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AUTHOR Whitfield, Melvin
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ABSTRACT

This booklet, one of a series developed by the Frederick County Board of Education, Frederick, Maryland, provides an instruction module for an individualized or flexible approach to 7th, 8th, and 9th grade science teaching. Subjects and activities in this series of booklets are designed to supplement a basic curriculum or to form a total curriculum, and relate to practical process oriented science instruction rather than theory or module building. Included in each booklet is a student section with an introduction, performance objectives, and science activities which can be performed individually or as a class, and a teacher section containing notes on the science activities, resource lists, and references. This booklet introduces students to the need for biological classification and the study of taxonomy. The estimated time for completing the activities in this module is 3-4 weeks. (SL)

AIDS TO INDIVIDUALIZE THE TEACHING OF SCIENCE

MINI-COURSE UNITS

BOARD OF EDUCATION OF FREDERICK COUNTY

1973

Frederick County Board of Education

Mini Courses for

Life, Earth, and Physical Sciences

Grades 7, 8, and 9

Committee Members

Life Science	-	Terrence Best Paul Cook Sharon Sheffield Melvin Whitfield
Earth Science	-	Nelson Ford John Fradiska John Geist
Physical Science	-	Ross Foltz Kenneth Howard Fred Meyers

Dr. Alfred Thackston, Jr.
Assistant Superintendent for Instruction

Marvin Spencer
Science Supervisor

Frederick, Maryland

1973

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FOREWORD

contents represented in these modules of instruction, called mini cou is an indication of our sincere desire to provide a more individualized and flexible approach to the teaching of science.

Data was accumulated during the school year relative to topics in life, earth, and physical science that were felt to be of greatest benefit to students. The final selection of topics for the development of these courses during the workshop was made from this information.

It is my hope that these short courses will be a vital aid in providing a more interesting and relevant science program for all middle and junior high school students.

Dr. Alfred Thackston, Jr.
Assistant Superintendent for Instruction

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Mr. Victor Gosnell, Printing Assistant
Mrs. Helen Shaffer, Printing Technician
Mr. Darl Hinkle and Staff, Instructional Materials Center

CLASSIFICATION: WHY IS THERE A NEED?

Prepared by

Melvin Whitfield

CONTENTS

Estimated Teaching Time

3-4 weeks

CLASSIFICATION: WHY IS THERE A NEED?

INTRODUCTION:

Some people say, "Who cares if a sponge belongs to the plant or animal kingdom? Why does it matter to what group anything belongs? There are so many living things, how is it possible to group them all?" The fact is, we all use and classify things every day of our lives. When you go to lunch today, some types of food will be called "good tasting" and others "distasteful". The school library uses the Dewey Decimal System for classifying books. If you want to find natural and physical science books, you look in the 500 section of the library. History books would be found in the 900 section. When shopping at the market, shopping is made easier and much faster by putting like products together. The meats are in one area, cereal in another, dairy products in another, and soaps and detergents in still another. By putting things that are similar together and those things that are not alike somewhere else, we add order to our lives and make our daily routine much easier to accomplish.

OBJECTIVES:

You should be able to complete the following:

1. Define:
    a. classification
    b. characteristics
    c. category
    d. taxonomy
2. Group from a given list of living things into one of the kingdoms.
3. Explain why a living thing belongs to the Protist, Animal, or Plant Kingdom.
4. Identify the "founder" of our present method of classification.
5. Explain why it is necessary for every living thing to have a scientific name.
6. Make a classification system of your own and be able to defend it.

ACTIVITIES:

A. Read from the text Living Things, copyright 1966, pages 144-151. Answer questions 1-7 on page 151.

B. By using the following references, answer the nine questions that follow on notebook paper and turn into your instructor. A class discussion will follow.

References:

a.	Adventure in Science	pages 287-288
b.	World of Living Things	58,158
c.	Life Science- A Modern Course	84- 90
d.	Living Things copyright 1962	116-123
	" 1966	144-160
e.	Life Science - A Problem Solving Approach	42- 46
f.	The Biological Sciences	54- 56
g.	Other references in room or library	54- 67

Questions:

1. Define classification.
2. Why is there a need to classify things?
3. On what basis are living things classified?
4. What are the three main groups of living things?
5. Every known living thing has a scientific name. Why do you think this is necessary?
6. Who is considered the "founder" of our present method of classification?
7. Why have some scientists decided upon dividing living things into 3 groups?
8. What is evolution and what part does it play in our system of classification?
9. What is a taxonomist?

C. When you classify things you put things together that are alike. Let's pretend that you were given a huge pile of money. This pile of money would cover your entire desk top. It would be in bills from $1 to $20. The change would consist of every type of coin minted in the United States today.

Give me a written answer on notebook paper to the following questions. We will discuss them as a group when everyone is finished.

