**CTEE 7436: CURRICULUM & TEACHING IN NATURAL SCIENCE**

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|  | **Instructor:** Dr. Charles J. Eick**Office:** Haley 5058**Office Hours:** Tuesdays 1:30-4:30 p.m. Wednesdays 1:30-4:30 p.m.**Phone:** 334-844-6887 **E-mail:** eickcha@auburn.edu **Class Time:** Thursdays 4:00-6:50 p.m.**Location:** Haley Center 2414**Credit Hours**: 3 semester hours  |  |

**Required Text:**

Krajcik, J. & Czerniak, C. (2007). *Teaching science in elementary and middle school: A project-based approach*. New York: Lawrence Erlbaum Associates **[J&M Bookstore]**

**Required Equipment:**

Computer (updated software), high-speed Internet access, and headset with microphone (USB connection and noise cancelling) ($25-35) for access to Blackboard tools

**Required Field Trip:**

Local stream monitoring with a community group – October 6th – 4:00-7:00 p.m. Details TBA.

**Borrowed Game Simulation:** Bioassess game card deck and handouts per pair/person

**Email Messages:** Frequently check university & Blackboard eMail for course communication.

**ASTA Conference:** McWane Science Center, Birmingham, October 18, Registration form attached.

**Electronic References:**

Annenberg Learner: [www.learner.org](http://www.learner.org) (select <<Science-ALL>>)

National Research Council (2005). *How students learn: Science in the classroom*.

<http://www.nap.edu/catalog.php?record_id=11102>

National Research Council (1996). *National science education standards* <http://www.nap.edu/catalog.php?record_id=4962>

American Association for the Advancement of Science (AAAS) (1993). *Benchmarks for science literacy* <http://www.p2061.org/publications/bsl/online/index.php?home=true>

TEAM-Science Curriculum Guides for state and national standards – <http://teamscience.auburn.edu>

Alabama Water Watch Program: <http://www.aces.edu/dept/fisheries/aww/aww/index.php>

Save Our Saugahatchee, Inc.: <http://sites.google.com/site/saveoursaugahatchee/>

Media & Digital Resource Lab (RBD Library): <http://lib.auburn.edu/drl/> (FREE Poster Services)

**Course Description:**

This course will apply current research and national standards on ‘best practices’ in science education to project-based design of science curriculum. Course experiences will build students’ understanding and ability to do Project Based Science (PBS) through lessons that support construction of the final project-based unit plan. Students will experience components of a model project-based science unit – *Living Streams* – and how it ties to science literacy on water sustainability issues. Students will create a project-based science unit that can be used in the classroom.

**Course Objectives:**

Upon completion of this course, students will be able to:

1. Identify and embrace important national goals of science education and science literacy in the K-8 classroom, including applications of science and technology to societal issues and problems.
2. Articulate a rationale for teaching science through social constructivism and brain-based research on how students learn.
3. Describe and define a project-based approach to teaching science, including key components, and how it is different from other integrated and thematic approaches.
4. Meaningfully demonstrate the inquiry process including planning scientific investigations, interpreting data, and supporting student collaboration in PBL units.
5. Apply best practices that support project-based learning in delivery strategies, management, and assessment of students in PBL units.
6. Create a project-based science unit plan for use in the classroom that incorporates PBL tenets.

**Course Assignments and Evaluation:**

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| --- | --- |
| Required Assignments (365 POINTS):Weekly Chapter Exercises – 100 points (10 @ 10 points each)Weekly Project Blog – 40 points (8 @ 5 points each)Rationale for Science Teaching Paper – 25 pointsProject-Based Unit Plan – 160 points (Points awarded in three parts)\*Project-Based Unit Poster – 40 points\*NOTE: The poster on the last class day will be the final course exam. | Grading Scale:327-365 points = A291-326 points = B254-290 points = C218-253 points = D 217-0 points = F |

All written assignments must be typed and should adhere to Standard English usage and conventions. Assignments with excessive grammatical errors or typos must be redone at point loss. Weekly assignments must be presented or posted on time for credit. Other major assignments if submitted late without excuse will lose a letter grade for each day late up to three days. Points earned for each assignment will be posted under the Gradebook tab on Bb.

