Course Goals:
This course is designed to help you explore teaching and learning mathematics in the early grades from a variety of perspectives. We will read and discuss theoretical articles, research-based articles, case-studies of actual classrooms, and narratives from teachers reflecting on their own practice. We will spend time becoming acquainted with different kinds of research in mathematics education and considering how research can inform your practice. There will also be several "try it in your own class" assignments so that you will have opportunities to draw connections between this class and your own teaching.

Specifically, this course will focus on:

- **How you can help all young children learn mathematics & believe that it should make sense**
- The importance of listening to children as both a teaching and assessment tool
  - How to understand children's content specific thinking in grades preK-4 with an emphasis on **problem solving, whole number operations, and base-ten understanding**
  - How to ask questions to get children to share their thinking, what to listen for, how to make sense of that information, and what to do with that information (planning instruction based on children’s thinking)
  - How to create a **classroom environment** that promotes discussion of mathematical ideas, investigation, risk-taking, and respect for all students’ ideas
- **Examining your beliefs about elementary school mathematics – expectations for what children can do, what your role should be, and what the classroom environment should look like.**

For those of you teaching grades 5-8 (or above), this course will allow you to reflect on how the students in your classes have developed the understandings (and misunderstandings) that you see. During the Fall 2014 semester, the roles were reversed and the focus was on teaching and learning in grades 5-8. At that time, you worked with your own students, and the K-4 teachers had an opportunity to consider how their students continue to develop mathematically after leaving their classes.

Required Materials:

Searchable IMAP Video Collection [from last semester]

Other readings will be provided in the form of PDF files
Course Policies:

Grading: I hope that we all recognize that grades are designed to reflect what one knows and what one has learned, but they do so inadequately. All grading systems are subjective, even those that are based solely on objective tests. But I do not want grades to interfere with your learning in this course, and I know how important grades are to some people, so I have decided that if your work is less than acceptable on any assignment, I will let you know so that you may redo the assignment. Because this is a graduate course, students are expected to maintain at least a B average. Therefore, if you turn your work in on time, you may assume that, unless I speak to you, I consider your work to be thoughtful and you are maintaining a passing grade. To earn an A, you should consistently grapple with the ideas at a deeper level, and I will expect this depth to be reflected both in your submitted work and in your comments during class discussions. Two examples of ways that you might indicate that you are grappling with ideas at a deeper level are that you draw connections among the readings and between the readings and your own teaching.

We learn not only from the readings and from the instructor, but also from our fellow students. For this reason, attendance and participation are essential in this class and I will consider them in your final grade. If you miss a class (or need to arrive late or leave early), you should email me to let me know, and advance notice is appreciated. It is also your responsibility to speak to me to determine whether you need to do anything to make up the absence. All assignments should still be submitted by the due date unless you have made other arrangements with me.

Most of you are currently serving as full-time teachers while enrolled in two graduate courses, so I know how busy you will be this semester. However, I have found that students with your busy schedules who fall behind find it difficult to catch up. Furthermore, if you come to class without having completed the weekly readings, you will not be able to contribute thoughtfully to our class discussions. For these reasons, I will note assignments that are turned in late, and if you consistently turn in late work, this will result in a lower final grade. I also understand that life presents circumstances for which we cannot plan, so please come speak to me if you find you are having difficulty keeping up with the work and I will do what I can to work with you. (Grading policy created and adapted in consultation with other program faculty.)

Religious Observances: University Policy on Absence for Religious Observances includes the following statements: “By the end of the second week of classes, students should notify the instructors of affected courses of planned absences for religious observances. Instructors shall reasonably accommodate students who notify them in advance of planned absences for religious observances.” Please notify me and a reasonable accommodation will be reached.

Policy on Cheating and Plagiarism: Please Do Not! Please be sure to read and understand the university policy on plagiarism and cheating, as it will be strictly enforced. Academic dishonesty will not be tolerated, will result in a failing grade for the course, and will be reported to the University. This policy is stated in the Graduate Bulletin (http://coursecat.sdsu.edu/bulletin/quickref.html).

Students with Disabilities: If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that
accommodations based upon disability cannot be provided until you have presented your instructor with an accommodation letter from Student Disability Services. Your cooperation is appreciated.

