

Augsburg College  
EED 360  
Science Methods for  
Elementary Classrooms (K-6)  
Spring, 2008

Dates: 4/7, 4/21, 5/5, 5/19, 6/2, 6/16, 6/23,  
Time: Mondays, 5:45 to 9:45 PM  
Location: Gage Elementary School Art Room  
Instructor: Ramona Back  
Office Hours: Before and After Each Class  
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**Credits:** 1

**Prerequisite:** Admission to the Education Department

**Required Reading:** *Methods for Teaching Science as Inquiry*, Arthur Carin, Joel Bass, and Terry Contant, Person, Merrill Prentice Hall: New Jersey (2005, 9<sup>th</sup> Ed.) and readings as assigned during class sessions.

**Course Description:** This course focuses on how to effectively plan for, teach, and assess elementary-aged learners in the content area of science. Scientific inquiry and developmentally appropriate practice will be stressed as well as the development of tools to facilitate active learning while effectively managing the elementary science classroom. This course includes a 10-hour service learning component that allows students to observe, interact with, teach, and assess elementary students in the area of science.

**Education Department Mission Statement:** “The Augsburg College Education Department commits itself to developing future educational leaders who foster student learning and well-being by being knowledgeable in their field, being competent in pedagogy, being ethical in practice, building relationships, embracing diversity, reflecting critically, and collaborating effectively.”

**Applicable Standards of Effective Practice:**

- 1 Standard 1. Subject Matter. A teacher must understand the central concepts, tools of inquiry, and structures of the discipline taught and be able to create learning experiences that make these aspects of subject matter meaningful for students. A teacher of children in kindergarten through grade six must demonstrate fundamental knowledge of scientific perspectives, scientific connections, science in personal and social perspectives, the domains of science, and the methods and materials for teaching science and scientific inquiry.
- 1 Standard 2. Student Learning. A teacher must understand how students learn and develop and must provide learning opportunities that support a student’s intellectual, social, and personal development.
- 1 Standard 3. Diverse Learner. A teacher must understand how students differ in their approaches to learning and create instructional opportunities that are adapted to students with diverse backgrounds and exceptionalities.

- t Standard 4. Instructional Strategies. A teacher must understand and use a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills.
- t Standard 5. Learning Environment; A teacher must be able to use an understanding of individual and group motivation and behavior to create learning environments that encourage positive social interaction, active engagement in learning, and self-motivation.
- t Standard 6. Communication. A teacher must be able to use knowledge of effective verbal, nonverbal and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.
- t Standard 7. Planning in Instruction. A teacher must be able to plan and manage instruction based upon knowledge of subject matter, students, community, and curriculum goals.
- t Standard 8. Assessment. A teacher must understand and be able to use formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the student.
- t Standard 9. Reflection and Professional Development. A teacher must be a reflective practitioner who continually evaluates the effects of choices and actions on others, including students, parents, and other professionals in the learning community, and who actively seeks out opportunities for professional growth.

**Course Objectives:** Students in this course will:

- t demonstrate knowledge of the scientific inquiry process. [Elem. 8a]
- t demonstrate how to effectively plan hands-on, guided inquiry science lessons that are developmentally appropriate, meet the needs of diverse learners, embed state and national standards, and develop and maintain positive and safe learning environments. [Elem. 8b,c,d,(i-vii), 2A,E,F; 3A,L; 4A; 5E,O; 7B,D,E,F,G,H]
- t demonstrate understanding of the teacher and student role in guided inquiry teaching and effective instructional strategies for implementing a guided inquiry curriculum [2G; 4C,D,F,H,J; 5D,I,M; 6J,K]
- t demonstrate how to effectively assess student learning in light of current national and state standards using a variety of assessment strategies. [2A,E; 8G,H,I,J,L]
- t demonstrate knowledge of commercial and local K - 6 science curriculum and key science education resources. [1G]
- t demonstrate a greater understanding of the nature of children's scientific and developmental thinking. [2A,E; 7B,C]

1 demonstrate critical self-reflection as learners and educators. [9D,H]

