What follows is the course syllabus for EDCI 36400. *This plan is to be taken as an outline* that individual instructors may deviate from at their own discretion. If you have questions or concerns, please contact your course instructor.

**Introduction**

EDCI 36400 is a course about the development of elementary school mathematics instruction based on understanding of and reasoning about children’s mathematics. Today’s teachers have the opportunity to teach children mathematics through the following processes:

1) problem solving;
2) mathematical reasoning;
3) communicating about mathematics;
4) making connections among mathematical ideas and applying mathematics in contexts outside mathematics;
5) creating and using representations of mathematical concepts.

Developing the ability to teach children mathematics using the processes described above means understanding how mathematics reasoning emerges and grows in children’s thinking and understanding the mathematics of elementary grades in flexible ways. Rather than being a topic taught with an emphasis on rote memory, school mathematics is now viewed completely differently. Naturally, this means a different type of pedagogy for teachers. This is the focus of EDCI 36400—the work of understanding children’s mathematics and using this understanding to teach children mathematics.

The National Council of Teachers of Mathematics (NCTM) has published a series of documents with a vision for mathematics teaching and learning in the United States: what mathematics should be taught; how mathematics should be taught, and how the learning and teaching of mathematics should be assessed. The most recent of these documents, *Principles and Standards for School Mathematics (PSSM)* <http://www.nctm.org/> was published in April, 2000. This document, which is an update and synthesis of previous publications, includes recommendations about what mathematics should be taught, how it should be taught, and how the learning and teaching of mathematics should be assessed. Standards in Indiana capitalize on ideas in PSSM. In this course we will use Indiana State Standards
(http://www.doe.in.gov/standards/mathematics), NCTM Standards (http://www.nctm.org/standards/content.aspx?id=4294967312), and readings exploring children’s development to build perspectives on what it means to teach mathematics so that all learners develop flexible understandings of mathematics concepts and procedures that enable them to foresee and respond to personal societal challenges.

Course Goals

As a student in this course, you will learn about teaching mathematics based on these new recommendations and through the following activities (Indiana Content Standards for Educators: http://www.doe.in.gov/sites/default/files/licensing/elementary-generalist.pdf):

1. Students will explore and reflect on their own beliefs about mathematics and mathematics teaching and learning. They will become aware of the impact of those beliefs on their teaching and on their children’s learning of mathematics. ICSE 4.10

2. Students will become aware of current recommendations for teaching mathematics, including the NCTM Standards. ICSE 4.9

3. Students will become familiar with research on children’s thinking about specific mathematical topics. That research includes information about how children’s thinking develops and about activities that support that development. Students will also learn to use this information to assess the mathematical thinking of the children in their classrooms. ICSE 4.10 and 4.11

4. Students will investigate how they can create a problem-solving environment in their own classrooms. This includes learning to establish norms that enable all children to participate in classroom interactions and learning to foster mathematical communication. ICSE 4.8 and 4.10

5. Students will apply the concepts discussed in the course to plan, carry out, and evaluate problem-solving lessons based on their knowledge of mathematics and of how children learn mathematics. ICSE 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7

Expected Outcomes

EDCI 36400 is designed to help you continue to develop the knowledge, dispositions, and performances that address the School of Education Guiding Principles in Practice: 1) Attention to Learners; 2) Understanding Curriculum in Context; and 3) Commitment to Professional Growth. In particular, by the end of EDCI 36400, we expect that you will:

1. Clarify and refine your beliefs about learning and teaching mathematics;

2. Present and defend your beliefs about elementary mathematics teaching;

3. Become more knowledgeable about how children think about mathematics;

4. Use questioning to reveal students’ mathematical thinking and understanding;

5. Gain skill in assessing, evaluating, and responding to the needs of diverse learners in mathematics;

6. Understand ways to assess students’ mathematical understanding and learning;

7. Learn, practice, and reflect on strategies of teaching mathematics and their relationships to your beliefs and knowledge about how children learn mathematics;
8. Learn to participate in joint work to develop teaching and learning situations;
9. Plan and carry out problem-solving mathematics instruction with a focus on students’ conceptual and procedural understanding;
10. Interact with a variety of curricular resources for teaching mathematics;
11. Reflect on your teaching of mathematics.

Course Format
EDCI 36400 has both a campus-based and a field-based component. The campus-based component consists of 2.5 hours of lecture each week. In addition to the on-campus meetings of the course, students will be scheduled into a field placement for nine three-hour blocks during the semester. The Theory Into Practice (TIP) field component is shared with EDCI 36500. Each cohort section of the block is partnered with its own local school. Purdue students will be matched with classrooms throughout the semester and will carry out mathematics and science activities in conjunction with the block courses. The three hours of TIP time includes: ½ hour of travel and up to 2 ½ hours teaching mathematics and science in the classroom. In addition, students will have the opportunity to correspond with children from an elementary school through a letter writing project. This project is considered to be a significant opportunity to build connections between language arts and mathematics. Meeting letter writing deadlines and correspondence guidelines is required to pass EDCI 36400.