**Weekly Assignments and Deadlines**

**Weekly Chapter Exercises:** The weekly chapter assignment is an individual and group completed assignment found in the appropriate Course Content folder on Bb for the listed meeting date. Students must use their text and each other in their group to complete the assigned exercises. Students write (or draw) their responses in the word document given. Scanning of work into pdf format may be needed. Points per response are designated.

Members must first complete the individual exercises BEFORE their scheduled Wimba LiveClassroom group meeting on Bb *(See Wimba Tools Folder on the Course Content page)*. Through the group meeting, students will discuss and complete the final ‘group’ exercises – having common responses. Students will be assigned a group for the semester for this exercise. ***{See the LiveClassroom protocol for conducting group meetings}.***

Word or pdf documents must be uploaded under the Assignments tab of Bb and under the appropriate chapter assignment. These weekly assignments must be completed and uploaded by Thursday before Midnight CST the week AFTER the scheduled topic/date in the syllabus.

**NOTE:** A group member must have attended the Wimba online meeting and contributed in the discussion in order to get credit for the group exercises portion of these assignments.

**Weekly Project Blog:** This weekly assignment is found under the Discussion tab on Bb. It is a public blog for the class to view. Students must respond to the blog questions/issues posted by the instructor about their thinking on the developing project. All blog postings must end with requested assistance or help for ideas to further project thinking and success. After blogs are posted by the given deadline, students must come back to comment to the blogs where they can help. The instructor will also participate in helpful commenting. Students are encouraged to later check their postings for the useful comments and suggestions given.

Blog ‘Ground Rules’ for Full Points:

1. Consider a strong subject line that focuses on your key request or issue to attract people who can help.
2. Post a blog that is a minimum of 100 words and a maximum of 175 words. Respond to the question first, before seeking further advice.
3. Post by the Thursday midnight CST deadline the week after the topic is assigned. Do NOT comment to the postings until AFTER this deadline so that everyone has an equal opportunity at receiving comments and assistance!
4. Comment to at least 3 postings where you can most give advice. Comments should be helpful and not simply affirm the posting. Do NOT comment only to people in your community group!
5. Comment BEFORE the deadline for the next posting.

**NOTE:** Students must meet all of the blog ground rules and deadlines in order to get credit for this assignment, including commenting to fellow students’ blogs.

**Major Assignments and Deadlines**

The **Rationale for Science Teaching Paper** (SEE ATTACHED) will incorporate newly learned information about how students learn science best, what you consider is most important in this process, and how you do/will enact this best practice in your classroom. Submission of this paper will be under the ASSIGNMENTS tab on Bb.

The **PBL Unit** (SEE ATTACHED) will be graded in three parts at three different times in the term. Comments and notes made on the first parts should be used to make changes to the final project due at end-term. Sample completed projects will be placed on Bb. Submission of the PBL assignment will be under the ASSIGNMENTS tab on Bb.

Students will present their PBL Unit through a required **Poster Session** (SEE ATTACHED) with refreshments on the last day of the course. Posters will be presented in person during the last class meeting, but also will be submitted electronically. Posters will present an overall picture of the student’s project-based learning unit. Posters can be made through the **RBD library Digital Media & Resources Lab**.

Major assignments are due by Thursdays before Midnight CST of the week that they are due – See syllabus schedule. Posters must also be brought to class on the last class meeting.

**Course Content and Schedule:**

**Frequently check your Bb and university emails (at least once per day) for course news and updates, including changes to this schedule and assignments.**

Week 1 8/18 ON-CAMPUS – Course Orientation, Technology Use, and Social

Week 2 8/25 ON-LINE – Teaching Science to Children – Chapter 1

* **Begin weekly chapter exercises**

Week 3 9/1 ON-LINE – How Students Construct Understanding of Science – Chapter 2

* **Rationale for Science Teaching Paper due next week**

Week 4 9/8 ON-LINE – Establishing Relevance to Students’ Lives – Chapter 3

* **Begin project blog postings and comments**

Week 5 9/15 ON-LINE –Developing Scientific Investigations – Chapter 4

 *Living Streams Project* – Virtual Stream Walk

* **PBL Unit – Numbers 1-3 due next week**

Week 6 9/22 ON-LINE – Making Sense of Data and Sharing Findings – Chapter 5

Using Learning Technologies to Support Students in Inquiry – Chapter 6

*Living Streams Project* – Bioassess Game, related activities and concepts

Week 7 9/29 ON-LINE – Making Sense of Data and Sharing Findings – Chapter 5 (cont.)