**Course Assessment:**

Assessment Tool	Activities	Program Standards/Course Outcomes
Hands-on experiences with inquiry-based science lessons with follow up discussion and reflection through class participation and a class science journal.	<ul style="list-style-type: none"> <li>•Experiencing inquiry-based science curriculum during class.</li> <li>•Lesson planning experience to determine elements of inquiry based elementary science.</li> <li>•Discussions of and/or relevant practice with classroom management issues, assessment options, integration strategies, and instructional strategies used to meet different learning styles, developmental and individual needs.</li> </ul>	<p>Elem. (8a), 1-G</p> <p>4A,C,D,F; 5D; 6J; 8G,I; 9D</p> <p>5E</p>
Guided Inquiry Unit	<ul style="list-style-type: none"> <li>•Reading and comprehending course textbook</li> <li>•Assessing student prior knowledge.</li> <li>•Planning outcomes, activities, and assessments.</li> <li>•Implementation of management techniques.</li> <li>•Implementation of parent involvement strategies.</li> </ul>	<p>Elem. (8a); 1G</p> <p>Elem. (8c); 2F</p> <p>Elem. [8a,d(I-vii)]; 2A,E,G; 4A,D,F,H,J; 5D,M,O; 6J; 7B,C,D,E,F,G,H; 8G,H,L</p> <p>5E,I</p> <p>10</p>
Technology Products	<ul style="list-style-type: none"> <li>•Creating technology-based instructional resources.</li> </ul>	<p>5E,I</p>

Field work surveys, observations, assessment, and reflection assignments.	•Reading and translating theory to practice	5E,I; 8I,J;
	•Observation/reflection of classroom climate, safety, instruction, and management strategies.	4C; 7G,H; 9D,H
	•Assessing student developmental level and special needs of a classroom population.	Elem (8Bc,) 3A,L
	•Reflecting on teaching method and student learning	4C; 7G,H; 9D,H

**Weight of Assessment Tools:** Your grade will be determined by the following:

1. Attendance and active participation in all class sessions*	26%
Attendance and participation - 16%	
Completed Class Science Journal - 10%	
2. Guided Inquiry Unit	35%
3. Technology Products (3 @ 5% each)	15%
4. Field Work Assignments (4 @ 6% each)	<u>24%</u>
	100%

**Additional Assessment Information:**

\*Student attendance during each session is required. Absences will affect your learning and will jeopardize your grade. It is impossible to make up hands-on lab experiences and other in-class activities done in groups. This is also a time for the instructor to evaluate comprehension and application of science education concepts as students complete in-class activities.

The Guided Inquiry Unit, Technology Products, and Field Work Assignments must be word processed or use other appropriate technology (PowerPoint, Microsoft Publisher, Excel, etc.) No handwritten work will be accepted on these assignments. Well-developed ideas presented clearly and with grammatical correctness are expected.

Late work will not be accepted for full credit.

**Grading:**

95 - 100%	=	4.0	Highest standard of excellence
90-94%	=	3.5	
86-89%	=	3.0	Above basic course requirements
80-85%	=	2.5	
75-79%	=	2.0	Basic standards

Course grades falling below 2.0 will not be accepted toward licensure in education. Students must receive a grade of 2.0 to pass this course.

**Academic Honesty Policy:** The Augsburg College policy on academic honesty applies to this course. *Please note that unless the instructor has instructed otherwise, it is dishonest to work with others on a single assignment that will be multiplied and turned in separately as if it were the work of each individual student.*

**Student Rights/Responsibilities:** “Students with diagnosed learning disabilities or physical handicaps may have legal rights to course modifications. Please identify yourself to the instructor so she or he may assist you with your course progress. All students have the right to use the College Counseling and Student Development staff as well as to receive assistance from the Writing Lab.” No special adaptations are allowed to complete course requirements if students do not contact the instructor.

