University of Hawai'i at Mānoa, College of Education

Curriculum Research & Development Group

providing quality educational programs and services for preschool through grade 12

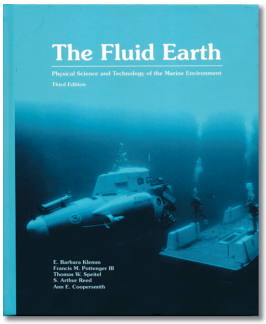
SCIENCE

The Fluid Earth/The Living Ocean *FELO*

Designed for secondary school students of all abilities, this curriculum teaches basic concepts of science through laboratory and field investigations into the marine environment. Content is drawn from biology, physics, chemistry, meteorology, geology, cartography, oceanography, ecology, and marine engineering. The units may be taught as a complete marine science course or used as modules in other science courses.

THE FLUID EARTH

Physical Science and Technology of the Marine Environment



Student Lab/Text Book

E. Barbara Klemm, Francis M. Pottenger III, Thomas W. Speitel, S. Arthur Reed, Ann E. Coopersmith

Explores the physics, chemistry, and geology of the oceans and their applications through ocean engineering and related technologies. Units: Earth and Ocean Basins, Waves and Beaches, Physical Oceanography, Chemical Oceanography, and Transportation.

Item #FE101, 386pp., ill., 3rd ed., 1990, hard,
ISBN-10 0-937049-58-1,
ISBN-13 978-0-937049-58-7

Teacher's Guide

E. Barbara Klemm, S. Arthur Reed, Francis M. Pottenger III, Ann E. Coopersmith

Overviews, purposes, background information on investigations, strategies for introducing topics, instructions for preparing materials, procedures for laboratory and field work, and questions and answers for each topic, all cross-referenced to the student lab/text book and workbook masters.

Item #FE100, 344pp., ill., 3rd ed., 1993, soft,
ISBN-10 0-937049-62-X,
ISBN-13 978-0-937049-62-4

Workbook Masters

E. Barbara Klemm, Francis M. Pottenger III, Thomas W. Speitel, S. Arthur Reed, Ann E. Coopersmith

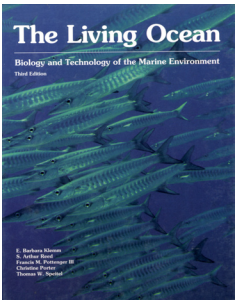
Data tables, diagrams, maps, and worksheets cross-referenced to investigations in the student lab/text book. Masters can be reproduced for classroom use.

Item #FE102, 76pp., ill., 1990, loose-leaf and padded

Preliminary findings from a study of CRDG programs in special-needs settings indicate that *FELO* science programs are being used successfully in inclusion classes. All students benefited from the hands-on, experimental learning that is the hallmark of *FELO*.

THE LIVING OCEAN

Biology and Technology of the Marine Environment



Student Lab/Text Book

E. Barbara Klemm, S. Arthur Reed, Francis M. Pottenger III, Christine Porter, Thomas W. Speitel

Explores traditional marine biology along with bioenergetics, satellite remote sensing, and global environmental changes. Contains activities, figures and tables, glossaries, materials lists, readings and questions, optional activities, and appendixes, all cross-referenced to the student workbook. Units: Fish, Invertebrates, Plants, and Ecology.

Item #LO101, 451pp., ill., 3rd ed., 1995, hard,
ISBN-10 0-937049-75-1,
ISBN-13 978-0-937049-75-4

Teacher's Guide

S. Arthur Reed, E. Barbara Klemm, Francis M. Pottenger III, Ann B. Weaver, Christine Porter

Overviews, purposes, background information on investigations, strategies for introducing topics, instructions for preparing materials, procedures for laboratory and field work, and questions and answers for each topic.

Item #LO100, 400pp., ill., 3rd ed., 1996, soft,
ISBN-10 0-937049-76-X,
ISBN-13 978-0-937049-76-1

Workbook Masters

E. Barbara Klemm, S. Arthur Reed, Francis M. Pottenger III, Christine Porter, Thomas W. Speitel

Data tables, diagrams, maps, and worksheets cross-referenced to investigations in the student lab/text book. Masters can be reproduced for classroom use.