Using Learning Technologies to Support Students in Inquiry – Chapter 6

 *Living Streams Project* – Interpreting data and the Alabama Water Watch website

Week 8 10/6 FIELD TRIP: Water testing at a local stream **[See instructions for details.]**

 *Living Streams Project* – Chemical and Biological Testing

Week 9 10/13 ON-LINE – Collaboration in the Science Classroom – Chapter 7

McWane Science Center – Alabama Science Teachers’ Association Conference – Tuesday October 18th – Birmingham, AL – All day

Week 10 10/20 ON-LINE – Instructional Strategies that Support Inquiry – Chapter 8

*Living Streams Project* – Direct-indirect strategies

Week 11 10/27 ON-LINE – Instructional Strategies that Support Inquiry – Chapter 8 (cont.)

*Living Streams Project* – Experiential strategies

* **PBL Unit – Number 4 (and 1-3 revision) due next week**

Week 12 11/3 ON-LINE – Assessing Students and Understanding in Science – Chapters 9/10

* **Last week for project blog postings and comments**
* **Last week for weekly chapter exercises**

 Week 13 11/10 NO MEETING – Complete PBL Unit – Instructor conferencing as needed

* **PBL Unit – Numbers 5-8 (and 1-4 revision) due next week**

 Week 14 11/17 NO MEETING – Complete PBL Poster – Library FREE Multimedia Resources

* **PBL Unit Poster due week 15**

Thanksgiving Break – Suggested Reading for New Teachers:

 Managing the Science Classroom – Chapter 11

 Week 15 12/1 ON-CAMPUS – Planning a Project-Based Curriculum – Chapter 12

 Poster presentations, social, and course evaluations

**Class Policy Statements**:

Participation: Students are expected to participate in all class assignments, group discussions, and field trip. It is the student’s responsibility to contact the instructor if assignment deadlines are not met, a group discussion is missed, or a field trip cannot be attended. Students are responsible for initiating arrangements for missed work. Late work will be accepted without penalty only for university-approved excuses as outlined in the *Tiger Cub*. Excused late work must be submitted directly to the instructor via email no later than 7 days after the original due date or it will not be accepted.

**Students must have the appropriate and working computer hardware, software, and Internet connection for this course. This is the student’s responsibility. Failure of students’ equipment (not University Blackboard) is NOT an excuse for on-line absences and late assignments.**

 Attendance/Absences: Attendance for students is required at scheduled ON-CAMPUS face-to-face class meetings (2) and scheduled field trip (1). Attendance at scheduled group online synchronous discussions is also required. Excuse notes for absences (with proper letterhead and signature) must be scanned (pdf) and email attached to the instructor no more than seven days after the absence, or it is unexcused.

 **Three unexcused absences (online and/or on-campus) will mean a failing grade in this course**.

***NOTE:*** *Students with documented distance constraints (e.g., more than 2 hour driving time) can be approved at the instructor’s discretion for an excuse from a face-to-face requirement with alternative*

*means of attending and/or assignment given, not counting toward the 3 absences policy.*

 Unannounced quizzes: There will be no unannounced quizzes.

 Accommodations: Students who need accommodations are asked to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternative time can be arranged. To set up this meeting, please contact me by e-mail. Bring a copy of your Accommodation Memo and an Instructor Verification Form to the meeting. If you do not have an Accommodation Memo but need accommodations, make an appointment with the Program for Students with Disabilities at 1244 Haley Center, 844-2096 (V/TT).

 Honesty Code: The University Academic Honesty Code and the Tiger Cub Rules and Regulations pertaining to Cheating will apply to this class.

 Professionalism: As faculty, staff, and students interact in professional settings, they are expected to demonstrate professional behaviors as defined in the College’s conceptual framework. These professional commitments or dispositions are listed below:

* Engage in responsible and ethical professional practices
* Contribute to collaborative learning communities
* Demonstrate a commitment to diversity
* Model and nurture intellectual vitality

Cell Phones: Students are expected to turn cell phones off or to vibrate during synchronous class time.

**RATIONAL FOR SCIENCE TEACHING PAPER – *25 points***

Why a rationale paper?