**Service Learning Experience:** You are required to complete 10 hours of field work in an elementary classroom observing, interacting with, and teaching students in the area of science. Many of your course assignments are to be completed in conjunction with this field experience. You will be expected to teach at least 3 lessons from your Guided Inquiry Unit during this field experience. Talk to your cooperating teacher early in your experience so that plans can be made for you to teach these lessons.

## **Bibliography:**

American Association for the Advancement of Science (AAAS) (1993) *Benchmarks for science literacy: Project 2061*, New York, NY: Oxford University Press

Banks, James A, & C Banks (2005). *Multicultural education - issues and perspectives* (5<sup>th</sup> Ed.) Hoboken, NJ: John Wiley and Sons.

Carin, Arthur, J. Bass, & T. Contant (2005). *Methods for teaching science as inquiry* (9<sup>th</sup> Ed.). Upper Saddle River, NJ: Person, Merrill Prentice Hall Publishing.

Hein, G.E. & S. Price (1994). *Active assessment for active science: A guide for elementary school teachers*. Portsmouth, NH: Heinemann.

Hixson, Kralik, Huston, & Robertson (1989). *Zero to einstein in 60*. Salt Lake City: Wild Goose Company.

Marzano, Robert J. (2004). *Building background knowledge for academic achievement*. Alexandria, VA: Association for Supervision and Curriculum Development.

Minnesota Department of Education (2003). *Minnesota academic science standards, k12*.

Minnesota Department of Education (2005) *Minnesota comprehensive assessments series II - draft test specifications for science*. Roseville, MN: Assessment and Testing.

National Research Council (1996) *National science education standards*. Washington, D.C: National Academy Press, Washington Academy Press,

Western Association of Fish and Wildlife Agencies & Western Regional Environmental Education Council (1986). *Project wild*. Western Regional Environmental Education Council.

**Class Schedule:** Please note that all assignments are due on the night listed. This includes assigned text readings.

Date	Topics	Assignments
Session 1 April 7	<ul style="list-style-type: none"> <li>• Introductory activities</li> <li>• The nature of science</li> <li>• Science processes</li> <li>• Considerations in lesson planning</li> <li>• Considerations in unit planning</li> </ul>	<ul style="list-style-type: none"> <li>••Carin, Chap. 1, 2, 3</li> <li>••<b>Read course syllabus carefully and come with questions to be answered.</b></li> </ul>
Session 2 April 21	<ul style="list-style-type: none"> <li>• National and state standards</li> <li>• Writing objectives for lessons</li> <li>• Questions which guide student learning</li> </ul>	<ul style="list-style-type: none"> <li>••Carin, Chap.4, 5, and pgs. 236 – 241</li> <li>•• Class Science journal</li> <li>••Fieldwork #1</li> <li>••Technology Product #1</li> <li>••Inquiry Unit Topic Due</li> </ul>
Session 3 May 5	<ul style="list-style-type: none"> <li>• Formative assessment</li> <li>• Performance Assessment</li> <li>• Rubrics and Checklists</li> </ul>	<ul style="list-style-type: none"> <li>••Carin, Chap. 6</li> <li>••Fieldwork #2</li> </ul>
Session 4 May 19	<ul style="list-style-type: none"> <li>• Surveying commonly used science curricula</li> <li>• Science learning Centers</li> <li>• The role of vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>••Carin, Chap. 7</li> <li>••Fieldwork #3</li> </ul>
Session 5 June 2	<ul style="list-style-type: none"> <li>• Summative Assessment</li> <li>• Considerations in Life Sciences</li> <li>• Project WILD</li> <li>• Quarry Hill Nature Center</li> </ul>	<ul style="list-style-type: none"> <li>••Fieldwork #4</li> <li>••Technology Product #2</li> </ul>
Session 6 June 16	<ul style="list-style-type: none"> <li>• Meeting the needs of Exceptional Students</li> <li>• Science and Technology</li> </ul>	<ul style="list-style-type: none"> <li>••Carin, Chap, 9</li> <li>•• Technology Product #3</li> </ul>

Session 7 June 23	<ul style="list-style-type: none"> <li>• Integrating science with the whole curriculum</li> <li>• Diversity in the Classroom</li> <li>• Putting theory into practice</li> </ul>	<ul style="list-style-type: none"> <li>••Carin, Chap. 8 and 10</li> <li>••Portfolio containing:            Guided Inquiry Unit            Class Science Journal</li> </ul>
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### **Class Science Journal - Requirements**

Science journals are an important way for students to reflect upon their science learning. Through a journal, students can explain their thinking, make predictions, ask questions, create drawings, charts, graphs, and also make conceptual maps for concepts and vocabulary. Science journals are also an excellent means of incorporating reading and writing into science lessons.

