TEACHING MATHEMATICS IN THE ELEMENTARY SCHOOL
EDMS 543 – Summer 2004

Tom R. Bennett, Ph.D. Office Phone: (760) 750-4307
Office (Hours): University Hall 414 (Before or after class) Email: tbennett@csusm.edu

The mission of the College of Education Community is to collaboratively transform public education by preparing thoughtful educators and advancing professional practices. We are committed to diversity, educational equity, and social justice, exemplified through reflective teaching, life-long learning, innovative research, and on-going service. Our practices demonstrate a commitment to student-centered education, diversity, collaboration, professionalism, and shared governance.

REQUIRED MATERIALS:

- California Department of Education (2000). Mathematics Content Standards for California Public Schools, Kindergarten Through Grade Twelve. Sacramento, CA: author. This document can be found on the WWW at: http://www.cde.ca.gov/standards/math/ (I highly encourage students to purchase this publication).
- National Council of Teachers of Mathematics (2000). Principles and standards for school mathematics. Reston, VA: author. Can be found on the WWW at: http://standards.nctm.org/
- Star Test Blueprints for Standards Items: http://www.cde.ca.gov/statetests/star/resources/blueprints.html
- Van de Walle, John A. (2004). Elementary and middle school mathematics: Teaching developmentally (5th ed.). Boston: Pearson Education, Inc.

COURSE DESCRIPTION:

Learning to teach mathematics well is difficult and, therefore, you must expect that this course will only begin your education in learning how to teach mathematics. This course is but one stage in what I hope will be a continuing evolution of you as a mathematics teacher. The focus of this course will be on (1) developing an understanding of the current practices in mathematics, (2) learning to teach content specific concepts using effective and appropriate strategies, and (3) practicing how to teach for mathematical understanding. Enfolded into this course will be curriculum development, developing an understanding of children's content specific thinking, creating a classroom environment that promotes the investigation and growth of mathematical ideas, and developing strategies to ensure the success of all students in multi-cultural settings.

TEACHER PERFORMANCE EXPECTATION (TPE) COMPETENCIES:

This course is designed to help teachers seeking the Multiple Subjects Credential to develop the skills, knowledge, and attitudes necessary to assist schools and district in implementing an effective program for all students. The successful candidate will be able to merge theory and practice in order to realize a comprehensive and extensive educational program for all students. The following TPE's are addressed in this course:

Primary Emphasis:

- TPE 1a-Subject Specific Pedagogical Skills for MS Teaching (Mathematics)

Secondary Emphasis:

- TPE 2-Monitoring Student Learning During Instruction
- TPE 3-Interpretation and Use of Assessments
- TPE 4-Making Content Accessible
- TPE 5-Student Engagement
- TPE 6a-Developmentally Appropriate Practices in Grades K-3
- TPE 6b-Developmentally Appropriate Practices in Grades 4-8
- TPE 6d-Developmentally Appropriate Practices for Special Education
- TPE 7-Teaching English Learners
- TPE 8-Learning About Students
- TPE 9-Instructional Planning
- TPE 10-Instructional Time
- TPE 11-Social Environment
- TPE 13-Professional Growth

INFUSED COMPETENCIES:

CLAD: In 1992, the College of Education voted to infuse Cross-cultural, Language and Academic Development (CLAD) competencies across the curriculum. The CLAD competencies are attached to the syllabus and the competencies covered in this course are highlighted.

Authorization to Teach English Learners: This credential program has been specifically designed to prepare teachers for the diversity of languages often encountered in California public school classrooms. The authorization to teach English learners is met through the infusion of content and experiences within the credential program, as well as additional coursework. Students successfully completing this program receive a credential with authorization to teach English learners.

Technology: This course infuses technology competencies to prepare our candidates to use technologies, emphasizing their use in both teaching practice and student learning.

KEY ASSIGNMENTS:

Reading Reflections (24%) - Each week students will write a "meaningful" one page reflection on the articles assigned to be read for that week. These reflections should clearly articulate your thoughts **on the articles** and discuss how you might **specifically apply** what you learned from the articles as a teacher in the classroom.

Student Interviews (24%) - You and one of your classmates will conduct a series of four different student interviews based on questions provided in class. For each interview, you will pose mathematical problems to any one student at a predetermined grade level. The purpose is to get you to begin thinking about students' mathematical understanding, to learn how to effectively pose questions and interpret the meaning of students' answers, and to provide you with an opportunity to interact with students.