Item #LO102, 140pp., ill., 1995, loose-leaf and padded

TEACHER SET

Teacher Set

Includes one each of the following: *The Fluid Earth* Student Lab/Text book (FE101), *The Fluid Earth* Teacher's Guide (FE100), *The Fluid Earth* Workbook Masters (FE102), *The Living Ocean* Student Lab/Text Book (LO101), *The Living Ocean* Teacher's Guide (LO100), *The Living Ocean* Workbook Masters (LO102), and *Fish and the Environment* (PA001)

Item #HMSS01

FREE SWIM

swim

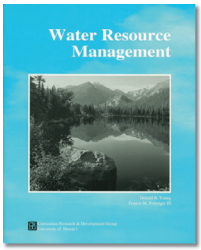
School Web of Instructional Media (SWIM)

A Web-based searchable database rich in instructional media, SWIM contains direct links to activities, teaching concepts, and units in *The Fluid Earth* and *The Living Ocean.*

- SWIM media are linked to specific pages in *The Fluid Earth* and *The Living Ocean* textbooks, and to topics on The Water Planet CD-ROM.
- SWIM enriches and enhances learning experiences with its quick textbook–media connections.
- As long as you have Internet connectivity, access to a web browser, and a username and password, you can use SWIM.

To get started, log in at: **www.hawaii.edu/swim.**

SUPPLEMENTARY MATERIALS



Water Resource Management Student Textbook

Donald B. Young and Francis M. Pottenger III

Designed to help students acquire the underlying knowledge and skills that will enable them to deal effectively with a variety of resource management issues by focusing on the study of water quantity and quality in their local community and region.

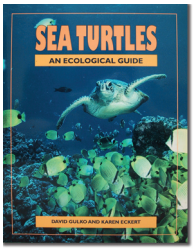
Item #HMSS09, 71pp., ill., 2nd ed., 1999, soft, **ISBN-10 1-58351-004-4, ISBN-13 978-1-58351-004-9**

Teacher's Guide

Donald B. Young and Francis M. Pottenger III

Overviews, purposes, background information on investigations, strategies for introducing topics, instructions for preparing materials, procedures for laboratory and field work, and questions and answers for each topic.

Item #HMSS08, 87pp., ill., 2nd ed.,1999, spiral, **ISBN 10-1-58351-005-2, ISBN-13 978-1-58351-005-6**

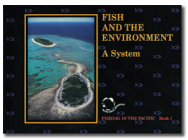


Sea Turtles: An Ecological Guide

David Gulko and Karen Eckert

Explores the amazing world of sea turtles—their natural history, life cycles, habitats, and struggles against the mounting threats posed by humans. *Sea Turtles: An Ecological Guide* is a must-have for educators, biologists, conservationists, and divers. Over 200 photographs and illustrations clearly depict every facet of a sea turtle's life and habitat. A portion of the proceeds from the sale of this book benefits the Wider Caribbean Sea Turtle Conservation Network (WIDECAST). Published by Mutual Publishing.

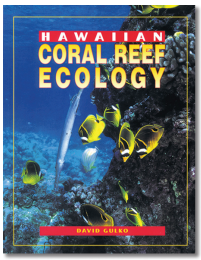
Item #HMSS12, 128pp., ill., 2004, soft, **ISBN-10 1-56647-651-8 ISBN-13 978-0-56647-651-5**



Fish and the Environment: A System

Pacific fisheries and their environments, with examples from the Pacific Northwest, Australia, New Zealand, and Japan.

Item #PA001, 55pp., ill., 1988, soft, **ISBN-10 0-937049-12-3, ISBN-13 978-0-937049-12-9**



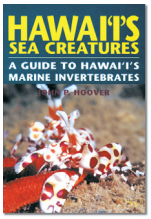
Hawaiian Coral Reef Ecology

Dave Gulko

Color photos, graphics, charts, graphs, diagrams, and cartoons explain the different types of corals, the vital role corals play in the ocean ecosystem, and the impact of local and global problems on the world's coral systems. Published by Mutual Publishing.

