

ATHENA

**The Academy for Teaching about
Health and Environment Associations**

Workshop Guide

**August 16th - 18th, 2010
Watertown Hotel
Seattle**

The Department of Environmental & Occupational Health Sciences



SCHOOL OF PUBLIC HEALTH

UNIVERSITY *of* WASHINGTON

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– **Jon Sharpe**, *ATHENA Project Manager*

ATHENA Teacher Advisory Committee:

Lisa Legary, Lakes High School, Lakewood

Maggie Rose, Ingraham High School, Seattle

Nancy Sedlacek, Yelm Extension School, Yelm

Jaime Woodard, R.A. Long High School, Longview

Jay Young, Wenatchee High School, Wenatchee

UW DEOHS ATHENA Support Team:

Dave Eaton, Principal Investigator for ATHENA

Kelly Edwards, Co-Principal Investigator for ATHENA

Dianne Botta, Research Scientist

Katie Frevert, Outreach Manager, Superfund Research Program

Steve Gilbert, Affiliate Professor

Wes Smith, Senior Fellow

Julia Tracy, Research Scientist

ATHENA Learning Objectives

Upon completion of the workshop, participants will be able to:

Objective 1: Explain the core concepts that serve as the foundation of the environmental and occupational health sciences and describe a variety of environmental and occupational health professions.

Objective 2: Provide several historical and contemporary examples of the relationship between the environment and human health outcomes.

Objective 3: Describe several environmental and occupational health sciences research projects being conducted at the University of Washington.

Objective 4: Demonstrate how to use an inquiry-based approach to share what they have learned with their students.

Objective 5: Explain how they can leverage UW expertise and resources to help them effectively incorporate environmental and occupational health sciences content into their teaching.

Agendas At-a-Glance

Monday, August 16 th			
<u>Focus for the Day: Environmental & Occupational Health Sciences (EOHS)</u> <u>Route of Exposure of the Day: Inhalation</u>			
Time	Title	Presenter(s)	Type of Session
8:30	Registration & Breakfast Buffet		
9:00	Welcome, introductions, & overview of the day ahead	Dave Eaton, Jon Sharpe	Presentation
9:30	Concept mapping activity	Jon Sharpe	Activity
10:00	Introduction to the UW DEOHS	Jon Sharpe	Presentation
10:15	Artifact brainstorm	Jon Sharpe	Activity
10:45	BREAK		
11:00	A small dose of toxicology: history, core concepts, and case studies from the science of poisons	Steve Gilbert	Presentation
NOON	LUNCH		
12:30	Introduction to occupational health and safety	Janice Camp	Presentation
1:30	Introduction to the <i>Health and Safety Awareness for Working Teens</i> curriculum	Darren Linker	Presentation Activity
2:15	Health effects of air pollution	Joel Kaufman	Presentation
3:00	BREAK		
3:15	Household hazards, labeling requirements, and trade secrets	Steve Gilbert	Presentation
4:00	Inhalation toxicology	Mike Morgan	Presentation
4:45	Wrap-up, reflection, and evaluation	Jon Sharpe	Activity
5:30	ADJOURN		

Tuesday, August 17th

Focus for the Day: **Food, Water, and Children's Environmental Health**

Route of Exposure of the Day: **Ingestion**

Time	Title	Presenter(s)	Type of Session
9:00	Overview of the day ahead	Jon Sharpe	
9:15	Artifact brainstorm	Jon Sharpe	Activity
9:30	Introduction to food and water safety	Scott Meschke	Presentation
10:30	BREAK		
10:45	The Hydroville Curriculum Project	Sandra Uesugi	Activity
11:45	The Youth Network for Healthy Communities	Jay Young, Nancy Sedlacek	Presentation
NOON	LUNCH		
12:30	Indigenous communities and traditional foods	Valerie Segrest	Presentation Activity
1:00	Children's environmental health: basic principles and current issues	Sheela Sathyanarayana	Presentation
1:45	Cancer, the environment, and food	David Eaton	Presentation
2:30	An overview of Integrated Pest Management and tour of web resources	Nick Thorp	Presentation
3:00	BREAK		
3:15	Dose/Response lab and Roosevelt facility lab tours	Julia Tracy	Activity
5:00	Wrap-up, reflection, and evaluation	Jon Sharpe	Activity
5:30	ADJOURN		
6:30	Movie and Pizza Night: Eat pizza, relax, and enjoy a selection of clips from EOHS related films (<i>participation is optional</i>)	Nancy Sedlacek, Jay Young	Activity

Wednesday, August 18th

Focus of the Day: **Risk Assessment, Management, and Communication**
Route of Exposure of the Day: **Dermal Absorption**

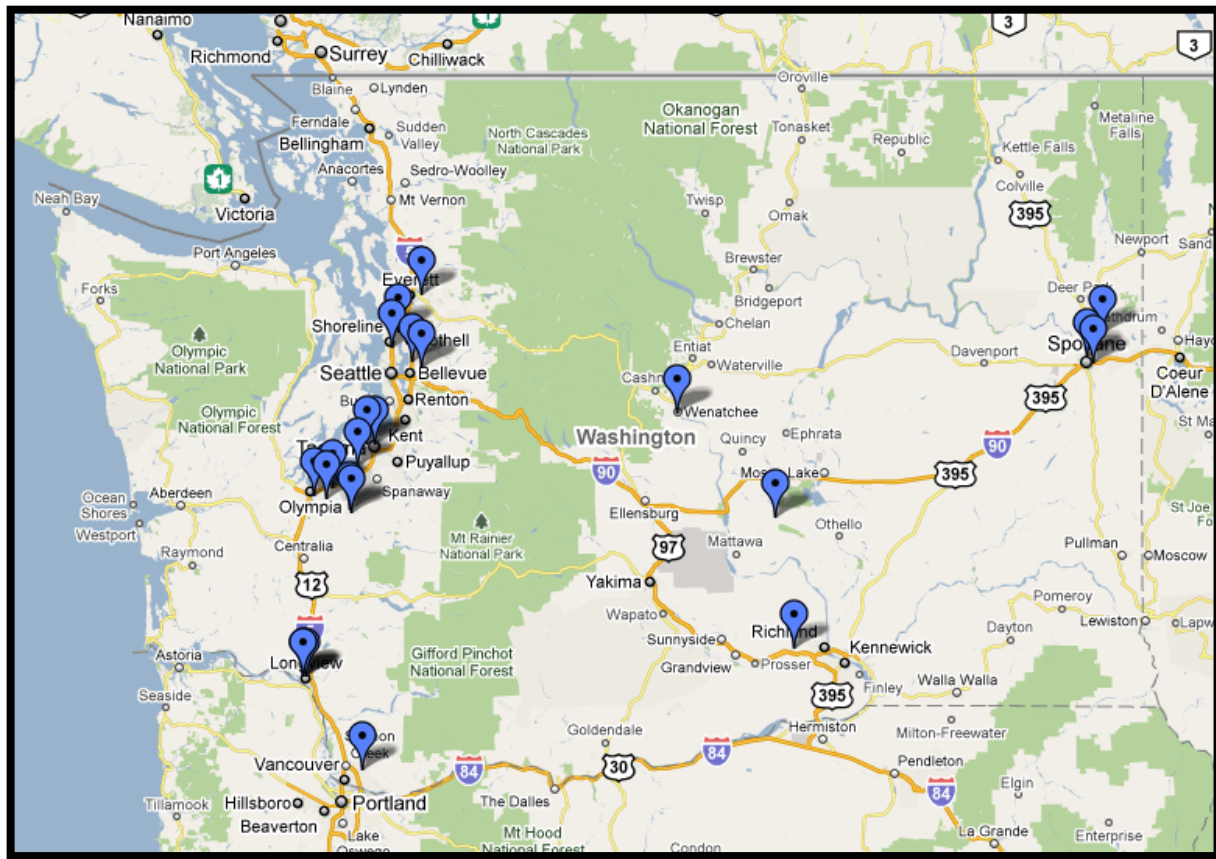
Time	Title	Presenter(s)	Type of Session
9:00	Overview of the day ahead	Jon Sharpe	
9:15	Artifact brainstorm	Jon Sharpe	Activity
9:30	Ethics of animal testing	Kelly Edwards	Presentation
10:00	Nanoscience, nano-safety, and current regulations	Dave Eaton	Presentation
10:45	BREAK		
11:00	Risk Assessment, the precautionary principle, and the National Children's Study	Elaine Faustman	Presentation
NOON	LUNCH (with presentations about UW DEOHS academic programs)	Susan Inman, Rory Murphy	Presentation
12:30	Nanoscience research highlight: quantum dots	Wes Smith	Presentation
1:00	Focus on dermal exposure: Sunscreen testing and diaper dissection	Steve Gilbert, Jon Sharpe	Activity
1:45	Wrap-up, reflection, assignments, and final evaluation	Jon Sharpe	Activity
2:45	ADJOURN		

