

Indiana Wesleyan University Unit Plan Mathematics Education-2012 NCTM Standards

General rationale: The candidate will write a series of lessons that adhere to a common topic or theme. These lessons will be organized and documented as a “unit plan.” The unit plan will include an overview (topic, duration, grade level, goals/standards, activities, materials, assessments, adaptations), block plan, lesson plans and unit assessment tools. The candidate should learn to integrate his/her knowledge of developmental learning theory and curriculum/instruction design to produce an effective Unit Plan. It is important the candidate begins to explore his/her ability to organize, sequence and structure information into a cohesive learning experience for students. The candidate will utilize the basic guidelines of Direct Instruction to incorporate all the elements of lesson design. The candidate will practice his/her developing skills in curriculum, instruction, management and assessment. This is a first attempt at unit planning in the content-specific teacher-training program. These skills should be further developed in the elementary methods or secondary content methods courses (EDU382) and practicum/student teaching experiences.

Structure of the Assignment:

1. Use the unit plan format from the Student Teaching Handbook (attached below).
2. Reference the Lesson Plan and Unit Plan evaluation rubrics.
3. Utilize the Lesson Plan Checklist to develop various design elements.
4. Remember: simple to complex and concrete to abstract various types of instruction (discovery, group, cognitive)

Required unit plan elements:

<ul style="list-style-type: none">• Unit content: the ‘big idea’ students will learn over the course of the unit• Unit rationale• NCTM standards• Instructional design; learning activities• Materials and resources	<ul style="list-style-type: none">• Assessment strategies and instruments• Management Strategies• Adaptations for students with special needs• Unit Block Plan
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Mathematics Education Unit Plan Format

Co-op Teacher _____ Initial []

Topic _____ Title of Unit _____

Duration of Unit _____ Student Teacher _____

Grade _____

I. Unit content (mathematics concepts and principles): what is the 'big idea'?

II. Rationale: why should students learn this material?

III. Standards: what NCTM standards are addressed in this unit?

NCTM Standard 3a Apply knowledge of curriculum standards for secondary mathematics and their relationship to student learning within and across mathematical domains.

IV. Instructional Design; learning activities

NCTM Standard 3b Analyze and consider research in planning for and leading students in rich mathematical learning experiences.

NCTM Standard 3c Plan lessons and units that incorporate a variety of strategies, differentiated instruction for diverse populations, and mathematics-specific and instructional technologies in building all students' conceptual understanding and procedural proficiency.

NCTM Standard 4b Plan and create developmentally appropriate, sequential, and challenging learning opportunities grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge and experiences.

V. Materials and resources: what materials, including appropriate technology, will be needed to teach this content?

VI. Assessment strategies: what assessments will you employ to determine if students have learned this content?

VII. Management strategies: what management issues need to be addressed as a result of the unique nature of this content

VIII. Adaptations for students with special needs:

NCTM Standard 4c The candidate incorporates knowledge of individual differences and the cultural diversity that exists within his or her classroom and includes culturally relevant perspectives as a means to motivate and engage students

Unit Block Plan

Columns should reflect number of days per unit.

1. Unit Content: what 'big idea' will you address in this unit?
2. Unit goals: what should students know and be able to do at the conclusion of this unit?
3. Rationale: why should students learn this material?
4. Standards: what NCTM and/or Indiana P-12 standards will be covered in this unit?
5. Develop a block outline of each day's instruction.

Day 1	Day 2	Day 3	Day 4	Day 5
<p>Learning Outcomes: What should students know and be able to do at the end of the lesson?</p> <p>Purpose: Aligned with learning outcomes. How does this lesson fit within the unit?</p> <p>Anticipatory Set: what is your 'hook'? How will you engage students' interest?</p> <p>Instructional design: body of lesson Model, guided practice, as necessary. How will you structure the lesson? What experiences will you design to involve students actively in the learning process?</p> <p>Materials and Resources: (include technology)</p> <p>Assessment strategies: Formative: checking for understanding Summative: what will students do to demonstrate learning?</p> <p>Management Strategies: given the content of this lesson, how will you manage time, students, and materials?</p> <p>Closure: Review of learning</p> <p>Adaptations: what lesson modifications are necessary to meet the needs of all students?</p>				
Day 6	Day 7	Day 8	Day 9	Day 10

Indiana Wesleyan University
Mathematics Education Unit Plan and Assessment Rubric