Item #HMSS04, 245pp., ill., 1998, soft, **ISBN-10 1-56647-234-2, ISBN-13 978-1-56647-234-0**

SUPPLEMENTARY MATERIALS cont.

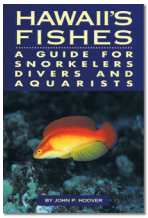


Hawai'i's Sea Creatures

John Hoover

A detailed exploration of Hawai'i's marine invertebrates. Over 600 color photographs give a comprehensive, up-close look at Hawai'i's fascinating sea creatures. Published by Mutual Publishing.

Item #HMSS06, 366pp., ill., 1998, soft, **ISBN-10 1-56647-220-2, ISBN-13 978-1-56647-220-3**

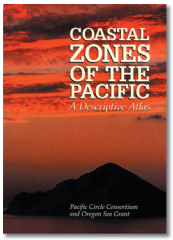


Hawaii's Fishes

John Hoover

Underwater photographs and informative descriptions of almost all the fishes encountered by divers and snorkelers in the islands. Their evolution, classification, and suitability for aquariums are discussed with recommendations on where to best see them. Published by Mutual Publishing.

Item #HMSS07, 183pp., ill., 1993, soft, **ISBN-10 1-56647-001-3, ISBN-13 978-1-56647-001-8**



Coastal Zones of the Pacific: A Descriptive Atlas

Defines the coastal zone and describes the kinds of coasts found in and along the Pacific. Illustrations include photographs, maps, diagrams, tables, and drawings. Published by Oregon Sea Grant.

Item #HMSS02, 160pp., ill., 1996, soft, **ISBN-10 1-881826-06-6, ISBN-13 978-1-881826-06-4**

PROFESSIONAL DEVELOPMENT

Workshops addressing content, instructional strategies, and assessment aligned with national standards are offered on *The Fluid Earth: Physical Science and Technology of the Marine Environment* and *The Living Ocean: Biology and Technology of the Marine Environment.*

Foundational Approaches in Science Teaching *FAST*

A multidisciplinary program emphasizing the concepts and methods of physical, biological, and earth sciences and their relation to the environment. Designed for students in grades 6 to 10 with a wide spectrum of abilities, this integrated, sequential curriculum allows for three or four years of study. Students devote 60 to 80 percent of the time in each course to laboratory or field investigations. They analyze and interpret their data, review related literature, discuss their findings in small groups or as a class, and write and share their reports.

FAST Instructional Guide

Donald B. Young and Francis M. Pottenger III

An overview of all three *FAST* courses, with goals and objectives, course content, strategies for managing space and time, and detailed descriptions of materials used by students and teachers.

Item #F113, 69pp., ill., 2nd ed., 1992, soft, **ISBN-10 0-937049-69-7, ISBN-13 978-0-937049-69-3**

FAST 1 THE LOCAL ENVIRONMENT

Student Lab/Text Book

Francis M. Pottenger III and Donald B. Young

Laboratory and field investigations of the components of the environment and their interrelationships engage students in discovery. The physical science strand introduces the properties of matter and changes in its state, and the relationships between temperature and heat. The ecology strand fosters awareness of interaction and interdependence in the environment. The relational study strand applies physical and ecological principles to the study of environmental issues.

Item #F101, 486 pp., ill., 2nd ed., 1992, hard, **ISBN-10 0-937049-67-0, ISBN-13 978-0-937049-67-9**

Student Record Book

Francis M. Pottenger III and Donald B. Young

Data tables, observation forms, and note sheets. Enables students to maintain a concise log of individual and class activities.

Item #F102, 83pp., ill., 2nd ed., 1992, soft

Teacher's Guide

Francis M. Pottenger III and Donald B. Young

Explains the logic underlying the sequence of investigations in the student text, with teaching suggestions, advice on classroom procedures, recommended schedules, a packet of Visual Aid Masters (F112), and equipment and supplies lists.

Item #F111, 658pp., ill., 2nd ed., 1992, soft, **ISBN-10 0-937049-68-9, ISBN-13 978-0-937049-68-6**

Visual Aid Masters

Francis M. Pottenger III and Donald B. Young

Data tables, observation forms, worksheets, diagrams, and reproducible game pieces.