Writing a rationale paper for your chosen practice in the science classroom supports your development as a teacher because you have to ponder and articulate your current thoughts about teaching, learning, and goals in your practice. A “rationale” is different from a “philosophy” because it merges *who you are* (including personal experience, beliefs, and values) with *what you are learning* about effective science teaching (including National Standards, scientific literacy, inquiry, constructivism, learning cycle, brain-based research, reading-writing to learn, etc.). Thus, a rationale paper of “you” is supported by elements of effective teaching that you have learned and are learning in your program. It should cite specific readings or resources from your past courses **and particularly in this one** that most inform your practice. Being able to articulate your rationale for science teaching to other peers, teacher colleagues, and administrators shows that you know who you are as a teacher and have a definite plan for your future classroom and students. *Your final paper should be free of spelling and grammatical errors.* Your rationale should make sense with what you believe about science teaching linked to what we know about best practice and what you want to do in your science classroom with children.

NOTE: Job interviewers who care about the quality of teachers hired in their systems often ask candidates about their teaching approach, philosophy, typical week, or rationale.

What’s in a rationale paper?

A rationale for science teaching paper is made up of five (5) parts where you describe your thoughts on:

1. (5 points) How learning takes place, consistent with learning theory and research. Refer to specific information from texts (e.g., Krajcik & Czerniak, 2007; National Research Council (NRC), 2005).
2. (5 points) What science teaching is, consistent with how learning takes place – tied to methods, models of teaching, and Standards from texts (e.g., American Association for the Advancement of Science (AAAS), 1993; Krajcik & Czerniak, 2007; NRC, 2005; NRC, 1996).
3. (5 points) Goals for students. Why are you doing what you are doing? What will students learn from your efforts? What goals are most important to you? – tied to scientific literacy, equity and opportunity for all students (e.g., AAAS, 1993; Krajcik & Czerniak, 2007).
4. (5 points) How you enact your rationale in practice, with descriptive examples of what you actually do (or plan to do) in your science classroom to demonstrate your rationale.
5. (5 points) References (3 minimum) – a reference or bibliography section in APA format, must be connected to the citations in your paper (i.e., no stand-alone references). Three references should be used from reading assignments from this course with other past course readings adding to this list. **See APA Guide on LRC reserve**.

What format should I follow in presenting the five (5) parts in my paper?

* Write between 3 and 5 pages double-spaced, one-inch margins, NOT counting reference page.
* Write for a non-science education audience (e.g. principal) so avoid too technical a discussion, using technical terms sparingly and describing/defining them when used.
* Write in a narrative, first person form.
* Write reflectively and personally as you address each point, using specific examples from your readings (cite) and from the classroom.
* Write with no spelling or grammatical errors (Check it: Does it read right and make sense?)

**Holistic Rubric:** 5 points = Excellent; 4 points = Good; 3 points = Fair; 2 points = Poor; 1 point = Incomplete

**NOTE:** Papers with multiple spelling or grammatical errors can earn no more than a ‘C’ grade after rewrite.

Adapted from Tom Rocklin (2000) website: <http://www.uiowa.edu/~c07p385/philosophy.shtml>

**Project-Based Learning Unit Requirements (160 points) – Follow chapter 12 of text**

Directions: Develop each given area below for your project-based unit and grade level. Submit your project online clearly delineating the seven sections ‘tabbed’. A project-based unit can be short or long, but for our course should be one to two weeks of 45-minute periods. Consider the use of *GEMS Guides* and other investigative curricula in your unit. You MUST use multiple sources for lessons or materials in your unit – to make it ‘your’ work. Use the **TEAM-Science Curriculum Guides** on the web for links to state and national standards (AAAS, 1993; NRC, 1996): <http://teamscience.auburn.edu/>.