Course Readings

Texts

Title: Teaching Number in the Classroom with 4-8 year olds
Author: Wright, R., Stanger, G., Stafford, A., Martland, J.
Publisher: Paul Chapman Publishing
Copyright: 2006
ISBN: 9781412907583

Title: Classroom Discussions: Using Math Talk to Help Students Learn (available through Blackboard)
Authors: Suzanne H. Chapin, Catherine O’Connor, and Nancy Canavan Anderson
Publisher: Math Solutions
Copyright: 2009
ISBN: 9781935099017

Supplemental Texts


Participation & Professionalism

Teachers are role models and leaders in society, entrusted with the nurturance of society's children. It is teachers who sustain and challenge themselves and others to demand more of and contribute to the shaping of the societies in which we live. These responsibilities are grounded in a foundation of commitment that includes being present and available to colleagues and members of the community they serve. As you prepare to enter the teaching profession, you will frame your own view of teaching with your actions. By signing the Purdue University Professionalism Agreement, you acknowledge your commitment to this disposition and willingness to take action regarding feedback about your professionalism. Professionalism impacts your development as a teacher and will be reflected in your course grade. Examples of impact are shared below.

Class Attendance

As a professional-in-training perfect attendance is one of your highest priorities. Being on time, in class, prepared, and engaged everyday illustrates and reinforces your commitment to becoming a professional teacher. **Attendance implies that a student in both physically and mentally present** (Students must not read the paper or books not required for class – including reading Kindle books, doing puzzles, texting, checking email, surfing the internet or otherwise using computers or phones for non-class based activity. There are times when critical email or a call is expected and you must check your phone. Just be sure to notify the instructor of the situation in advance.)

Purdue University policy states that all students are expected to be present for every meeting of classes in which they are enrolled. All matters relative to attendance, including the make-up of missed work, are to be arranged between you and the instructor. Only the instructor can excuse you from classes or course responsibilities. In the case of an illness, accident, or an emergency, you should make direct contact with your instructor as soon as possible, preferably before the class. If the instructor cannot be reached directly a message should be left in the instructor's department mailbox or with the instructor's secretary. Additionally, if it is a TIP day, you must also make direct contact with your cooperating teacher. If you will be absent for more than five days, have not been able to reach the instructor in person or by telephone or through leaving notification of your circumstances with the instructor's secretary, you or your representative should notify the Office of the Dean of Students (765-494-1254) as soon as possible after becoming aware that the absence is necessary. Be advised, you may be asked to provide documentation from an authorized professional or agency which supports an explanation for your absence.

Campus-based class meetings. Because of the interactive and field-based nature of this course, regular attendance as defined above is required. Each student may have a life event that causes it to be difficult to attend class. Should you need to be away from class, you must provide advance notice if at all possible. After the first two absences your grade will be impacted as follows. For each absence after the first two excused absences your final grade will be reduced by 10 points.

Theory into Practice. Time in the field is so critical to your understanding of teaching and learning. It is your interactions with school personnel, children, and others in the community that provide the raw material for your own learning. Without these experiences, the learning goals for the course will be beyond your reach. Being in the school setting is of the utmost importance. No unapproved absences will be accepted during your TIP experience. **Each unapproved TIP absence will automatically result in a letter grade reduction of your final grade.** Since TIP also includes a letter writing component, **failure to meet deadlines and guidelines for letters will automatically result in a**
letter grade reduction of your final grade. Further, every time you email your cooperating teacher, you must copy your instructor on the e-mail.

**Professional Responsibility.** Since you will be working with professionals and students in schools, you will be expected to understand and respect the nature of professional duties and responsibilities. The practices of confidentiality, respect of diversity, appropriate dress for teaching, and professional conduct including all types of communication (with students, mentors, staff, administrators, instructors, and peers) are required of teacher/learners. It is part of the professional lives of teachers to accept critiques from mentors, administrators, and instructors, and willingly work to overcome perceived weaknesses in addition to those you identify. Meeting deadlines is also a professional responsibility. Demonstrations of professional practice by completing your work according to deadlines, descriptions of assignments, and rubrics are expected. *Late work for all assignments will result in a lower grade (One letter grade for each day late).* Note: All pen pal activities are governed by the above rule restated here (*failure to meet deadlines and guidelines for letters will automatically result in letter grade reduction in your final grade.*)

**Engagement & Equity.** Being an engaged teacher/learner requires being attentive, curious, sensitive, concerned, and involved in all aspects of the learning process. Taking initiative in class and the field, to make the most of your time with the children and teachers, is expected. As a professional you will be working with children, parents, and colleagues that bring a variety of backgrounds, values, customs, attitudes and experiences to the learning situation. This course will provide opportunities for you to develop skills that enable you to weave these differences into the fabric of learning. Self-identifying areas of challenge with engagement and embracing diversity will be important, as will exploring and building an action plan for identified challenges. *Lack of action regarding identified areas of challenge in engagement and equity will result in one letter grade reduction for each area (adult, child) applied to your final course grade.*

Any violations of stated attendance, professional responsibility, engagement and equity expectations will result in a D-2.