Creating and using a class science journal will help you to understand how a student in your classroom will react to the use of a science journal. In addition, this journal will assist you in teaching your own science units by helping you collect examples of appropriate literature and simple science experiments that you can use in your classroom. Your science journal will be assessed. It will be part of your class participation grade.

- Read the article on science journals and also the information in your text on science journals.
- Create a journal that you will use in class for weeks 2 - 8. (You will be given an example to use for week one of class.)
- You must create a section in your journal for each of the following:
  - Weekly notes from topics discussed in class. Be sure to emphasize your own vocabulary development in this note section and highlight relevant vocabulary from class.
  - Literature which can be used in your science classroom. – You will be given many examples during class. Record at least 10 titles, authors, and ISBN #'s
  - 25 Experiments that can be used in your science classroom. Record the title, grade level, and give a thorough description of the experiment; OR include actual copies of experiments. (The Internet will be of great help here.)

### **Field Work#1 - Organization, Procedures, and Safety in the Classroom. Requirements**

Your initial visits to your field experience school should focus on careful observation of the students, teacher, and the interactions within the classroom. This initial observation period should focus not

only on science, but on characteristics of the classroom in general that enhance students' attitudes, thinking, and behavior. You will also need to make an appointment early on to interview your classroom teacher.

Through your observations and interview explain the following in a typed paper. **Be sure to answer each question asked.** Be clear and concise, using as many specific examples as possible. See Grading Rubric for Field Work #1 for details. (Do not exceed three pages - single spaced.)

- A. How is this classroom physically arranged? What is the general physical arrangement? How does this arrangement allow students to work cooperatively? How is large group instruction held? How/where is small group instruction held? Are spaces set aside for quiet vs. interactive work? Is there a science area or wall space designated to science topics? (If not, ask where you will be able to use such a space in the classroom) How does this arrangement allow for safety within the classroom? Where are science/working materials stored? What parts of this classroom arrangement foster a positive learning environment? How conducive is the physical arrangement for teaching and learning science?
- B. What is the classroom management style in this room? How does the teacher establish attention during lessons? How are students called on? In what ways do students share information with the rest of the class? How does the teacher respond to appropriate student actions and interactions? How are inappropriate actions and interactions handled? What teaching strategies are used during the lesson to keep the students on track? How are procedures such as handing in supplies, money, and homework handled? How are papers/materials handed out to students? Are there procedures for entering or leaving the classroom? What classroom management practices would the classroom teacher like you to maintain while you are teaching?
- C. How is safety studied and practiced in this classroom? How have general safety issues (both classroom and school) been specifically taught? Which procedures and interactions within the classroom lead to a safe environment for students and teachers? How is science safety taught? How does someone in this classroom know where to go in case of a fire, tornado, or evacuation emergency? What are the procedures for a fire drill? A tornado drill?

## **Field Work #2- Teaching and Reflection on Science Lesson One**

Reflection upon your teaching that includes the honesty to explain what went well during a lesson and what needs to be changed for improved instruction, along with the knowledge of why parts of lessons work well and other parts do not, is one of the most important skills an educator can possess. Regular reflection must become part of your teaching. It is one of the critical skills that will allow you to grow and flourish as an educator.

After you have taught your first lesson, it is crucial that you reflect upon and evaluate this lesson. Do this reflection and evaluation shortly after delivering the lesson; the sooner you look back upon what went well and what could be done differently, the more fresh your ideas and recollections will be.