Counseling & Psychological Services: You are embarking on an awesome and sometimes stressful journey. We need to be sure we take care of ourselves both physically and mentally. There are services available to you as a SDSU student to help if you are feeling stressed, overwhelmed, or depressed. I would encourage you to contact these helpful services located at the Counseling and Psychological Services, Calpulli Center Room 4401, www.sdsu.edu/cps. You can also call to speak with a therapist at (619) 594-5220.

Assignments:
Each week you will engage in a variety of activities for homework. These activities will generally involve reading articles, watching video clips, and/or engaging students in mathematical tasks. Details of each assignment are provided beginning on page 7.

All written assignments (unless otherwise specified) must be typed, double-spaced, and submitted on Blackboard. Page lengths are specified for each assignment to provide you with an indication of the depth of discussion I am expecting. Consider the specified lengths only as guidelines. Therefore, it is fine if your papers are a little longer or shorter than what is specified – you do not need to adjust font and margin size! On the other hand, if your paper is much shorter than what is specified, you should probably recheck the assignment instructions to make sure that you have fully completed the assignment.

Table 1 Assignments Summaries with Percentages and Due Dates

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Value</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Summaries (Complete 11 of 13)</td>
<td>5%</td>
<td>Each week after 1/26</td>
</tr>
<tr>
<td>Online Tasks</td>
<td>10%</td>
<td>Throughout the Course Posted on Blackboard</td>
</tr>
<tr>
<td>Interview #1</td>
<td>15%</td>
<td>February 16</td>
</tr>
<tr>
<td>Story Problem Design</td>
<td>20%</td>
<td>March 2</td>
</tr>
<tr>
<td>Counting Task</td>
<td>10%</td>
<td>March 16</td>
</tr>
<tr>
<td>Interview #2 (Analysis of Children’s Thinking)</td>
<td>15%</td>
<td>April 13</td>
</tr>
<tr>
<td>Interview #2 (Analysis of Teacher’s Moves)</td>
<td>15%</td>
<td>April 27</td>
</tr>
<tr>
<td>End of Term Reflection</td>
<td>10%</td>
<td>May 11</td>
</tr>
</tbody>
</table>

Readings:
Note: Readings are to be completed by the date under which they are listed.

January 26
   No readings or assignments due

February 2: Problem Solving


**February 9: Problem Types & Solution Strategies (Addition & Subtraction)**


**February 16: Problem Types & Solution Strategies (Multiplication & Division)**


**February 23: What Does Math Class Look Like?**
View video clips 515, 525, and 526


**March 2: Early Math Skills & Family Math**


**March 9: Counting**


**March 16: Number Fact Fluency**


**March 23: Place Value**

View video clips 152, 155, and 156


**March 30: SPRING BREAK**

Next weeks reading is quite a bit. You may want to start reading this week.

**April 6: Base Ten Number Concepts & Solution Strategies**

**April 13: Role of the Teacher-Interviewing Tips**


**April 20: Role of the Teacher-Classroom Discussions**


**April 27: Role of the Teacher-Engaging Students with Each Other’s Ideas**


**This book can be viewed free, online at** [http://www.stenhouse.com/html/intentional-talk.htm](http://www.stenhouse.com/html/intentional-talk.htm)

**May 4: Links to Algebra**
# MTHED 600 Class Schedule:
Table 2 Class Schedule Including Topics, Dates, Readings, and Assignments Due

<table>
<thead>
<tr>
<th>Class #</th>
<th>Topic</th>
<th>Date</th>
<th>Readings</th>
<th>Assignment Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>1/26</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Problem Solving</td>
<td>2/2</td>
<td>NCTM (2014) Carpentner et al. (2015): Intro, Ch. 1 &amp; 8</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Story Problem Types (Add &amp; Sub)</td>
<td>2/16</td>
<td>Carpenter et al. (1996) Carpentner et al. (2015): Ch. 4</td>
<td>Interview #1</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>3/30</td>
<td>Spring Break</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Base Ten</td>
<td>4/6</td>
<td>Carpenter et al. (2015): Ch. 6 &amp; 7</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Role of the Teacher 3</td>
<td>4/27</td>
<td>Carpenter et al. (2015): Ch. 10 Kazemi &amp; Hintz (2014): Ch. 1</td>
<td>Interview #2 Teacher Move Analysis</td>
</tr>
<tr>
<td>Finals</td>
<td></td>
<td>5/11</td>
<td>-</td>
<td>End of Term Reflection</td>
</tr>
</tbody>
</table>
Reading Summaries

Complete 11 of 13

Each week (except 1/26 and 3/30), you will submit a brief summary of the readings that will help you remember the main points. You may include as much or little detail as you wish—bulleted items and/or sentence fragments are appropriate for this summary. Make the format and content of these summaries work for you and your future learning.