List of ATHENA Participants

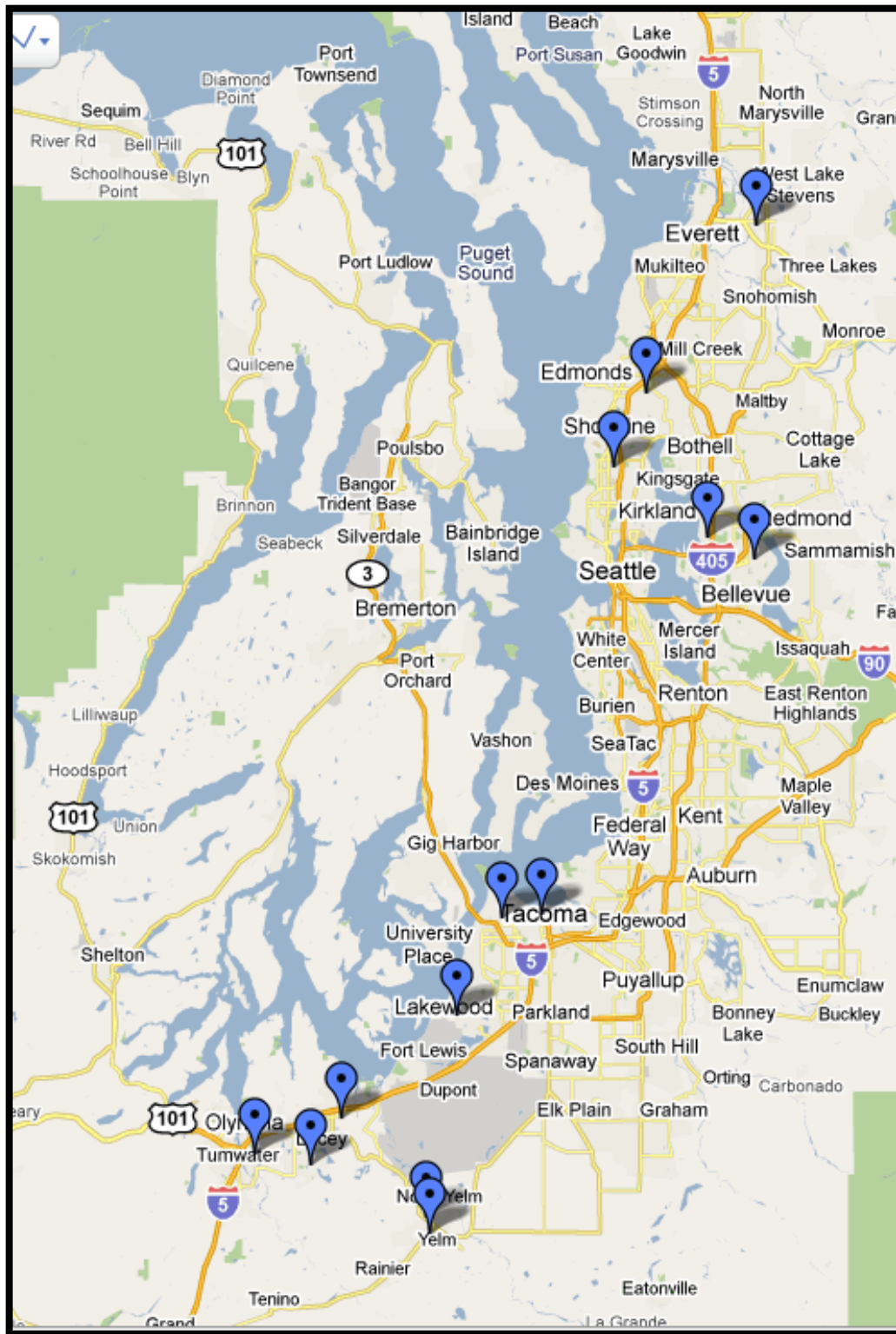
Name	School Name	City	Subjects
Jane Allaire	Olympia High School	Olympia, WA	Health, CTE, Psychology
Lindzee Alvarez	Interlake High School	Bellevue, WA	Health
Cheryl Ausboe	Wilson High School	Tacoma, WA	Health
Dorn Barr	Timberline High School	Lacey, WA	Health, CTE
Dawn Boyden	PROVE High School	Everett, WA	Health, CTE, Photography, Fitness, Daycare
Tracy Bumgarner	BEST High School	Kirkland, WA	Health, CTE
Audra Degg	On-Track Academy	Longview, WA	Science, Health
Peter Ellis	Spokane School Admin	Spokane, WA	Health
Jill Geyen	River Ridge High School	Lacey, WA	Science, Health
Mario Godoy-Gonzalez	Royal High School	Royal City, WA	Science, ESL, History, Biology, Math, English
Nancy Keller	Heritage High School	Vancouver, WA	Science, CTE
Heidi Kirk	Olympia High School	Olympia, WA	Science
Lisa Legary	Lakes High School	Lakewood, WA	Science, CTE
Marci Mahler	Mountlake Terrace HS	Mountlake Terrace, WA	Health, PE
Kathryn Miller	Mark Morris High School	Longview, WA	Science
Jennifer Oliver	Kiona-Benton City HS	Benton City, WA	Health, CTE
Maggie Rose	Ingraham High School	Seattle, WA	Science
Nancy Sedlacek	Yelm Extension School	Yelm, WA	Science, Health, CTE
Martha Severn	Havermale High School	Spokane, WA	Science
Larry Stranahan	Mt Spokane High School	Mead, WA	Science
Rebecca Wallace	Yelm HS/Ridgeline MS	Yelm, WA	Science, CTE
Katrina Weihs	Lakes High School	Lakewood, WA	Science, possibly environmental issues
Jennifer Wood	Stadium High School	Tacoma, WA	Health
Jaime Woodard	R. A. Long High School	Longview, WA	Health, CTE
Jay Young	Wenatchee High school	Wenatchee, WA	Social Studies

Maps of ATHENA School Locations

Washington State Map



Close up of Puget Sound



Session Descriptions, Monday, August 16th

Focus for the Day: **Environmental & Occupational Health Sciences (EOHS)**
Route of Exposure of the Day: **Inhalation**

9:00 Welcome, introductions, and overview of the day

(PRESENTATION) This session will include a formal welcome by Dr. David Eaton, Principal Investigator on the ATHENA Project. Following that, Mr. Sharpe will invite the participants to briefly introduce themselves then go over the agenda for the day and any relevant logistics. (Presenters: **David Eaton & Jon Sharpe**)

9:30 Concept Mapping Activity

(HANDS-ON ACTIVITY) This hands-on, small group activity is designed to explore participants' existing knowledge and understandings of concepts to be explored in the workshop. (Presenter: **Jon Sharpe**)

10:00 Introduction to UW DEOHS

(PRESENTATION) This session will introduce participants to the discipline of environmental and occupational health sciences and contextualize it within the field of public health. It will also provide participants with a brief overview of the ATHENA project, including funding source, goals of the project, and how it relates to the overall mission of the UW DEOHS. (Presenter: **Jon Sharpe**)

10:15 Artifact Brainstorm

(HANDS-ON ACTIVITY) Each day of the workshop will start with an "Artifact Brainstorm" session to model inquiry-based teaching and learning for the participants. Working in collaborative groups, the participants will be asked to generate as many questions as they can about the artifacts on their table and how these products might influence human health. These questions will then be posted around the room on flip chart paper. Throughout the remainder of the day, following their presentations, the various presenters will be asked to address questions about which they feel they have some expertise. At the end of the day we will briefly review how many of the questions we feel were answered, which would require further research, and how we might go about that. (Presenter: **Jon Sharpe**)

11:00 A Small Dose of Toxicology: History, core concepts, and case studies from the science of poisons

(PRESENTATION) The session will introduce the core concepts of toxicology, including dose/response, routes of exposure, and individual susceptibility. Participants will also learn about several historical figures who contributed to the development of the science of toxicology, review case studies of environmental

health catastrophes, and be introduced to some of the ethical issues related to the field of environmental health. (Presenter: **Steven Gilbert**)

12:30 Introduction to occupational health and safety

(PRESENTATION) This session will provide an overview of the ways in which workplace environments can influence human health and how this has varied over time. It will also provide an introduction to the history of worker safety and health, especially as it played out in this country in the 20th century and how various regulations and regulatory agencies have been created to safeguard workers. The session will include a description of a recent UW DEOHS research or outreach project related to occupational health and inhalation as a route of exposure. (Presenter: **Janice Camp**)

1:30 Introduction to the *Health and Safety Awareness for Working Teens* curriculum

(PRESENTATION and HANDS-ON ACTIVITY) This session will introduce participants to a set of classroom materials and DVD created by the UW DEOHS. *Health and Safety Awareness for Working Teens* is designed to help teens entering the workforce develop an awareness of workplace health and safety issues. Through this comprehensive set of free classroom materials, teens are exposed to information and activities that introduce concepts such as workplace hazards, labor laws and worker rights, conflict resolution and sexual harassment. The session will include a hands-on activity from the curriculum. (Presenter: **Darren Linker**)

2:15 Health effects of air pollution

(PRESENTATION) This session will introduce participants to the various ways in which air pollution influences human health. Recent research has demonstrated that air pollution can lead to harmful effects on the cardiovascular system, not just the respiratory system. This session will describe the major sources and components of air pollution and the ways in which they are able to negatively impact health. It will also include examples of current UW DEOHS research projects related to air pollution and cardiovascular health. (Presenter: **Joel Kaufman**)

3:15 Household hazards, labeling requirements, and trade secrets

(PRESENTATION) This session will focus on recent and on-going research into the various ways in which labeling on a wide range of commercial products may not be providing enough information to protect human health. The session will provide an overview of the types of health hazards most commonly found in homes, especially those to which we are exposed through inhalation. If time allows, a hands-on activity will also be included that looks at six examples of substances in consumer products and how our attitudes towards them have changed over time as more information about their harmful effects became known. (Presenter: **Steven Gilbert**)

4:00 Inhalation toxicology

(PRESENTATION) In this session participants will be introduced to the core concepts of inhalation toxicology, including respiratory physiology and human response to inhalation of air contaminants. The focus will be on actions we all take that can increase or decrease our risk for health effects. Participants will hear about current UW DEOHS research projects related to workplace exposures to airborne agents, and will also discuss recent examples of exposures to air contaminants that have been in the news. (Presenter: **Michael Morgan**)

4:45 Wrap-up, reflection, assignments, and final evaluation

(HANDS-ON ACTIVITY) During this final session of the day, participants will be asked to identify which of the questions they generated during the morning “Artifact Brainstorm” session were answered during the day, and which require further research. We will also spend part of the time doing a creative reflection activity (a component of our project evaluation). (Presenter: **Jon Sharpe**)

Session Descriptions, Tuesday, August 17th

Focus for the Day: Food, Water, and Children's Environmental Health
Route of Exposure of the Day: Ingestion

9:00 Overview of the day ahead

(PRESENTATION) The agenda for the day will be reviewed and any relevant logistics will be presented. Mr. Sharpe will also briefly introduce the "5E Instructional Model." (Presenter: Jon Sharpe)

9:15 Artifact brainstorm

(HANDS-ON ACTIVITY) See description from Monday morning's "Artifact Brainstorm" session. (Presenter: Jon Sharpe)

9:30 Introduction to food and water safety

(PRESENTATION) In this session participants will be introduced to the core concepts of food and water safety and sanitation. They will also learn what how ingestion differs from other routes of exposure and hear about current UW DEOHS research projects related to food and water safety. (Presenter: J. Scott Meschke)

10:45 Hydroville curriculum project activity

(PRESENTATION & HANDS-ON ACTIVITY) In this session participants will be introduced to the *Hydroville Curriculum Project* developed by the NIEHS Environmental Health Sciences Center at Oregon State University. The session will also include a hands-on activity from the curriculum related to drinking water quality and standards. (Presenter: Sandra Uesugi)

11:45 The Youth Network for Healthy Communities

(PRESENTATION) In this session participants will learn about the UW DEOHS sponsored *Youth Network for Healthy Communities* (YNHC) and how it is relevant to the ATHENA project. YNHC is a quarterly videoconference series that has been hosted by the UW DEOHS for the past ten years. This innovative project has given middle and high school teachers from across Washington State the opportunity to work with students on environmental health issues in their own communities. Students researched environmental health projects and presented their findings to experts via the statewide K20 videoconference network. In this session, participants will learn how they can use the YNHC model and materials in the coming school year to help their students conduct research and share their results with UW DEOHS experts via real-time videoconferencing. (Presenters: **Jay Young & Nancy Sedlacek**)