- Hand in a copy of lesson 1. This lesson should follow the format for all lessons developed in your guided inquiry unit. See unit requirements for complete explanation of what must be included in your lesson.

- Hand in your cooperating teacher's observation sheet for this lesson. (Copy Attachment A)
- Answer **each** of the following questions in a typed document. Include specific examples for each question. See Grading Rubric for Field Work #2 for details. (Do not exceed 2 pages - single spaced.)
- Explain two specific parts of the lesson that went well. Why do you think these parts were successful?
- What could you have done differently in this lesson? (This does not mean that this part of your lesson did not go well. It is important to generate other ideas for parts of the lesson.) Think of one area in your lesson that you could have done differently and explain how you could have done that in another way.
- What assumptions did you make in the lesson/activity that did not prove to be true? How did you feel during this part of the lesson? How did you adjust when this happened?
- What part of the lesson did you enjoy the most? Why?
- What part of the lesson did the children enjoy the most? Why?
- Which of your questions provided the most engagement by the students? Why do you think this happened?
- What information did the lesson's evaluation (formative assessment) provide you about the children's understanding of science concepts and/or processes? Is there another way you could have assessed this lesson? Explain one way.

### **Field Work #3 – Teaching Science Lessons 2 and 3 and Reflection on Science Lesson Three Requirements**

Again, do this reflection and evaluation shortly after delivering the lesson; the sooner you look back upon what went well and what could be done differently, the more fresh your ideas and recollections will be. Remember just how important honest reflection will be toward your success as an educator.

- Hand in copies of the last two lessons taught. These lessons should follow the format for all lessons developed in your guided inquiry unit. See unit requirements for complete explanation of what must be included in your lesson.
- Hand in your cooperating teacher's observation sheets for these two lessons. (Copy Attachment A) – You must hand in two separate observation sheets.
- Answer the following questions in a typed document for **only the last lesson taught (Lesson 3)**. Include specific examples for each question. See Grading Rubric for Field Work #3 for details. (Do not exceed 2 pages - single spaced.)
- Explain two specific parts of the lesson that went well. Why do you think these parts were successful?

- What could you have done differently in this lesson? (This does not mean that this part of your lesson did not go well. It is important to generate other ideas for parts of the lesson.) Think of one area in the lesson that you could have done differently and explain how you could have done that in another way.

(The next questions require you to think about how you have grown in your teaching since you began working with these students in science.)

- How was your teaching of this lesson stronger than your first lesson?
- How have students' understandings of the concepts and process skills changed from your first lesson to this lesson?
- What instructional/learning strategies do you believe were most powerful in any lesson taught as a part of this unit? Why?
- Which parts of the 5-E learning cycle are the easiest for you to plan and deliver? Which part is the most difficult?
- Which questioning strategies do you believe were the most powerful in any lesson taught as a part of this unit? Why?
- Which assessment strategies do you believe were the most powerful in any lesson taught as a part of this unit? Why?

### **Field Work #4 Individual Differences and Exceptional Students Requirements**

In order to truly be successful as an educator, you must know your students on an individual level. It is never enough to just see them as a member of a group. Students belong to many groups. If a teacher is to be effective with individual students, a teacher must be aware of the unique differences each student has. In order for you to begin this process, complete the following. You will again rely on your observations of classroom interactions and also teacher and student interviews if applicable. Explain each of the following in a typed paper; remember do not use student names in your answers: See Grading Rubric for Field Work #4 for details. (Do not exceed 3 pages - single spaced.)

- Cultural/ethnic/gender differences. How many different cultural/ethnic groups are represented by the students in this classroom? How many girls/boys? How will this information affect your unit and lesson development?
- Exceptional Students: Which special education services do students in this classroom receive? (Remember that "exceptional students" includes the category of "gifted and talented" students as well as those who receive special education services.) For each type of exceptional student you have in this room, briefly describe how these exceptionalities will affect your unit and lesson planning.
- Other special needs: Describe students you see in the class that seem to have special learning needs not included in special education programs as well as ESOL students. What do you

see? Observe reading, writing, and communication abilities. How will these special learning needs impact your teaching?