I recognize that you are busy professionals and therefore I like to provide you some flexibility in organizing your workload. **You only need to submit 11 of the 13 possible reading summaries.** You may use your “freebies” any time throughout the semester. *I strongly encourage you to complete the readings for all the weeks — even the ones for which you do not submit a summary.*
Interview #1: Problem-Solving Focus (Due February 16)

This assignment is designed to give you an opportunity to focus on individual children’s mathematical thinking. Identify two children you want to interview one-on-one. You need to work with K-4 children even if you are an upper grade teacher. You may choose children of any ability level; it does not matter how many problems the children solve correctly, and you will learn something from all children.

Note: When possible, I encourage you to interview children with another teacher in this class – two teachers and one child. You should then complete individual write-ups.

In this interview, you will have a chance to try for yourself some of the problems discussed in the Kindergarten study (Carpenter et al., 1993). You should ask each child to solve at least 4 of the 8 problems listed below (and discussed in the article). Alternative numbers have been provided, and you should decide which numbers are most appropriate for the child you are interviewing. You do not need to use the same problems or number choices for both children. Some form of counters should be available.

1. Paco had 13 cookies. He ate 6 of them. How many cookies does Paco have left? \([alternate \ #: (43, 16) (1000, 11)]\)

2. Robin has 3 packages of gum. There are 6 pieces of gum in each package. How many pieces of gum does Robin have altogether? \([alternate \ #: (4, 12) (9, 25)]\)

3. Carla has 7 dollars. How many more dollars does she have to earn so that she will have 11 dollars to buy a puppy? \([alternate \ #: (19, 40) (89, 110)]\)

4. Tad had 15 guppies. He put 3 guppies in each jar. How many jars did Tad put guppies in? \([alternate \ #: (54, 3) (280, 20)]\)

5. James has 12 balloons. Amy has 7 balloons. How many more balloons does James have than Amy? \([alternate \ #: (45, 38) (102, 87)]\)

6. Mr. Gomez had 20 cupcakes. He put the cupcakes into 4 boxes so that there were the same number of cupcakes in each box. How many cupcakes did Mr. Gomez put in each box? \([alternate \ #: (42, 3) (124, 4)]\)

7. Maggie had 3 packages of cupcakes. There were 4 cupcakes in each package. She ate 5 cupcakes. How many are left? \([alternate \ #: (4 packages, 10 per package, ate 13) (8 packages, 12 per package, ate 25)]\)

8. 19 children are going to the circus. 5 children can ride in each car. How many cars will be needed to get all 19 children to the circus? \([alternate \ #: (51, 4) (123, 5)]\)

Interviewing Tips

- Be curious! The point of the interview is to discover how the child thinks – not to guide the child
to the correct answer. (For the purposes of this assignment, it does not matter if the child solves everything incorrectly – you will learn something about his/her thinking in all cases.)

- Read each problem to the child – one at a time – and provide him/her with sufficient time to complete each problem. You may also want to provide the child with a written copy of each problem – only give the child one written problem at a time (not the whole interview).

- After the child answers each problem, ask a variety of questions to help you to better understand the child’s thinking and to assess his/her mathematical understanding. For example, if the child is not forthcoming with a response or says “I just knew it,” you might respond with “What did you think about first?” or “If you were helping a friend, how would you explain what you did?” or ....

- Be careful to respond similarly to correct and incorrect answers. Be curious about all responses.

- Your primary role is to listen. Make sure you allow enough “wait time” – it is often hard (!) but children need time to think before answering.

- What if a child cannot solve a problem?
  - You can try asking the problem again but making the numbers smaller.
  - You can try asking the problem again, keeping the structure of the problem the same, but making the context more familiar (e.g., putting the child's name in the problem).
  - You can move on to the next problem and write about what you learned from this experience.