Item #F112, 107pp., ill., 1992, loose-leaf

Evaluation Guide

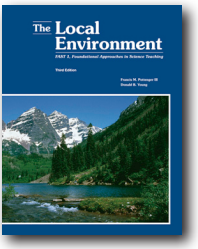
Francis M. Pottenger III and Donald B. Young

Contains tests for assessing laboratory skills and comprehension of scientific concepts, and record forms to help monitor students' progress toward mastery.

Item #F114, 147pp., ill., 2nd ed., 1992, spiral, **ISBN-10 0-937049-73-5, ISBN-13 978-0-937049-73-0**

FAST 1 THE LOCAL ENVIRONMENT Third Edition

Francis M. Pottenger III and Donald B. Young



Laboratory and field investigations of the components of the environment and their interrelationships engage students in discovery. The physical science strand introduces the properties of matter and changes in its state, and the relationships between temperature and heat. The ecology strand fosters awareness of interaction and interdependence in the environment. The relational study strand applies physical and ecological principles to the study of environmental issues.

Student Lab/Text book

Item #F101B, 362 pp., ill., 3rd ed., 2008, hard,
ISBN 978-1-58351-039-1

Third edition teacher's material coming soon!

FAST 1 SETS

***FAST* 1 MATERIALS ARE ALSO AVAILABLE IN THE FOLLOWING SETS**

FAST 1 Teacher Set

Includes one each Student Lab/Text Book (F101), Student Record Book (F102), five *FAST* 1 reference booklets (F105–F109), Teacher's Guide (F111), *FAST* Instructional Guide (F113), *FAST* 1 Evaluation Guide (F114).

Item #F110

FAST 1 Classroom Set

Includes 30 Student Lab/Text Books (F101), 30 Student Record Books (F102), and one Library Starter Set (F103)

Item #F100

FAST 1 Library Starter Set

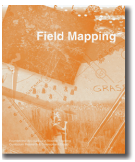
Includes 15 copies each of the following *FAST* 1 reference booklets: *Animal Care* (F105), *Field Mapping* (F106), *Plant Propagation* (F107), *Sampling Methods* (F108), and *Weather Instruments* (F109)
Item #F103, ISBN-10 0-937049-20-4,
ISBN-13 978-0-937049-20-4

REFERENCE BOOKLETS

Animal Care

Instructions for building cages and environments for keeping animals often found on schoolgrounds, with basic information on their food and habitat needs.
Item #F105, 33pp., ill., 1983, soft,
ISBN-10 0-937049-22-0,
ISBN-13 978-0-937049-22-8

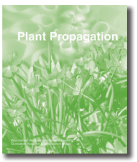
Field Mapping



Instructions for making detailed, scaled, and contour-lined maps of a class study area, and making and using mapping tools.

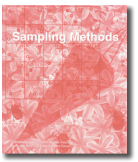
Item #F106, 33pp., ill., 1983, soft,
ISBN-10 0-937049-23-9
ISBN-13 978-0-937049-23-5

Plant Propagation



Propagating and growing plants with techniques for grafting, air layering, and using hydroponic solutions; discussion of dormancy, planting containers, media, and watering.
Item #F107, 43pp., ill., 1983, soft,
ISBN-10 0-937049-24-7
ISBN-13 978-0-937049-24-2

Sampling Methods



Techniques for determining population size, density, and frequency by random sampling and by using quadrats, transects, and other methods.

Item #F108, 36pp., ill., 1983, soft,
ISBN-10 0-937049-25-5
ISBN-13 978-0-937049-25-9

Weather Instruments

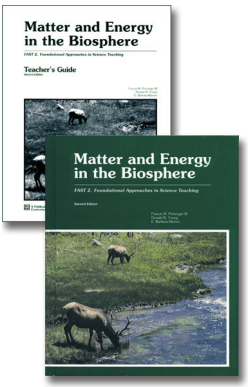
Instructions for building a weather station, making weather instruments, and setting up instruments to measure air quality.