12:30 Indigenous communities and traditional foods

(PRESENTATION and HANDS-ON ACTIVITY) In this session participants will be introduced to the ways in which indigenous communities are struggling to improve their health by incorporating more traditional and locally produced foods into their diets. The cultural and spiritual significance of food will also be discussed, and participants will take part in a activity that explores the various ways in which is more than just nutrition to individuals, families, cultures, and societies. (Presenter: **Valerie Segrest**)

1:00 Children's environmental health: basic principles and current issues

(PRESENTATION) In this session, participants will learn about the many ways in which children's physiology and behaviors make them more vulnerable than adults to the harmful effects of environmental contaminants. They will also hear about current environmental health topics of particular relevance to children, such as potentially harmful chemicals found in baby bottles, toys, and diapers. (Presenter: **Sheela Sathyanarayana**)

1:45 Cancer, the environment, and food (45 minutes)

(PRESENTATION) In this session participants will learn about the cascade of events that have to take place in order for a normal cell to become a cancer cell. They will also participate in a hands-on activity that demonstrates the difference between normal cells and cancer cells. Finally, they will learn the role that the environment plays in various types of cancer and hear about on-going research into the potential role that certain foods can play in helping prevent cancer. (Presenter: **David Eaton**)

2:30 Integrated Pest Management and a tour of web resources

(PRESENTATION) In this session participants will learn about alternatives to pesticide use through the Integrated Pest Management approach. The presenter will also highlight a set of cutting-edge web-based tools such as Toxipedia and IPMopedia that give teachers and students easy access to a wealth of environmental health resources. (Presenter: **Nick Thorp**)

3:15 Dose/response lab and Roosevelt lab tours

(HANDS-ON ACTIVITY) In this lab-based experiment, participants will explore the relationship between dose and response. There will also be opportunities for participants to tour UW DEOHS labs in small groups while the experiment is running. (Presenter: **Julia Helen Tracy**)

5:00 Wrap-up and closure (30 minutes)

(HANDS-ON ACTIVITY) During this final session of the day, participants will be asked identify which of the questions they generated during the morning "Artifact Brainstorm" session were answered during the day, and which require further research. We will also spend part of the time doing a creative reflection activity (a component of our project evaluation). (Presenter: **Jon Sharpe**)

Session Descriptions, Wednesday, August 18th

Focus of the Day: **Risk Assessment, Management, and Communication**
Route of Exposure of the Day: **Dermal Absorption**

9:00 Overview of the day ahead

(PRESENTATION) The agenda for the day will be reviewed and any relevant logistics will be presented. (Presenter: **Jon Sharpe**)

9:15 Artifact brainstorm

(HANDS-ON ACTIVITY) See description from Monday morning's "Artifact Brainstorm" session. (Presenter: **Jon Sharpe**)

9:30 Ethics of animal testing

(PRESENTATION) Following the previous afternoon's hands-on experiment with fruit flies, this session will build on what participants have learned about toxicology and animal models to explore the ethics of using animals in biomedical research. A model for talking about biomedical ethics with students will be presented and discussed. (Presenter: **Kelly Edwards**)

10:00 Nanoscience, nano-safety, and current regulations

(PRESENTATION) Hundreds of consumer products containing nanomaterials are currently on the market – and many more are expected to be introduced in the future. These include products across a wide range of categories, such as health care, sports and fitness, appliances, electronics and computing, food, toys, home and garden. Nanoscience holds great promise, especially for health care products, but who is responsible for regulating its use and ensuring that workers and consumers are adequately protected from the risk of unforeseen health hazards? In this session, Dr. Eaton will provide an overview of the issues and discuss his work on a national panel convened to review current regulations and make recommendations for policies to better protect the public. (Presenter: **David Eaton**)

11:00 Risk assessment, the precautionary principle and the National Children's Study

(PRESENTATION) This session will provide participants with an overview of the complex risk assessment process, including exposure assessment, risk management and risk communication. It will also contrast the U.S. approach to risk assessment and industry regulation with the one adopted by the European Union, and explore the Precautionary Principle as an alternative framework to protecting the public from unreasonable risk from environmental contaminants. Finally, participants will learn about an exciting and ambitious national study that is seeking to better understand how children's health is related to their environment. (Presenter: **Elaine Faustman**)

12:15 Overview of UW DEOHS academic programs

(PRESENTATION) This session will provide participants with an overview of both the undergraduate and graduate degree programs in Environmental and Occupational Health Sciences. Participants will also be given degree program brochures and contact information to take back to their schools and share with their peers and school guidance counselors in order to raise awareness of the UW DEOHS academic offerings. (Presenters: **Susan Inman & Rory Murphy**)

12:30 Nanoscience research highlight: Quantum dots

(PRESENTATION) This session will highlight a specific research project related to nanomaterials that is currently being conducted by DEOHS faculty and staff. Quantum dots, a product of the revolution in nanotechnology increasingly used in electronics, solar cells, and medical imaging devices, may pose health risks that are not yet understood. Participants will learn about this cutting-edge research and hear about what the researchers have learned so far. (Presenter: **Wes Smith**)

1:00 Focus on dermal exposure: sunscreen testing and diaper dissection

(HANDS-ON ACTIVITY) This hands-on session will give participants an opportunity to explore two very different examples of dermal exposure. Working in small groups, half of the participants will compare two types of sunscreen, one with nanomaterials and one without, to see if one is more effective than the other at blocking out UV radiation. The other half of the participants will dissect baby diapers containing a super-absorbent polymer that may cause allergic reactions if it comes in direct contact with skin. To wrap up the activities, one person from each group will share that they did and how it might be used with students to introduce issues related to risk and dermal exposure. (Presenters: **Jon Sharpe & Steven Gilbert**)

1:45 Wrap-up and closure

(HANDS-ON ACTIVITY) During this final session of the workshop, we will go over the participants' assignment for the second part of the workshop in May 2011. Some time will be given for participants to work in pairs, sharing their ideas for lesson plans with one another in order to get feedback from a peer. Final evaluations and reflections will be completed during this time as well. (Presenter: **Jon Sharpe**)

Presenter Biographies

Janice E. Camp, MSPH, MSN. Ms. Camp is a Senior Lecturer in the Department of Environmental and Occupational Health Sciences and Director of the Field Research and Consultation Group. The Field Research and Consultation Group (FRCG) is a Departmental field based service unit providing occupational safety and health consultation to Washington State business and labor groups.

David L. Eaton, PhD. Dr. Eaton received his Ph.D. in pharmacology from the University of Kansas Medical Center (KUMC) in 1978 and joined the UW faculty in 1979. He is currently Professor and Director of the UW Center for Ecogenetics and Environmental Health, an NIEHS Center of Excellence, and Associate Vice Provost for Research for the University of Washington. Dr. Eaton maintains his own active research and teaching program focused in the area of the molecular basis for environmental causes of cancer, and how human genetic differences in biotransformation enzymes may increase or decrease individual susceptibility to chemicals found in the environment.

Kelly Edwards, PhD. Dr. Edwards is an Associate Professor in the Department of Bioethics and Humanities in the UW School of Medicine, Core Faculty in the Institute for Public Health Genetics in the UW School of Public Health, and Adjunct Associate Professor in the Department of Environmental and Occupational Health Sciences. She has expertise in ethics education, research ethics, and community-based participatory research (CBPR).

Elaine Faustman, PhD. Dr. Faustman is a Professor in the Department of Environmental and Occupational Health Sciences and Director of the Institute for Risk Analysis and Risk Communication. She is also Director of the National Institute for Environmental Health Science (NIEHS)/Environmental Protection Agency (EPA) Center for Child Environmental Health Risks Research. Her research interests include understanding mechanisms of developmental and reproductive toxicants, characterizing in vitro techniques for developmental toxicology assessment, development of biologically based dose-response models for non-cancer risk assessment, and development of decision-analytic tools for incorporating new scientific findings into risk assessment and risk management decisions.

Steven G. Gilbert, PhD, DABT, Director and Founder of the Institute of Neurotoxicology and Neurological Disorders (INND), has a Ph.D. in toxicology and is a Diplomat of American Board of Toxicology. He is an Affiliate Professor in the Department of Environmental and Occupational Health Sciences, University of Washington and Affiliate Professor, Interdisciplinary Arts & Sciences, UW Bothell. Dr. Gilbert's research has focused on neurobehavioral effects of low-level exposure to lead and mercury on the developing nervous system. His book, "A Small Dose of Toxicology- The Health Effects of Common Chemicals" was published in 2004. His more recent focus is web-based tools such as Toxipedia - www.toxipedia.org - connecting science and people.

Susan Inman, MSSW. Susan Inman is the program manager and adviser for the Environmental Health bachelor's degree at the University of Washington. She was raised in a military family, lived across the U.S. and Europe, and is happy to call Seattle her adopted home. She earned a bachelors in international affairs and sociology at the Florida State University and a Master of Science in Social Work at the University of Texas at Austin. After six years in undergraduate and graduate admissions at other research universities, Susan joined the UW in 2004 to coordinate outreach efforts to Washington community colleges for the Office of Admissions. Looking to help underrepresented students navigate to the

sciences, she joined the Department of Environmental and Occupational Health Sciences in 2009.

Joel Kaufman, MD, MPH. Dr. Kaufman is a physician-epidemiologist, board-certified in internal medicine and occupational medicine. He has been a full-time faculty member at the UW since 1997, currently holding appointments in the Departments of Environmental & Occupational Health Sciences, and Medicine (General Internal Medicine), and Epidemiology. He is the director of the Occupational and Environmental Medicine Program, in both the School of Public Health and the School of Medicine. Dr. Kaufman's research integrates the disciplines of epidemiology, exposure sciences, toxicology, and clinical medicine. His current research activities are primarily focused on environmental factors in cardiovascular and respiratory disease.

Darren Linker, MEd, currently supervises the laboratory and research facility survey and inspection program for the University of Washington (UW). Prior to this, he managed the Washington State Young Worker Safety Education Program where he worked with the UW Department of Environmental and Occupational Health Sciences. He has extensive experience in curriculum development, and most recently was responsible for completing the new "OSHA's 11" national curriculum, targeting young workers as well as a national version of the video *Teen Workers: Real Jobs, Real Risks*. He has over sixteen years of experience working in environmental health and safety compliance and training, and began his career in education as a junior high school math and science teacher.

J. Scott Meschke, PhD, MS, JD is an environmental and public health microbiologist, specializing in the mobility, persistence, and detection of pathogens in the environment. His dissertation research focused on the comparative adsorption, persistence, and mobility of Norwalk virus, Poliovirus type 1, and F+RNA coliphage MS2 in soils and groundwater. Other research includes development and evaluation of detection methods for human caliciviruses; virus recovery and detection in complex food items, surface water and groundwater; disinfection of microbes with chemically generated mixed oxidants; use of coliphages as indicators of viral contamination of surface and groundwater; and monitoring of wells for fecal contamination following hurricane associated floods.