- What if a child solves all the number choices quickly?
  - You can try asking the problem again but making the numbers larger.
  - You can ask the child to make up a problem (one that s/he thinks is challenging).
  - You can move on to the next problem and write about what you learned from this experience.

**What should you include in your write-up?**

Your 3–4 page write-up should include the following:

1. For each child, describe his or her strategies and answers on one problem. If possible, pick a problem for which you were surprised or intrigued by what the child did. You do not need to pick the same problem for each child, but you can.
   - Be sure to tell me the grade level of each child, the problem you are describing, and if you changed number sizes or contexts (and why).
   - The main goal of this part of the assignment is to practice listening to what children say and do. Therefore, you want to describe as specifically as possible what the child said and did. For example, do not only say, "The child used the cubes to solve the problem." You need to explain how the child used the cubes. For example, for 13–6, you might say, "The child counted out 13 cubes by 1, connecting each of the cubes into a long train. Then he counted 6 cubes (by twos!) from the top of the train and broke off those 6 cubes. He put the 6 cubes aside and counted (by ones) the number of cubes that were still in the train and found that there were 7 cubes left. He answered the problem by saying that he had 7 cookies left." Similarly, for 43–16, do not only say, "The child subtracted to get the answer." You will need to explain how he subtracted. If he used the standard algorithm, say that. If he subtracted in his head, explain what he did.
2. Pick one child to consider in more depth, and respond to the following two prompts.
   o Identify a few things you learned about the child's mathematical understandings (and describe what in the interview specifically led you to those conclusions).
   o If you were to work with this child again, what specific problem (including number choices) would you like to ask to further this child's understandings? Be sure to include an explanation of what you hope to learn by posing this problem. There will not be a perfect answer here. The goal is to give you the opportunity to think hard about how (with a class of 1!) you could use what you just learned about a child’s mathematical understandings to help you plan instruction.

3. Write a final paragraph sharing anything else of interest to you that is related to mathematics, teaching, or learning. For example, you might reflect on what you learned about yourself as an interviewer or on what you learned about particular problem types or....
Story Problem Design (Due March 2)

We have discussed how young children view story problems for addition, subtraction, multiplication, and division, and now it is your turn to design some story problems. You will need to write one of each of the following 12 types of problems:

- Join Result Unknown
- Join Change Unknown
- Join Start Unknown
- Separate Result Unknown
- Separate Change Unknown
- Separate Start Unknown
- Part-Part-Whole Whole Unknown
- Part-Part-Whole Part Unknown
- Compare Difference Unknown
- Multiplication
- Partitive Division
- Measurement Division

You can choose to write all 12 problems about the students/events in your classroom or all 12 problems about a piece of literature.

- **Linking Story Problems to Your Classroom:** You can write 12 story problems about the children in your classroom and the events in their lives both inside and outside of school. As you discussed in Lisa’s class, there are big benefits to getting to know your students on a personal level, and mathematical story problems are an excellent way of incorporating children’s cultures and prior experiences into the curriculum. Problems can include children’s names, interests, ideas, etc. Even simple things like putting a child’s name in a problem can make a difference. Problems that actually reflect children’s lives can help to bring their cultures into the classroom and make them feel at home. You can also integrate another academic area, for example, by writing problems around a science or a social studies theme.

- **Linking Story Problems to Literature:** You can write 12 story problems about a piece of literature. The book you select does not have to be one that was written to promote mathematical understanding (but it could be). The only requirement is that you feel the book is a worthwhile piece of literature.

Regardless of which of these two overall contexts you choose, each problem should focus on something different (e.g., a different child, a different part of the book, etc.). Remember that you can include large numbers, fractions, or decimals to make the problems harder. Be creative and be sure to create your own problems rather than use ones we have discussed in class.

**Using Your Story Problems**

Pick two of the problems you have written and give them to your students (any grade). If you wrote story problems about children in your classroom, you should be sure that the group of students who are solving the problem includes the children who are the stars of your problems. Have a class discussion in which students share their solution strategies. Collect your students’ work and categorize their solution strategies.
Write a 2-3 page reflection in which you discuss your experience of writing and using the problems you wrote, having students share their solution strategies, and how you categorized their work. Include the different categories of solutions students used to solve the problems, the number of students that used similar strategies, and cite examples from your students’ work. There may be some student work that can not be deciphered, which is ok, perhaps talk with some of those students who’s work you can not understand to get a better picture of their mathematical thinking. Be sure to turn in your list of story problems you created along with your reflection.
Counting Task (Due March 16)

We will discuss counting tasks for several weeks, and this assignment is designed to let you explore counting with your students (any grade). You will complete a classroom investigation involving counting and write a reflection on your counting experience.