1. Cover sheet (required) – Name, date, grade level, project driving question, duration of unit, related sketch/image
2. Student learning performances (objectives) **(24 points)**
	* Consult the TEAM-Science curriculum guides for the grade level science standards (state and national) that apply to your chosen topic.
	* Develop learning performances or objectives in each of the four knowledge domains, considering higher levels of cognitive functioning, from your applicable standard(s).
	* Create a table similar to Table 12.1 on page 435 for your generated learning performances and place your chosen state and national standard(s) before it.
3. Driving question **(16 points)**
	* Suggestion: See Learning Activity 12.2 on page 452.
	* Write out your driving question and your rationale for selecting it.
4. Lesson plans including[[1]](#footnote-1): **(48 points)**
	* student learning performances (or learning objectives) – applicable ones from #2 table above.
	* **relationship of lesson to the driving question** (How does its sub-question help answer it?)
	* materials (and any special needed print material for lesson parts or assignments)
	* instructional strategies[[2]](#footnote-2)
	* time required
	* cautions
	* instructional sequence – introduction, representing the content, establishing links to the driving question
	* assessment – description of the assessment embedded in the lesson for evaluating student learning
5. Assessments **(32 points)**
* Create varied and embedded assessments that are appropriate for measuring student learning performances (objectives); Assessments must be complete and with scoring rubrics, check-lists, etc.
* Revisit your learning performance table and add the assessment performance that matches it (See Table 9.1)
1. Calendar of activities **(16 points)**
* See Table 12.5 example on page 458 before creating your own calendar of activities. Entitle each day with your **sub-question** (or inquiry question) that the lesson addresses. Also, list your **embedded assessment**.
1. Resources **(16 points)**
* Select and evaluate (See Table 12.6 and 12.7) major resources not readily available to all teachers
* Create a resource list with contact-purchase information (e.g., community contacts, GEMS guide, FOSS kit)
1. Integration of curriculum **(8 points)** [NOTE: Not a separate section of your unit plan]
* Review your unit for other disciplinary standards that you meet: Grades 5-6 see Table 12.11; Grades K-4 see state standards for your grade level.
* Add these standards under their appropriate discipline heading (math, etc.) to #2 above.

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Project-Based Learning Unit Scoring Rubric (160 points)**

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| RUBRIC 8.0 points = completely meets requirement 6.0 points = mostly meets requirement4.0 point = sometimes meets requirement2.0 point = rarely meets requirement0.0 point = does not meet requirement | NOTE KEY LESSON REQUIREMENTS+At least one detailed Scientific Investigation as defined in this  course is required or the PBL Unit will be incomplete.+Multiple sources (more than one) for lesson plans are required.+At least one community resource is required. |

1. Cover sheet complete: \_\_\_\_\_\_\_ **(required check)**
2. Student learning performances **(24/\*8 points)**
3. All science Standards (State and National) that apply are listed: \_\_\_\_\_
4. \*All non-science standards (State and/or National) that apply are listed: \_\_\_\_\_
5. Learning performances in a table in all knowledge *domains* and *dimensions*: \_\_\_\_\_
6. Learning performances are congruent with listed Standards: \_\_\_\_\_
7. Driving question **(16 points)**
	1. The driving question meets the 6 criteria for a good question: \_\_\_\_\_
	2. Learning performances directly address the Driving Question: \_\_\_\_\_
8. Lesson plans **(48 points)**
	1. Opening and closing activities address the Driving Question: \_\_\_\_\_ **(required check)**
	2. Lesson-to-lesson sequence (multiple sources) is coherent & conceptually strong: \_\_\_\_
	3. Lesson content and process matches student learning performances: \_\_\_\_\_
	4. Lesson sub-questions or outcomes help answer the driving question: \_\_\_\_\_
	5. Scientific Investigation *(clearly identified)* includes all appropriate sections: \_\_\_\_\_
	6. *Instructional sequence* of lessons are ‘teacher-ready’ to follow and use: \_\_\_\_\_
	7. Each lesson includes all completed 8 sections outlined in the assignment: \_\_\_\_\_
9. Assessments **(32 points)**
	1. Assessments are *authentic*, meaningful, multiple, and varied: \_\_\_\_\_
	2. Assessments are *embedded* in instruction: \_\_\_\_\_
	3. Assessments are congruent with learning performances (and listed in Table): \_\_\_\_\_
	4. Assessments have rubrics/checklists for scoring, where appropriate: \_\_\_\_\_
10. Calendar of Activities **(16 points)**
	1. Calendar lists each day of unit instruction & activity description in table format: \_\_\_\_\_
	2. Calendar days list sub-question as header and embedded assessment piece: \_\_\_\_\_
11. Resources **(16 points)**
	1. All major resources that are not readily available to the teacher are listed: \_\_\_\_\_
	2. Resources include contact, location, source, and/or purchasing information: \_\_\_\_\_
12. (Integrated into #2b above).