**Description of Graded Assignments**

Be sure to check Blackboard for assignments and due dates.

ALL ASSIGNMENTS will be submitted on Blackboard unless otherwise indicated. All feedback will be provided via Blackboard unless otherwise indicated. **Blackboard and the syllabus will contain all due dates.** If there are materials you need to have prepared for class and need to bring to class the assignment directions or course instructor will notify you.

**Homework & Reading Quizzes:** All course readings are to be completed prior to class. Quizzes for some of the readings (as noted on the calendar) are useful in helping you build vocabulary and awareness of key ideas. Other readings provide insights and background.

**5 reading quizzes (20 points each).** You are expected to complete all assigned readings before we meet for classes. Reading quizzes will be available on Blackboard at least 48 hours prior to due dates. The goal of these quizzes is to insure familiarity with the readings prior to in class discussions. Students are expected to complete all readings.
Summative Evaluation (100 points). This evaluation will be based on course readings, student work, and dilemmas drawn from the practice of teaching mathematics. This assessment will be hand written and students will be allowed to collaborate and discuss questions prior to submitting their assessment in class.

Video Explanation (25 points). As a teacher, you will need to be able to understand and explain how students solve problems and be able to connect their processes with other methods (such as the algorithms) in clear ways. The purpose of this assignment is for you to hone your ability to explain clearly and make these connections using representations to help illustrate the explanations. Such information can also be invaluable for parents as they try to understand how best to help their children at home.

For this assignment, you will work with a partner and submit a short (5-min. max.) video of the two of your explaining how a student solved a particular problem and showing, using a representation, how the student’s method relates to the traditional algorithm for that operation. Explaining “in-the-moment” can be difficult, so this will allow you to practice with a less-threatening medium (video). Plus, you could use the video as a resource for parents!

The emphasis on this assignment will be the clarity and accuracy of your explanations.

Steps to help you complete the assignment:
1. Analyze the example of student work for your assigned problem and determine how the student solved the problem. Write an explanation for what the student did and come up with a representation that can illustrate the student’s method.
2. Write an explanation for how to explain solving the problem using a traditional algorithm. Pay particular attention to the language you use (hint: think about place value language).
3. Think about how the student’s method can serve as a spring board or can be connected with the algorithmic method. What are the similarities? Differences? How do the computations the student uses compare with the computations in the algorithm?
4. Create a video in which you and your partner explain the methods. Be sure to incorporate the student’s work and your own representations in the video to support your explanations. Both partners must contribute to the final explanation.

Bring a copy of the video to class on your assigned day to present to the group.

Theory Into Practice (TIP)

Graded assignments are connected to your TIP experiences and consist of planning, teaching, and assessing classroom activities you develop and teach to promote student mathematical understanding. These assignments require you to take an inquiry teaching stance that is compatible with that advocated in the NCTM and INTASC standards.

Please Note: Assignments (except the Pen Pal exchange) conducted during TIP must be taught in the classroom. Any alterations must have Course Instructor and Cooperating Classroom teacher approval.

Exploring Student Thinking (EST). As a teacher, you will have to quickly gauge what your students understand on a particular topic, sometime with little information. Using effective problems and questions can help you in this process. This assignment will give you an opportunity to
learn about the range of students’ understanding in your placement classroom on the general topic of subtraction. Further, you will have the chance to develop problem-posing skills and work with a student to find “the edge” of his/her subtraction understanding.

Class Pre-Assessment (partners administer the 1 question collaboratively). On your first day of the field placement, you will administer a 1-question assessment to your placement class. This rich problem should help you get a sense for what the class knows about subtraction (see example word problems posted in Blackboard).

Work with your partner to develop 1 subtraction problem for the students in your placement classroom to solve (use the Indiana Academic Standards, 2014, as a content guide).

1. Students should be able to answer the problem and explain their thinking within 10 minutes.
2. The question needs to be administered on a piece of paper so that you can collect student work.
3. Try and make the question rich enough that it will give you helpful information. For example, if I ask you to write the answer to 22 – 17, I could potentially miss out on how you solved the problem (especially if you used your fingers or counted in your head). Therefore, I might include a statement that you have to draw a picture showing what you did or write a sentence explaining what you did to solve the problem. If students have trouble with this, it will give you additional information! It may be useful to ask a question with a drawing or image.

EST Interview (each partner will pick a different student and use their own questions). Your whole-class problem will only provide you with a quick snapshot of children’s subtraction understanding. However, you will then have the opportunity to interview one of the students with a further set of questions to learn more about what he/she understands about subtraction. Your goal is to find “the edge” of the student’s subtraction understanding (When does the student’s understanding start to break down? Is it only when they no longer have manipulatives to work with, regardless of the numbers involved? Is it when they have to work with double-digit numbers? Is it when the distance between the numbers being subtracted is small? Is it when the problem would result in a negative number? Is it when they have to solve a word problem, even if they can solve a similar problem outside of the context? Can they subtract in chunks? – these might be important edges for you to test).

