	<u>Points</u>	<u>Grade</u>
	97-100	A+	84-86	B
	95-96	A	80-83	B-
	90-94	A-	77-79	C+
	87-89	B+	70-76	C

*Note:* No grade of INC will be given unless the Fellow has applied for (in writing) and received permission for this INC prior to end of the course. Incompletes will only be considered in cases of emergencies, not poor planning.

## 7. Required Texts and Materials

Van de Walle, John. (2011). *Elementary and Middle School Mathematics: Teaching Developmentally*, 8<sup>th</sup> Ed. Boston: Pearson.

### *Print and Online Articles*

Articles from relevant journals and books will be available on Blackboard, online, or distributed in class.

## Part II: Course Outline

*Topics and assignments are subject to change. Check Blackboard for updates.*

Assignments are due at the beginning of the session. Refer to the guidelines and rubrics in the syllabus to guide your work.

Session	Topics for Discussion and Activities	Reading and Assignments <b>Due at the beginning of the session.</b>
1 <b>01/29</b>	<ul style="list-style-type: none"> <li>• Overview and Goals of EDSE 2700E</li> <li>• Number Concepts &amp; Number Sense</li> </ul>	EDSE 2700E Syllabus <b>R&amp;R:</b> Equitable Mathematics for <i>All Students</i>
2 <b>02/05</b>	Developing Concepts of Fractions, Decimals, & Percents	<b>R&amp;R:</b> Clarke, Roche, & Mitchell. (2008). <i>Practical tips for making fractions come alive and make sense.</i>  <b>R&amp;R:</b> Smith & Stein. (1998). <i>Selecting and creating mathematical tasks.</i>
3 <b>02/19</b>	Proportional Reasoning	<b>R&amp;R:</b> Langrall & Swafford. (2000). <i>Three balloons for two dollars: Developing proportional reasoning.</i>  <b>R&amp;R:</b> McDuffie, Wohlhuter, & Breyfogle. (2011). <i>Tailoring tasks to meet students' needs.</i>
4 <b>02/26</b>	Algebraic Thinking: Generalizations, Patterns, & Functions	<b>R &amp; R:</b> Van de Walle, John, Karp, Karen; & Bay-Williams, Jennifer. ( 2012). <i>Elementary and Middle School Mathematics: Teaching Developmentally</i> Chapter 14.
5 <b>03/05</b>	Developing Measurement Concepts	<b>R&amp;R:</b> Little, Hauser, & Corbishley. (2009). <i>Constructing complexity for differentiated learning.</i>
6 <b>03/12</b>	Developing Concepts of Exponents, Integers, and Real Numbers	<b>R&amp;R:</b> Van de Walle, John, Karp, Karen; & Bay-Williams, Jennifer. ( 2012). Chapter 23.
7 <b>03/19</b>	Geometric Thinking & Geometric Concepts	<b>Planning for Final Project:</b> Bring five copies of a written description of your chosen concept and the task or activity you intend to use in order to receive feedback from the instructor and from your peers.  <b>R&amp;R:</b> Malloy. (1999). <i>Perimeter and area through the van Hiele model.</i>  <b>R&amp;R:</b> Murrey. (2008). <i>Differentiating instruction in mathematics for the English language learner.</i>
8 <b>03/26</b>	CLASS CANCELED	
9 <b>04/02</b>	Mathematical Games & Puzzles	<b>R&amp;R:</b> Quinn, Koca, & Weening. (1999). <i>Developing mathematical reasoning using attribute games.</i>
10 <b>04/16</b>	Developing Concepts of Data Analysis	<b>R&amp;R:</b> Zawojewski & Shaughnessy. (2002). <i>Mean and median: Are they really so easy?</i>  <b>R&amp;R:</b> Confrey, Jere, Makar, Katie, Kazak, Sibel. (2004). <i>Undertaking Data Analysis of Student Outcomes as Professional Development for Teachers</i>
11 <b>04/23</b>	Exploring Concepts of Probability	<b>R&amp;R:</b> Van de Walle, John, Karp, Karen; & Bay-Williams, Jennifer. (2012). Chapter 22.
12 <b>04/30</b>	Presentations	<b>Submit Final Project: Differentiated Learning</b>  Submit Peer Reviews of Presentations (close of session)
13 <b>05/07</b>	Presentations	Submit Peer Reviews of Presentations (close of session)
14 <b>05/14</b>	Manipulative Presentations	Remember to register for summer and/or fall.
15 <b>05/21</b>	<b>Written Assessment</b>	<b><i>Have a great summer!</i></b>

### Part III: Assessment Guidelines and Scoring Rubrics

#### Studentship

**Purpose:** This is an inquiry-based course. Your successful experience is in large part contingent upon your effort in preparing for class; your active participation in class activities and discussions, and your contributions as a member of a mathematical learning community.

