

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: TEACHING SCIENCE AND MATH

CODE NO.: ED 267 SEMESTER: FOUR

PROGRAM: EARLY CHILDHOOD EDUCATION

AUTHOR: LORNA CONNOLLY BEATTIE

DATE: JANUARY 1996

NEW: _____ REVISED: X

APPROVED: K. DeRosario Jan 6/96
K. DeRosario, Dean Date
School of Human Sciences and
Teacher Education

****NOTE:** Do not discard this outline. It will be required by other educational institutions if you are attempting to obtain credit for this course.



I. PHILOSOPHY/GOALS:

This is an advanced methods course dealing specifically with math and science concepts and skills with emphasis on Piagetian theory. The focus of this course is familiarizing the students with classification and discovery systems applicable in child care settings.

II. STUDENT LEARNING OUTCOMES:

Upon successful completion of this course the student will demonstrate the ability to:

1. research and translate fundamental principles of science and math into learning experiences for children.
2. present a comprehensive, developmentally-appropriate curriculum which fosters math and science principles in young children.
3. use process-oriented and divergent teaching techniques to incorporate science and math experiences throughout the curriculum.

III. TOPICS TO BE COVERED:

1. Concept Development
2. Fundamental Concepts and Skills and Activities involving Math and Science
3. Scientific Investigations
4. Presenting Science Centres and Preschool Curriculum Ideas

IV. EVALUATION METHODS

1. Science Learning Activity - 10%
Each student will plan and present for evaluation a science activity in his/her fieldwork setting. Students should also be prepared to share their learning activity with the class.

2. Math Activity Resource Book - 30%
Each student will prepare a "Math Activity Resource Book" to include examples that are specifically related to the following fundamental concepts. The book will be handed in during the semester for evaluation and will include 1 activity for each "fundamental concept". Each activity must be described in detail using the attached form. (Example forms are also attached).

Fundamental Concepts	Due Date
1. One to One Correspondence; Number & Counting; Sets & Classifying; Ordering & Patterning	February 9 (4 activities - 10%)
2. Shape; Space; Parts & Whole; Comparing	March 1 (4 activities - 10%)
3. Measurement: Time; Volume; Weight; Length; Measurement; (choose 4 of the 5 measurement concepts for use in Resource Book)	March 29 (4 activities - 10%)

3. Math Learning Activity - 5%
Each student will choose one of the math activities prepared for the "Math Activity Resource Book" and plan and present for evaluation this activity in his/her fieldwork setting.
4. Science Centre and Preschool Curriculum Ideas - 25%
Students will research a chosen topic and then gather materials to design a science centre related to the topic. Students will refer to the list of topics attached. The centre will include visual and concrete materials, pertinent experiments and appropriate curriculum learning devices.
They will also prepare an information packet for use in the preschool setting including: title page, research material, bibliography of references and resources, centre planning chart, and, specific details for 2 circle ideas, 2 art ideas, 2 science activities and 2 related children's stories. These activities must be thoroughly explained with procedures, materials recipes, etc.

4. Science Centre and Preschool Curriculum Ideas
(Continued):

These centres will be displayed in class and will be evaluated by the instructor and fellow classmates.

Students must submit a typed 2-page "basic outline" of basic research and preschool ideas to be duplicated ONE week in advance of presentation for distribution to the class. The complete information packet is due when centre is presented. Dates to be arranged in class.

4. Tests

Test #1 - Friday, February 23 - 15%
Test #2 - To be announced - 15%

If a student is unable to write a test on the required date, the instructor must be called prior to the start of the test, or the student will receive a "0". All assignments are due on the dates indicated by the instructor. The late policy of the E.C.E. department will be enforced (Refer to NQA Contract guidelines).

COLLEGE GRADING POLICY

90 - 100% = A+
80 - 89% = A
70 - 79% = B
60 - 69% = C
BELOW 60% = R

V. REQUIRED STUDENT RESOURCES:

Exploring Science in Early Childhood: A Developmental Approach - Lind

RESOURCE:

Early Childhood Curriculum - Wortham

VI. SPECIAL NOTES:

Students with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the course material, order of presentation, and dates of tests and assignments as he/she deems necessary to meet the needs of students.