EST Interview Questions
1. Develop a series of follow-up questions to ask 1 student after administering the whole-class pre-assessment. Each intern will interview a different student. You will audio-tape this follow-up interview.
   - The series of questions should help you figure out the student’s “edge” of subtraction understanding. Have them record their answers, so that you can collect their work.
   - Include questions that help you get to know the student and how they are experiencing school, community, and the world.
   - You will have no more than 20 minutes for this follow-up interview.
2. Submit your whole-class problem and the list of follow-up questions you and your partner will use on Blackboard Learn.
3. Include a list of materials you will provide.
4. Email your cooperating teacher (AND COPY YOUR INSTRUCTOR) to find out when you could administer the whole-class assessment. We expect that you will be able to do this activity on TIP day 1. Teachers have been alerted that you will be asking for time on your first TIP day. Be
sure to tell them it will not take more than 10-15 minutes. Also, remind them that you would
like to interview 1 student afterwards. Ideally, you would like up to 20 minutes (depending on
the grade level), but ask the teacher what would be possible.

**EST Report (100 points)** (Four sections and appendices; Page limits are given for each section,
except for the Visual and Appendices.)

**Visual.** Create a chart that summarizes the students’ understanding drawn from the whole class
assessment (you may work with your partner on this part only). For example, you might
organize the results according to their strategy for solving the problem and their answer.
After you receive feedback and a grade on the EST from your instructor, send an email to your
cooperating teacher (and copy your instructor) with the VISUAL.

**Whole class trend (1 page limit).** Discuss what most students appear to understand well and, if
relevant, any misunderstandings, confusions, or needs (including a need for greater challenge)
that were apparent for some or most students. Share sample student work to clarify your
insights. Support your analysis using ideas from your reading of Wright, Stanger, Stafford, and
Martland (2006) or other readings you view as contributing to your ideas. Be sure to
appropriately cite.

**Individual student performance (1 page limit).** Introduce the student to the reader. Why did you
pick this student? What is the edge of the student’s subtraction understanding and how do you
know? (What are the student’s strengths and needs in terms of the mathematics concepts,
language, etc.? How did the student approach the problems? Were certain ones
easier/harder? Why or why not? Did they use different approaches? Why do you think this is?)
Support your analysis using ideas from your reading of Wright, Stanger, Stafford, and Martland
(2006) or other readings you view as contributing to your ideas. Include examples and
descriptions of the student’s work and/or quotes from the transcript to support your analysis.

**Potential next steps (1 page limit, including picture).** Identify one activity from the Wright,
Stanger, Stafford, and Martland (2006) that you think would be appropriate to do with the class
based on the whole-class data. Provide the title and page number of the activity, include a
screenshot or picture of the page from the book, write a brief summary of the activity, and
explain why it would be appropriate and how you could modify it (if necessary) to reach all of
the students in the class.

**Appendices.**
1a. Your whole-class problem
1b. Student work (at least 6 work samples) from the whole class on the whole-class problem
2a. Your follow-up questions (including any you asked on the second day)
2b. Transcript of your interview with the student*
2c. Student’s work to the follow-up questions

*You should also include the first name only, age (be specific), and grade of the student you
interviewed; and your teacher’s name. **Audio record your sessions and transcribe your
interactions. Also collect all student work that you will use as evidence of student understanding. This may include pictures of manipulatives, but not pictures of the student.**
Lesson Planning/Teaching/Reflection/Analysis. Due to the limited number of placements we have available to us in the Block V schools, you will likely be paired with other students in your TIP classroom. You and your partner will be responsible for teaching three related lessons: one co-taught string lesson, each of you will also teach an individual lesson. The topic for your three lessons will be negotiated with your teacher and instructor, but all planning documents and student handouts should be drawn from the curriculum “Investigations in Number, Data, and Space” (http://investigations.terc.edu/; this curriculum is also in the TRC). All three lessons must be related. The topic for your lessons must be approved in advance.

Lesson Planning Packet. You will complete a Lesson Planning Packet for a coherent sequence of lessons on a single mathematics concept prior to TIP 4. The Lesson Planning Packet will include an overview of all three lesson plans (a string lesson, and two individual lessons: one for each student) and provides a record of your work to build coherent and productive engagements based on your analysis of existing resources, understanding of mathematics, and understanding of children’s development. Note that this is a tentative plan and is a sketch of your intended sequence of lessons, rather than final lesson plans.

The string lesson enables you to gain insight into the concept you will teach in your remaining two lessons. This lesson requires a separate template that is available on Blackboard. Each student is to submit the string lesson individually to allow for grading.