**Assessment Rubric:**

Criteria	Target (5 pts)	Acceptable (3 pts)	Unacceptable (no credit)
Attendance	Missed no more than 2.5 hours of class.	Missed no more than 5.0 hours of class.	Missed no more than 7.5 hours of class.
Full participation in class assignments and activities	Enthusiastically participated in class activities.	Participated in class activities	Took little interest in class activities.
Collegiality	Respectful of the ideas of others. Encouraged others to participate. Supported the work of others.	Respectful of the ideas of others. Supported the work of others.	Disrespectful to others or did not support the work of others.

#### Reading Assignments: Read & Reflect (R & R)

**Purpose:** The goal of these assignments is to connect the work we do in class to current research and to national/state standards for mathematics teaching and learning; to provide a framework for discussion of the reading assignments; and to encourage reflection, not mere summary.

**Template:**

1. Three Key Points:
2. Two Connections:
  - 1) Connect the article to our class or your classroom
  - 2) Connect the article to current research or national/state standards for mathematics teaching and learning
3. If only: Write about a thought that includes the words 'if only'. Example: to raise an issue that you feel you need clarification or elaboration.
4. Reflect: One thing that caused you to reflect on your own beliefs and/or practice:

**Assessment Rubric:**

Criteria	Proficient Full credit	Developing Half credit	Unsatisfactory No credit
High-Level Thinking	Depth of thought, connections, and reflections are evident.	Thoughts, connections, and reflections are present, but need to be more fully developed.	Depth of thought, connections, and reflections are lacking or incomplete.
Quality of Report	Fulfills all aspects of the required task with detail and completeness. Neat and organized.	Mostly fulfills aspects of the required task with detail and completeness.  Mostly neat and organized.	Half or less of the required task with detail and completeness.  Difficult to read / disorganized.

## ***Final Project: Differentiated Learning***

### **Overview:**

One of the most difficult challenges for today's teachers is to meet the needs of all of their students. Research in mathematics education suggests that a problem-based classroom is the best way to reach students with a wide range of abilities (Van de Walle, 2004, p. 84). Problem-based classrooms allow students to use a variety of strategies to solve problems and to explore concepts. Students discuss their understanding and clarify their thinking as part of the learning activity. To be even more effective in this problem-based environment, teachers should plan for the use of differentiated mathematical tasks.

Differentiated mathematical tasks take many forms. They can be tasks that focus on the same concept or topic but have multiple entry points.

### **Example:**

Students are given a collection of parallelograms including squares and rectangles as well as nonrectangular parallelograms. They are then assigned one or more of the following tasks:

- Select a shape and draw at least three new shapes that are like it in some way. Tell how your new shapes are both similar to and different from the shape you selected.
- Draw diagonals in these shapes and measure them. See what relationships you can discover about the diagonals. Describe the relationships and explain how you know those relationships are valid.
- Make a list of all the properties that you can find among your set of shapes. Classify your shapes based on these properties. Indicate in a Venn Diagram, how your shapes were classified. Explain your classification scheme and your Venn Diagram in writing. (Or present your classification scheme and your Venn Diagram to the class.) (Van De Walle, 2004, p.85)

Teachers can also differentiate the task by asking the same content questions with a different context. For example, a unit on statistics might ask questions about the following: baseball, music album sales, or calories in different fast food meals. Students would be expected to collect data regarding one of the topics and answer questions that would require them to find measures of central tendencies and represent their findings using appropriate graphs and charts. Allowing student to have a choice makes them more accountable for their work.

A third way to differentiate instruction is to allow students a choice in how they show what they know or can do. Some students prefer to write about their findings, while others prefer to do oral presentation. Some students are very creative and engage more fully in the learning process when can present skits, write poetry, or draw graphical representations. Many students prefer to apply their knowledge to a real world problem or project.