Mathematical Resources & Lesson (32%)– Working in small groups, your team will first compile resources on a predetermined mathematical topic (20%) and then design a lesson that you will present in an elementary class (*if possible given schedule, 12%). The purpose of this activity is to help you learn how to design effective mathematical activities, to provide you with an opportunity to begin compiling mathematical resources, and to provide an opportunity for you to practice teaching mathematics.

Curriculum Assignment (20%)– Students will review the mathematics curriculum currently being used in their classroom (e.g., a textbook) at one grade level and write a short paper that investigates the curriculum alignment with the CA Content Standards and current high stakes assessments. Students will also provide their general thoughts and concerns related to the curriculum (e.g., how the curriculum might need to be altered to make strong connections between mathematical concepts and procedures).

GRADING SCALE:

Grades will be based on the following grading scale:

A.....90 -100%
B.....80 - 89%
C.....70 - 79%
D.....60 - 69%
F.....Below 60%

ATTENDANCE POLICY:

The attendance policy of the College of Education: Due to the dynamic and interactive nature of course in the COE, all students are expected to attend all classes and participate actively. At a minimum, students must attend more than 80% of class time, or s/he may not receive a passing grade for the course at the discretion of the instructor. If you miss two class sessions or are late (or leave early) more than three sessions, you cannot receive a grade of "A". If you miss three class sessions, your highest possible grade is a "C+". Should you have extenuating circumstances, contact the instructor as soon as possible. Please discuss with me any extenuating circumstances that will cause you to miss class prior to your absence. Attendance will be taken at each class session. Furthermore, grades on assignments turned in late will be lowered unless **prior arrangements** have been made with the instructor.

PLAGIARISM AND CHEATING:

Please be sure to read and understand the university policy on plagiarism and cheating as it will be strictly enforced. Academic dishonestly will not be tolerated and will result in a failing grade for this course and will be reported to the University.

STUDENTS WITH DISABILITIES REQUIRING REASONABLE ACCOMMODATIONS:

Students are approved for services through the Disabled Student Services Office (DSS). This office is located in Craven Hall 5205, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive reasonable accommodations should meet with their instructor during office hours or, in order to ensure confidentiality, in a more private setting.

SB2042 – AUTHORIZATION TO TEACH ENGLISH LEARNERS COMPETENCIES

TEST 1: LANGUAGE STRUCTURE AND FIRST- AND SECOND-LANGUAGE DEVELOPMENT	TEST 2: METHODOLOGY OF BILINGUAL, ENGLISH LANGUAGE DEVELOPMENT, AND CONTENT INSTRUCTION	TEST 3: CULTURE AND CULTURAL DIVERSITY
I. Language Structure and Use: Universals and Differences (including the structure of English)	**I. Theories and Methods of Bilingual Education**	**I. The Nature of Culture**
A. The sound systems of language (phonology)	**A.** Foundations	**A.** Definitions of culture
B. Word formation (morphology)	**B.** Organizational models: What works for whom?	**B.** Perceptions of culture
C. Syntax	**C.** Instructional strategies	**C.** Intragroup differences (e.g., ethnicity, race, generations, and micro-cultures)
D. Word meaning (semantics)	**II. Theories and Methods for Instruction In and Through English**	**D.** Physical geography and its effects on culture
E. Language in context	**A.** Teacher delivery for <u>both</u> English language development <u>and</u> content instruction	**E.** Cultural congruence
F. Written discourse	**B.** Approaches with a focus on English language development	**II. Manifestations of Culture: Learning About Students**
G. Oral discourse	**C. Approaches with a focus on content area instruction (specially designed academic instruction delivered in English)**	**A.What teachers should learn about their students**
H. Nonverbal communication	**D.** Working with paraprofessionals	**B.How teachers can learn about their students ***
II. Theories and Factors in First- and Second-Language Development	**III. Language and Content Area Assessment**	**C.How teachers can use what they learn about their students (culturally responsive pedagogy)***
A. Historical and current theories and models of language analysis that have implications for second-language development and pedagogy	**A. Purpose**	**III. Cultural Contact**
B. Psychological factors affecting first- and second-language development	**B. Methods ***	**A.** Concepts of cultural contact
C. Socio-cultural factors affecting first- and second-language development	**C. State mandates**	**B.** Stages of individual cultural contact
D. Pedagogical factors affecting first- and second-language development *	**D. Limitations of assessment**	**C.** The dynamics of prejudice
E. Political factors affecting first- and second-language development	**E. Technical concepts**	**D.** Strategies for conflict resolution
		IV. Cultural Diversity in U.S. and CA
		A. Historical perspectives
		B. Demography
		C. Migration and immigration