Each of your individual lessons will be implemented as an inquiry lesson using lessons from the curricula “Investigations in Number Data and Space” (http://investigations.terc.edu/; this curriculum is available in full in the TRC), “Context for Learning Mathematics” (http://www.contextsforlearning.com/), or “Connected Mathematics” http://connectedmath.msu.edu/; this curriculum is available in full in the TRC). You should not plan to teach all three lessons in a single day. Any plans for lessons (string or individual) must be submitted to your instructor 7 days prior to your planned teaching date on the Lesson Overview Template. The plan will be approved or returned for further elaboration within 24 hours. You will then have 24 hours to submit a final plan. Once the plan in approved by the instructor, send a copy to your mentor teacher and cc the instructor. It is sometimes necessary to amend plans; however, this should not be done without providing sufficient advance notice (7 days) to your mentor teacher and instructor. If changes to the Lesson Overview Template are made, new plans must be crafted and submitted for approval from the instructor and mentor teacher. Failure to attend to planning guidelines will result in a D-2 and a 10% reduction in grade. You may not teach any lesson without submitting a plan (to your mentor teacher and instructor) 7 days prior to teaching the lesson and without approval from both your instructor and your mentor teacher unless you have negotiated an alternative date for submission of your plan with your instructor and the mentor teacher.
As you work to build lessons keep in mind that the plans should be considered ideal. You are preparing to engage with the children and to support their development as learners. Plans help you build ideas about how to engage and illustrate how you will implement a lesson. Typically, lessons do not go exactly as planned since your interaction with children encourages you to adjust your plans. In addition, plans help you prepare to collect evidence of student reasoning through your interaction with the children. The RISE Rubric includes planning as a critical area of assessment of teacher effectiveness (http://www.riseindiana.org/how-does-rise-work/training-support-and-resources). You will have the opportunity to revise your plans after you teach a lesson to reflect insights you gain as a result of teaching the lesson you have planned.

Responsibility: The responsibility for the string lesson will be shared between teaching partners. The responsibility for the planning will rest with the teacher team. The responsibility for the individual lessons will rest with the individual charged with leading the lesson. Responsibility for the coherence in the lesson collection will rest with the teacher team. Responsibility for identifying 3 peer reviewed readings to support understanding teaching and learning of the concept will rest with the teacher team.

Lesson Planning Packet (50 points). Complete the lesson planning packet template available on blackboard.

Teaching. I will make every effort to see you teach, but in most cases will be unable to stay for the entire time you teach. You must alert me to any changes in the time you are teaching to enable me to see your lesson. I will ask you to report the time you are teaching each lesson at least two days prior to teaching the lesson. Your work with your mentor teacher is critical, as is the feedback they provide on your interaction. You should discuss your work with your mentor teacher asking for specific feedback on areas of concern you have. You may even design an observation form that will enable the mentor teacher to help you achieve your teaching goals or ask the teacher to use the school/district observation rubric. We will provide a form that you can share with your teacher. Your reflection on your work engaging the students and supporting their collaboration and learning of mathematics is critical in building your understanding of mathematics teaching. Be sure to collect evidence of student work (e.g., pictures, written work) from your lessons.

String Reflection (25 points). Write your reflection as soon as possible after you have taught the lesson and submit it within 48 hours of your lesson so that it is based on “fresh” memory. Please organize your reflection using the following sections.

1. Discuss the actual strategies students used to solve the problems. Highlight the strategies that were not expected and/or were particularly useful for connecting student thinking within and across the problems.
2. Describe the representations you used to illustrate student thinking. Explain any changes you would make in the sequence or types of problems included in the number string and/or the representations you used. What is your rationale?
3. Discuss the implications of this number string on your future teaching. What did you learn in terms of student thinking, use of questioning strategies, etc. which will inform your teaching or choice of problems?

Lesson Analysis (100 points). Submit this analysis within 7 days of teaching your individual lesson. The analysis will become a comprehensive record of your planning/teaching/reflecting/analysis cycle. To gain insight into your own development and to learn from your experience teaching children you will complete a lesson analysis. In your analysis you will revisit your work as a teacher through a detailed exploration of your individual lesson. This is an academic assignment that allows you the opportunity to report the findings you collected in terms of children’s reasoning/strategies, explore the mathematics concept or concepts you were teaching, summarize sources in mathematics education into a discussion of the evolution of children’s understanding of the concept you taught, revisit your lesson making appropriate changes based on your experience teaching the lesson and your analysis of the children’s work, and reflect on what you learned through your engagement with the children.

The lesson analysis will include the following components in a three page overview of the lesson you taught:

1. Tasks/Activities/Rationale/Method: What are the primary tasks/activities from your lesson? What was your rationale for the selection and method of implementation of these materials? Describe your rationale and activities in light of your readings about the concept and for the course.

2. Student Understanding/Reasoning: Select work from two students to discuss. Using their work and photos you have taken, discuss what each student understands (much like you did for your EST) and their reasoning. In your analysis, refer to their work, utterances, and/or photos AND information from your readings to provide evidence for your interpretations.

3. Concept: Discuss how students, in general, develop an understanding of the concept that was the focus of your lesson. What concepts do they build on? What are their typical struggles and typical approaches? This section should also be informed by your work with the children in your TIP experience. Be sure to cite and reference using APA style. Do not use websites, but rather draw insights from peer reviewed journals, readings provided in the course content area in blackboard, and course readings.