**SCIENCE CATEGORIES
AND TOPICS**

PHYSICAL SCIENCES:

Magnets

Simple Machines

Electricity - static and current

Light and Shadows

Gravity

Sound

Energy

States - liquid, solid, gas
- density

Matter

EARTH SCIENCES:

Rocks and Minerals

The Four Elements - Water, Air, Fire and Earth

Fossils

Dinosaurs

Weather

Outer Space

LIFE SCIENCES:

Ecosystems - food chains

Life Cycles

Plant Life - trees
flowering/non-flowering plants
seeds and germination

Man and Environment

- Compost
- Landfill Sites
- Endangered Species
- Recycling

Nutrition - Where does our Food come from

**SCIENCE CATEGORIES
AND TOPICS**

LIFE SCIENCES (CONTINUED):

Human Body

Five/six senses

ANIMALS:

Annelids

Insects

Arachnids

Amphibians

Reptiles

Fish

Birds

Mammal - Non-humans

Habitat - Ponds/Wetlands
- Ocean
- Desert
- Forest - different types
- Rivers/Lakes

MATH ACTIVITY FORM

Activity Title:

Age Group:

Developmental Stage:

Fundamental Concept:

Objective:

Materials:

Activity:

Follow-Up:

Assessment

Method:

Skill:

Procedure:

Evaluation:

EXAMPLE #1 MATH ACTIVITY FORM ED267

ACTIVITY TITLE: Matching - Dogs and People

AGE GROUP: 3 - 5 **DEVELOPMENTAL STAGE:** Pre-operational

FUNDAMENTAL CONCEPT: One-to-One Correspondence

OBJECTIVE: To make joined groups of three objects

MATERIALS: Two sets of three objects which normally would go together, for example, doll people holding dogs on leashes.

ACTIVITY: "Here are some people and some dogs. The dogs are on leashes. Does each person have a dog? Show me how you can tell."
Note if the children can show or explain that the leashes connect the dogs and people.

FOLLOW UP: Use other groups of objects such as cats and kittens; cups and saucers; houses and roofs; etc. Increase number of items in each group as the 3 to 3 task becomes easy.

ASSESSMENT

METHOD: Demonstration/Interview

SKILL: Child can match joined groups of 3 objects.

PROCEDURE: Present activity to child as outlined above. If the child cannot do the task try it with 2 or 1 joined object.

EVALUATION: The child can explain or demonstrate that the leashes connect the dogs and people to demonstrate understanding of one-to-one correspondence.

ACTIVITY TITLE: Discrimination of Geometric Shapes

FUNDAMENTAL CONCEPT: Shape Recognition

OBJECTIVE: To see that geometric shapes may be the same or different from each other.

MATERIALS: Any or all of the following may be used:

- magnet board with various shapes of different sizes and colours
- Flannel Board with shapes of various types, sizes and colours
- Cards with pictures of various geometric shapes in different sizes (they can be outlines and/or solids of different colours)

ACTIVITIES: Possible activities are: Matching, Classifying, and Labelling

Matching: Put out many shapes. Show one shape to child, "Find all the shapes like this one."

Classifying: Put out many different shapes, "Put all the shapes that are alike together."

Labelling: Put out several kinds of shapes, "Find all the squares (or triangles or circles) or "Tell me the name of this shape" (POINT)

FOLLOW UP: Do with individual, progress to small group. Do same basic activity with different materials.

ASSESSMENT

METHOD: Interview/Demonstration

SKILL: When given an assortment of SHAPES (size, colour, shape), the child will be able to recognize that shapes may be the same or different from each other.

PROCEDURE: Present activity as outlined above, If the child cannot complete the task, simplify by focusing on one area of difference, eg. size or colour, etc.

EVALUATION: Note and record if the child can discriminate between different shapes, sizes, and colours. Specifically, make note of success in matching, classifying and labelling.