### **Assignment:**

The assignment provides you the opportunity to create a differentiated learning task for your classroom. The task should be aligned with the New York City/New York State Learning Standards. It should allow students working at different levels of mathematics to engage in learning a topic of your choice. To complete the assignment you are to:

1. Read about differentiated instruction. (Suggested references can be found below, in addition to our class articles.)
2. Think about your current or potential NYC school community and class. What are / will be their learning needs? How are they alike? How are they different? What characteristics should you consider when designing a learning task?
3. Choose a topic and design a differentiated task. Describe the task. Why did you chose it? How does it fit into your curriculum? What are the levels of the task and how did you decide on these levels? Describe clearly any modifications and/or support for your diverse learners.
4. Create your lesson, using the template in this syllabus.
5. Design a pre and post assessment for this task. How will you evaluate the student work? Provide copies of the rubrics.
6. Presentation: Implement the task in our class.

## General Information About Differentiated Instruction:

Hall, T. (2000). Differentiated instruction. National Center on Accessing the General Curriculum. Retrieved November 1, 2003, from <http://www.cast.org/ncac/index.cfm?i=2876>

How to use zone of proximal development in the classroom. (2000). *The university of Wisconsin board of regents*. Retrieved November 1, 2003, from <http://www.wcer.wisc.edu/step/ep301/Spr2000/Constance-B/>

## Additional Websites:

<http://www.ascd.org> The Association for Supervision and Curriculum Development provides a definition of differentiated learning along with practical classroom examples.

<http://ascd.org/handbook/demo/ctq/8spr00.html> *Focus on differentiated instruction: A supplement to the Curriculum Handbook*. (2000, Spring).

<http://www.ascd.org/pdi/demo/diffinstr/tomlinson2.html> Mapping a route toward differentiated instruction

<http://www.ascd.org/pdi/demo/diffinstr/differentiated1.html> Differentiating instruction – Pat Burke Guild and Stephen Garger, *marching to different drummers*

<http://www.ascd.org/pdi/demo/diffinstr/differentiated2.html> It begins with Good instruction

<http://www.cast.org/ncac/DifferentiatedInstruction2876.cfm> National Center on Accessing the General Curriculum provides information on differentiated instruction as well as an extensive list of other web resources

<http://curry.edschool.virginia.edu/centers/secme/diverse.txt> Meeting the needs of diverse Learners

<http://www.ed.gov/nclb/overview/intro/index.html> This web site contains information on the No Child Left Behind Act

<http://www.ericfacility.net/ericdigests/ed389141.html> Differentiating Instruction for Advanced Learners in the Mixed-Ability Middle school classroom

<http://www.glencoe.com/sec/teachingtoday/subject/dimath.phtml>

<http://www.mamleonline.org/resources/differentiation/developapprop.htm> Delving into Differentiation in Middle School

<http://www.mcps.k12.md.us/departments/eii/eiimanagepracticespage.html> Montgomery County, MD Schools offer a colorful website that explores the richness of differentiated instruction.

<http://www.middleweb.com/MWLresources/rickdiffbiblio.html> List of books and articles that explore, explain and support differentiated instruction

<http://www.southlakecarroll.edu/differentiation/DI%20Brochure.pdf>

<http://www.sp.uconn.edu/~nrcgt/news/spring99/spring993.html> High end learning in the diverse middle school: *Investigating the possibilities*

<http://www.teach-nology.com/tutorial/teaching/differentiate/planning> The Art and Science of Teaching with Technology offers a planning guide for teaching with Differentiated Instruction

[http://www.tki.org.nz/r/gifted/pedagogy/differentiation\\_e.php](http://www.tki.org.nz/r/gifted/pedagogy/differentiation_e.php) Differentiation for gifted and talented students