Unit Content

	Needs Improvement 1	Emerging Competence 2	Competent 3	Outstanding 4
	The unit content is appropriate for the students being taught, but lacks the depth or breadth expected. Factual errors are present. <input type="checkbox"/>	The unit content is appropriate for the students being taught, but lacks the depth or breadth expected. Factual errors are present. <input type="checkbox"/>	The unit content is significant in the discipline, is appropriate for the age and developmental level of the students being taught, and is presented in sufficient depth and breadth. The content is factually correct. <input type="checkbox"/>	The unit content is significant in the discipline, is appropriate for the age and developmental level of the students being taught. The depth and breadth of the planned content coverage exceeds expectations. <input type="checkbox"/>

Unit Rationale

	Needs Improvement 1	Emerging Competence 2	Competent 3	Outstanding 4
	The unit rationale is missing or is incomplete. <input type="checkbox"/>	The unit rationale does not indicate how the content fits within the course of study or makes an insufficient case for why students should learn the material. <input type="checkbox"/>	The unit rationale makes an effective case for how the content fits within the course of study and why students should learn it. <input type="checkbox"/>	The unit rationale makes a compelling case for how the content fits within the course of study, why students should learn it, and how it will engage their interest. <input type="checkbox"/>

Unit Standards

	Needs Improvement 1	Emerging Competence 2	Competent 3	Outstanding 4
Connection to NCTM Standards	The unit plan contains no connection or reference to a standard course of study or to state and/or national curriculum standards. <input type="checkbox"/>	The unit plan contains some connection or reference to a standard course of study or to state and/or national curriculum standards. <input type="checkbox"/>	The unit plan includes connections to core curriculum with clear references to a course of study or to state and/or national curriculum standards. <input type="checkbox"/>	The unit plan supports core curriculum content appropriate to the targeted student group and is well integrated with a course of study and aligned with appropriate state and/or national standards. <input type="checkbox"/>

Instructional design: Learning Activities

	Needs Improvement 1	Emerging Competence 2	Competent 3	Outstanding 4
Variety of strategies and inquiry approaches	The instructional strategies and/or inquiry approaches included in the candidate's unit plan are not adequate for the subject matter. They do not demonstrate how students learn in the content discipline. <input type="checkbox"/>	The candidate's unit plan includes strategies and inquiry approaches that demonstrate his or her knowledge but lacks understanding of how students learn in the content discipline. <input type="checkbox"/>	The candidate's unit plan includes a variety of strategies and inquiry approaches that demonstrate his or her knowledge and understanding of how students learn in the content discipline. <input type="checkbox"/>	The candidate's unit plan includes multiple strategies and inquiry approaches carefully aligned with unit subject matter that demonstrate his or her thorough knowledge and understanding of how students learn in the content discipline. <input type="checkbox"/>

Materials and Resources

	Needs Improvement 1	Emerging Competence 2	Competent 3	Outstanding 4
The candidate designs and selects learning resources-- including technology, to achieve unit learning goals.	Few resources are cited for teachers and students. Some materials appear to be inappropriate for the developmental or other needs of students. There appears to be a haphazard connection to lesson standards and a random collection of unrelated materials. Borrowed materials and resources are not adapted or identified. <input type="checkbox"/>	An attempt has been made to list adequate and appropriate resources for teachers and students, but additional resources may be necessary to adequately meet unit standards and goals. Resources and materials borrowed from outside sources are poorly adapted and/or identified. <input type="checkbox"/>	A variety of identifiable resources, including technology, is used to support student learning relative to unit standards. Resources are well organized by type or function, by whom, and for what purposes. Resources and materials are created specifically and intentionally for the unit; resources and materials borrowed from outside sources are identified as such and are adapted specifically for the purposes of the unit. <input type="checkbox"/>	A rich variety of resources facilitate meeting standards through, for example, the creative use of technology, developmentally-appropriate literature, primary sources, guest speakers, etc. Each resource serves an identifiable purpose in the unit and increases all students' learning. Resources and materials are created specifically and intentionally for the unit; resources and materials borrowed from outside sources are identified as such and are adapted specifically for the purposes of the unit. <input type="checkbox"/>