Michael S. Morgan, DSc. Since earning his advanced degree in Chemical Engineering (MIT) and receiving post-doctoral training in Respiratory Physiology (Harvard School of Public Health), Dr. Morgan has spent twenty-four years teaching and studying the human response to inhalation of air contaminants, including the products of combustion and volatile solvents. His research has encompassed both ambient air contaminants and occupational environmental health hazards.

Rory Murphy. Rory Murphy has worked for the University of Washington for 35 years. She has worked in patient care (managing a psychological testing laboratory at Harborview Medical Center), grant management (coordinating a five year National Library of Medicine informatics grant), and as a graduate program adviser in two different academic departments (School of Medicine/Pharmacology from 1987 to 1994 and her current job in Public Health/Environmental and Occupational Health Sciences beginning in 1999). In addition to advising current students, she is also responsible for identifying and matching students to available funding, managing the admissions process, coordinating graduate curriculum and teaching activities, and graduate recruitment/marketing. She has particular interest in diversity recruiting. In 2009 she was first recipient of the Graduate School's "Distinguished Graduate Program Adviser" award which was created to recognize the outstanding graduate adviser on campus.

Sheela Sathyanarayana, MD, MPH. Dr. Sathyanarayana is an Assistant Professor in the Department of Pediatrics at Harborview Medical Center and sees patients at the Harborview Children and Teens Clinic. She completed a fellowship in Pediatric Environmental Health and earned her MPH from the UW School of Public Health. Dr. Sathyanarayana's research focuses on the effects of prenatal and early childhood exposures to environmental chemicals, such as phthalates and bisphenol A, and she has a special interest in human risk, public health, and policy. In 2007 she was one of the first ten outstanding scientists chosen as Science Communication Fellows, sponsored by the non-profit publishers of Environmental Health News to assist in identifying important new research findings about environment and health and promoting them to a broader public audience.

Nancy Sedlacek, BS. Nancy received her degree in Home Economics Education from WSU in 1980 and has been teaching in Yelm ever since, first at the main high school, but mostly at the alternative high school. When it comes to education, she is always looking for options for students. She began using the Internet with students before it had graphics, and hasn't looked back, technology-wise. Nancy has been part of the YNHC videoconference project from its inception and has enjoyed every one of the ten years. When she isn't taking workshops, developing curriculum, or just plain working in the classroom, Nancy can be found spinning, weaving, reading, hiking or weeding her gardens.

Valerie Segrest, BS. Valerie Segrest is a native nutrition educator who specializes in local and traditional foods. She received a Bachelor of Science in Nutrition from Bastyr University in 2009. She works for the Northwest Indian College's *Traditional Plants Program* as a nutrition educator. In 2010 she co-authored the book "Feeding the People, Feeding the Spirit: Revitalizing Northwest Coastal Indian Food Culture." Valerie hopes to inspire and enlighten others about the importance of a nutrient-dense diet through a simple, common sense approach to eating.

Jon Sharpe, MEd, has a background in educational technology, curriculum development, project management, and science communication. After receiving a Masters of Education in Curriculum and Instruction in 1996, he joined the UW Department of Environmental and Occupational Health Sciences (DEOHS) to complete work on a high school level science curriculum on CD-ROM. Following the completion of that project, Mr. Sharpe went on to work on a variety of middle and high school environmental health projects, including the *Integrated Environmental Health Middle School Project*. This seven-year project (2000-07) trained middle school teachers across Washington State in the core concepts of environmental health. In addition to his work in K-12 education, Mr. Sharpe also has worked with a variety of community and Tribal groups around environmental health issues and the ethical dimensions of research and research partnerships. In 2010, he was nominated for the UW Distinguished Staff Award.

Wesley E. Smith, Ph.D. Wes Smith earned his Ph.D. in Pharmacology/Pharmaceutical Sciences with additional training in toxicology while working with Dr. Richard J. Bridges at the University of Montana in 2007. After working in the area of neuropharmacology/neurotoxicology, he joined the lab of Dr. Eaton where he is currently working on a nanotoxicology project in collaboration with Dr. Kavanagh. Dr. Smith's primary work on this project involves assessing the toxic properties of semiconductor quantum dots, using primary human hepatocytes as a model system. In addition to this research, he recently designed and taught a section of an undergraduate seminar class titled "Environmental Challenges: Are there solutions." During this class, Dr. Smith focused on the emerging field of nanotoxicology and the potential for environmental contamination.

Nick Thorp, BA. Nick is a project manager for the Institute of Neurotoxicology and Neurological Disorders, a Seattle based non-profit whose mission is to educate the public about the health and environmental impacts of toxic chemicals. One of the projects he manages is IPMopedia (<http://www.ipmopedia.org>), a site dedicated to providing advice and tips to Northwest gardeners on non-toxic pest control, sustainable design, and environmentally friendly practices. Since moving to Seattle four years ago Nick has worked at a variety of non-profit organizations on projects related to strengthening food systems and organic farming. He graduated from the University of Oregon with a degree in International Environmental Studies and French.

Julia Helen Tracy, MS. Julia Helen Tracy is a molecular biologist with over 15 years of laboratory experience. She is a singer, a lover of nature, a passionate reader, writer, hiker, oenophile, and traveler. She adores food, cooking, and sharing long, slow meals with dear friends.

Sandra Uesugi, MS. Ms Uesugi earned a degree in Environmental Toxicology from UC Davis in 1996 and now works as the Community Outreach and Education Program coordinator at Oregon State University's Environmental Health Sciences Center (EHSC). Prior to coming to OSU, Sandra worked as a research assistant in a soil microbiology lab at UC Davis. It was there that she became interested in bioremediation and pursued a MS in Soil Science and Bioresource Engineering at OSU. After completing her masters in 2000, Sandra remained at OSU as a pesticide specialist for the National Pesticide Information Center. After her position at NPIC, she began working for the EHSC to pursue her outreach and educational interests.

Jay Young, BA. Mr. Young received his BA in Political Science from Pacific Lutheran University. He has been teaching at Wenatchee High School for 35 years. Currently he teaches World History and team teaches an American Studies course. He also teaches one online course in World History. In addition to his teaching responsibilities, he is the girls' varsity bowling coach. Jay was one of the original members of the Youth Network for Healthy Communities team and has enjoyed ten years of working with that project and connecting with so many students and teachers across the state. In his spare time he enjoys reading, gardening and anything outdoors.

Quick Reference Guide for Ethics

Kelly Edwards, PhD edwards@u.washington.edu
University of Washington School of Medicine

Ethics: What is the right act? And what makes it so?

Core Skills in Ethics:

- ✓ Recognition: What are the issues? What is at stake?
- ✓ Reasoning: Can you reason through the dilemma (see below)?
- ✓ Responsibility: What is your professional or personal obligation?
- ✓ Respond: What will you do? (And why?)

Frameworks for Ethics: The following three approaches are used in most ethical arguments. Each framework is valid, but it is important to be explicit about which framework is being used, otherwise disagreements may appear insolvable (if rules are being countered with consequences, for example). It can be useful to review justifications for alternative solutions from each perspective, working toward the best possible solution:

- ✓ **Rule-based: an action is right if it follows fundamental moral rules**
 - Rules and principles may come from multiple sources, including one's profession, society, religion, or an institution. Rules or principles, even from within the same system, may come into conflict at any one time. Common principles: respect for persons, autonomy, beneficence, nonmaleficence, justice.
- ✓ **Consequence-based: an action is right if the good consequences outweigh the bad consequences**
 - The reasoning process here involves identifying specific anticipated, as well as unintended, outcomes of various options.
- ✓ **Virtue-based: an action is right if it enacts a core purpose**
 - The reasoning process in this approach involves identifying what role the decision maker will take in the situation (is it one of physician? Student? Citizen? Scientist? Physician? Policymaker?). From there, one must decide what the core values are for that position (e.g. what would the ideal physician do?). These core values should capture the core purpose (e.g. as a mother, my core purpose is to protect my children from harm). What would physicians you admire do? "Character is what happens when no one is watching."

These frameworks will all come into play when you are using the other ethics approaches (principlism, casuistry, narrative, feminist). After working through any process you will need to justify a preferred course of action. What will you do, and why?

The Five E's Instructional Model

As you prepare and pilot your EOHS Unit, we ask that you use the 5 E's instructional model to help frame your planning. This model will help ensure that you are using an inquiry-based approach with your students and will help us track what you did with your students so we can easily share it with other teachers who might want to implement the unit with their students.

The 5 E's is an instructional model based on the ***constructivist approach** to learning, which says that learners build or construct new ideas on top of their old ideas. The 5 E's can be used with students of all ages, including adults. Each of the 5 E's describes a phase of learning, and each phase begins with the letter "E": **Engage, Explore, Explain, Elaborate, and Evaluate**. The 5 E's allows students and teachers to experience common activities, to use and build on prior knowledge and experience, to construct meaning, and to continually assess their understanding of a concept.

Engage: This phase of the 5 E's starts the process. An "engage" activity should do the following:

- Make connections between past and present learning experiences
- Anticipate activities and focus students' thinking on the learning outcomes of current activities. Students should become mentally engaged in the concept, process, or skill to be learned.

Explore: This phase of the 5 E's provides students with a common base of experiences. They identify and develop concepts, processes, and skills. During this phase, students actively explore their environment or manipulate materials.

Explain: This phase of the 5 E's helps students explain the concepts they have been exploring. They have opportunities to verbalize their conceptual understanding or to demonstrate new skills or behaviors. This phase also provides opportunities for teachers to introduce formal terms, definitions, and explanations for concepts, processes, skills, or behaviors.

Elaborate: This phase of the 5 E's extends students' conceptual understanding and allows them to practice skills and behaviors. Through new experiences, the learners develop deeper and broader understanding of major concepts, obtain more information about areas of interest, and refine their skills.

Evaluate: This phase of the 5 E's encourages learners to assess their understanding and abilities and lets teachers evaluate students' understanding of key concepts and skill development.

***Constructivism** is a learning strategy that draws on students' existing knowledge, beliefs, and skills. With a constructivist approach, students synthesize new understanding from prior learning and new information. The constructivist teacher sets up problems and monitors student exploration, guides student inquiry, and promotes new patterns of thinking. **Working mostly with raw data, primary sources, and interactive material, constructivist teaching asks students to work with their own data and learn to direct their own explorations.** Ultimately, students begin to think of learning as accumulated, evolving knowledge. Constructivist approaches work well with learners of all ages, including adults.

