

Syllabus

Math & Science for the Young Child

ECE 109

CRN: 10541

(TR 11:00-12:20)

Three Rivers Community College

Mohegan Campus

Norwich, CT. 06360

Barbara Barton: Instructor

Phone: 383-5214

e-mail: bbarton@trcc.commnet.edu

(Make sure you identify yourself in subject of e-mail or we will not open it; due to viruses & junk mail)

Office Hours by Appointment

Or as Posted

Spring 2007

Course Name: Science and Math for Young Children

Common Course Number: ECE* 109

Credits: 3

Course Description: This course is designed to help students explore a wide variety of math and science experiences suitable for use with young children. Math and science concepts are presented in relation to everyday objects and occurrences. Emphasis will be placed on the relationship between affective and cognitive learning.

Prerequisite: Determined by individual college.

Course Objectives:

1. To provide students with an opportunity to apply theories of child development to learning experiences with young children.
2. To offer child-oriented experiences in order to stimulate children's curiosity.
3. To support the young child's natural desire to explore and learn.
4. To discover how to make simple low-cost materials in order to teach science and math concepts.
5. To discover strategies that aid in the development of problem-solving skills of young children.
6. To utilize observation as a tool for planning curricular experiences.

Course Outcomes: (See ECE 109 Outcomes Grid)

Course Content: The following topics will be covered:

1. Concept Development in Mathematics
2. Number and Operations
3. Patterns, Functions, and Algebra
4. Geometry and Spatial Sense
5. Measurement
6. Data Analysis and Probability
7. Making Math Meaningful through Children's Books
8. Concept Development in Science
9. Life Science: Plant Life
10. Life Science: Animal Life
11. Life Science: Human Body
12. Environmental Science: Ecology and the Environment
13. Chemistry and Earth Science: Air, Water, Weather
14. Geology: Rocks and Minerals
15. Physical Science: Magnetism
16. Physical Science: Gravity, Sound & Light, and Machines
17. Technology
18. Geography

In-Class Key Experiences:

1. Theory of Multiple Intelligences Activities: Students will work independently, then in small groups on the following two projects:
 - *How am I Smart?* : Students will compare their own personalities to those based on characteristics of individuals in eight of the nine Intelligences developed by Howard Gardner. Once completed, each student will chart each intelligence area and correlate with their self reflections.
 - *"Frogs" Activity*: After a brief discussion on Howard Gardner's Nine Intelligences, Using the topic of frogs, students will work together (in groups) to come up with activities (in web form), which would be appropriate to use with young children. All nine intelligences should be represented in the activities.
2. Block Play: After video, discussion, and manipulation of blocks (in reference to mathematical values and stages), children will be invited from the laboratory school (Children's Center) to build with various blocks (children from different developmental stages will be invited). The students will observe the "builders." The observation group will record and sketch their observations. A class discussion will follow.
3. *Using Technology in the Classroom vs. Sensory & Constructivist Education: Class Debate*
4. *Making Math Games* Using materials in the classroom students will develop the following games:
 - *One to One Correspondence Game*: a one to one correspondence matching game to be used with young children (state age(s)). Be prepared to show this game to the class.
 - *Number Concept Game*
 - *Classification Game*
 - *Seriation*
 - *Sequence*
 - *Shape or space game*
5. *Using Piaget's stages of measurement development (including measurement of time), develop games/activities for children in the following age groups: 2-3, 4-5, & 6 years*
6. *Graphing & Estimating*: Students will be involved in making several graphs.
7. *Develop a math activity related to a children's book.*
8. *The Thinking Process Exercise*: Invite Children from Center. Use direct instruction with 2-3 children from center. Invite 2-3 more and use a more constructivist model. Invite 2-3 more and use the Montessori Approach. Students observe and reflect.
9. Talking to Children using *open ended questioning* and other techniques: practicing in role play. (Lev Vygostky and Constance Camii)

10. Life Science, Earth Science or Environmental Science Activities: In a free choice environment, students will work creating activities such as the following activities/ experiments:

- *Making a root view farm from milk cartons*
- *Greenhouse in a bag*
- *Seed Spouting plus Sequence and or Nomenclature Cards*
- *Beat a Leaf*
- *Poetry Garden*
- *Out in The Garden Flannel Board*
- *Roots Hold Soil Together Experiment*
- *Digestive System simulation with zip loc bag, water, and cracker*
- *Make a feely box*
- *Sound Cylinders Match*
- *Bug viewing boxes*
- *Bird feeders*
- *Tadpole to Frog or Butterfly sequence/ metamorphosis*

11. *Chemistry*: Students will experiment with mix simple substances to form new solutions. Items for experimentation include things such as: vinegar, water, baking soda, corn starch, flour, and yeast.