Item #F109, 45pp., ill., 1983, soft,
ISBN-10 0-937049-26-3
ISBN-13 978-0-937049-26-6

FAST 2 MATTER AND ENERGY IN THE BIOSPHERE

Student Lab/Text Book

Francis M. Pottenger III, Donald B. Young, E. Barbara Klemm



By exploring the transfer of matter and energy through ecosystems, students discover that all living organisms are part of a complex, interdependent biosphere. In the physical science strand they investigate light, compounds in search of evidence for an atomic theory, and the kinetic molecular theory of matter. In the ecology strand they investigate photosynthesis, respiration, and decomposition. In the relational study strand they make decisions about issues that require analyzing global energy problems such as shortages of food or fossil fuels.

Item #F201, 317pp., ill., 2nd ed., 1994, hard, **ISBN-10 0-937049-83-2, ISBN-13 978-0 937049-83-9**

Student Record Book

Francis M. Pottenger III, Donald B. Young, E. Barbara Klemm

Data tables, observation forms, and note sheets. Enables students to maintain a concise log of individual and class activities.

Item #F202, 77pp., ill., 2nd ed., 1994, soft

Teacher's Guide

Francis M. Pottenger III, Donald B. Young, E. Barbara Klemm

Explains the logic underlying the sequence of investigations in the student text, with teaching suggestions, advice on classroom procedures, recommended schedules, a packet of Visual Aid Masters (F212), and equipment and supplies lists.

Item #F211, 506pp., ill., 2nd ed., 1996, soft, **ISBN-10 0-937049-84-0, ISBN-13 978-0-937049-84-6**

Visual Aid Masters

Francis M. Pottenger III and Donald B. Young

Data tables, observation forms, worksheets, diagrams, and reproducible game pieces.

Item #F212, 95pp., ill., 1996, loose-leaf

Evaluation Guide

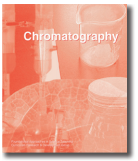
Francis M. Pottenger III and Donald B. Young

Contains tests for assessing laboratory skills and comprehension of scientific concepts as well as record forms to help monitor students' progress toward mastery.

Item #F213, 134pp., ill., 2nd ed., 1996, spiral, **ISBN-10 0-937049-86-7, ISBN-13 978-0-937049-86-0**

REFERENCE BOOKLETS

Chromatography



Procedures for separating pigments by paper chromatography and thin-layer chromatography; instructions for preparing leaf pigment extracts.

Item #F204, 35pp., ill., 1987, soft,
ISBN-10 0-937049-28-X,
ISBN-13 978-0-937049-28-0

Components of Biomass

Instructions for simple tests to identify components of plant and animal biomass such as starch, sugar, protein, amino acids, fats, carbon, and water.

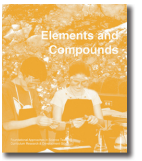
Item #F205, 29pp., ill., 1986, soft,
ISBN-10 0-937049-07-7,
ISBN-13 978-0-937049-07-5

Composting

Procedures for making aerobic and anaerobic compost, with methods of investigating decomposition processes.

Item #F206, 24pp., ill., 2nd ed., 1999, soft,
ISBN-10 1-58351-003-6,
ISBN-13 978-1-58351-003-2

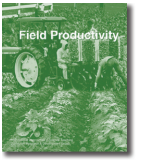
Elements and Compounds



Instructions for identifying elements and compounds by their physical and chemical properties.

Item #F207, 20pp., ill., 1987, soft,
ISBN-10 0-937049-30-1,
ISBN-13 978-0-937049-30-3

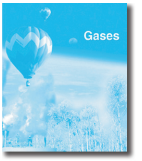
Field Productivity



A gardening guide with instructions for planning; advice about soil testing, supplying water and nutrients; and coping with pests to maintain a healthy crop.

Item #F208, 70pp., ill., 1987, soft,
ISBN-10 0-937049-31-x,
ISBN-13 0-937049-31-0

Gases



Methods for generating, identifying, and controlling gases to support studies of respiration, photosynthesis, and decomposition.

Item #F209, 44pp., ill., 1987, soft,
ISBN-10 0-937049-32-8,
ISBN-13 978-0-937049-27-3

FAST 2 SETS

***FAST* 2 MATERIALS ARE ALSO AVAILABLE IN THE FOLLOWING SETS**

FAST 2 Teacher Set

Includes one each Student Lab/Text Book (F201), Student Record Book (F202), six *FAST* 2 reference booklets (F204–F209), Teacher's Guide (F211), *FAST* Instructional Guide (F113), *FAST* 2 Evaluation Guide (F213).