From: <http://enhancinged.wgbh.org/research/eeeeee.html>

What the teacher does:

Stage	That is CONSISTENT with the model	That is INCONSISTENT with the model
ENGAGE	<ul style="list-style-type: none"> • Piques students' curiosity and generates interest • Determines students' current understanding (prior knowledge) of a concept or idea • Invites students to express what they think • Invites students to raise their own questions 	<ul style="list-style-type: none"> • Introduces vocabulary • Explains concepts • Provides definitions and answers • Provides closure • Discourages students' ideas and questions
EXPLORE	<ul style="list-style-type: none"> • Encourages student-to-student interaction • Observes and listens to the students as they interact • Asks probing questions to help students make sense of their experiences • Provides time for students to puzzle through problems 	<ul style="list-style-type: none"> • Provides answers • Proceeds too rapidly for students to make sense of their experiences • Provides closure • Tells the students that they are wrong • Gives information and facts that solve the problem • Leads the students step-by-step to a solution
EXPLAIN	<ul style="list-style-type: none"> • Encourages students to use their common experiences and data from the Engage and Explore lessons to develop explanations • Asks questions that help students express understanding and explanations • Requests justification (evidence) for students' explanations • Provides time for students to compare their ideas with those of others and perhaps to revise their thinking • Introduces terminology and alternative explanations after students express their ideas 	<ul style="list-style-type: none"> • Neglects to solicit students' explanations • Ignores data and information students gathered from previous lessons • Dismisses students' ideas • Accepts explanations that are not supported by evidence • Introduces unrelated concepts or skills
ELABORATE	<ul style="list-style-type: none"> • Focuses students' attention on conceptual connections between new and former experiences • Encourages students to use what they have learned to explain a new event or idea • Reinforces students' use of scientific terms and descriptions previously introduced • Asks questions that help students draw reasonable conclusions from evidence and data 	<ul style="list-style-type: none"> • Neglects to help students connect new and former experiences • Provides definitive answers • Tells students that they are wrong • Leads students step-by-step to a solution
EVALUATE	<ul style="list-style-type: none"> • Observes and records as students demonstrate their understanding of concept(s) and performance of skills • Provides time for students to compare their ideas with those of others and perhaps to revise their thinking • Interviews students as a means of assessing their developing understanding • Encourages students to assess their own progress 	<ul style="list-style-type: none"> • Tests vocabulary words, terms, and isolated facts • Introduces new ideas or concepts • Creates ambiguity • Promotes open-ended discussion unrelated to the concept or skill

What the students do:

Stage	That is CONSISTENT with the model	That is INCONSISTENT with the model
ENGAGE	<ul style="list-style-type: none"> • Become interested in and curious about the concept/topic • Express current understanding of a concept or idea • Raise questions such as, What do I already know about this? What do I want to know about this? How could I find out? 	<ul style="list-style-type: none"> • Ask for the “right” answer • Offer the “right” answer • Insist on answers or explanations • Seek closure
EXPLORE	<ul style="list-style-type: none"> • “Mess around” with materials and ideas • Conduct investigations in which they observe, describe, and record data • Try different ways to solve a problem or answer a question • Acquire a common set of experiences so they can compare results and ideas • Compare their ideas with those of others 	<ul style="list-style-type: none"> • Let others do the thinking and exploring (passive involvement) • Work quietly with little or no interaction with others (only appropriate when exploring ideas or feelings) • Stop with one solution • Demand or seek closure
EXPLAIN	<ul style="list-style-type: none"> • Explain concepts and ideas in their own words • Base their explanations on evidence acquired during previous investigations • Record their ideas and current understanding • Reflect on and perhaps revise their ideas • Express their ideas using appropriate scientific language • Compare their ideas with what scientists know and understand 	<ul style="list-style-type: none"> • Propose explanations from “thin air” with no relationship to previous experiences • Bring up irrelevant experiences and examples • Accept explanations without justification • Ignore or dismiss other plausible explanations • Propose explanations without evidence to support their ideas
ELABORATE	<ul style="list-style-type: none"> • Make conceptual connections between new and former experiences • Use what they have learned to explain a new object, event, organism, or idea • Use scientific terms and descriptions • Draw reasonable conclusions from evidence and data • Communicate their understanding to others 	<ul style="list-style-type: none"> • Ignore previous information or evidence • Draw conclusions from “thin air” • Use terminology inappropriately and without understanding
EVALUATE	<ul style="list-style-type: none"> • Demonstrate what they understand about the concept(s) and how well they can implement a skill • Compare their current thinking with that of others and perhaps revise their ideas • Assess their own progress by comparing their current understanding with their prior knowledge • Ask new questions that take them deeper into a concept or topic area 	<ul style="list-style-type: none"> • Disregard evidence or previously accepted explanations in drawing conclusions • Offer only yes-or-no answers or memorized definitions or explanations as answers • Fail to express satisfactory explanations in their own words • Introduce new, irrelevant topics

From *The Teacher’s Guide to Using Technology to Study Cellular and Molecular Biology*, pages 11-12.

ATHENA Participant To Do List

The overall goal of the August workshop is to give you the knowledge and resources to be able to successfully incorporate environmental and occupational health sciences topics into your teaching. We hope that you are now excited and eager to communicate what you have learned to students and colleagues back at your school. How you do that is largely up to you. Here are a few guidelines, however, that we hope will help guide you between now and the May follow-up workshop.

To share what you have learned with your students:

- ✓ Review the various resources provided to you during the August session and identify one or more EOHS topics or concepts that will integrate well into your teaching.
- ✓ Review existing curricula and lesson plans related to that topic and decide if any of them will work in your unit. You are encouraged to adopt existing lesson plans or activities (no need to reinvent the wheel). You are also encouraged to consider using the Youth Network for Healthy Communities model and having your students share their culminating presentations with us here at UW via live videoconference. **We will need to know how many teachers plan to do this no later than December 31, 2010, however, in order to set up all the necessary logistics.**
- ✓ Use the Five E's Instructional Model to create a unit focused on the topic of your choice. **The unit should take a minimum of 5 hours of classroom time and include at least one student assignment and evaluation component.** Use the "ATHENA EOHS Unit Planning Form" included on your thumb drive to document your unit plan.
- ✓ Pilot the unit with at least one class, then revise/complete your Unit Planning Form based on your experience. This document will be due a few weeks prior to the May 19th and 20th, 2011 session (exact date TBD) so we can collate all your work into a collection of lesson plans to share.

To share what you have learned with your colleagues:

- ✓ Identify colleagues at your school (e.g., other teachers, school nurse, vocational guidance counselor, etc.) who would benefit from knowing more about EOHS and the related academic programs here at the UW. Share information and resources with them in whatever way you deem appropriate. Possibilities include: presenting at an after school in-service or department meeting, meeting with your district curriculum person and sharing information with him or her, or having informal discussions with colleagues. Keep track of these interactions so you can include them in your May presentation.

To share what you have learned with us:

- ✓ Prior to the May workshop, prepare an engaging 15-minute presentation describing your EOHS Unit, reflecting on how it went, and reporting on how you shared EOHS resources and information with your colleagues. Consider taking photos as you implement the unit and bringing (de-identified) examples of actual student work to liven up your presentation.

ATHENA EOHS Unit Planning Form

Your name:

Your school:

Unit title:

Target grade level:

Target subject area(s):

Number of classes and students reached:

Dates implemented:

Brief synopsis of unit (2-3 sentences):

Learning objectives (a list of what the student should be able to do upon completion of the unit):

How does this unit integrate with the existing curriculum for the course(s) in which you are teaching it?

EALRs addressed by the unit:

Teacher preparation time required:

Time required to teach the unit (if given in class periods, please indicate how long a period is at your school):

Materials needed:

Set-up instructions for the teacher:

Background knowledge for the teacher (this can include excerpts from a variety of sources, summaries you have prepared yourself, as well as a list of references for further reading):

Health and safety notes (what do teachers need to do or know to keep their students safe?):

Using the approach described in the “**Five E’s Instructional Model**” handout included in your ATHENA materials, describe in detail the activities, discussions, assignments, etc. that make up this unit. Make sure to include what you as the teacher actually did, what was expected of students, etc. In some cases, an activity might address more than one of the Five E’s. That’s okay, just include it under the one you think fits the best and note in the description that it could fit under the other E as well. It is also common in practice that this flow of **Engage → Explore → Explain → Elaborate → Evaluate** is cyclical or iterative; you might go through the cycle several times in a unit. If so, try dividing the unit into individual “lessons,” each of which follows the flow below, and document the unit accordingly. If you are adopting existing curricula or lesson plans that don’t follow the Five E’s format, try modifying them to fit into this inquiry-based model.

FIVE E’S	Unit Elements (lectures, discussions, brainstorm, demonstrations, experiments, assignments, presentations, quizzes, field trips, etc.):
ENGAGE: <ul style="list-style-type: none"> • Pique students’ curiosity. • Generate interest. • Determine students’ current understanding of the concepts featured in the unit. • Invite students to raise their own questions. • Encourage students to compare their ideas with the ideas of others. • Allow you to assess what students do or do not understand about the stated outcomes of the lesson. 	NOTE: A Word version of this form is available on your thumb drive to use as a template.
EXPLORE: <i>Create opportunities for students to:</i> <ul style="list-style-type: none"> • Interact with materials and ideas during the unit. • Consider different ways to solve a problem or answer a question. • Acquire a common set of experiences with their classmates so they can compare results and ideas. • Observe, describe, record, compare, and share their ideas and experiences. • Express their developing understanding in various formats (e.g. orally, in writing, with graphs and images, etc.). 	

EXPLAIN:

Create opportunities for students to:

- Explain concepts and ideas about their investigations in their own words.
- Listen to and compare others' explanations of their results with their own.
- Become involved in student-to-student discourse in which they explain their thinking to others and debate their ideas.
- Revise their ideas.
- Record their ideas and current understanding.
- Use labels, terminology, and formal language to describe their current understanding.
- Compare their current thinking with what they previously thought.
- Compare their ideas with what scientists know and understand about the topic.

ELABORATE:

Create opportunities for students to:

- Make conceptual connections between new and former experiences.
- Use what they have learned to explain related phenomena not covered in the unit.
- Connect ideas, solve problems, and apply their understanding in these new situations.
- Use scientific terms and descriptions accurately in new contexts.
- Draw reasonable conclusions from evidence and data.
- Add depth to their understanding of concepts and processes.
- Effectively communicate their understanding to others.

EVALUATE:

Create opportunities for students to:

- Demonstrate what they understand about the concepts presented in the unit.
- Share their current thinking with others.
- Apply their understanding and knowledge in a unique, but related, situation.
- Assess their own progress by comparing their current understanding with their prior knowledge
- Ask new questions that take them deeper into a concept or topic area presented in the unit.

The examples above are modified from the teacher's guide for "Chemicals, The Environment, and You," pages 6-8.

ATTACHMENTS:

Please attach any handouts you used (e.g., readings, worksheets, assignments, reference lists, quizzes, etc.) as well as answer keys where appropriate. If possible, please attach a few examples of student work showing a range of performance levels. (Note: *Please white out any identifying information on student materials before submitting.*)

REFLECTION QUESTIONS:

Following implementation of the lesson, please take a few minutes to answer the following questions:

What went as expected and what had to be modified as you implemented the unit?