Date	Session Number and Topic	Assignment to be Completed BEFORE Class Session
Tue 5/25	1. Introduction to Mathematics Education Developing Mathematical Understanding	Van de Walle ch. 2, 3
Thu 5/27	2. Problem Solving Standards	Van de Walle ch. 4 CA Content Standards
Tue 6/1	3. Instructional Practices Technology	Van de Walle ch. 6, 7, 8
Thu 6/3	4. Assessment & Conducting Student Interviews	Van de Walle ch. 5; Assigned Article(s)
Tue 6/8	5. Lesson Study & Working Groups	Assigned Readings: (http://www.lessonresearch.net)
Thu 6/10	6. Addition and Subtraction	Van de Walle ch. 9, 10, 11, 13 *Student Interview #1 Due Today
Tue 6/15	7. Multiplication and Division	(Reading integrated with Session 9) *Mult/Div Interview Due (option 2)
Thu 6/17	8. Number Concepts	Van de Walle ch. 12, 14 *Number Concepts Interview Due (option 2)
Tue 6/22	9. Fractions, Decimals, Percents, Ratio & Proportion	Van de Walle ch. 15, 16, 17, 18 *Fractions Interview Due (option 3)
Thu 6/24	10. Algebraic Thinking	Van de Walle ch. 22, 23 *Algebra Interview Due (option 3)
Tue 6/29	11. Measurement & Geometry	Van de Walle ch. 19, 20 *Meas/Geo Interview Due (option 4)
Thu 7/1	12. Data Analysis & Probability Wrap-up	Van de Walle ch. 21 *Data Anal/Prob Interview Due (option 4)

STUDENT INTERVIEW GUIDELINES
EDMS 543

Student interviews are designed to provide students with opportunities to focus on a single child's thinking about mathematics. It will also help students to improve their use of inquiry for assessment purposes and to better understand elementary level students with different understandings.

I recommend that students work together with a partner on these interviews. As a pair, you would interview one child for each content interview and together write up your evaluation of the student (please also submit the child's written work attached to your paper).

Prior to the interview

- You should arrange with a teacher (or parent of a child you know) to interview one child for 20-30 minutes in a quiet place outside the classroom, if possible.

- Provide the teacher with some understanding of what the interview will contain and see if he/she has any thoughts about how this child will do on the assessment.

- Develop a list of questions you may want to use if the child is not forthcoming with a response. For example, if the child 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?"

During the interview

Work with the child individually. Begin the interview by informing the child that you will be giving him/her a series of math problems to solve and that you are interested in his/her thinking process and in the strategies s/he uses to solve these problems. Inform the child that s/he can solve the problems in any way s/he wants. Please remind the child that the interview is voluntary and that s/he can end the interview at any time (if a student does end early then please find another willing student). Do everything you can to help make the child comfortable.

Orally provide the child with each problem, posing them one at a time, you received from class 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.

After the child answers each problem you should ask a variety of questions that will help you to better understand the child's thinking and to assess his/her mathematical understanding. **You will want to note the questions you ask and the child's responses** and it may be necessary to ask the child to wait while you are writing -- it is OK to ask the child to wait. **You should not tape-record/video-tape the interview without parental permission**.

During the interview, be sure to consider the following:

- The best thing you can be is genuinely curious. Remember the point of the interview is to discover how the child thinks -- ***NOT*** to guide the child to the correct answer (try to fight the urge to be "teacher").

- Be careful to respond similarly to correct and incorrect answers. Be curious about all solution strategies -- not just the ones leading to incorrect solutions.

- Your primary role is to listen. Make sure you allow enough "wait time" -- children need time to think before answering.

- Make sure the child feels comfortable during the entire interview. If the child clearly cannot answer a problem, move on to the next problem. If you feel that the child is really struggling and frustrated, you may want to end the interview or give the child a problem you are fairly certain s/he can solve and then end the interview. If you cut an interview short because of student difficulty, be sure to discuss your reasoning in your write-up.

After the interview

You (and your partner) should **together** write no more than a two page reflection that includes a brief discussion on each of the following two points:

- What specifically did you learn about this child's mathematical understanding? Here you will want to make some claims about the mathematics your student understands or doesn't understand. I am looking for more of an explanation than just your student could or couldn't solve a particular problem.

- What specifically might you do for this child if you were his/her teacher? Here you might want to include discussions about such issues as curriculum, instructional strategies, etc.

Grading:

Each interview will be worth a total of 6 points (24 points (or 24%) total). More specifically, I will be looking for nicely written papers that clearly and specifically express what you learned about: 1) the child's mathematical understanding and 2) what you would do next for this child if you were his/her teacher (again be specific here). For example, you might recognize that this student lacks a conceptual understanding of multiplication – so as this child's teacher you might want to pose meaningful problems related to multiplication, etc.

*NOTE: When you turn in your write-up, you should also include the child's written work (if it exists) and without the student's "actual" name listed.

MATHEMATICAL RESOURCES ASSIGNMENT
EDMS 543

In preparation for your Classroom Presentation Assignment, your "content group" will construct an Annotated List of Resources that your fellow colleagues will find helpful when teaching your mathematical topic to students. Your list should include resources that directly relate to your mathematical topic (e.g., algebra, geometry, etc.). For example, you should include such things as children's literature, teacher support materials, manipulatives, WWW locations, research articles, videos or movies, software, etc. Please include any useful information that you find when researching your topic so that your colleagues can learn from your work (but do not include duplicated pages from teacher workbooks, rather provide citations along with short descriptions of your resources). I will be looking to find well- constructed packets of information. If you partition the workload it should not be an overwhelming task. If each group prepares a packet of materials that is filled with important resources, and we share that information in class, then you will each have a wealth of information on some of the important mathematical resources for use when you teach! A general "rule of thumb" might be for your group to try and find 10 resources in each of the areas mentioned. Some topics will naturally have more resources than other topics.

Your group will need to turn in one nicely prepared copy of your List of Resources in on the day of your group presentation. Your group should also be prepared to make a 5 minute presentation that highlights some of the resources you found (consider bringing in a few of the items that you found most helpful when planning your presentation and resources for these materials).

This project is purposefully open-ended in the hopes that you will go out and find some great resources for your mathematical topic and for your presentation. You should talk with your master teachers, use the internet, and make use of materials I provide. However, if you have any questions or challenges finding resources, please be sure to ask (I am happy to provide support…I want these to be good so they are good resources)!

DESIGNING & TEACHING A LESSON IN MATHEMATICS
EDMS 543

Students will participate in small groups (approximately four to six students) to design, construct, and teach a single lesson on an assigned mathematical topic. The lesson will be designed for use with children at a specific grade level (based on the grade level of the cooperating teacher). The purpose of this activity is to help you learn how to design effective mathematical lessons for a specific group of students, learn where to find mathematical resources, provide you with an opportunity to practice teaching mathematics and to receive feedback, and to learn how to effectively collaborate with colleagues in order to improve your teaching.

Plan of Action:
When planning your lesson, each group should:

1. Clearly identify the objective(s) of your lesson within the context of the overall goals and objectives of the unit. Similar to the Japanese Lesson Study process, your group might also want to identify a specific problem or issue that needs resolution.

2. Identify students' prior knowledge before making decisions about curriculum and instructional practices.

3. Consider whether your curriculum clearly brings forward your mathematical objective(s) and what, if any, alterations are necessary. Furthermore, your lesson must be consistent with the Mathematics Framework for California Public Schools (e.g., Content Standards).

4. Each group will be required to meet with me at least one time prior to the date of your presentation (this is not to say that we can only meet once!). One of the primary purposes of this activity is to provide me with an opportunity to work with each of you on a more individual basis so that I can help you learn to design effective mathematical activities. I will be happy to provide you with suggestions after you have given it some thought.

5. Make sure that each member of the group participates fully in the design and implementation of the lesson and that the workload is shared equitably. As part of your written report, each member must include a short written evaluation that describes the contributions made by each member of the group (indicating whether the workload was shared fairly among the members of the group).