- Observe all students for their group and individual work habits as well as emotional needs you notice. What do you observe?
- Case study: Observe one student in your class and describe that student's academic, social, and emotional strengths and weaknesses. How does s/he go about doing assigned work? What is their level of comprehension of directions? Reading level? Writing level? Speaking? Do they excel in any academic area? How do they interact with/react to peers? What does he/she do when frustrated? What seems to work to help that student overcome their barriers to learning? What will you need to do in order for this child to be successful in your science instruction?
- Read through Chapter 9 and describe 3 different strategies you will use to accommodate exceptional students and other students with special needs in your unit.

### **Technology Product #1 - Safety Slide Show Requirements**

Create a safety slide show using PowerPoint that will be appropriate to show to your students. This show should be 5 - 8 slides long. Include a title page for your show. You may also incorporate this slide show as a part of your guided inquiry unit. See grading rubric for details. **Submit this slide show for grading by e-mailing it as an attachment on or before the date it is due.**

### **Technology Product #2 - Science Education Resources: Internet Resources Requirements**

Complete the "Review of Internet Resources for Science Education Classrooms" for five science education websites. Provide thoughtful and thorough responses to each question and analyze each website critically. Be ready to present your findings to the rest of the class. See grading rubric for the review form and grading criteria.

### **Technology Product #3 - Mini-reports on Three Minority Scientists Requirements**

Create three "mini-reports" about scientists who are/were women or people from minority populations. These "mini-reports" should look like posters that are attractive and suitable for use on a bulletin board or science center. Use a publishing program such as Microsoft Publisher or use good publishing skills with Microsoft Word to create a one page report on each scientist. If you choose to use a word processing program, be careful that your work still uses publishing elements and has the look of a poster. Be ready to present your reports to the rest of the class.

Each report must include the following:

- 5 "life facts" about this person. (Life facts are facts about the scientist's personal life not connected with their profession. Facts such as date and place of birth, information on the scientist's family, etc.)
- Highlights of their notable scientific accomplishments.

- Their picture or a drawing of their likeness.
- **Student friendly language appropriate for elementary-aged children.**
- Publishing elements such as word art, use of text boxes or frames, tables, columns, graphics, etc. (Make this report look like a poster that will catch the attention of your students).

Bring enough copies (black and white copies are okay) of each report to class so that each member of the class will receive a copy of your reports. Be prepared to share information.

Bring one color copy of your report to class to be handed in and graded.

See grading rubric for details.

### **Guided Inquiry Unit - Requirements**

Throughout your career as a teacher, you will be developing and individualizing curricula from packaged curriculum, bits and pieces from many different sources, or creating something totally original. Even with a packaged science curriculum, teachers must make sure that science lessons are as inquiry based as possible and reasonable. Lessons must take into consideration the individual students' needs in your classroom, the time of the year, the materials available, and the scope and sequence of the district's curriculum. This is a time-consuming endeavor. However, this intense planning and preparation are necessary in order to successfully deliver and assess instruction for your students. Successful educators take the time to thoroughly plan units of instruction with interesting lessons and varied assessments that are connected to other curricular areas and which make use of educational technology.

### **General Requirements**

- Your science unit must be 5 lessons long. Your unit must be part of the larger science unit that is part of the regular science curriculum being taught in your field experience classroom.
- You must teach at least three lessons from this science unit to the students in your field experience classroom. Your classroom teacher will complete an observation sheet for each of these lessons. You will hand in these observation sheets as part of field experience requirements 2 and 3.
- One of your lessons must show integration of science with technology or language arts.
- Use a three-ring binder to hand in your materials on the last night of class.

**Specific Unit Requirements** - Copies of all must be included in your unit binder.

- **Unit Overview: 1 - 2 typed pages which explain the following:**
  1. A description of the unit itself. Describe what concepts, science processes, and attitudes you wish to develop through this unit. Also explain which Minnesota Graduation Standards are addressed in this unit.
  2. A brief (2 - 3 sentences) description of each lesson taught in this unit.