Assessment

	Needs Improvement 1	Emerging Competence 2	Competent 3	Outstanding 4
Assessment Plan	Little or no connection exists between the assessment plan and unit standards and goals. <input type="checkbox"/>	The links between the assessment plan and unit standards and goals could be clearer. Students are provided few alternatives to demonstrate their learning. <input type="checkbox"/>	The assessment plan is clearly linked to and addresses all unit standards and goals <input type="checkbox"/>	The assessment plan is clearly aligned with and addresses all unit standards and goals. Identified assessments allow students to demonstrate learning in a variety of ways. <input type="checkbox"/>
Assignment descriptions and rubrics	Assessments are poorly described; rubrics are not included. <input type="checkbox"/>	Assessment descriptions are unclear; rubrics are not well thought out. <input type="checkbox"/>	All assessments are adequately described; rubrics for most assessments are included. <input type="checkbox"/>	The descriptions for all assessments are clear and sufficiently detailed to enable full student understanding of what is being asked of them. Rubrics detailing the essential elements of each assessment as well as levels of performance for each element are included. <input type="checkbox"/>
Formative and summative assessments	The assessment plan does not include both formative and summative assessments. <input type="checkbox"/>	Included assessments are included but appear to be an afterthought and/or not essential elements of the instructional design. <input type="checkbox"/>	The assessment plan includes both formative and summative assessments. <input type="checkbox"/>	Both formative and summative assessments are completely aligned with unit standards/goals/objectives and are included as essential elements of the design and structure of the unit plan. <input type="checkbox"/>

Management Strategies

	Needs Improvement 1	Emerging Competence 2	Competent 3	Outstanding 4
	The unit management plan is incomplete or poorly conceived; there is little connection between the plan and unit activities. <input type="checkbox"/>	A management plan is included, but important considerations are left out and/or the scope of the management plan is not sufficient to address the unique requirements of the unit plan. <input type="checkbox"/>	The unit management plan takes into account the content of the unit, the materials and activities included in the unit, and the needs of the children being taught. <input type="checkbox"/>	The unit management plan is thoughtfully and thoroughly designed; the plan is designed to enable all students to be on task and successfully engaged in the business of learning. <input type="checkbox"/>

Special Needs Adaptations

	Needs Improvement 1	Emerging Competence 2	Competent 3	Outstanding 4
	No consideration for special-needs students is included in the unit plan. <input type="checkbox"/>	Included adaptations are incompletely developed and/or are not well correlated with UP goals and objectives. <input type="checkbox"/>	The unit plan includes appropriate adaptations for special-needs students. <input type="checkbox"/>	Adaptations for students with special needs are thorough and detailed. Adaptations are designed to allow special-needs students to participate fully in lesson activities. <input type="checkbox"/>

Unit Block Plan (calendar of lessons)

	Needs Improvement 1	Emerging Competence 2	Competent 3	Outstanding 4
	Not all elements in the Unit Block Plan are addressed; most elements are poorly or incompletely developed. <input type="checkbox"/>	Each required element in the Unit Block Plan is addressed; some elements are under developed. <input type="checkbox"/>	Each required element in the Unit Block Plan is appropriately addressed. <input type="checkbox"/>	Each required element in the Unit Block Plan is developed thoroughly and completely. The block plan provides visual 'proof' that the standards, goals and objectives are being met and are aligned with activities and assessments. <input type="checkbox"/>