6. On the day your topic is to be discussed in class, your group will turn in a lesson plan for your activity (using the format discussed in your Curriculum & Instruction Course), a reflection of your group's collaboration process and the teaching of your lesson, and a paragraph from each member that describes how the workload was shared. Each group will email a copy of your lesson plan and mathematical resources to each of your classmates for their teaching files.

7. Each group will either show a short snippet of your actual lesson to the class for discussion or will allow others to observe the actual lesson (we will discuss the options).

Grades:

For this activity, which will be worth a total of 12 points (12%), I am as interested in the process your group goes through as much as the final product. I want this to be an opportunity for you to learn such things as where to go for mathematical resources, to learn how to prepare lesson plans and what to consider when writing a lesson plan, to recognize the many challenges of teaching mathematics, to learn how to reflect and critique lessons, and to begin to understand the importance of on-going professional development opportunities. Your grade on this assignment will be based on the following:

- The design of your lesson plan. For example, adheres to identified lesson plan format described in your Curriculum and Instruction course, adheres to the California Content Standards, makes good use of student thinking, is grade appropriate, is sensitive to the needs of all students, and includes a plan for assessment, etc.

- The level of collaboration among the members of your group, the depth of your reflections (collaboration and teaching of the lesson), and what you learned from this process. You must be willing to take risks, commit yourself fully to this process, and desire to learn as much as possible from others and from the process. The success of this lesson depends on how much YOU put into this activity!

- As discussed earlier, each member of the group will need to include a short paragraph that describes how the work was shared among the members of the group (was the work shared fairly?). If the overall group identifies one member that did not fairly contribute to the final product then I will likely lower the grade of that individual (please work together and share the workload).

- Although the actual presentation of the lesson will NOT be factored into your grade, each group will receive feedback. I believe that this is a time for you to try things out and to make mistakes, not to be judged. Don't be afraid to take some risks and to make mistakes.

*** If anything is unclear or if you ever have questions, please ASK me.**

CURRICULUM ANALYSIS
EDMS 543

Curriculum Assignment (20%) – Students will review at least one chapter or unit from the mathematics curriculum currently being used in a mathematics classroom (e.g., a textbook) and write a short paper that investigates the curriculum as well as its alignment with the CA Content Standards and current high stakes assessments. Students must provide supporting evidence from various resources (e.g., CA Content Standards, course materials, etc.) and provide their general thoughts and concerns related to the curriculum (e.g., how the curriculum might need to be altered in order to make strong connections between mathematical concepts and procedures).

This assignment is designed to give you an opportunity to closely examine mathematics curriculum currently being used in schools and identify how it might need to be altered to better meet the needs of your students given the goals of your mathematics program. You and a partner will select the mathematics curriculum at a specific grade level to examine. This assignment will be more meaningful if you are able to use the mathematics curriculum you will be teaching from during your student teaching assignment or the curriculum you will be teaching from for the lesson study assignment). Each pair will submit a 4-6 page written report (6 pages max) focused on your analysis of the curriculum on the due date. The following questions are provided to help you focus your analysis – you do **NOT** need to specifically address each of the bulleted questions!

Some key questions you might include in your evaluation:

- Is this curriculum compatible with the new California Content Standards?
- Does this curriculum develop students' procedural knowledge, conceptual knowledge, or a "bridge" between the two?
- What are the greatest strengths of this curriculum?
- What concerns do you have about this curriculum?
- If you were to teach from this curriculum, how specifically might you supplement the curriculum in order adequately prepare your students?
- What kind of instructional practices are encouraged? Do you agree?
- Would you recommend that your district adopt and use this curriculum?

Grading:
This assignment will be worth 20 points (or 20% of your overall grade). I will be looking for reports that are insightful, specific, provide supporting documentation to support their thoughts, and are nicely written. I want your analysis to include some discussion related to how well your curriculum addresses the new California Content Standards (you will need to go beyond what the textbook says about the content standards!) and provide your personal analysis of the curriculum based on what you want students to learn from your math class (what do you want students to learn on this topic and will this curriculum get students to that point?). Be specific and give examples whenever possible to support your position.

Addition/Subtraction Interview
EDMS 543

For this interview, you should provide students with:

- paper and pencil
- something to count with (unifix cubes, base 10 blocks, etc.)