What would you do differently next time?

Several of the middle and high school curricula from the National Institutes of Health's *Curriculum Supplement Series* that are relevant to EOHS use the Five E's model. They are available as PDF files or as web-based supplements. The complete PDF files are included on your thumb drive in the "Curricula" folder.

Cell Biology and Cancer

<http://science-education.nih.gov/customers.nsf/HSCancer.htm>

Emerging and Re-emerging Infectious Disease

<http://science-education.nih.gov/customers.nsf/HSDiseases.htm>

Human Genetic Variation

<http://science-education.nih.gov/customers.nsf/HSGenetic.htm>

The Brain: Understanding Neurobiology Through the Study of Addiction

<http://science-education.nih.gov/customers.nsf/HSAddiction.htm>

Using Technology to Study Cellular and Molecular Biology

<http://science-education.nih.gov/customers.nsf/HSTechnology.htm>

Chemicals, the Environment, and You: Explorations in Science and Human Health

<http://science-education.nih.gov/customers.nsf/MSEnvironment.htm>

Understanding Alcohol: Investigations into Biology and Behavior

<http://science-education.nih.gov/customers.nsf/MSAlcohol.htm>

Resources: Web Sites

Government Web Sites

<http://depts.washington.edu/ceeh>

The UW Center for Ecogenetics and Environmental Health. This site features a variety of curriculum resources, fact sheets, and useful links for those interested in environmental health, ecogenetics, and bioethics.

<http://www.niehs.nih.gov/science-education/>

NIEHS Environmental Health Science Education Pages. This is a great place to start for students and teachers interested in learning more about environmental health. It includes links to on-line curricula, background information about a variety of topics, and links to pages designed specifically for students.

<http://toxtown.nlm.nih.gov/>

ToxTown. A great, user-friendly site where you can visit virtual places (city, town, port, farm, and US/Mexico border) and learn about the environmental health hazards that are found there. There is also great up-to-date information related to the recent Deepwater Horizon spill.

<http://toxmap.nlm.nih.gov/toxmap/main/index.jsp>

TOXMAP: Environmental Health e-Maps. Produced by the National Library of Medicine, this interactive mapping site lets you enter an address or zip code and see a map showing all of the Superfund sites and industries that report releases of toxic substances in that area. The site uses data from the EPA's Toxic Release Inventory (TRI) program and Superfund National Priorities List (NPL) to populate the maps, making them up-to-date and reliable.

<http://www.epa.gov/teachers/>

EPA Teaching Center. A wealth of links for teachers. The Curriculum Resources page has great links for EH topics, especially the Air, Human Health, Waste & Recycling, and Water sections. Also currently has featured resources on oil spill related lesson plans.

<http://sis.nlm.nih.gov/enviro.html>

The National Library of Medicine (NLM) Environmental Health and Toxicology Pages. Great source for detailed background information on a variety of topics and substances. Includes a set of great online toxicology tutorials.

<http://www.atsdr.cdc.gov/>

Agency for Toxic Substances and Disease Registry. This site includes very detailed information about a wide variety of hazardous substances ("Toxicological

Profiles” section). It also gives you an up-to-date list of all the hazardous waste sites in Washington (“Hazardous Waste Sites by State”).

<http://www.epa.gov/superfund/kids/>

Superfund for Kids Pages. Great information about hazardous waste cleanup and the EPA Superfund program - developed especially for kids.

<http://www.cdc.gov/health/default.htm>

The National Centers for Disease Control A-Z Index. This site can be searched for the latest information on any health topic.

<http://www.kingcounty.gov/healthservices/health.aspx>

Public Health Seattle King County. This site provides fact sheets, reports, and guidelines about toxic hazards and public health issues in Seattle and King County.

<http://phpartners.org/environmentalhealth.html>

Partners in Public Health - Environmental Health Pages. This site includes a comprehensive list of useful links to a variety of agencies and associations, substance-based resources, and professional associations.

Websites of Non-profit Organizations

<http://toxipedia.org/>

Toxipedia. Toxipedia is a wiki-website created to bring experts and lay people together to lessen the information gap between those with knowledge on environmental and public health and those that need the information to lead healthier lives.

<http://www.asmalldoseof.org/>

A Small Dose of Toxicology. This web site has great information about the history of toxicology, the precautionary principle, nanotechnology, and ethical issues related to environmental health. You can download various PowerPoint presentations here, as well as access a number of resources in Spanish.

<http://www.scorecard.org>

Scorecard. Go to this site and type in your zip code to get detailed information about who is polluting your neighborhood.

<http://www.nwabr.org/education/index.html>

The Northwest Association for Biomedical Research Education Page. this page is a excellent portal into a wide range of resources related to ethics education, including events, workshops, curricula and lesson plans.

<http://www.watoxics.org>

Washington Toxics Coalition. A Seattle-based non-profit organization dedicated to protecting public health and the environment by eliminating toxic pollution. The site includes news, updates on relevant legislative efforts, and activism opportunities.

<http://www.healthandenvironment.org/>

The Collaborative on Health and the Environment (CHE). A diverse network of more than 3000 individual and organizational Partners in 45 countries and 48 states, CHE is working collectively to advance knowledge and effective action to address growing concerns about the links between human health and environmental factors.

Environmental Justice Websites

<http://www.ccej.org/>

Community Coalition For Environmental Justice. This Seattle-based organization provides community education, speakers, activism opportunities, and an EJ library.

<http://www.ecoss.org>

Environmental Coalition of South Seattle. This group provides education and other resources on environmental health issues in south Seattle.

<http://www.clearcorps.org>

Clearcorps is a community organization working to protect children from lead poisoning. They toured an excellent play with local student actors called "Jimmy's getting better".

<http://www.weact.org/>

West Harlem Environmental ACTION (WEACT) is a non-profit working to improve environmental policy, public health, and quality of life in communities of color. WEACT advances its mission through research, public education, advocacy, organizing, government accountability, litigation, legislative affairs and sustainable economic development. WEACT works for environmental and social justice on issues of land use, waterfront development, brownfields redevelopment, transportation and air pollution, open space, and environmental health.

<http://www.ejrc.cau.edu/>

Environmental Justice Resource Center of Clark Atlanta University. Great resource for reports, news, books, other resources.

<http://www.ccae.org/>

Center for Community Action and Environmental Justice. Resource center for community groups working on EJ.

<http://www.ejhu.org/disparities.html>

The Environmental Justice and Health Union. They just announced the release of “Environmental Exposure and Racial Disparities” an analysis of racial exposure to environmental chemicals, which documents how people of different races living in the United States are exposed to different chemicals in the workplace and the home. See summary article at <http://www.rachel.org> (July 31, 2003 issue)

Resources: Curricula and Lesson Plans

National Institutes of Health Curriculum Supplement Series

Publisher: NIEHS with BSCS and Videodiscovery

Grade Level: 7 through 12 (depending on the supplement)

Format: Some available in print, all available online as PDFs and with web-based components and activities.

URL: <http://science-education.nih.gov/customers.nsf/WebPages/CSHome>

Description: The NIH curriculum supplements are teacher's guides to two weeks of lessons on the science behind selected health topics. They combine cutting-edge biomedical discoveries with state-of-the-art instructional practices. HTML and PDF versions of each supplement are online and accessible to all. Print versions are FREE upon request to educators in the U.S. There is a great EH-focused supplement for middle school students called "*Chemicals, The Environment and You.*" Topics covered at the high school level are:

- Exploring Bioethics
- Cell Biology and Cancer
- Emerging and Re-emerging Infectious Diseases
- Human Genetic Variation
- The Brain: Understanding Neurobiology Through the Study of Addiction,
- Sleep, Sleep Disorders and Biological Rhythms
- Using Technology to Understand Cellular and Molecular Biology

Environmental Health Perspectives Education Partnership

Publisher: Environmental Health Perspectives (Journal of the NIEHS)

Grade Level: Various

Format: Excel File with matrix of all available lesson plans, Searchable database of lessons, Downloadable PDF files of actual lessons, and a web page with links related to each lesson.

URL: <http://ehp.niehs.nih.gov/science-ed-new/download.html>

Description: *Environmental Health Perspectives* (EHP) is a monthly journal of peer-reviewed research and news on the impact of the environment on human health. As part of their science education outreach efforts, they have created over 100 lesson plans as extensions to actual articles published in the journal. The topics are wide ranging and the lesson plans range in length from 30 minutes to several class periods.

The Quicksilver Question Web Module

Publisher: Center for Ecogenetics and Environmental Health

Grade Level: 6 - 8

Format: Online interactive game

URL: http://depts.washington.edu/ceeh/education_quicksilver.html

Description: This web-based interactive curriculum introduces students to the connections between historic gold mining, mercury contamination, fish consumption and human health. Students explore the fictional town of Quicksilver, Washington searching for a series of key documents that will help them decide if fish from the local lake are safe to eat. A series of in-class extension activities are available for teachers in a variety of subject areas.

The Environmental Health Fact File: LEAD

Publisher: Center for Ecogenetics and Environmental Health

Grade Level: 6 - 8

Format: PDF document

URL: http://depts.washington.edu/ceeh/education_resources.html

Description: A collection of integrated lesson plans designed to introduce middle school students to the topic of lead and its effects on human health. This curriculum provides EALR aligned lesson plans to teachers in a variety of subjects. At least two lessons are provided for each subject. The lessons are designed to be stand-alone units, allowing teachers to mix and match lessons and present them in any order. Resource materials are also included to help school librarians who are facilitating student research projects. This Fact File is also a valuable resource for school nurses, out of school programs, and parents.

The Environmental Health Fact File: ASTHMA

Publisher: Center for Ecogenetics and Environmental Health

Grade Level: 6 - 8

Format: PDF document

URL: http://depts.washington.edu/ceeh/education_resources.html

Description: A collection of integrated lesson plans designed to introduce middle school students to the topic of asthma and its effects on human health. This curriculum provides EALR aligned lesson plans to teachers in a variety of subjects. At least two lessons are provided for each subject. The lessons are designed to be stand alone units, allowing teachers to mix and match lessons and present them in any order. Resource materials are also included to help school librarians who are facilitating student research projects. This Fact File is also a valuable resource for school nurses, out of school programs, and parents.

The Health & Environment Activities Research Tool (HEART)

Publisher: Center for Ecogenetics and Environmental Health

Grade Level: 6 - 8

Format: PDF document

URL: http://depts.washington.edu/ceeh/education_resources.html

Description: A collection of worksheets and resources that helps teachers engage their students in locally relevant environmental health research projects. These inquiry-based materials provide the scaffolding necessary for students to successfully identify and investigate how things in their environment impact their health.