NCTM Standards

	Needs Improvement 1	Emerging Competence 2	Competent 3	Outstanding 4
<p>Knowledge of curriculum standards NCTM 3a</p>	<p>The candidate does not incorporate knowledge of secondary mathematics curriculum standards in his or her lesson plans.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate's lesson plan(s) incorporate some knowledge of secondary mathematics curriculum standards, but standards are not well aligned with student learning outcomes.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate applies knowledge of curriculum standards for secondary mathematics and their relationship to student learning within and across mathematical domains.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate's application of knowledge of curriculum standards for secondary mathematics and their relationship to student learning results in instructional experiences that enable all students to meet expected learning outcomes.</p> <p style="text-align: right;"><input type="checkbox"/></p>
<p>Research of mathematical learning experiences NCTM 3b</p>	<p>The candidate does not consider research in planning for students' learning experiences.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate considers research in planning for students' mathematical learning experiences.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate analyzes and considers research in planning for and leading students in rich mathematical learning experiences.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate analyzes and considers multiple sources of research in planning for and leading students in rich mathematical learning experiences.</p> <p style="text-align: right;"><input type="checkbox"/></p>
<p>Variety of instructional strategies NCTM 3c</p>	<p>The candidate's lesson plan(s) incorporate an insufficient number of strategies; differentiated instruction for diverse populations, and mathematics-specific and instructional technologies are not included in lesson plan(s).</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate's lesson plan(s) incorporate a limited number of strategies; differentiated instruction for diverse populations, and mathematics-specific and instructional technologies is included.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate's lesson plan(s) incorporate a variety of strategies, differentiated instruction for diverse populations, and mathematics-specific and instructional technologies in building all students' conceptual understanding and procedural proficiency.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate's lesson plan(s) incorporate a variety of strategies designed to meet the learning needs of his or her students, including differentiated instruction for diverse populations, and mathematics-specific and instructional technologies in building all students' conceptual understanding and procedural proficiency.</p> <p style="text-align: right;"><input type="checkbox"/></p>
<p>Learning opportunities grounded in mathematics education research NCTM 4b</p>	<p>The learning opportunities included in the candidate's lesson plan(s) are not developmentally appropriate, are not grounded in mathematics education research, or do not engage students actively in building new knowledge from prior knowledge and experiences.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate considers mathematics education research in the planning and creation of learning opportunities, but opportunities are not consistently developmentally appropriate or are inadequate for enabling students to build new knowledge from prior knowledge and experiences.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate plans and creates developmentally appropriate, sequential, and challenging learning opportunities grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge and experiences.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate regularly and consistently plans and creates developmentally appropriate, sequential, and challenging learning opportunities grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge and experiences.</p> <p style="text-align: right;"><input type="checkbox"/></p>
<p>Knowledge of individual differences and cultural diversity NCTM 4c</p>	<p>The candidate does not incorporate knowledge of individual differences or the cultural diversity that exists within his or her classroom or include cultural perspectives relevant to his or her students.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate understands his or her students' individual differences and the cultural diversity that exists within his or her classroom, but does not consistently incorporate culturally relevant perspectives as a means to motivate and engage them.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate incorporates knowledge of individual differences and the cultural diversity that exists within his or her classroom and includes culturally relevant perspectives as a means to motivate and engage students.</p> <p style="text-align: right;"><input type="checkbox"/></p>	<p>The candidate seeks to know and understand his or her students and the differences and the cultural diversity that exists within his or her classroom as a means to adapt and improve instruction; he or she includes culturally relevant perspectives as a means to motivate and engage students in meaningful ways.</p> <p style="text-align: right;"><input type="checkbox"/></p>

Grammar/Mechanics/Construction

	Needs Improvement 1	Emerging Competence 2	Competent 3	Outstanding 4
	The unit plan may contain serious and distracting errors in grammar and punctuation as well as numerous irritating minor errors and frequent misspellings. <input type="checkbox"/>	Sentences are generally correct in structure; may display isolated serious errors in grammar and punctuation or frequent minor errors that do not interfere substantially with meaning or do not greatly distract the reader; occasional misspellings. <input type="checkbox"/>	Grammar is accurate; noun/verb agreement, and pronoun/antecedent agreement is mostly accurate; point of view is consistent; few errors in spelling and punctuation; no typographical errors. <input type="checkbox"/>	Grammar is consistently accurate; subjects agree with verbs in number and tense; pronouns agree with antecedents; point of view is consistent; spelling and punctuation are accurate; no typographical errors. <input type="checkbox"/>

Unit Plan Summative Assessment				
Unit Content	/4	NCTM Standards		Note to faculty: While unit plans submitted for class assignments may be scored on a scale appropriate for the class, UPs submitted for student-teaching defense must be scored on this 68-point scale. In addition, unit plans submitted with the ST portfolio: a. must include this scale with the individual element scores; and b. must be signed by a faculty member signifying that the UP meets program quality expectations.
Unit Rationale	/4	Knowledge of curriculum standards	/4	
Unit Standards	/4	Research of mathematical learning experiences	/4	
Instructional Design: Learning Activities	/4	Variety of instructional strategies	/4	
Materials and Resources	/4	Learning opportunities grounded in mathematics education research	/4	
Assessment		Individual differences and cultural diversity	/4	
Assessment Plan	/4	Grammar/Mechanics/Construction	/4	
Assessment Descriptions and Rubrics	/4			
Formative and Summative Assessments	/4			
Management Strategies	/4	Total	/68	
Adaptations Special Needs	/4	Passing = 51/68		
Unit Block Plan (Calendar of Events)	/4	No individual element score may be < 2		