1. How would you classify this money?
2. If you got more specific and looked at mint marks and dates, how would you classify this money now?

D. On notebook paper, group the following into classes of your choice. Give reasons for classifying things the way you did. Turn in the assignment when complete.

Terrier	Collie	German Shepherd
Chalk	Paper	Irish Setter
Bass	Pug	Robin
Falcon	Chicken	Quail
Owl	Eagle	Shark
Pencil	Perch	Blue Jay
Beagle	Desk	Trout
Boxer	Cocker Spaniel	Catfish
Bluegill	Lead	Blackboard
Minnow	Pheasant	Paper Clip
Tape	Wren	Eraser
Bulldog	Canary	Carp
Dalmation	Mollies	Raven
Sparrow	Salmon	Hawk
Pen	Poodle	Dove
Book	Bloodhound	Tuna
Starling	Parakeet	Goldfish
Marlin	Ruler	Pencil
Chair	Ink	Angel fish

E. The following is to be answered on notebook paper and will later be discussed. Your written response will be turned in.

Use the following headings as a means of classifying things: (1) Living, (2) Non-living, but was once alive, and (3) Non-living, and never was alive. From your seat, complete this assignment. You are not to stand up or move about the classroom in any way during this assignment.

F. Read from the text The Biological Sciences, pages 54-67. Do Test Yourself, 1-10 on page 85. Answer questions 4 & 5 on page 86. Turn in written responses to your teacher.

G. Read pages 84-88 in the text Life Science - A Modern Course. Answer question 3, 5, and 6, and turn in the answers to your teacher.

H. You are to do the following labs in the order that they are listed. You are responsible for labs a, b, and c. Labs d, e, and f are labs you may do for extra credit, and if time permits. Follow the instructions carefully. All labs are to be written on notebook paper and turned in to your teacher as you complete them.

a. LAB INVESTIGATION: Classification of Organisms

Biologists have estimated that there are over 1,250,000 kinds of living things (organisms) in existence. To work with such large numbers, with so many differences between them, a system of classification has been arranged. Biologists depend upon structure as a major basis for their grouping systems. (Question-

1. Why not color? _____
2. Why not where the organism is found? _____

So living things are arranged in groups according to related structures and the groups are given names.

The currently used systems of classification which we will use has three major divisions called kingdoms: _____ Kingdom, _____ Kingdom, _____ Kingdom.

Problem:

What characteristics of organisms can be used for classification?

Materials:

Numbered specimens from the three kingdoms, reference materials, sheet of paper for chart.

Procedure:

Method: WORK ALONE.

There are about 20 numbered specimens around the room. Some are whole representatives of living things, some are parts, some are pictures and some are slides.

A. Observe. Compare the specimens with characteristics of the kingdoms described in your text or other reference. Decide to which kingdom each specimen belongs and record your decisions on a chart like the following:

Kingdoms		
Protist Kingdom	Plant Kingdom	Animal Kingdom

B. On the back of your sheet, answer the following:

1. What characteristics do the protists seem to have in common?
2. What characteristics do plants have in common?
3. What characteristics do animals have in common?

C. Extra Credit - Make your own chart.

Organisms Classified According to Phyla

Kingdom	Name of specimen	Name of phylum	Characteristic that was reason for choice of phylum

Use reference to complete chart.

b. LAB: Classification of Bird Seed

You have learned that things are usually classified into groups because of their likenesses and differences. Such things as shape, color, size, and texture are used to group things. Structure is the major basis for grouping systems.

Problem:

How is color, shape, size, and texture used in the classification of seeds?

Materials:

Bird seed (canary), vial (stoppered), toothpick, and a hand lens.

Procedure:

You will be given a vial of bird seed and the other materials listed from your teacher. Pour the contents onto a piece of paper. Examine it carefully. With the hand lens, observe the seeds. Note likenesses and differences. With the aid of a toothpick classify your bird seed into groups of your choice. Be ready to defend your reasons for classifying as you did. When you feel you are done, ask your teacher to examine your results. When you have completed this assignment, as determined by your teacher, pour the bird seed back into the vial and turn all materials back to your teacher.

Results:

1. On what basis did you classify bird seed?
2. Did you give titles to your groups? Why or why not?

c. LAB: Classification of Living Things on the School Grounds

There are many living things found around your school. The living things found around your school belong to one of the three kingdoms: Protist, Animal, or Plant. You will be asked to go for a walk around your school and identify every living thing that you can.

Problem:

To which kingdom do living things belong?

Materials:

School grounds and hand lens

Procedure:

Go for a walk around your school grounds with your classmates and teacher. Look anywhere you want. Some places you might try are: trees, shrubs, grass, roof edge, in the air, window ledge, beams, etc. If you happen to see something that is dead, but was once alive, you may use it. A dead bird or insect may be found perhaps. If you do not know the name of something, ask a friend if they know the name. You can also check references for its name. If you fail to get its name, then describe it the best you can. Make 3 headings- Animal, Plant, and Protist- and list the things you observed under one of the three headings.