Select one of the 5 classroom investigations described below and explore children's counting skills and understandings. Most of the investigations can be done with a whole class or a small group, but the final option allows you to work with an individual child if you prefer. You may want to audio record some of your students' counts, if you think it would be helpful. You should write 2-3 pages explaining:

(a) the details of the task you posed (specifically how you implemented the task)
(b) describe what you learned about children's counting skills and understandings, and how to facilitate counting tasks
(c) any suggestions you have for improving the task
(d) identify some ideas you have for exploring counting with your students (or the children you interviewed) in the future

Choose 1 of these 5 counting investigations...

1. Try a counting collections task

Based on the article by Schwerdtfeger & Chan (2007), ask your students to count a collection of items. You can choose which items and how you want to present the task (e.g., if they are counting boxes of markers, you will need to decide if they can unpack the markers when counting or if they have to count with the boxes closed). The article provides a variety of suggestions for questioning. The goal of this task is not for students to get a final count of the number of items in the collection but instead for you to use the task of counting collections to explore and extend their counting skills and understandings.

2. Try a building numbers task

Have your students build numbers with base-ten cubes (or other manipulatives). Alternately, you could build the numbers and have the students identify what number you built. In either case, be sure to ask several follow-up questions. You might want to ask questions about how the students organized their materials or how they knew they finished. You might also want to explore component numbers within the number that was built. For example, if 4301 was built, you might want to ask how many 100s are 4301 (vs. what digit is in the 100s place). Similarly, you might want to ask if there is a 5 in 8 or a 10 in 23 or.... Be sure to try a few numbers and play around with a variety of follow-up questions.

3. Try a choral counting task

Engage students in counting together and then talking about the patterns that are embedded in that counting. Decide on a number to count by, which direction to count (forwards or backwards), and what number to start and end with. Ask the class to count together out loud while you record the count on the board. Be sure to think ahead about how you want to use your board space so that a few of the mathematically important patterns are more obvious. It may also be helpful to give the kids a
few minutes to think about the first number in the count (by themselves or with a partner) before starting the choral counting. As the kids are counting, you can stop the counting at strategic points to discuss the patterns they are noticing. The goal is not to identify a particular pattern – instead, encourage the students to explore multiple patterns.

Below are some sample reflection questions. Feel free to try some of these questions, and I also encourage you to create some of your own.

To explore how students are determining the next count...
How did you figure out the last number?
Does everyone feel they have a way to figure out the next few numbers in the count?
Invite the class to use what one student just shared to help them think about what count comes next.

To explore patterns in the count...
What patterns do you notice?
Turn to your neighbor and explain the pattern that student X and Y are noticing.
Why do you think these patterns happen? (It can be productive to discuss the patterns even if students cannot always explain why.)
Will the pattern ever break?
If this pattern continues, what will the next number be?
Who can circle all the multiples of 10 on the board? (As you discuss patterns in the counting sequence, many mathematical ideas will emerge for you to ask questions and build on.)

4. Try a counting journal task

Decide on a number to count by, which direction to count (forwards or backwards), and what number to start and end with. Ask each child to write the counting sequence in a journal. After the students have finished (or while they are working), be sure to ask questions about how they are determining the next number in the sequence, the patterns they are noticing, etc.

This task is related to the choral counting task in that many of the teachers’ decisions and questions are similar. One difference is that all children will have a chance to generate one or more sequences for themselves. Another difference is that you will not be organizing the way the counts are recorded so the pattern-seeking discussion is less predictable (but can be quite interesting!).