4. Curricular Implications: Discuss a specific productive activity you would ask each child to engage in to continue to develop his or her understanding of the concept under study and explain why (that is, provide a specific activity and rationale): Why is the activity appropriate based on what you observed and how children develop an understanding of the concept that you described in part 3? What do the readings suggest in terms of what would be a good next step?

5. Reflection: Reflect on your role in the activity, describe specific evidence of your efforts to incorporate talk moves into your lesson, and share your impressions of your effort. What talk moves did you use? When? Were they effective? Why or why not? What
steps will you take to continue to improve? (cite Chapin et al. (2003), Your revised plan should reflect your acquired knowledge and analysis for what you would do differently)

6. **References** (will not count in page limit, use APA style)

7. **Appendices** (will not count in page limit):
   a. Student work Samples (at least 2 samples should be included)
   b. Your revised Lesson Plan Overview: Your revised plan should reflect your acquired knowledge and analysis for what you would do differently if you taught this lesson again (use the review tools in Word to identify and share reasons for changes to your plan by using “track changes”)

**Pen Pals (100 points).** During your TIP experience, you will have the opportunity to communicate with children using a series of letters containing mathematical tasks. The focus of this experience is soliciting higher levels of mathematical activity from the children you are working with. You will have an opportunity to illustrate how you adapt to children’s mathematical reasoning and processes and encourage higher level thinking through mathematical questioning. The children will have an opportunity to share their thinking with you!

**Goal:** The goal of the project is for you to elicit higher levels of reasoning from your students over the course of your letter exchange. You should be personalizing and individualizing the tasks for your students by building from their interests and previous responses.

This Theory into Practice experience has two components.

1. **Five Letters and Task Analysis Summary**

   Letter 1: You will initiate the pen pal activity by introducing yourself in person and posing your version of the first task we have designed for your students. Fill in the task summary with your expectations for the child’s approach to the task.
   After you receive the child’s response, begin filling in the task analysis summary. In class we will discuss the children’s responses and begin considering new visual tasks based on children’s reasoning.

   Letter 2: Being sure to (1) answer questions the child asks you, (2) comment on the child’s problem solving/critical thinking, pose a next visual task for your students.
   After you receive the child’s response, continue filling in the task analysis summary and design a next task for your students.

   Letter 3: Being sure to (1) answer questions the child asks you, (2) comment on the child’s problem solving, pose your third task for your students. You may use tasks from the resources folder of Visual tasks on Blackboard, but be sure you are working to engage the child based on your understanding of his or her reasoning.
   After you receive the child’s response, continue filling in the task analysis summary and design a next task for your students.

   Letter 4: Being sure to (1) answer questions the child asks you, (2) comment on the child’s problem solving, pose your fourth task for your child. Be sure you are building toward higher level thinking tasks and that you are working to gather evidence of the child’s thinking.
   After you receive the child’s response, finish filling in the task analysis summary and begin crafting your analysis of the child’s progress.
Letter 5: Being sure to (1) answer questions the child asks you, (2) comment on the child’s problem solving, thank the child for being your pen pal. Describe what you have learned to the child.

2. **Pen Pal Analysis for Teacher/Instructor (2 pages) (100 points)**  
   *Be sure to format your report so that the child’s progress section is on page 1 and your progress is on page 2.*

Write an analysis of one of your students’ strategies and growth in critical thinking including the following components:

a. **Child’s Progress:** This page will be sent directly to the child’s teacher. You should look over all of the letters and describe the child’s development of strategy used indicated by each response, sharing supporting evidence. Each claim should be supported with explicit evidence from the student’s responses. Quotes and images are expected. Be sure to show the teacher the tasks you asked the child to do, since each child did different tasks. You will want the teacher to be able to make sense of your description of the child’s strategies and any analysis you provide. Finally, suggest additional tasks the child could engage in to build his/her critical thinking.

b. **Your Progress:** You should look over all of the letters and describe your efforts to engage the child. What is difficult about communicating with a child in writing? How did you overcome the difficulties of communicating feedback about the child’s strategies in writing? How did you frame your feedback to the child? How did you build your visual tasks from the child’s strategies? What insight have you gained about visual tasks? What insights have you gained about children's strategies and their development? What insights have you gained about providing written feedback?

c. **Appendix**

- Include copies of all five of your letters and the child’s response to each letter.
- Include your task analysis (use the task analysis summary template on blackboard). Be sure each task you posed is included on the task analysis sheet.
Grades and Course Requirements
(Detailed Descriptions of Graded Assignments are posted on Blackboard)

Course grades will be based on total points earned, and the following scale will be used to assign final grades. Adjustments for absences or professionalism (as described in the participation section) will not appear in blackboard, but will be assessed after all assignments are completed.

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<tr>
<th>Grade</th>
<th>Points</th>
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<tbody>
<tr>
<td>A</td>
<td>540-600</td>
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<tr>
<td>B</td>
<td>480-539</td>
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<tr>
<td>C</td>
<td>420-479</td>
</tr>
<tr>
<td>D</td>
<td>360-419</td>
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<tr>
<td>F</td>
<td>&lt; 419</td>
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Grades will be based on the following (provided no deductions are necessary for professionalism or absenteeism):

- Reading Quizzes: 100 points
- Pen Pal Analysis: 100 points
- Video Explanation: 25 points
- EST Report: 100 points
- Lesson Planning Packet: 50 points
- Summative Evaluation: 100 points
- String Reflection: 25 points
- Lesson Analysis: 100 points

**TOTAL** 600 points

All students must submit a Taskstream portfolio to be eligible for student teaching (See requirements below).