1. Lucy ordered 45 cupcakes for her birthday. At the party, her guests ate 27 cupcakes. How many does she have left?

    * if the child cannot solve this problem, try the same problem with smaller numbers (12,7)
    ** if the child cannot solve the problem with the easier numbers, skip problem 2 and problem 3

2. Bill loves to make cookies. He had 14 cookies on a plate. His mom gave him some more cookies and how he has 21 cookies. How many cookies did his mom give him?

You need to write problem 3 vertically on a piece of paper that you can hand to the student.

3. . 43 * if the child cannot solve this problem, try 13
-26 - 6

Note: If the child cannot solve problems 1 or 3 (with the smaller numbers), end the interview with an easy problem and maybe have the child make up a problem for you.

You need to write problem 4 horizontally on a piece of paper that you can hand to the student.

4. 16+___=23

5. Lizzie collects lizards and beetles. She has 8 creatures in her collection so far. Altogether they have 36 legs. How many of each kind of creature does she have so far?

(FYI -- beetles have 6 legs and lizards have 4 legs)

Multiplication and Division Interview
EDMS 543

• You should provide your students with paper and pencils.
• You will need to have access to manipulatives for counting.

1) A restaurant puts 3 slices of cheese on each sandwich. How many slices of cheese will the restaurant need to make 8 sandwiches?

2a) Forty-two students in a class were going to work on some projects in groups. If you were asked to divide the class into 3 groups with the same number of students in each group, how many students would there be in each group?

2b) What if you were asked to put these same 42 students into groups with 3 people in each group. How many groups would you have? (what you are looking for here is whether students can automatically transfer their knowledge to this problem since the answer will be the same...or is their knowledge fixed to the context??)

Show your student 7x5 written on a piece of paper

3) a) What is the answer to this problem?
b) What does this mean? (while pointing to the written 7x5 on the paper)
• If problems explaining, try asking "Can you create a real-life problem that would represent 7x5."

Show your student 32÷4 written on a piece of paper.

4) a) What is the answer to this problem?
b) What does this mean? (while pointing to the written 32÷4 on the paper)
• If problems explaining, try asking "Can you create a real-life problem that would represent 32÷4."

<u>Optional</u>:

5) Each go-cart needs 4 tires. You have 22 tires. How many go-carts can you make?
(Look to see what students do with the remainder)

Number Sense and Place Value Interview
EDMS 543

• Be sure to choose a child that can count to at least 60.
• You should provide your students with paper and pencils.
• You will need to have access to unifix cubes and/or base-ten blocks.

Place 32 cubes out on a desk (in stacks of 10)
1). "How many cubes are there on this table?"
(notice how the student counts the total number...does he/she count by 10's, recognize that he/she needs 3 sets of 10 to make 30, etc.)

Don't remove the 32 cubes from the last question. Also, make sure you have several stacks of 10 cubes available on the table for this question.
2). "Show me 52 cubes"
(notice if the student adds by sets of 10 or whether he/she counts individual cubes)

Don't remove the 52 cubes from the last question. Show the student the number 52 written on a sheet of paper.
3). a) "What does the five mean in this number" (showing them the written number 52)
• "Can you show me with the cubes?"

b) "What does the two mean in this number" (showing them the written number 52)
• "Can you show me with the cubes?"

Place cubes on a desk in stacks of 10 as well as loose.
4). Max has 38 comic books and for his birthday his father gave him 25 more comic books. How many comic books does Max have now?

<u>Optional</u>:
With <u>NO</u> Manipulatives and NO paper and pencil (for students to do in their heads)
5). Marta has 24 pennies in her bank. She collected 35 more pennies. How many pennies does she have in her bank now?
(Notice if the student uses 10s in his/her computations. If the student tries to count by 1s, notice if s/he starts with the 24 or 35.)

Fraction Interview
EDMS 543

1. 2 children want to share 3 cookies so that each child gets the same amount. How much can each child have?
   (If the child doesn't use the last cookie, prompt: They want to share this cookie too. Can you show how they would do that?)

2. 4 children want to share 9 candy bars so that each child gets the same amount. How much can each child get?

3. Who gets more pizza: a child at a table where 6 children are sharing a small pizza equally or a child at a table where 5 children are sharing a small pizza?

4. During chocolate week, a class of first graders decided to have a party. At one table, 2 children want to share 3 chocolate bars equally. At another table, 4 children want to share 6 chocolate bars equally. At what table will a child get more chocolate to eat?