5. Try a counting interview

Select two children (any grade) to interview. For each of the counting tasks, select one or more of the number choices provided (or create your own). For older children, you might want to include counting by fractions or decimals.

a) Count from ____ and I’ll tell you when to stop
   (sample # choices: from 19 to 32; from 93 to 121; from 588 to 612; from 991 to 1014; from 9998 to 10,023)
   For a more challenging variation, you could have children count by 10s or 100s from these starter numbers.

b) (1) What number comes right after ____?
   (sample # choices: 14, 20, 29, 65, 99, 100, 109, 342, 909, 999, 3399, 9999, 10099)
(2) What number comes right before ____?
(sample # choices: 17, 30, 41, 67, 99, 100, 110, 612, 801, 1000, 5000, 8847, 10270)
For a more challenging variation, you could ask what number comes 2 numbers before/after ____
or what number comes 10 numbers before/after _____.
Here are two questions I might want to try: What number comes 10 after 99? 10 after 999?

c) Ask the children to solve the following without paper and pencil or any manipulatives:
How much is 100 take away 3?
(some alternate #s: 301 take away 4, 1000 take away 3, 7000 take away 25)
Interview #2: Place-Value Focus
Analysis of Children’s Thinking Analysis (Due April 13)
Analysis of Teacher’s Moves (Due April 27)

Like Interview #1, this assignment is designed to give you an opportunity to focus on individual children’s mathematical thinking. Identify two children you want to interview one-on-one. **You need to work with K-4 children even if you are an upper grade teacher.** You may again choose children of any ability level; it does not matter how many problems the children solve correctly, and you will learn something from all children. (You may work with the same 2 children you interviewed earlier or you may work with new children.)

*Note:* When possible, I encourage you to interview children with another teacher in this class – two teachers and one child. You should then complete individual write-ups.

Unlike Interview #1, **you need to audiotape or videotape these interviews.** Please be sure that you have permission to do so (parent permission forms can be found on Blackboard in the Syllabus/Assignments folder.) Your write-up will also be in two parts. The first part (due April 13) will include your analysis of what you learned about the children’s thinking about place value (similar to what you did for the first interview and children’s problem solving). The second part (due April 27) will include an analysis of your own questioning skills.

This interview will give you a chance to explore children's knowledge of 10s. Therefore, for the younger grades, pick at least one child with some knowledge of 10s – you may have to move up a grade – so that you can see some solution strategies beyond counting by 1s. You should ask each child to solve 4 of the 8 problems listed below. Alternative numbers have been provided, and you should decide which numbers are most appropriate for the child you are interviewing. You do not need to use the same problems or number choices for both children. Some form of counters that can be grouped in 10s should be available.

1. We have 4 boxes of crayons with 10 crayons in each box. We also have 6 extra crayons. How many crayons do we have?
   
   *alternate numbers:* (24 boxes, 10 crayons in each, 6 extra crayons)  
   (15 boxes, 21 crayons in each, 6 extra crayons)]

2. The teacher wants to pack 43 books in boxes. If 10 books can fit in each box, how many boxes does she need to pack all the books?
   
   *alternate numbers:* (120, 10) (287, 10) (360, 20)]

3. There were 36 children on the playground, and 20 more children came to play with them. How many children are on the playground now?
   
   *alternate numbers:* (89, 41) (199, 304)]

4. **Ask the child to solve the following without paper and pencil or any manipulatives:**  
The principal bought a package of 100 stickers. She gave 11 to Sasha for helping her at lunch. How many stickers does the principal have left?
   
   *alternate numbers:* (30, 11) (1000, 11) (10,000, 111)]
* If the child cannot solve the problem in his/her head, ask him/her to solve it any way s/he wants (e.g., with paper & pencil, manipulatives, etc.)

5. Ask the child to solve the following without paper and pencil or any manipulatives:
   Matt had 18 pennies in his bank. For his birthday, he got 25 more pennies. How many pennies does Matt have now?
   [alternate numbers: (20, 11) (32, 63) (80, 40) (99, 26) (198, 282)]
   * If the child cannot solve the problem in his/her head, ask him/her to solve it any way s/he wants (e.g., with paper & pencil, manipulatives, etc.)

6. How many tens are in 240? (Remember to ask the child to explain his/her reasoning.)
   [alternate numbers: (number of 10s in 543) (number of 100s (and/or number of 10s) in 1365)]

7. Say or write the following problem and ask the child to solve it: 100–3
   [alternate numbers: (30 – 2) (100 – 98) (1000 – 6) (1000 – 1) (1000 – 999)]

8. Write the problem below and ask the child to solve it.
   \[
   \begin{array}{c}
   70 \\
   \underline{+ 23}
   \end{array}
   \]
   Ask the child how s/he solved the problem. If his/her answer is 53, pose the following problem and ask the child to consider them together
   \[
   \begin{array}{c}
   76 \\
   \underline{+ 23}
   \end{array}
   \]

*Be sure to review the interviewing tips from the directions for Interview #1.