The Youth Network for Healthy Communities (YNHC)

Publisher: Center for Ecogenetics and Environmental Health

Grade Level: 6 - 12

Format: Videoconference network with dedicated classroom resources

URL: http://depts.washington.edu/ceeh/education_ynhc.html

Description: YNHC is a video conference series that gives middle and high school teachers in Washington state the opportunity to work with students on environmental health issues in their communities. Students prepare projects and present their findings to experts at the University of Washington via the statewide K20 video conference network. Participating teachers receive a stipend and Teacher's Guide that includes student worksheets and classroom resources.

Project Ambient Modules

Publisher: University of Miami, NIEHS

Grade level: 9 - 12

Format: Web site

URL: <http://www.rsmas.miami.edu/groups/niehs/ambient/modules.html>

Description: A comprehensive interdisciplinary environmental health curriculum targeted to urban students in a culturally sensitive manner. There are modules on Air, Water, Soil, Food, Toxicology, Ethics, and soon Global Change. The curriculum also has evaluation pages.

The SEPUP Modules

Publisher: Lawrence Hall of Science, UC Berkeley

Grade Level: 6 - 9

Format: Print materials and science kits

URL: <http://www.lawrencehallofscience.org/sepup/>

Description: A SEPUP (Science Education for Public Understanding) Module is a series of related activities designed for the secondary grades. These activities use inquiry-based problem-solving approaches to learning that emphasize the importance of basing one's decisions on evidence. There are 12 different modules. Modules cover topics such as risk, threshold limits, water quality, toxic waste, food additives, and household chemicals. Each module includes a kit containing materials needed to complete the activities, student pages, and background and instructional materials for the teacher. (Cost varies)

Exploring Environmental Issues: Focus on Risk

Publisher: Project Learning Tree

Grade Level: 9 - 12

Format: Print materials

URL: <http://www.plt.org/curriculum/risk.cfm>

Description: This module helps students explore the different aspects of environmental and human health risks that affect their everyday lives. It incorporates science, social studies, math, geography, and language arts. Through eight hands-on activities, students analyze, explore, discover, and learn about risk assessment, risk communication, risk perception, and risk management. (Free to teachers who participate in a workshop.)

Project Hydroville

Publisher: Oregon State University, Corvallis, OR.

Grade Level: 7 - 12

Format: Print materials

URL: <http://www.hydroville.org/>

Description: An excellent integrated curriculum based on a hypothetical pesticide spill. Activities train students to be "experts" in four jobs necessary to cleaning up the spill: mechanical engineer, environmental toxicologist, soil scientist, and analytical chemist. Very well laid-out, with activities and extensions to the four major subject areas. Teacher training workshops available.

Thinkport: Environmental Health Connections

Publisher: Maryland Public Television and Johns Hopkins University Center for Technology in Education

Grade level: 6-8

Format: Web site

URL: <http://www.thinkport.org/Career/connections/default.tp>

Description: Curriculum modules designed by teachers include several lessons on environmental health. Most involve watching short video clips- topics such as asthma, water, air pollution, waste water, cholera. For lessons and videos, type a keyword into the search box on the homepage, and scroll down below the advanced search menu. Also, there are two excellent “mystery” scenarios about Environmental Health issues (mold/asthma and water) featuring excellent videos and supporting materials.

PEER (The Partnership for Environmental Educational and Rural Health) Modules

Publisher: Texas A&M (NIEHS supported)

Grade Level: 6 -8

Format: Web site, CD-ROM, print materials

URL: <http://peer.tamu.edu/>

Description: This Integrative Curricula follows an adventure story in which the characters (middle-school aged students) travel in time and space to different parts of the world where they are faced with various environmental health problems that they are required to solve.

Strive to Thrive

Publisher: Miami University Center for Chemistry Education

Grade Level: 7-12

Format: Web site

URL: <http://www.terrificscience.org/thrive>

Description: The Strive to Thrive! activity handbooks, written directly to the young teen audience, allow for learning and discovery that draws teens, their families, and friends into discussions on these pertinent topics. These handbooks are great resources for self-directed learning in informal settings such as science clubs, youth organizations, and after school programs.

University of Arizona Center for Toxicology Educational Activities and Curricula

Publisher: University of Arizona (NIEHS supported)

Grade Level: 7 -12

Format: Web site

URL: <http://coep.pharmacy.arizona.edu/curriculum/index.html>

Description: At this site there are a variety of curricula that involve both online and lab activities, with downloadable instructions, overheads, and handouts.

Assessing Toxic Risk

Publisher: NSTA Press

Grade Level: 7 -12

Format: Books (teacher and student editions)

URL: <http://www.nsta.org/recommends/ViewProduct.aspx?ProductID=12835>

Description: Good curriculum about toxicology concepts aimed at high school students. Focuses on bioassays; e.g. testing the effects of chemicals on duckweed, daphnia, or seed germination. Includes laboratory activities, and a section to help

students plan bioassay experiments to test the effects of suspected toxics. Student and teacher editions are available for a fee.

Toxic Leak! An Event-based Science Module

Publisher: Addison-Wesley

Grade Level: 7 -12

Format: Books (teacher and student editions) and accompanying video

URL: <http://www.ebsinstitute.com/ebs.ToxicLeak.html>

Description: An interdisciplinary curriculum centered around a real gasoline leak, that contains activities to study groundwater, pollution, permeability and porosity of soils, and geology. The unit is inquiry-oriented and emphasizes cooperative learning, teamwork, independent research, and hands-on investigations.

Health and Safety Awareness for Working Teens

Publisher: UW and WA Labor and Industries

Grade Level: 9 -12

Format: Print curricula and accompanying videos

URL: <http://www.uvworksafe.com>

Description: This website is a link to information and curriculum resources available to educate teens and young workers in Washington State. The site also provides basic information for educators, teens, parents, and employers around young worker health and safety information.

Resources: News and In-depth Reports

EOHS Related News Sites

<http://www.ehponline.org/>

Environmental Health Perspectives (EHP) is a monthly journal of peer-reviewed research and news on the impact of the environment on human health. EHP is published by the National Institute of Environmental Health Sciences and its content is free online.

<http://www.EnvironmentalHealthNews.org>

Environmental Health News is a news service to increase public understanding of emerging scientific links between environmental exposures and human health. They also have a free subscription service called "Above the Fold" that sends you a single email each day with links to EH related articles from around the world.

<http://www.OurStolenFuture.org>

Our Stolen Future. The book *Our Stolen Future* brought world-wide attention to scientific discoveries about endocrine disruption and the fact that common contaminants can interfere with the natural signals controlling development of the fetus. This website tracks the most recent developments in this area of research.

<http://www.protectingourhealth.org/>

Protecting Our Health is the science web site for the Collaborative on Health and the Environment, a non-profit organization dedicated to raising awareness of the impacts of the environment on human health.

<http://www.ewg.org/>

The Environmental Working Group. A national watchdog organization that provides up-to-the-minute information on EH news.

<http://ace.orst.edu/info/extoxnet/newsletters/ucdnl.htm>

The Environmental Toxicology Newsletter is one of the best newsletters for interesting environmental toxicology articles. Arrange for email notification of the latest issue.

EOHS Related In-depth Reports

<http://www.pbs.org/wgbh/pages/frontline/poisonedwaters/>

Poisoned Waters is an excellent PBS series investigating the state of America's waterways and how they may be impacting human health. The program is available on DVD and includes resources for use in classrooms.

http://seattletimes.nwsourc.com/news/special/fear_fields.html

"Fear in the Fields: How Hazardous Wastes become Fertilizer." An alarming and award-winning series from 1997 that lead to the book: "Fateful Harvest : The True Story of a Small Town, a Global Industry, and a Toxic Secret." A must-read eye-opening exposé of the practice of turning hazardous waste into fertilizer.

<http://seattlepi.nwsourc.com/specials/sound/index.asp>

"Our Troubled Sound." A series of great articles about pollution in the Puget Sound.

<http://seattlepi.nwsourc.com/specials/mining/index.asp>

"The Mining of the West." A series of articles about mining and its environmental (and environmental health) impacts. In-depth Special Reports Related to Environmental Health

<http://seattlepi.nwsourc.com/specials/arsenic/>

"Arsenic's Legacy." A short series about the health risks of arsenic contamination by Asarco smelters and older pesticides containing arsenic.

<http://seattlepi.nwsourc.com/uncivilaction/>

"Uncivil Action: Asbestos mining leaves a deadly legacy in Libby, MT and nationwide." This series also lists other recent coverage of asbestos issues.

<http://seattlepi.nwsourc.com/methamphetamines/>

"An epidemic in Our Midst: Methamphetamines." This series won an award for best environmental health story.

<http://seattlepi.nwsourc.com/pipelines/>

"Pipelines: America's hidden hazards." Based on the pipeline explosion in Bellingham.

<http://seattlepi.nwsourc.com/specials/pesticides.shtml>

"A Tainted Land." An award-winning report consisting of two articles about pesticide contamination and high leukemia rates in Whatcom County.

<http://www.pbs.org/unnaturalcauses/>

Unnatural Causes. A four-part PBS documentary series focusing on the issue of health disparities. The series criss-crosses the country investigating the stories and findings that are shaking up conventional notions about what makes us healthy or sick. It turns out there's much more to our well-being than genes, behaviors and medical care. The social, economic, and physical environments in which we are born, live and work profoundly affect our longevity and health – as much as smoking, diet and exercise.

Readings: EOHS Related Books

Text Books

Basic Environmental Health

Annalee Yassi, Tord Kjellstrom, Theo de Kok, and Tee L. Guidotti, Oxford University Press, 2001.

Environmental Health

Dade W. Moeller, Harvard University Press, 2004.

Living with the Earth: Concepts in Environmental Health Science

Gary S. Moore, CRC Press, 2007.

Our Global Environment: A Health Perspective

Anne Nadakavukaren, Waveland Press, 2005

Other EOHS Related Books

A Small Dose of Toxicology

Steven Gilbert, Informa Healthcare, 2004.

"I found this book to be a delightful text that reminded me of all the wonderful ways in which toxicology impacts our lives... It is a great primer for young people considering a career in the field, but, importantly, is also an excellent text for introducing the topic to the general public, something that I feel has historically been lacking. The author should be commended for his efforts in compiling this text." - *BTS Newsletter*

Been Brown so Long, It Looked Like Green to Me: The Politics of Nature

Jeffrey St. Clair, Common Courage Press, 2003.

"From the co-founder of CounterPunch, "America's best political newsletter" (Out of Bounds Magazine) comes a comprehensive seven-part reader on environmental politics. Covering everything from toxics to electric power plays, St. Clair gives you a shocking view of how money and power determine the state of our environment. St. Clair names the culprits and exposes the deeds. The book opens with Oregon as a metaphor for the nation. Now becoming "Californicated," Oregon's mythological beauty is transforming into just that: more myth every day." - *Amazon.com product description*

Collapse: How Societies Choose to Fail or Succeed

Jared Diamond, The Penguin Group USA, 2005.