**TASKSTREAM PORTFOLIO AND ARTIFACTS (Pass/Fail)**

You will be required to submit the graded assignments as artifact for your Taskstream Portfolio. These will demonstrate your ability to use student mathematical thinking and standards-based documents to design and teach lessons for student learning with understanding. These pieces are:

1. Exploring Student Thinking Report
2. Lesson Analysis Final Paper
3. Pen Pal Analysis

**You must pass the Gate C Taskstream Portfolio assignment in order to pass EDCI 36400.** Failure to pass the Gate C Taskstream Portfolio assignment for EDCI 36400 will result in receiving a grade of ‘F’ for the course. A description of the artifact and assessment matrix is available on Taskstream. **All class assignments that contribute to your Taskstream submission must earn a grade of C or better.**
EMERGENCY STATEMENT
In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. Here are ways to get information about changes in this course. BlackBoard web page, my email address: skastber@purdue.edu and my office phone: 494-2354.

BEERING HALL EMERGENCY STATEMENT
Students are required to visit http://www.education.purdue.edu/emergency/ to review the response procedures for emergencies in Beering Hall. It is necessary that you review these directions within the first week of your Beering classes. If you have any questions see your instructor.

ADAPTIVE PROGRAMS STATEMENT
Students with disabilities must be registered with Adaptive Programs in the Office of the Dean of Students before classroom accommodations can be provided. If you are eligible for academic accommodations because you have a documented disability that will impact your work in this class, please schedule an appointment with me as soon as possible to discuss your needs.

ACADEMIC DISHONESTY STATEMENT
Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III-B-2-a, University Regulations] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." [University Senate Document 72-18, December 15, 1972]

ELEMENTARY EDUCATION COURSE COMPLETION POLICY STATEMENT
Elementary Education majors have two opportunities to enroll in and pass required EDCI, EDPS, and EDST courses with a minimum grade of C-. Withdrawal from a course (W or WF) constitutes one of the two opportunities. Failure to successfully meet these requirements will result in dismissal from the Elementary Education Program. Courses repeated to improve a grade must be taken at the West Lafayette campus. [Approved by the Elementary Teacher Education Committee, April 20, 2007.]

COURSE EVALUATION STATEMENT
During the last two weeks of the semester, you will be provided with an opportunity to evaluate this course and your instructor. Purdue University now uses an online course evaluation system. Near the end of classes, you will receive an official e-mail from evaluation administrators with a link to the online evaluation site. You will have up to two weeks to complete this evaluation. Your participation is an integral part of this course, and your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.

CLASS ATTENDANCE STATEMENT
Purdue University policy states that all students are expected to be present for every meeting of classes in which they are enrolled. All matters relative to attendance, including the make-up of missed work, are to be arranged between you and the instructor. Only the instructor can excuse you from classes or course responsibilities. In the case of an illness, accident, or an emergency, you should make direct contact with your instructor as soon as possible, preferably before the class. If the
instructor cannot be reached directly a message should be left in the instructor's department mailbox or with the instructor's secretary. If you will be absent for more than five days, have not been able to reach the instructor in person or by telephone or through leaving notification of your circumstances with the instructor's secretary, you or your representative should notify the Office of the Dean of Students (765-494-1254) as soon as possible after becoming aware that the absence is necessary. Be advised, you may be asked to provide documentation from an authorized professional or agency which supports an explanation for your absence. Please see Purdue University Senate Policy on attendance: http://www.purdue.edu/univregs/pages/ac_regs_pro/classes.html.

COURSE EVALUATION STATEMENT
During the last two weeks of the semester, you will be provided with an opportunity to evaluate this course and your instructor(s). Purdue now uses an online course evaluation system. Near the end of classes, you will receive an official e-mail from evaluation administrators with a link to the online evaluation site. You will have up to two weeks to complete this evaluation. Your participation is an integral part of this course, and your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.