Item #F210

FAST 2 Classroom Set

Includes 30 Student Lab/Text Books (F201), 30 Student Record Books (F202), and one Library Starter Set (F203)

Item #F200

FAST 2 Library Starter Set

Includes 15 copies each of the following *FAST* 2 reference booklets: *Chromatography* (F204), *Components of Biomass* (F205), *Composting* (F206), *Elements and Compounds* (F207), *Field Productivity* (F208), and *Gases* (F209)

Item #F203, ISBN-10 0-937049-27-1,
ISBN-13 978-0-937049-27-3

FAST 3 CHANGE OVER TIME

Student Lab/Text Book

Edna L. Demanche, Will Kyselka, Francis M. Pottenger III, Donald B. Young

Students begin by measuring force, gravity, work, and energy. They develop an operational definition of life, study the structure of organic molecules, and explore theories of molecular evolution and the origin of life on earth. To discover how interactions between living things and their environments bring about change, they study interactions of populations in local ecosystems. They consider the changing roles of humans as they gained control over their environment through hunting, agriculture, and industry. Finally, they practice making decisions that require balancing knowledge and technical capacity with problems of resource depletion, overpopulation, energy consumption, and other kinds of environmental stress.

Item #F301, 450pp., ill., 1996, hard, **ISBN-10 0-937049-10-7, ISBN-13 978-0-937049-10-5**

Teacher's Guide

Edna L. Demanche, Will Kyselka, Francis M. Pottenger III, Donald B. Young

Explains the logic underlying the sequence of investigations in the student text, with teaching suggestions, advice on classroom procedures, recommended schedules, a packet of Visual Aid Masters (F306), and equipment and supplies lists.

Item #F305, 485pp., ill., 1996, soft, **ISBN-10 0-937049-72-7**, **ISBN-13 978-0-937049-72-3**

Visual Aid Masters

Edna L. Demanche, Will Kyselka, Francis M. Pottenger III, Donald B. Young

Data tables, worksheets, diagrams, and reproducible game pieces.

Item #F306, 119pp., ill., 1996, loose-leaf

Stars in Mind

Will Kyselka and Lee Kyselka

Learning the skies by tracing the constellations on sky maps, one for each month. Published by Pacific Books–Hawaii.

Item #F308, 56pp., ill., 1981, soft

Twelve Sky Maps

Ray Lanterman and Will Kyselka

Twelve large laminated star charts, one for each month, with information about constellations, the galaxy, and other celestial objects. Published by Pacific Books–Hawai'i.

Item #F309, ill., 1974, laminated

Ostrich Bay Environmental Simulation Game

Ronald L. Mitchell, Francis M. Pottenger III, Gregory L. Rhodes, Ronald F. Turner

A decision-making game demonstrating the linkages among economics, politics, environmental quality, and coastal development. The class explores the human impact on environments by forming special interest groups and making decisions about energy and land. Includes teacher's packet, instruction book, game boards, group folders, handouts, and worksheets.

Item #F310, 1979, boxed

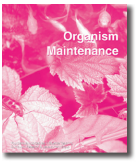
REFERENCE BOOKLETS

Components of Biomass

Instructions for simple tests to identify components of plant and animal biomass such as starch, sugar, protein, amino acids, fats, carbon, and water.

Item #F302, 29pp., ill., 1986, soft,
ISBN-10 0-937049-07-7,
ISBN-13 978-0-937049-07-5

Organism Maintenance



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Item #F303, 41pp., ill., 1986, soft,
ISBN-10 0-937049-06-9,
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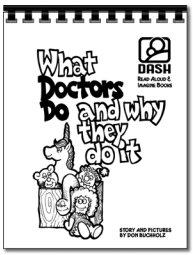

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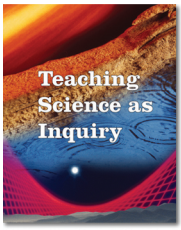

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