"Jared Diamond's Collapse: How Societies Choose to Fail or Succeed is the glass-half-empty follow-up to his Pulitzer Prize-winning *Guns, Germs, and Steel*. While that book explained the geographic and environmental reasons why some human populations have flourished, Collapse uses the same factors to examine why ancient societies, including the Anasazi of the American Southwest and the Viking colonies of Greenland, as well as modern ones such as Rwanda, have fallen apart. Not every

collapse has an environmental origin, but an eco-meltdown is often the main catalyst, he argues, particularly when combined with society's response to (or disregard for) the coming disaster.” – *Amazon.com Review*

DDT, Silent Spring, and the Rise of Environmentalism

William Cronon, University of Washington Press, 2008.

“No single event played a greater role in the birth of modern environmentalism than the publication of Rachel Carson's *Silent Spring* and its assault on insecticides. This collection of documents, the first of its kind, traces shifting attitudes toward DDT and pesticides in general through a variety of sources: excerpts from scientific studies and government reports, advertisements from industry journals, articles from popular magazines, and the famous "Fable for Tomorrow" from *Silent Spring*. Beginning with attitudes toward nature at the turn of the twentieth century, the book moves through the use and early regulation of pesticides; the introduction and early success of DDT; the discovery of its environmental effects; and the uproar over *Silent Spring*. It ends with recent debates about DDT as a potential solution to malaria in Africa. These texts allow readers to see how scientists, pesticide manufacturers, conservationists, and ordinary citizens approached this issue and how profoundly their attitudes changed from the 1890s to the present.” – *Amazon.com product description*

Deceit and Denial: The Deadly Politics of Industrial Pollution

Gerald Markowitz and **David Rosner**, University of California Press, 2003.

“This is a historical account of corporate control of the lead, plastics, and petroleum industries and the campaign of denial regarding the toxic effects on workers, consumers, and the general public of chemicals used in the manufacture of paint, toys, furniture, plastics, and other products.” – *Library Journal review*

Doubt is Their Product: How Industry's Assault on Science Threatens Your Health

David Michaels, Oxford University Press, 2008.

"In *Doubt Is Their Product*, David Michaels gives a lively and convincing history of how clever public relations has blocked one public health protection after another. The techniques first used to reassure us about tobacco were adapted to reassure us about asbestos, lead, vinyl chloride-and risks to nuclear facilities workers, where Dr. Michaels' experience as the relevant Assistant Secretary of Energy gave him an inside view. And if you're worried about climate change, keep worrying, because the same program is underway there." - *Donald Kennedy, Editor-in-Chief, Science*

Dumping in Dixie: Race, Class, and Environmental Quality, 3rd Edition

Robert Bullard, Westview Press, 2000.

“To be poor, working-class, or a person of color in the United States often means bearing a disproportionate share of the country's environmental problems. Starting with the premise that all Americans have a basic right to live in a healthy environment, *Dumping in Dixie* chronicles the efforts of five African American communities, empowered by the civil rights movement, to link environmentalism with issues of social justice. In the third edition, Bullard speaks to us from the front lines of the environmental justice movement about new developments in environmental racism, different organizing strategies, and success stories in the struggle for environmental equity.” – *Amazon.com product description*

Exploring the Dangerous Trades: The Autobiography of Alice Hamilton, M.D.

Alice Hamilton, Miller Press, 2007.

“Alice Hamilton, the first woman appointed to the faculty of Harvard Medical School, said she chose medicine as a career not because she was scientifically minded but because, as a doctor she could go anywhere she pleased and be quite sure that she would be useful. Her commitment to making her life count led her to combined roles as scientific researcher, skillful negotiator, labor organizer, and vocal and tireless crusader for social reform. In *Exploring the Dangerous Trades*, she recounts the story of her remarkable life with wit and forthrightness.” - *Occupational and Environmental Medicine website*

Fast Food Nation: The Dark Side of the All-American Meal

Eric Schlosser, Harper Perennial, 2005.

“Schlosser's incisive history of the development of American fast food indicts the industry for some shocking crimes against humanity, including systematically destroying the American diet and landscape, and undermining our values and our economy. The first part of the book details the postwar ascendance of fast food from Southern California, assessing the impact on people in the West in general. The second half looks at the product itself: where it is manufactured (in a handful of enormous factories), what goes into it (chemicals, feces) and who is responsible (monopolistic corporate executives). In harrowing detail, the book explains the process of beef slaughter and confirms almost every urban myth about what in fact “lurks between those sesame seed buns.” – *Publisher's Weekly review*

Food Inc.: Mendel to Monsanto – The Promises and Perils of the Biotech Harvest

Peter Pringle, Simon & Schuster, 2005.

“Imagine a world where yellow beans are patented, aromatic basmati rice has lost its fragrance because of genetic tinkering and Canadian farmers are sued by multinational behemoths because pollen from GM (genetically modified) crops somehow got into their fields and fertilized their plants. You don't have to imagine it: this, says Pringle, is the world we live in today. A widely published journalist, Pringle (*Those Are Real Bullets*) paints a troubling picture of the world's food supply.” *Publisher's Weekly review*

Guns, Germs and Steel: The Fates of Human Societies

Jared Diamond, W.W. Norton & Company, 2005.

“Most of this work deals with non-Europeans, but Diamond's thesis sheds light on why Western civilization became hegemonic: ‘History followed different courses for different peoples because of differences among peoples’ environments, not because of biological differences among peoples themselves.; Those who domesticated plants and animals early got a head start on developing writing, government, technology, weapons of war, and immunity to deadly germs.” – *Library Journal review*

Lasso the Wind: Away to the New West

Timothy Egan, Vintage Departures, 1999.

“In a freewheeling, deeply meditative journey across “the big empty” (the 11 contiguous states west of the 100th Meridian), Egan, the Pacific Northwest correspondent for the New York Times, attempts to understand the American West, a place caught between myth and modernity. Beginning in Jackson Hole, Wyo., at a gathering of writers, ranchers and Native Americans debating “the next hundred years in the American West,” Egan sets out across the vast landscape, using a different city as a jumping-off point in each chapter. What emerges is a portrait of the new West constantly at odds with the old: defiant cattlemen fight to preserve their dying industry, passing protective laws in the name of “custom and culture”; the residents of Butte, Montana, wait for the toxic waste from a huge abandoned copper mine to overflow and destroy the once-prosperous city; and everywhere ambitious communities such as Las Vegas scramble for more of the precious water that would bring life to the desert - life, that is, in the form of residential complexes with lush grass lawns.” – *Publisher’s Weekly review*

The Arsenic Century: How Victorian England Was Poisoned at Home, Work, and Play

James Whorton, Oxford University Press, 2010.

“Arsenic is rightly infamous as the poison of choice for Victorian murderers. Yet the great majority of fatalities from arsenic in the nineteenth century came not from intentional poisoning, but from accident. Kept in many homes for the purpose of poisoning rats, the white powder was easily mistaken for sugar or flour and often incorporated into the family dinner. It was also widely present in green dyes, used to tint everything from candles and candies to curtains, wallpaper, and clothing (it was arsenic in old lace that was the danger). Whether at home amidst arsenical curtains and wallpapers, at work manufacturing these products, or at play swirling about the papered, curtained ballroom in arsenical gowns and gloves, no one was beyond the poison's reach.” – *Amazon.com product description*

The Hawk’s Nest Incident: America’s Worst Industrial Disaster

Martin Cherniack, Yale University Press 1986.

“In the early 1930s, the Union Carbide Company dug a water tunnel along a river in West Virginia to generate power for a chemical plant. After extensive research, including interviews with survivors and relatives, Cherniack concludes that over 700 workers died from acute silicosis, a disease little known at the time. From his account we learn more about what happened to the mostly black, mostly migrant laborers, digging a three-mile silicon-laden tunnel, than contemporary accounts were able to provide. We learn of the futility of those long-ago law suits and congressional hearings and of the power of a large corporation (Union Carbide). And we learn of the sad state, back then, of environmental concerns.” - *Library Journal review*

EOHS on Screen: 10 Documentaries to Get You Started

Addicted to Plastic (2008) – Plastics are perhaps the most ubiquitous and versatile material ever invented. This film is a global journey to investigate what is really known about the "material of a thousand uses". There is discussion of why there is so much of it, its toxic legacy, and what is being done to clean it up

Blue Vinyl (2002) – This film uses the new blue vinyl siding on the narrator's parents' house as a focal point for exploring pollution from vinyl production, dangers to anyone living in a building with vinyl siding, and the extensive cover-up that the industry has engaged in for decades. It gets a little long at times, but it is very thorough and thought provoking.

Environmental Hazards in the Home – Learn about hazards found in homes and become a more educated consumer of products containing toxins. (From <http://www.learn360.com/>)

Fresh (2009) – Although it includes coverage of the consequences of industrial agriculture: food contamination, environmental pollution, depletion of natural resources, and morbid obesity, the main focus is on forging healthier, sustainable farming and food alternatives. The film offers a practical vision for the future of our food and our planet.

Homo Toxicus (2009) – Carried out with intelligence and humor, *Homo Toxicus* explores the myriad links between toxic chemicals and increasingly common health problems such as cancer, allergies, hyperactivity, and infertility.

Public Exposure – Learn how cell phones and other electronic devices are (or may be) impacting our health. (Available on <http://video.google.com> for free downloading/streaming)

Teen Workers: Real Jobs, Real Risks (2005) – A short presentation for teens of information they need to know about their rights and responsibilities on the job, especially in relation to safety and health. (Available from <http://www.uwworksafe.com/request/index.cfm>)

The Story of Stuff, ...Cosmetics...Bottled Water – Deceptively simple in concept, these line drawing animations, narrated by Annie Leonard, are great overviews of how "stuff" impacts our health. All are available from <http://www.storyofstuff.com>)

Toxic Trespass (2007) – This is an investigation into the effects of the chemical soup around us, and a survey of two Canadian toxic hotspots, with startling clusters of deadly diseases. Much of what is covered in this video is also in *Homo Toxicus*, but they are different enough to show both.

Water Pollution and Related Diseases – See the effect of contaminated water on those exposed to the parasites and toxins in it. (From <http://www.learn360.com/> streaming)

And One "Cartoon"

The Meatrix (2003) – These three animated movies draw attention to the problems created by industrial agriculture (the meat industries in particular) by spoofing the *Matrix* trilogy of films. They are humorous and attention grabbing, but should be followed with other, more balanced presentations.

Find more videos reviewed at <http://www.grinningplanet.com> under the "movies" tab at the top. And don't forget to look at your ESD media center and search YouTube.