TIP School Delays/Cancellation: In the event that school cancelled on a TIP day students will be expected to meet in their university classroom. For morning classes, if there is a 1 or 2 hour delay, classes will meet at the university.
<table>
<thead>
<tr>
<th>Week 1</th>
<th>Aug 25</th>
<th>Introduction</th>
<th>Number Concepts: Counting Skits</th>
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<tbody>
<tr>
<td></td>
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<td>Pockets</td>
<td>Reading for class: Wright et al.</td>
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<td>Introduction, pages 1-28</td>
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<thead>
<tr>
<th>Week 2</th>
<th>Sept 1</th>
<th>No Class</th>
<th>Addition and Subtraction</th>
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<tr>
<td></td>
<td></td>
<td>Labor Day</td>
<td>Reading: Wright et al., pages 29-32, 47-50, 64-67, 82-84, 98-104</td>
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<td></td>
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<td>Pen Pals and Mathematics and Science Night Introduction</td>
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<thead>
<tr>
<th>Week 3</th>
<th>Sept 8</th>
<th>Algebra: the equal sign, growing patterns</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Readings Wright et al., pages 120-124, 144-147, 155-161</td>
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<tr>
<td></td>
<td></td>
<td>EST Introduction</td>
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<thead>
<tr>
<th>Week 4</th>
<th>Sept. 15</th>
<th>Pen Pal Project Overview and Planning for Meet &amp; Greet</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>EST Overview</td>
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<td></td>
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<td>Reading Vac: (1993)</td>
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<tr>
<th>Week 5</th>
<th>Sept 22</th>
<th>Multiplication</th>
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<tr>
<td></td>
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<td>Readings: Fosnot &amp; Dolk, Chapters 3</td>
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<th>Week 6</th>
<th>Sept. 29</th>
<th>Multiplication</th>
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<td>Readings: Fosnot &amp; Dolk, Chapter 5</td>
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<td>Pen Pal Letter Problem Development</td>
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<tr>
<th>Week 7</th>
<th>Oct 6</th>
<th>Problem Solving Lessons</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Media: Turkey Part I</td>
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<thead>
<tr>
<th>Week 8</th>
<th>Oct. 13</th>
<th>No Class</th>
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<tr>
<td></td>
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<td>Fall Break</td>
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<tr>
<th>Week 9</th>
<th>Oct. 20</th>
<th>Turkey Part II –Classroom Talk: making connections among students’ strategies</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Reading: Chapin et al., Ch. 5-8</td>
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<tr>
<th>Week 10</th>
<th>Oct. 27</th>
<th>Questioning and Levels of Math Talk</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Reading: Vanderbyhe &amp; Demers (2007); Chapin et al., Ch. 9-11</td>
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<tr>
<th>Week 11</th>
<th>Nov 3</th>
<th>Stations and other lesson structures</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Andreasen &amp; Hunt (2012); Zebiek &amp; Boone (2007)</td>
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<tr>
<th>Week 12</th>
<th>Nov 10</th>
<th>Using Technology</th>
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<tbody>
<tr>
<td></td>
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<td>Reading: Polly (2011); Suh &amp; Seshaiyer (2012)</td>
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<tr>
<th>Week 13</th>
<th>Nov 17</th>
<th>STEM Integration: Fractions &amp; Community Garden</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Readings: SeedFolks (Fleishman, 1997)</td>
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<td></td>
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<td>Readings: Norton (2007); Empson (2001)</td>
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<th>Week 14</th>
<th>Nov 24</th>
<th>Summative Evaluation</th>
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<tbody>
<tr>
<td></td>
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<td>No Class</td>
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<td>Thanksgiving</td>
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<tr>
<th>Week 15</th>
<th>Dec 1</th>
<th>STEM Integration: Surface Area and Volume &amp; Food Packaging/Storage</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Readings: Suh, Seshaiyer, Moore, Green, Jewell, &amp; Rice (2013)</td>
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<tr>
<th>Week 16</th>
<th>Dec 8</th>
<th>Using of Funds of Knowledge, Talking with Parents, Evaluation</th>
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<thead>
<tr>
<th>Grade Assignment Due Dates</th>
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<tbody>
<tr>
<td>Quiz 1: Wright et al., pages 29-104 (Sept. 2, 11:59 pm)</td>
</tr>
<tr>
<td>Quiz 2: Wright et al., pg. 120-161, (Sept 8, 11:59 pm)</td>
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<tr>
<td>Contact mentor teacher</td>
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<tr>
<td>EST Interview Questions (Sept 19, 11:59pm)</td>
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<td>EST Due (Sept 28, 11:59pm)</td>
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<tr>
<td>October 2: NCS Family Mathematics &amp; Science Night</td>
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<tr>
<td>Lesson Planning Packet Due (Oct 10, 11:59)</td>
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<tr>
<td>Pen Pal Letter 3 (Oct 12, 11:59)</td>
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<tr>
<td>Quiz 3: Chapin Chapter 1-4 (Oct 14, 11:59)</td>
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<tr>
<td>Quiz 4: Chapin Chapter 5-8 (Oct 19, 11:59)</td>
</tr>
<tr>
<td>Pen Pal Letter 4 (October 24, 11:59)</td>
</tr>
<tr>
<td>Quiz 5: Chapin Chapter 9-11 (October 26, 11:59)</td>
</tr>
<tr>
<td>Pen Pal Letter 5 (Nov. 9, 11:59)</td>
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<tr>
<td>Quiz 6: Chapin Chapter 9-11 (October 26, 11:59)</td>
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<tr>
<td>Pen Pal Analysis (Nov 21, 11:59)</td>
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<tr>
<td>Video Explanations Showcase</td>
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<tr>
<td>Video Explanations due during last class</td>
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<tr>
<td>Week 17</td>
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<tr>
<td>Exam</td>
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