**FINAL PROJECT: DIFFERENTIATED LEARNING ASSESSMENT RUBRIC (COVER SHEET)**

Name: \_\_\_\_\_

Submission Date: \_\_\_\_\_

<b>Element</b>	<b>Proficient 3</b>	<b>Developing 2</b>	<b>Beginning 1</b>	<b>Unsatisfactory 0</b>
Understanding of differentiated instruction	The overview of the project references a variety of readings on differentiated instruction, synthesizes the reading and strongly connects the project to review of the literature.	The overview of the project references the literature on differentiated instruction and synthesizes the literature. There is some justification for the project based on the literature.	The overview of the project showed a basic understanding of the literature on differentiated instruction and provides a limited synthesis of the literature.	Demonstrates little or no understanding of the literature on differentiated instruction.
Project connection to the learning community.	Description of the learning community includes rich descriptions of the school setting, class setting, and addressed learning needs, styles, and/or goals of the students. Clearly connects project to the learning community.	Provides a description of the learning community. Shows a connection between the students interests and needs and the project.	Provides a brief description of the learning community. Demonstrates little or no connection between the students interests and needs and the project.	Learning community description is weak or missing.
Task Design	The teacher sets challenging, varied, and appropriate learning goals; designs instruction for specific learning goals, and student characteristics and needs. Task design shows a deep and flexible understanding of topic and levels of understanding of the topic and a strong understanding of how to differentiate instruction for this group. Task is aligned with NYC and or NYS performance indicators.	The teacher sets appropriate learning goals and designs instruction for specific learning goals, student characteristics and needs. Task design shows a basic understanding of topic and levels of understanding of the topic. Performance indicators are omitted or inappropriate.	The teacher sets appropriate learning goals. Task design considered student needs. Task design shows a basic understanding of topic, but differentiated levels are limited. Performance indicators are omitted or inappropriate.	Learning goals are missing or inappropriate for students. Task design showed little understanding of the topic beyond basic level. Performance indicators are omitted or inappropriate.
Task Assessment Design	The teacher uses multiple assessment modes and approaches, aligned with learning goals to assess student learning before, during, and after instruction. Task assessments are appropriate and identify students at different levels of understanding.	The teacher uses assessment approaches aligned with the task learning goals to assess student learning at a variety of points during the instructional process. Task assessments attempt to identify students at different levels of understanding.	The teacher uses some assessment techniques. Alignment with learning goals is limited. Levels of understanding are not clear.	Few or inappropriate assessments are used in the project. Assessment feedback does not define levels of understanding.

<b>Element</b>	<b>Proficient 3</b>	<b>Developing 2</b>	<b>Beginning 1</b>	<b>Unsatisfactory 0</b>
Task Implementation	The teacher provides a rich description of the task implementation. The description includes the classroom structure, instructions given to students, grouping of students and timing of activities. Implementation decisions are related to the literature review, the learning community and task goals.	The teacher provides a description of the task implementation. The description includes the classroom structure, instructions given to students, grouping of students, and timing of activities.	The teacher provides a description of the task implementation. The description failed to include one or more of the following: the classroom structure, instructions given to students, grouping of students and timing of activities.	Task implementation is missing or inappropriate.
Assessment Implementation	The teacher designs appropriate pre and post assessment data to demonstrate growth in student learning. Task assessments identify students at different levels. Evaluation of student work is fair and appropriate.	Task assessments are appropriate and identified students at different levels. Evaluation of student work is fair and appropriate. There is no attempt to show growth in student learning.	Assessments are aligned with learning goals, but student levels are ill defined, demonstration of student growth was limited.	Assessments are not aligned with the learning goals. Assessments do not show student growth or identify students at different learning levels.
Quality of the report	Meets all of the following standards: <input type="checkbox"/> Well-organized and written. <input type="checkbox"/> Complete. <input type="checkbox"/> Sources and APA citation style. <input type="checkbox"/> On time	Meets all of the following standards: <input type="checkbox"/> Complete. <input type="checkbox"/> Sources and APA citation style. <input type="checkbox"/> On time <input type="checkbox"/> Some organization / writing errors	Only partially meets more than one of the following standards <input type="checkbox"/> Well-organized and written. <input type="checkbox"/> Complete. <input type="checkbox"/> Sources and APA citation style. <input type="checkbox"/> On time	Most standards are not met. <input type="checkbox"/> Organization and writing. <input type="checkbox"/> Incomplete <input type="checkbox"/> Few or no sources and /or not in APA citation style. <input type="checkbox"/> Late

**Comments:**

**Presentation:**

The following lists the criteria that will be used to evaluate your presentation. Your evaluation will include feedback from other members of this class who attend your presentation.

**Overall evaluation of the presentation**

The presentation was well organized, flowed smoothly, information presented was relevant to students in the class, and the presentation actively engaged students. PowerPoint or SmartBoard Notebook was used to support the presentation. The information presented was grounded in a recognized knowledge base.

**Presentation Criteria (0-4 points)**

- Information is presented in a logical, interesting manner that the audience (your colleagues) can follow
- Demonstrates full knowledge of the material presented and questions are easily answered with clear explanation and elaboration
- Uses PowerPoint and graphics to explain and reinforce screen text
- Is grammatically correct with no misspellings
- Is lively; presenters rarely read notes
- Is loud (enough) with correct pronunciation, particularly of mathematical terms
- Appropriate handouts were provided

# LESSON PLAN TEMPLATE<sup>1</sup>

**Lesson Title:** \_\_\_\_\_

**Grade Level:** \_\_\_\_\_ **Text or Resource and Relevant Pages:** \_\_\_\_\_

**Overview:** What is the basic idea of the lesson? What will students do and learn?

**Objectives:**

- What specific mathematics will students develop, practice, or deepen during this lesson?
- What on-going objectives (mathematical processes, affective, collaborative) will students continue to build?
- What NCTM standards does this lesson address?
- What state standards does this lesson address?