TOTAL SCORE: \_\_\_\_\_\_\_\_ (out of 160 points)

**What to Prepare for the Poster Presentation… (40 Points)**

Posters should have clear writing and images that are large enough to be read from 4-6 feet away. Creatively arrange your text and embed graphics and a few images to make an aesthetically appealing poster that makes your project easy to read and understand. Graphics and images should focus on the driving question, project location, unique materials/resources, or children engaged in a sample lesson. Balance what must be read with visual support. Poster size may vary but should be 3-4 X 4-6 feet in dimension.

Include the following sections and information:

* Your name, course (CTEE 7436)
* School and grade level
* Driving question (as a title)
* Overview of PBL unit (paragraph)
* State Content Standards (science and other)
* Lesson titles, and briefly how each addresses the driving question and student learning
* Community resources (names, affiliations, addresses, contact information)
* Sample key assessment(s)

**Food and Drink**: Bring an unusual snack or finger food to share with the whole class. Also, designate someone in your group to bring a liter of drink (between four people). Dr. Eick will bring plates, utensils, napkins, and cups.

Poster Descriptive Rubric:

36-40 points: Poster size is appropriate; All information is supplied; Information is arranged in easy to read and follow format; Information clearly informs reader about project intent and purposes in all areas; Judicious and creative use of images/graphics; Images/Graphics are very clear and appropriately highlight the project

32-35 points: Poster size is appropriate; All information is supplied; Information is arranged in easy to read and follow format; Information adequately informs reader about project in most areas; Judicious and creative use of images/graphics; Images/graphics are mostly clear and highlight the project

28-31 points: Poster size is appropriate; Most information is supplied; Information is arranged in somewhat easy to read and follow format; Information somewhat informs reader about project; Judicious use of images/graphics; Images/graphics are mostly clear and somewhat highlight the project

24-27 points: Poster size is inappropriate; Some information is supplied; Information is somewhat difficult to read or follow; Information does not adequately inform reader about the project; Somewhat judicious use of images and graphics; Images/graphics are not clear and/or do not highlight the project

Less than 24 points: Poster size is inappropriate; Some information is supplied; Information is very difficult to read, follow, or comprehend; Information does not inform reader about the project; Improper underuse or overuse of images/graphics; Images/graphics are not clear and/or do not highlight the project

**2011 ASTA Fall Conference Registration Form**

**Tuesday, October 18, 2011—McWane Science Center—Birmingham, AL**

*Please use one form per registrant.*

**Last Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ First Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_ MI \_\_\_\_\_\_\_\_\_**

**School/Organization \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Grade Level /Subject Area \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Home Address \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**City \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ State \_\_\_\_\_\_\_\_ Zip Code \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Home Phone ( ) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Work Phone ( ) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

***(Please provide both E-mail addresses & check which one you would like your newsletter and other correspondence sent.)***

**( ) Send to this Email address \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(school)**

**( ) Send to this Email address \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(home)**

**Your registration form and payment must be postmarked no later than September 23, 2011. After this date you must register ON SITE.**

**Conference registration includes $20 for membership in the Alabama Science Teachers Association which runs from October 1, 2011 - September 30, 2012.**

**Registration Fees: Please circle amount being paid**

ASTA Membership Rate/Renewal 2011-2012 + Registration $50

Pre-Service Rate/Renewal 2011-2012 + Registration $50

Retired Teacher Rate/Renewal 2011-2012 + Registration $40

Your name badge and receipt will be mailed to you if you register before 9/23/11.

Please make all checks and Purchase Orders payable to:

***Alabama Science Teachers Association***

*Attn: Jennifer McCrary 148 Fairview Lane Montevallo, AL 35115*

1. Most curricula will include activities written like lesson plans that address most of these bullets. Attach a copy of the activity itself and only add the missing bullets of information. Also, attach any needed print materials for lesson parts or assignments. **Note: You must have an opening and culminating activity that address your Driving Question.** [↑](#footnote-ref-1)
2. Consider varied instructional strategies from each category: Direct, indirect, experiential, independent. You MUST include at least one scientific investigation (inquiry question, data gathering, data analysis, conclusion, and sharing), a community resource, children’s literature, and use of technology – ALL OF THESE ITEMS ARE REQUIRED. [↑](#footnote-ref-2)