<u>(If time and you think it is appropriate)</u>

5. Tina and Tony painted pictures this afternoon. Tina used half a jar of blue paint for her picture. Tony used a fourth of a jar of blue paint for his picture. How much blue paint did Tina and Tony use altogether for their paintings? (Would the paint they used fill up more or less than one jar?)

Algebra Interview
EDMS 543

• You should provide your students with paper and pencils.
• You might bring something that students can count with (counting cubes, etc.).

1). Have you heard the story of Alice in Wonderland?
Let's pretend that Alice is 4 feet tall and that she grows 3 feet in height for each ounce of cake she eats.

a). How tall will she be after eating 6 ounces of cake?
b). If she is now 16 feet tall, how many ounces of cake did she eat?

<u>If the student answers #1 correctly then do #2 (else go to #3):</u>
2). If Alice starts off at 24 feet tall and she drinks 5 ounces of water to get back to her original height of 4 feet tall, how much did she shrink for each ounce of water she drank?

3). While picking flowers you collect:
2 daisies
Twice as many roses as daisies,
9 flowers in all.

Daisies = _____ Roses = _____Carnations = _____

4). If 6 small coins weigh the same as 2 medium sized coins then:
1 medium sized coin = _____ small coins

IF THE STUDENT ANSWERS #4 THEN DO #5
5). If 4 small nails weigh the same as 2 medium sized nails and
if 2 medium sized nails weighs the same as 1 large nail then:
1 medium = _____ small
1 large = _____ medium
1 large = _____ small

Geometry & Measurement Interview
EDMS 543

GEOMETRY - Things you will need:

- something circular (like a lid to a jar, a frisbee, or a large coin, etc.)
- something square (like a square napkin, the tile on the floor, etc.)
- something triangular (picture of a steel bridge, etc.)
- something rectangular (like a piece of plain paper, a 3x5 card, or a rectangular book, etc.)

1. - 4. Give each student one of the objects and ask them to describe the shape as if they were asked to describe it to a friend over the phone (without using the word for the shape).

For example, you might tell the student "Let's pretend that you and I are on the phone and you needed to describe the shape of a particular object to me without using the name of the shape. What would you say about this shape...remember, I can't see the object on the phone."

5. Ask the student to draw (in this order) a:

- circle
- square
- triangle
- rectangle

MEASUREMENT

1) On a sheet of paper, show me the length of an inch, a foot, a cm
   - Is a yard longer or shorter than a foot?
   - How many feet are in a yard?
   - How many inches are in a foot?

2) Draw a line that is 5" long

3) What is this called (holding up a ruler)?

4) Have student measure the length of various lines (perhaps lines that are 8", 15", 5 1/2", 2 1/4", and 4 3/4").

Statistics & Probability Interview
EDMS 543

• You should provide your students with paper and pencils.
• You will need to bring something that students can compare (i.e., M&M's, marbles, etc.)

For this first question you will need to have constructed a bar graph (I can give you an example)...if you are planning to work with young children you might consider a "picto-graph" instead.

1). You have a bag of M&M's (or marbles, etc.). This picture (show student your graph) describes the number of each color of M&M's that you have in your bag.

a) Do you know what this kind of picture is called? (you can tell them this)
b) Which color M&M do you have the most of? (How do you know?)
c) Which color M&M do you have the least of? (How do you know?)
d) How many (i.e., green) M&M's do you have? (How do you know?)
e) Let's pretend that we have 4 red M&M's, how would you show that on this picture?

For this question you will need to show students a bag with 5 green M&M's and 2 brown M&M's (or color cubes, etc.)

2). If you were to close your eyes and select one M&M from my bag do you think you would get a green or a brown M&M? (WHY?)

a) (Pick out one of the green M&M's so now only 4 green and 2 brown)

If you were to close your eyes and select one M&M from my bag do you think you would get a green or a brown M&M? (WHY?)

b) pick out one more of the green M&M's so now only 3 green and 2 brown)

If you were to close your eyes and select one M&M from my bag do you think you would get a green or a brown M&M? (WHY?)

c) pick out one more of the green M&M's so now only 2 green and 2 brown)

If you were to close your eyes and select one M&M from my bag do you think you would get a green or a brown M&M? (WHY?)