**Materials:** What materials will be required (e.g., student sheets, transparencies, manipulatives, technology)? What supplies are students expected to have daily (e.g., graph paper, calculators, rulers, compasses, protractors)? What additional supplies do students need for this lesson?

**Use of Space:** What special space arrangements must be made (e.g., rearrangements of desks, use of computers, lab, hall space, library, or outdoor space)?

## Launch / Explore / Share & Summarize:

**Launch:** *Engage the students in preliminary thinking related to the coming activity.*

- How will students be organized (individually, pairs, small groups, full class)? What cooperative learning strategy will be used?
- What prior knowledge might need activation?
- Is there a literature segment, everyday experience, visual aid, or other device that will spark students' interest or curiosity? How can I make the situation personal to them? List or describe what you will do.
- How can I keep from giving away ideas I want students to generate?
- What examples will be shown? If we play a game, how will I help students understand the rules?

**Explore:** *Have students explore the problem or activity. Observe, listen closely, and ask questions that promote learning.*

- How will students be organized? What cooperative learning strategy will be used?
- What strategies, representations, and solutions might students use?
- What misconceptions do I anticipate? How will I address them?**
- Specify how to support students who are struggling.**
- Specify how to scale up the lesson for students ready for deeper thinking.**
- Which strategies do I particularly want to have shared in the Summary?
- Embedded Assessment: What will I look and listen for during the Explore to gauge student progress?
- Is there a brief segment of direct instruction needed during the Explore? If so, what should it be? How do I ensure it is brief?
- Will sharing be needed at an intermediate point? If so, where?
- Are there issues of language or symbolization to which I must be sensitive?**

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<sup>1</sup> Adapted from *Teaching and Learning Middle Grades Mathematics* ©2004 Key College Publishing

**Share & Summarize:**

Have individuals, pairs, small groups, or the whole class share their learning. Use the lesson objectives to identify key ideas you want highlighted. Based on those, prepare questions to help students develop or consolidate these new ideas.

- a. How will students be organized? What cooperative learning strategy will be used?
- b. What are the key mathematical concepts, representations, and processes that need to be highlighted?
- c. How can I orchestrate the summary so students draw big ideas from the exploration or activity? What questions will elicit key concepts, representations, and processes?
- d. How can I help students integrate new learning with previous learning?
- e. How can I help students extend or generalize their understanding?
- f. **Embedded Assessment:** What will I look and listen for during the Summary?

**Application or Extension:**

- a. Identify activities, writing assignments, journal questions, or problems that students can do independently in class or at home to continue to develop, practice, apply, or extend their learning. Identify activities that set up a subsequent lesson.
- b. **Embedded Assessment:** What will I look for and listen for during the Application or Extension?

**Adaptations:** What adaptations are needed for students with special needs (e.g., physical disabilities, emotional/behavior impairments, English-language learners)?

**Assessments:** What assessment activities within this lesson, its extension, or later will gauge students' learning of the lesson's objectives?

**Attachments:** Attach all materials needed for this lesson: relevant text or resource pages, transparencies, student sheets, games with directions, or any other materials that clarify precisely what is planned.

**PEER REVIEW OF PROJECT PRESENTATIONS TEMPLATE**  
*Print 5 copies and bring to class on the day(s) of the presentations.*

Reviewer: \_\_\_\_\_

Presenter:

Requirement	Comments and Justification
<input type="checkbox"/> Information is presented in a logical, interesting manner that the audience (your colleagues) can follow <input type="checkbox"/> Demonstrates full knowledge of the material presented and questions are easily answered with clear explanation and elaboration <input type="checkbox"/> Uses PowerPoint and graphics to explain and reinforce screen text <input type="checkbox"/> Is grammatically correct with no misspellings <input type="checkbox"/> Is lively; presenters rarely read notes <input type="checkbox"/> Is loud (enough) with correct pronunciation, particularly of mathematical terms <input type="checkbox"/> Appropriate handouts were provided	

Points: \_\_\_\_\_ / 4

I learned:

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