**What should you include in your April 13 write-up?**
Your 3–4 page write-up should include the following:

1. For each child, describe his or her strategies and answers on one problem. If possible, pick a problem for which you were surprised or intrigued by what the child did. You do not need to pick the same problem for each child, but you can.
   - Be sure to tell me the grade level of each child, the problem you are describing, and if you changed number sizes or contexts (and why).
   - The main goal of this part of the assignment is to practice listening to what children say and do. Therefore, you want to describe as specifically as possible what the child said and did.

2. Pick one child to consider in more depth, and respond to the following two prompts.
   - Identify a few things you learned about the child's mathematical understandings (and describe what in the interview specifically led you to those conclusions).
   - If you were to work with this child again, what specific problem (including number choices) would you like to ask to further this child's understandings? Be sure to include an explanation of what you hope to learn by posing this problem. There will not be a perfect answer here. The goal is to give you the opportunity to think hard about how (with a class of 1!) you could
use what you just learned about a child’s mathematical understandings to help you plan instruction.

3. Write a final paragraph sharing anything else of interest to you that is related to mathematics, teaching, or learning. For example, you might reflect on what you learned about yourself as an interviewer or on what you learned about particular problem types or....

**What should you include in your April 27 write-up?**

You have an opportunity to re-analyze your Interview #2 (place-value focus) to further explore your moves and decision making. Use the Jacobs & Ambrose (2008) article to guide your analysis, but feel free to discuss categories/ideas not mentioned in the article. In this 3–5 page write-up, you should:

- Provide an analysis of your supporting moves (things you did before a child arrived at the correct answer) and an analysis of your extending moves (things you did after a child arrived at the correct answer)—What types of moves did you use? What did the students learn from your moves? What did you learn from the students’ responses? Specific examples are helpful.

- Select at least 1 minute of transcript that stands out to you because of what you learned about your questioning. In your write-up, you should include the 1-minute transcript, and explain why you selected it. You may want to number the lines in the transcript and refer to them in your discussion.

- In addition to analyzing what you did, I want you to also think about what else you could have done (hindsight is always great!). Please identify at least one supporting move and one extending move that you wish you had tried, and explain your reasoning.

- Write a final paragraph summarizing what you learned about yourself and your questioning.
Wrap-Up Writing (Due May 11)

This assignment is designed to give you an opportunity to pull together the “big” ideas from the semester. An added benefit of this assignment is the preparation it will give you for the comprehensive exam that you will take during the second year of the program. You will write a reaction to a synthesis question in a take home assignment given on April 27. The reading summaries that you complete weekly should be useful for this assignment.

Writing suggestions

You should make sure that your response is accurate, coherent, and grounded in the literature you have read in the program, and your response should not look the same now as it might have looked before you enrolled in the masters program. Below are some specific suggestions.

- Before you start writing, it may be useful for you to construct a quick outline that includes the major ideas, how you intend to sequence them, and what papers you will cite.
- Make sure to answer the question asked and respond to all parts of the question.
- Instead of providing a list of everything that you know that is relevant to the question, be sure to take the time to think through and organize your ideas.
- Reference specific articles and/or authors, you may use exact quotes as needed (please limit them). Try to use the authors’ main ideas in formulating an argument (and then be sure to give them credit). Why should you limit the use of exact quotes? One goal of this assignment is to see how you are conceptualizing and connecting ideas across readings, however you may use quotes to as evidence for your claims.
- When you reference an article, be sure to cite all the authors. For example, use the reference (Carpenter, Franke, & Levi, 2003) the first time you cite the article, cite the article as (Carpenter et al., 2003) each subsequent time.
- Remember that your response should go beyond anecdotes of your teaching experiences. That does not mean you cannot include an anecdote, but after doing so, you should connect the anecdote to other ideas in the field.
- Proofread your response to ensure proper use of the English language (e.g., spelling, grammar, etc.).
- Please include a list of references at the end of the paper, you may cite articles from a source other than this course. (That is, if you have read articles from other courses in the program or from outside readings that you have done.)