12. *Physical Science*: Students choose from activities including the following:

- *Magnets: Repel/ Attract*
- *Transparent, Translucent, or Opaque?*
- *Nothing Can Be Seen Without Light*
- *Big and Small Shadows*
- *Levers*
- *Pulleys*
- *Wheels*
- *Sound Waves, Vibration*
- *Liquid, Solid and Gas*
- *Making Sounds Louder (megaphones, stethoscopes)*
- *Complete the electric circuit*
- *What Rolls Faster?*

13. Project: Connections

14. Natural Science: Scavenger Hunt Course Mohegan Park

Assignments/Math & Science; Spring 2006

	Sci & Math ECE 109	Assignments	Submitted:	Point Value	Attend- ance
23-Jan-	Week 1	Quiz 1: Section 1 & 2	Online	50	5
25-Jan-		Binders set up			5
30-Jan-	Week 2	Quiz 2	Online	50	5
1-Feb-					5
6-Feb-	Week 3	Math Activity I/T & Write up	In Class	25	5
8-Feb-					5
13-Feb-	Week 4	Quiz 3	Online	50	5
15-Feb-		Activity #2 & Write Up		25	5
20-Feb-	Week 5		Online	50	5
22-Feb-		Activity # 3 & Write Up	In Class	25	5
27-Feb-	Week 6	Intro 3-4 pages	Online	100	5
1-Mar		Activity # 4 & Write Up	In Class	25	5
6-Mar	Week 7		In Class		5
8-Mar		Math Matrix		25	5
13-Mar	Week 8	Math Binder	In Class	25	5
15-Mar					5
20-Mar		SPRING BREAK			5
22-Mar		SPRING BREAK			5
27-Mar	Week 9	Quiz 4	In Class	50	5
29-Mar-		3 Science Activities & Write Ups		75	5
3-Apr	Week 10	Connections Activities Ready	Class	50	5
5-Apr					5
10-Apr	Week 11	PARTICIPATION IN SCI FAIR	In Class	40	5
12-Apr		Science Matrix		25	5
17-Apr	Week 12	Quiz 5	Online	50	5
19-Apr-		Science Binder		25	5
24-Apr	Week 13	Science Intros. 3-4	Online	100	5
26-Apr		Geography Folders	In class	25	5
1-May	Week 14	Quiz 6		50	5
3-May					5
8-May	Week 15	RETURNS and CLOSURE			5
	Total			1000	60

Subject to change by instructor as needed.

Syllabus
Math & Science for the Young Child ECE K109
Instructor: Barbara Barton
3 Credits

Method of Evaluation

The following numerical grade system will be used:

<u>Grade</u>	<u>Equivalent</u>	<u>Quality Points</u>
A	96-100	4.0
A-	90-95	3.7
B+	86-89	3.3
B	83-85	3.0
B-	80-82	2.7
C+	77-79	2.3
C	73-76	2.0
C-	70-72	1.7
D+	67-69	1.3
D	63-66	1.0
F		0.0

Required Text:

Charlesworth, Rosalind and Karen K. Lind. *Experiences in Math and Science for Young Children*, New York: Delmar. 2003.

State of CT, Department of Ed. CT Benchmarks

Required web site:

Other Texts & References:

NAEYC, Developmentally Appropriate Practice in E.C. Programs

Paciorek & Munro, Ed. Early Childhood Ed2002

Numerous Articles & Assessment tools & handouts on reserve.

Withdraw Policy:

Students may withdraw in writing through the registrars office for any reason before _____. A student may withdraw from classes with instructors or advisors signature until _____.

Disabilities Statement

If you have hidden or visible disability which may require classroom or test taking modifications, please see me as soon as possible. If you have not already done so, please be sure to register with Student Services Counselors who coordinate services for students with disabilities. (Chris Scarborough is a Disabled Student Counselor).

Bibliography:

- Bodrova, Elena and Deborah Leong. *Tools of the Mind*. Merrill Publishing Co. 1996.
- Charlesworth, Rosalind and Deanna Radeloff. *Experiences in Math for Young Children*. New York: Delmar. 2005.
- Charlesworth, Rosalind and Karen K. Lind. *Experiences in Math and Science for Young Children*, New York: Delmar. 2003.
- Churchill, E. Richard, et al. *365 More Simple Science Experiments for Young Children*. NY: Black Dog Publishers. 1998.
- Copley, Juanita. *The Young Child and Mathematics*. Washington: NAEYC. 2000
- Hall, Nadia Saderman. *Creative Resources for the Anti-bias Classroom*. NY: Delmar. 1999
- Kamii, Constance. *Number in Preschool & Kindergarten: Educational Implications of Piaget's Theory*. Washington DC: NAEYC. 1990.
- Kohl, MaryAnn and Jean Potter. *Science Arts: Discovering Science through Art Experiences*. WA: Bright Ring Publishing. 1993.
- Kohl, MaryAnn and Cindy Gainer. *Math Arts: Exploring Math through Art for 3 to 6 Year Olds*. Maryland: Gryphon House. 1996.
- Koralek, Derry, editor. *Spotlight on Young Children and Math*. NAEYC. 2003.
- Koralek, Derry and Laura J. Colker. *Spotlight on Young Children and Science*. NAEYC. 2003.
- Martin, David Jerner. *Constructing Early Childhood Science*. NY. Delmar. 2001.
- Platz, Don and Nancy. *Creative Resources for School Age Children*. NY: Delmar. 2005
- Prairie, Arleen Pratt. *Inquiries into Math, Science and Technology for Teaching Young Children*. NY: Delmar. 2005.
- Rockwell, Robert E. *Hug a Tree, and other Things to do Outdoors With Young Children*. New York: Delmar.
- Sherwood, Elizabeth, et al. *More Mudpies to Magnets: Science for Young Children*. Maryland: Gryphon House. 2000
- Smith, Susan Sperry. *Early Childhood Mathematics*. Boston: Allyn & Bacon. 2001.
- Worth, Karen & Grollman, Sharon. *Worms, Shadows, and Whirlpools*. NH: Heinemann. 2003.

Related Websites:

- www.ed.gov/pubs/EarlyMath.
- www.math.com.
- www.naeyc.org/resources/position statements/psmath.htm.
- www.nctm.org.
- www.nsta.org.
- www.pbs.org/teachersource/sci_tech.htm/.