Results:

1. Did you find any protist? Why or why not?
2. Which kingdom has the most listings? Why do you think this is true?

OPTIONAL LABS

The following labs are optional labs you may wish to do is time permits.

d. From the text, The Biological Sciences, do "Do It Yourself" on page 65.

e. From the text, Life Science-A Problem Solving Approach, do Problem 3-2 on page 50.

f. From the text, Interaction of Man and the Biosphere, do the following: Investigation 9.1 on pages 214-219; Investigation 9.2 on pages 219-222; and Investigation 9.3 on pages 226-227.

I. Read from Interaction of Man and the Biosphere, pages 208-213, and 223-225.

Scramble

Unscramble these words, one letter to each space, to form six terms associated with classification.

		ANSWERS
N N S U L A I E	L _ _ N _ _ _ _	Linnaeus
G D I N K M O S	_ _ N _ _ _ M _	Kingdoms
T T S I O R P	_ _ _ T _ _ T	Protist
T A R Y E A O G	C _ _ _ _ _ _ Y	Category
L N T S A P	_ _ _ _ T _	Plants
N I M L S A A	A _ _ _ A _ _	Animals

(Don't include answers in student sheets.)

Now unscramble the circled letters to form the surprise answer.

_	_	O	_	_	_	N	_
G	r	o	u	p	i	n	g

J. Extra Credit

A. Collect pictures from magazines, newspapers, and other sources, and group them into one of three kingdoms - Animal, Plant, or Protist. You may put this into your notebook or mount it on tagboard for display.

B. Do the same as above, but put on bulletin board for class display. This must be approved by your teacher before you begin on the bulletin board display.

Evaluation

Your written responses to questions, your lab work, your discussion, your extra credit, and how you went about your work will be used to grade you on this unit. Turn in all assignments asked for so that you may be graded properly. A written evaluation will follow when all assigned work has been completed.

The reading assignments and lab activities are geared toward my objectives. For instance, the labs are to have students classify, putting things into groups and noting similarities and differences. The labs identified do not make a student use a key and know scientific names. Students should be aware of scientific names and why they are necessary, but they are not necessary to know on the 7th grade level. However, the optional labs deal with keys and scientific names and if these are your objectives, you may substitute or use them in addition to the labs listed.

Texts

A. The Biological Sciences - Frazier & Smith, Laidlaw Brothers, 1971

B. Life Science - A Problem Solving Approach - Carter & others, Ginn & Co., 1971

C. Life Science - A Modern Course - Mason & Peters, Van Nostrand Co., Inc., 1965

D. Interaction of Man and the Biosphere - Abraham & others, Rand McNally & Co., 1970

E. Living Things - Fitzpatrick & others, Holt, Rinehart & Winston, 1962 & 1966

Note: Students can also find information in dictionaries, encyclopedias, by using the library, and other books in the classroom.

Audio-Visuals

The following filmstrip is available from the IMC:

FS580 How Plants are Classified

Note: Check with librarian for materials available in your school, and also check with IMC and TJ.

Evaluation Form for Teachers

1. Name of the mini course _____

2. Was this unit appropriate to the level of your students?

3. Explain how this mini course was used with your students. (Individual, small group, or total class)

4. Identify the plus factors for this course.

5. List the changes that you would recommend for improvement.

7. Did you use any other valuable resources in teaching this unit? If so, please list.

PLEASE RETURN TO SCIENCE SUPERVISOR'S OFFICE AS SOON AS YOU COMPLETE THE COURSE.

ADDITIONAL SCIENCE MINI-COURSES

	Prepared by
LIFE SCIENCE	
A Study for the Birds	Terrence Best
Creepy Critters (Snakes)	Terrence Best
How's Your Plumbing?	Paul Cook
Guess Who's Been Here for Dinner	Paul Cook
Plants - The "Other" Living Things	Sharon Sheffield
Let's Look at You - The Human Organism	Sharon Sheffield
Classification: Why is There a Need?	Melvin Whitfield
Protist: The "Unseen" Kingdom	Melvin Whitfield
EARTH SCIENCE	
Coastline Development	Nelson Ford
Ocean Currents	John Fradiska
Features of the Ocean Floor (Ocean Floor Topography)	John Fradiska
Space and Its Problems	John Geist
Invertebrate Fossils: Clues to the Distant Past	John Geist
An Attempt towards Independent Study in Astronomy	John Geist
PHYSICAL SCIENCE	
Household Chemistry	Ross Foltz
Notions on Motions	Kenneth Howard
Environmental Chemistry	Fred Meyers