3. Modes of assessment used in this unit. Briefly describe the following:

Pre-assessment (diagnostic assessment) used to gauge students' level of understanding of major concepts and processes involved in your unit before any of the unit has been taught.

Formative types of assessment to be used during the unit.

Summative assessment used. (End of unit assessment.) Explain thoroughly the tasks that will demonstrate "how well" the students understand the concepts and process skills that are the focus of your unit. **Performance assessments must be a part of your summative assessment.** Explain how you will complete this performance assessment.

4. Safety notes. Define which safety precautions you will be taking with materials and which procedures you will use to ensure that materials are handled safely.

- **Letter to Parent/Guardian:** Introduce yourself, what the unit is about, a description of a few activities, specific concepts emphasized in the lessons; reminders for students to bring special items for the unit; ways that parents can engage their child in this unit.
- **Science Resource Center:** To be set up in the classroom during your teaching. Include the following:
  1. A picture of your center as it appears in your field work classroom.
  2. A list of materials used in the center.
  3. Rules for using the center
  4. Resource information to help students understand the main concepts/process skills of your unit. This information can be from books, internet websites, magazines or newspaper articles. List these resources.
  5. One or two activities which will help students practice science concepts and skills. Include a description of the activities, copies of directions and/or activity sheets used at the center, and a list of materials included in your center.
- **The science journal your students will use for this unit.** Attach a complete, blank journal.
- **Individual Lesson Plans for each lesson of your unit.** *Include the following in each plan:*

*Lesson Name/Grade Level:*

*Concepts and Processes developed in the lesson:*

*Concepts: What do you want students to be able to know at the end of this guided inquiry lesson? This is the conceptual knowledge that is developed through the lesson.*

*Processes: What do you want students to be able to do as a result of this lesson? What scientific processes will be used during the lesson?*

*Specific Instructional Objectives for the lesson. For each concept and process you wish to develop in the lesson, you must write a specific instructional objective.*

*Vocabulary and/or word parts students will add to their journals*

*Materials needed for the lesson.*

*Structure of working groups for the lesson.*

*The 5-E Learning Cycle as described in Carin.*

*Briefly explain what will occur during the five parts (engage, explore, explain, elaborate, evaluate) of the learning cycle used in your lesson. What will the teacher and the students do during each stage? These explanations should be clear enough for another person to follow. (Explain as steps in a process.)*

*Convergent and divergent questions that will be asked during the different stages of the learning cycle. Each lesson must make use of good questioning techniques. List questions that will be asked during the different stages of the lesson.*

*In your “evaluate” portion of the lesson, include copies of any assessment checklists, rubrics, observational forms, or other assessments used by the teacher during the lesson.*

*Copies of all handouts and/or recording sheets used by students during the lesson.*

- **Summative Assessment:** A copy of the actual instrument(s) you used as a summative assessment measure for your unit. Part of this summative assessment must include a performance assessment.

See Guided Inquiry Unit Evaluation for Details

Classroom Teacher Observation Page  
Use for Lesson Observation  
Students Enrolled in EED 360 - Elementary Science Methods

Dear Classroom Teachers,

Please place a check in the column which most closely matches what occurred in the lesson you observed today. Thank you very much for your help, support, and feedback. Your expertise will be invaluable to this Augsburg student, a future science teacher!

Field Experience Student: \_\_\_\_\_

Lesson Name \_\_\_\_\_ Date \_\_\_\_\_

Classroom Teacher's Signature \_\_\_\_\_

	Very Good Evidence Seen	Some Evidence Seen	More Evidence Needs To Be Seen
Written lesson plans were present			
Materials prepared and organized.			
The teacher discussed safety issues for this lesson.			
The teacher had strategies for managing the classroom positively.			
An introduction to the lesson engaged students with questions.			
Students were allowed to explore the central question of the lesson in a “lab activity.”			
The teacher and students participated in a discussion of the lab activity.			
The teacher clearly explained important concepts and other necessary knowledge for this lesson.			
The teacher asked both closed and open-ended questions throughout the lesson.			

Comments: