DOCUMENT RESUME

ED 360 252 SO 023 350

AUTHOR Harik, Ramsay M.
TITLE Thinking about Our Future: War, Society, and the Environment. A Series of Lesson Plans.
INSTITUTION Indiana Univ., Bloomington. Indiana Center on Global Change and World Peace.
PUB DATE 93
NOTE 130p.
PUB TYPE Guides - Classroom Use - Teaching Guides (For Teacher) (052)

EDRS PRICE MF01/PC06 Plus Postage.
DESCRIPTORS Citizen Participation; Cooperative Learning; Ecology; Environment; High Schools; International Relations; Nuclear Warfare; Peace; Social Studies; War; World Affairs
IDENTIFIERS Cold War; Global Education; Peace Education

ABSTRACT

This packet of 11 lesson plans is designed to help high school social studies classes examine socio-political issues facing the post-Cold War world. Though its multi-disciplinary approach touches upon a number of current topics, the packet's particular focus is on the wide-ranging impact of war and militarism on the planet's growing ecological crises. The lessons have been designed to introduce students to the background information they need to intelligenly analyze today's international news, as well as to encourage students to ask critical, normative questions such as "what is the meaning of 'security' in today's world?" and "what is the role of the citizen in fostering environmental consciousness?" A basic premise running throughout the lessons is that new, globally-oriented thinking must take the place of the old, narrowly defined nation-state system if humanity is going to overcome the environmental crisis facing it. Thus, in addition to lessons such as "Re-thinking 'Security' in the "'New World Order'" and "Weapons Conflict Resolution at the Personal, Social, and International Level," there is also a strong focus on nuclear proliferation as a paradigm of the special dangers of violent confrontation in the modern age. The lessons offer a variety of activities and strategies to encourage an active and constructive engagement with these issues, in particular role-playing, cooperative learning formats, and journaling. A resource list at the end of the packet describes currently available fiction, non-fiction, videos, journals, and organizations relevant to the issues at hand. (RMH)

THINKING ABOUT OUR FUTURE:

WAR, SOCIETY, AND THE ENVIRONMENT

A Series of Lesson Plans

designed by

Ramsay M. Harik

and sponsored by

The Indiana Center on Global Change

and

World Peace

ACKNOWLEDGEMENTS

The author would like to thank a very special educator, Dr. Paul Singh, for inspiring this project, as well as Dr. James Becker for his wise guidance, Dr. John Lovell for his thoughtful support, and Victoria Cuffel for her valuable assistance throughout. The author would also like to thank the Joyce Mertz-Gilmore Foundation for a generous grant which made this project possible.

TABLE OF CONTENTS

FOREWORD

A remarkable series of events in the early 1990's relegated the Cold War to history. These striking events created hopes among peoples the world over for a better future. The subsequent instability and violence in much of the world, along with increasing concern about the environment, suggest that even more far-reaching changes are necessary if hopes for a new and better world order are to be realized. Violence and anarchy, political instability, the continuing availability of arms--nuclear and conventional--and the environmental costs of these developments create challenges as daunting as any during the Cold War.

Interest in these issues is growing, but there are few accurate, up-to-date materials available to inform public discussion of the costs and benefits of various proposals for meeting these challenges. Thinking About Our Future: War, Society, and The Environment, designed by Ramsay M. Harik and sponsored by the Indiana University Center on Global Change and World Peace, addresses these issues for high school social studies students (and others) in a timely, balanced, and effective manner. These lesson plans provide the information, insights, and teaching strategies to help teachers help their students come to grips with these critical global concerns.

Dr. James Becker
Senior Consultant
Social Studies Development Center
Indiana University School of Education

THINKING ABOUT OUR FUTURE:
WAR, SOCIETY, AND THE ENVIRONMENT
Eleven interdisciplinary lessons
designed for high school age and above.

"The future is big with every possibility of achievement and tragedy."

Alfred North Whitehead

I. INTRODUCTION

The momentous world political transformations of the last several years have captured the imaginations of us all, filling us with great hope for a safer, saner world. For the social studies teacher and his or her students, it is an especially exciting time, as we watch and analyze history unfolding before our eyes. Now more than ever, it is in the social studies classroom that tomorrow's adults must cultivate the understanding they will need if they are to participate wisely in the shaping of a credible "New World Order".

The questions facing us are large and often troubling. Given the immense changes, crises, and possibilities in today's world, what are the options now before us? Where do we go from here as a nation, as a species? What do we need to know and do to preserve a planet increasingly threatened by environmental disaster? What is the "new world order", and what ought it to be? What is the meaning of security in this new world of interdependence and common vulnerability? How do we adapt our thought and action to these newly emerging realities?

The exciting changes we have seen in the early 90's offer us historic new opportunities to create a safer world than the Cold War allowed. Yet as old dangers disappear, new threats emerge to confront us. The world's weapons are becoming ever more lethal and widespread, and the economic and environmental burdens they place on us are becoming ever harder to bear. Nuclear weapons, despite many encouraging cuts, still haunt us with their specter of untold destruction, especially as proliferation puts them within reach of unstable Third World nations and breakaway Soviet republics. The litany of environmental crises threatening our planet grows ever longer and more troubling. And as population grows and resources are stretched thin, we face the prospect of widespread shortages, famine, and accelerating social dislocation.

Yet we should also be aware that none of these crises is inevitable. With foresight and commitment, the nations of the world can recognize the global dimensions of today's problems and act promptly in cooperative efforts to save our increasingly fragile planet. The signs of the times offer us hope that the "new world order" will be characterized by just such common efforts to address our pressing common concerns. New-found collaboration between old enemies, the resurgence of the United Nations, and,

perhaps most importantly, a flowering of new globally-oriented thinking here and abroad all offer us powerful new tools to bring forth a world of genuine peace, justice, and sustainability. Huge opportunities lay before us, and as the world's most powerful nation, we as Americans have the chance to lead the world in seizing them.

What follows is a comprehensive book of interdisciplinary social studies lessons designed to identify and explore some of the most urgent--and promising--issues facing the world today. As citizens of the 21st century, today's students will find themselves challenged by unprecedented threats to global survival, and it is our hope that these lessons will help prepare them to face the challenge with knowledge, wisdom, and hope.

II. THE THEMES

> "Either war is finished or we are...war is an old habit of thought, an old frame of mind, an old political technique, that must now pass as human sacrifice and human slavery have passed. I have faith that the human spirit will prove equal to the long heavy task of ending war."
>
> Herman Wouk, author of War and Remembrance.

> "Security can only be that combination of economic, political, and military factors which protect populations and the civilizations they build. There is no room for genocidal devices, whether they are nuclear weapons, poison gases, or bacteriological agents...Whether in the United States, in the Soviet Union, or other parts of the world, the reality is that security depends on our common interest in humanity."
>
> Noel Gayler
> Admiral, former Commander-in-Chief
> U.S. Forces Pacific

Our lessonbook opens with an exploration of the environmental crises threatening our present and future (Lesson 1). Global warming, ozone depletion, air/water/soil pollution, loss of rainforest and arable land, toxic and radioactive wastes, and other ecological crises seem to loom larger every year. How did we arrive at such a predicament? How can we remedy it? Students today seem to appreciate the scope and urgency of the ecological crisis. Our approach challenges them further by looking at environmental degradation in its broadest dimensions--as a threat to the survival of life on earth, as a potential source of new conflict for the 21st century, and as an opportunity for unprecedented global cooperation. Perhaps no other topic is as ideally suited as this one is for exploring interdependence in today's world.

Not unrelated to the environmental crisis is the global arms race (Lessons 4 and 8). The effects of rampant militarization are powerfully documented in Ruth Leger Sivard's highly recommended annual report, World Military and Social Expenditures. These range from the threat of nuclear proliferation, to the bankrupting price tag of militarization, to the generation of tremendous amounts of toxic waste and environmental damage, and finally, of course, to the ghastly human and material destruction caused by 20th century wars. In the 127 wars waged around the world since 1945, 21.8 million human beings have been killed. By the late 80's, modern warfare had become so indiscriminate and wide-ranging that three-fourths of the war dead were civilians. Military control and repression in the Third World continue to go hand-in-hand, resulting in extreme human rights violations, anti-democratic governments, and serious misuse of resources and arable land.

The nuclear threat (Lessons 5,6,7,and 8) remains an especially troubling--and instructive--element of the global arms proliferation dilemma. Despite the relaxing of tensions between the U.S and Russia and the accompanying arms reductions, weapons of mass destruction continue to be developed, tested, stockpiled, and, in the case of several Third World states, actively sought after. As scientists come to better understand the potential effects of even a limited--or accidental--nuclear strike, they warn us of horrors almost beyond imagining. And as we learn more about the economic and environmental costs of production, transport, and deployment of these weapons, we are realizing that nuclear weapons wield tremendous destruction whether they are used or not. Radioactive contamination of our soil and water, deteriorating production and storage facilities, and the dangers of testing continue to threaten public health and safety every day. Our excitement at the dramatic cuts of the early 90s must be tempered by a sober assessment of the thousands of nuclear weapons remaining in the world today. Ultimately we must ask, now that their Cold War rationale has dissolved, how essential are nuclear arms to our vision of the future: how do they contribute to or detract from security in the New World Order?

Given the costs and threats associated with the global arms race, there is growing concern as to whether the world can much longer sustain the reliance on military power to address international--or internal--policy issues. While the political realities of old dictated a clear equation between power and armaments, the shape of our emerging world order, driven as it is by economic forces, suggests that today the old power equations may no longer make sense. Nations today stand to gain far more by cultivating economic ties with their neighbors than by invading them. Today's realities offer something we could only dream of in the past: the obsolescence of war and the advent of true global interdependence.

Within all these themes, students will be examining and re-examining their notions of "security" (Lesson 3). Students will look at the role of heavy weaponry in determining our national security. They will ask whether our national security can be meaningfully separated from the much larger global security issues now facing us as citizens of the planet. They will be introduced

to the idea that in today's world, real security must take into account not only the defense of national borders, but also the protection of a global environment upon which all people depend, regardless of nationality. As noted minister William Sloane Coffin puts it, "the survival unit in our time is no longer a single nation or a single anything; it is the entire human race plus our environment."1

Students are also challenged to examine their understandings of peace, to take into consideration environmental quality and economic health as well as political stability in the definition and pursuit of peace (Lesson 9). In keeping with the growing educational movement toward global themes and cross-disciplinary approaches, these lessons stress the urgent need to re-think our assumptions and priorities, to develop new ways of thinking and new fields of vision, if today's students are to successfully meet the challenges that will soon face them. Above all, the emphasis is on action: what are the avenues of change available to us if we want to make a difference (Lessons 10 and 11)?

III. THE APPROACH

> "Education is the point at which we decide whether we love the world enough to assume responsibility for it and by the same token save it from ruin, which except for the coming of the new and the young, would be inevitable."
>
> Hannah Arendt

> "We ignore these issues at our peril, because if we numb ourselves to the forces that threaten the existence of our individual group and our species, how can we call ourselves students of humankind, how can we call ourselves teachers with any kind of wisdom?"
>
> Robert Jay Lifton, Yale professor of psychiatry

Students equipped with the critical capacity to understand and assess the threats facing their world become caring citizens who are active subjects of their own history, democrats in the truest sense of the word. Noted Indiana University educator Barry Kroll reminds us that "not to decide is to let someone else decide for you",2 and certainly in no other arena is it more dangerous to abdicate to a select few "experts" decisions that affect the very survival of humanity. Our approach aims to return to students a sense of responsibility for the world they want to inhabit: knowing the threats, assessing the alternatives, embracing the opportunities, and acting toward their vision of the future, students become creative problem-solvers employing their energies in what might be called the greatest community service project of them all: the preservation and improvement of life on earth.

The issues explored in these lessons are presented in the most timeless fashion possible, in order to avoid outdating and to provide students with the background knowledge that will help them

make sense of the often confusing developments appearing in the news every day. Each lesson comes with a comprehensive report to the teacher providing necessary topical information along with ideas for implementing the lesson. Our pedagogical approach introduces much of the material in student-centered, cooperative-learning formats; rarely is the teacher expected to provide more than a few minutes' lecture. We feel that the models of inter-dependence, cooperation, and democratic participation are best acquired when they inform the structure of learning as well as its content.

Toward this end, we strongly recommend that all lessons in this unit be conducted in an "open classroom" format, with students and teachers participating equally in a roundtable atmosphere of discussion, sharing, and mutual respect. The affective dimension of these lessons is also crucial: students must feel safe to express their fears and hopes as well as their knowledge and ideas. With this in mind, the implementation of a daily journaling system becomes an invaluable means for students to grapple with these difficult issues. Many of the lessons have journal assignments for homework. We also recommend that teachers make newspapers and journals available to the class, and that films and speakers be included in the unit to add local interest and variety (see Resource List).

Finally, then, we present this unit as a timely opportunity for today's social studies educator to put into practice--indeed, to merge--the ideals of both American civic education and global education. Our lessonbook is concerned first with the survival of the human species, but also with the formation of a new generation of Americans equipped to participate in a world marked by increasing interdependence and decreasing tolerance for war's global devastation. In the words of the preamble to the UNESCO constitution, "since wars begin in the minds of men, it is in the minds of men that defenses of peace must be constructed." It is our hope with these lessons to help students understand this simple but profound truth, and to help them envision a physical and social environment in which they and their children can flourish.

NOTES

1W.S. Coffin, in Disarmament: Possibilities III. (New York: United Nations, 1990), p.130.

2Barry Kroll, quoted in "Teaching Students to Read and Write About War," in Research and Creative Activity, Indiana University, Bloomington 13:1 (Oct. 1989), p.7.

INTRODUCTORY LESSON

"It is not incumbent on us to finish the task; neither are we free to exempt ourselves from it."

Ancient rabbinical saying

Overview

This lesson provides teacher and students an opening into the issues they will explore in the coming weeks. The class begins with a brainstorming session in which students start to connect their own hopes for the future with the possible futures facing our nation and world. Students will also work on a pre-test/questionnaire designed to 1) introduce them to the themes of the unit, 2) help them examine their views on these themes, 3) help the teacher assess students' thinking and background on these issues, and 4) provide students a yardstick for comparing the progress they have made by the end of the course.

Objectives

Students will:

1) become familiar with the themes of this curriculum unit,
2) explore together and in private their hopes, fears, and views on the future.

Materials

Pre-test/questionnaire

Procedures

1) Introduction to the themes of the unit (20 min.). Divide the board beforehand into 4 parallel sections, and write at top of board Alfred North Whitehead's quotation: "The future is big with every possibility of achievement and tragedy." Brainstorming session: ask students to respond together as a class to the following questions in order, and write responses in appropriate spaces on the board:

1) what do you think will have happened in your life by the year 2012 (twenty years from now)?
2) what do you think will have happened in the world?
3) what do you fear will have happened in the world or to you?
4) what do you hope will have happened in the world?

2) (10-15 min.) Drawing on concerns raised in the previous exercise, teacher explains the themes of the unit to class, and describes some of the upcoming lessons and activities. Themes: the environment, the military and war, the arms race and the Cold War, nuclear weapons issues, conflict resolution, present opportunities to create a safer world. Emphasize the power of each student to shape his or her hoped-for future through personal day-to-day lifestyle changes and by participation in the national discussion on issues and priorities.

3) Pre-test/questionnaire (remaining time, homework). Pass out pre-test/questionnaire and explain its purposes. Remind students that the idea is not to arrive at "correct" answers but rather to begin to explore their views on the issues of the unit. (Teacher should be sure to save these completed forms for the last lesson.)

PRE-TEST/QUESTIONNAIRE

(short answer)

1) list the three environmental problems of greatest concern to you.

2) list any ideas or images that come to you when you hear the word "nuclear".
3) briefly describe the impact of military spending on a nation's economic health.

4) list three ways a conflict between nations may be addressed.

5) do you think the threat of nuclear disaster is increasing, diminishing, or remaining the same? Why?

6) what do you understand by the term "new world order"?

7) what do you know about the United Nations and how do you view it?

8) whom or what do you see as our "enemy" today?

9) how safe a place to grow up in is the world today? Why?

10) what role do you feel you can play in making the world a safer place?

The following twelve facts describe current developments in the United States and the world. Read the items, and rank them from one to twelve, one being the most positive development and twelve the most negative. Next, describe how your #1 choice can be encouraged to continue, and then how your #12 choice can be turned around.

1) The Earth's population of 5.2 billion in 1990 is projected to increase this decade by nearly one billion, the fastest population growth in history.

2) With only 5% of the world's population, the United States currently uses 25-40% of its natural resources (depending on method of measurement).

3) The United States is the world's wealthiest and most militarily powerful nation.

4) The end of the Cold War and new cooperative efforts between the West and the Russian republics have dramatically reduced the threat of global nuclear war.

5) The world today has 157 billionaires, about 2 million millionaires, and 100 million homeless.

6) U.N. statistics show about a fifth of humanity--one billion people--live in areas where the air is not fit to breathe.

7) The U.S. and the combined Soviet republics together have about 12,000 nuclear warheads, enough for each side to destroy the other several times over.

8) Much of the technology needed to reduce global warming to an acceptable level is already available and cost-effective.

9) The U.S. moved from being the world's largest creditor nation in 1980 to the world's largest debtor nation in 1990.

10) An estimated 40,000 children die each day in the Third World from severe malnourishment and preventable diseases.

11) The U.S. provided over $128 billion in weaponry and military assistance to more than 125 countries in the 1980s, making it the world's top weapons supplier.

12) In the past 10 years, the United Nations has expanded its international influence considerably. Among its achievements have been wars ended (Afghanistan, Iran-Iraq, Western Sahara, Namibia, El Salvador, Cambodia), treaties signed (on the ozone layer, drift-net fishing, children's rights), and the winning of the Nobel Peace Prize.

(brief essays)

1) Describe the conditions you see as necessary to your hopes for a happy and prosperous future. Describe both personal and global conditions.

2) Twenty years from now, how do you see the world?

REPORT TO TEACHERS

Our world's pre-occupation with military threats real or imagined has frequently blinded us to the environmental and economic destruction happening all around us. Even with the Soviet challenge all but evaporated, many of our leaders seem more comfortable with the old certainties of the Cold War than with the challenge of redefining our priorities to adapt to a drastically changed world. This adherence to out-dated realities is evident in the amount this country continues to spend to protect ourselves militarily, an amount still close to the peak of our Cold War spending and many times greater than what we invest to establish environmental security.

Yet today's students are free to look beyond the constraints of the Cold War, free to focus on the very real threats immediately upon them. And though perhaps less focussed than the challenges of the Cold War, the problems facing us today demand at least as vigorous and determined a response. Unlike previous generations, students in our time can--and must--learn to see other human beings as something other than enemies, as partners in a common quest to solve common problems.

A fundamental premise of this curriculum is that an accurate understanding of the challenges ahead is essential if today's students are to arrive at workable solutions for a sustainable future. This undertaking is not always pleasant: like the uncertainty of a changing world, bad news can be unsettling. The material in this lesson and throughout the unit can be as disturbing to teach as to learn, and the line between concern and despair can at times become thin indeed. Yet at the global level as at the personal, the surest way to let a crisis overcome us is by ignoring its warning signs.

Experts predict a "shelf-life" for Earth of perhaps fifty more years unless we take drastic action now to mend our ways. With this introductory lesson, students will begin their engagement with the issues that will be of crucial concern to them throughout their lives. By the end of the unit, they should have knowledge and understanding enough to continue this engagement as effective citizens and leaders.

OUR COMMON ENVIRONMENT
(Note: may require two class periods)

> "If all the beasts are gone, man would die from a great loneliness of the spirit. For whatever happens to the beasts, soon happens to man. All things are connected...Teach your children what we have taught our children--that the earth is our mother. Whatever befalls the earth befalls the sons of the earth."
>
> Chief Seattle, 1854

OVERVIEW:

This lesson opens our exploration of the environment: how we define it, how we assess the threats it is facing, how we can address those threats with new thinking and creative problem-solving. Students will think about the environment both in its local and global dimensions, and will choose an environmental topic on which to write a report due at the end of the unit.

OBJECTIVES:
Students will:

1) be able to define "environment" in its local and global contexts.
2) be able to list and describe the threats facing our global environment.
3) develop group problem-solving skills.
4) be able to describe and propose solutions to "the tragedy of the commons."

MATERIALS:

Group handout, unit writing project handout, homework sheet.

PROCEDURES:

1) Defining "environment" (15 min.). Students spend 5-10 minutes writing down their personal definitions of "environment", and describing their local environments. Descriptions should include nature of the physical environment (buildings, trees, farmland), local flora and fauna, air and water quality, food sources, and issues of local environmental concern. Have selected students read for the class what they have written.
Place on board Webster's definition: "all the conditions, circumstances, and influences surrounding and affecting the development of an organism or group of organisms."

2) Discussion of threats to the global environment (15 min.). What do we mean by "the global environment?" How is it similar to and different from the local environment you have described? What are some to the threats facing our global environment today? List

on board should include: global warming, ozone depletion, air/water/soil pollution, radioactive waste, loss of rainforest, extinction of species and loss of genetic diversity, decrease in food production relative to growing population, and depletion of fresh water. Tell students to choose one of these by the end of the class as their unit writing project.

3) Group problem-solving role-play (20-25 min.). Have students divide into groups and hand out "The Problem of Fossil Fuels" to each group. If time, have groups discuss their proposals together as a class.

HOMEWORK: Hand out "Tragedy of the Commons" worksheet. Also hand out unit writing assignment.

THE PROBLEM OF FOSSIL FUEL POLLUTION

The burning of fossil fuels (oil, natural gas, coal) is a major factor in one of the most serious environmental crises facing our planet, global warming. Global warming is the gradual elevation of the atmosphere's average temperature, threatening to disrupt weather patterns, dry up fresh water sources, cripple agriculture, flood coastlines around the world, and alter life on earth in a variety of other, unpredictable ways. The 1980's saw the five hottest years in recorded history, and scientists predict that if we do not significantly change our ways, within a few decades we will be experiencing average temperatures never before felt while humans have walked the planet. The burning of fossil fuels contributes to global warming because it releases "greenhouse" gases such as carbon dioxide (CO_2), methane, and nitrous oxides, which tend to trap heat in our atmosphere. As global population increases, more cars are driven, more homes are heated, and more factories are operated, with the result that in 1988, carbon emissions alone went up 3.7% to 5.66 billion tons.

Perhaps the fossil fuel most familiar to us is gasoline. Gasoline begins as crude oil deep below the earth's or ocean surface. Once removed by drilling, it is processed at oil refineries, which produce many petroleum products from it, including gasoline. From the refinery, gasoline is transported all over the world, usually ending up at gas stations, where motorists and truckers purchase it to fuel their vehicles. Inside the internal combustion engine, gasoline is slowly burned, producing energy and releasing CO_2 among other greenhouse gases. Thus, in addition to polluting the air we breathe, motor vehicles are a chief culprit in the broader environmental crisis of global warming.

ASSIGNMENT:

Your group is a blue-ribbon panel of experts and concerned citizens appointed by the United Nations to study the impact of automobile pollution on global warming. U.N. Secretary-General Butros Ghali has personally requested that the panel propose at least four realistic strategies that could significantly reduce the amount of greenhouse gases released by the world's automobiles. Proposals can be addressed to the world's scientists, governments, consumers, or other players in this crisis. Be sure to explain how each proposal will produce its desired effect.

THE TRAGEDY OF THE COMMONS

Years ago, traditional British sheepherding communities experienced an interesting and disturbing situation, which today we call "the tragedy of the commons." In these communities, some grassland was privately owned and some treated as the common property of the community. The common property, known as "the commons", was available to shepherds for grazing their sheep. Shepherds well understood that overgrazing would hurt the land and result in a loss of grazing possibilities, and so they took care not to overgraze their own private lands. Yet somehow they allowed themselves to treat the commons differently.

The shepherds recognized that a healthy commons was good for everyone, but each shepherd also recognized that if he refrained from grazing his sheep on the commons, other shepherds would take advantage of his restraint and fatten their sheep on the public lands. So, as each shepherd tried to do as much grazing on the commons as he could before the others did, the commons grass quickly disappeared, resulting in a commons that could no longer support any sheep or shepherds.

Assignment: In your journals, reflect on "the tragedy of the commons." How might the tragedy have been avoided? Does this story have any relevance for today's environmental crises? Explain. Can you think of any ways the global community might avoid a similar "tragedy of the commons"?

"THINKING ABOUT SECURITY" UNIT WRITING ASSIGNMENT

Choose one of the many environmental crises facing our planet today. In a 10-15 page "Report to the President", describe the crisis, including its causes, its effects, and why we should be concerned about it. When possible, examine the impact of wars, military spending, and militarism on your crisis. Finally, be sure to offer some possible remedies to your crisis, and ways we might put them into practice.
Bibliography and footnotes required. See teacher for a list of helpful resources.

REPORT TO TEACHER

Following up on the first lesson's introduction to the themes of the entire unit, this lesson focuses student attention on the environmental challenges facing us today. It is in an awareness of these global environmental crises that students may best come to grasp the interconnected, commonly vulnerable nature of today's world. As the homework exercise entitled "the tragedy of the commons" suggests, today our survival as a species depends first and foremost on our taking responsibility for maintaining the planetary life-support systems that we have until now taken for granted. A growing number of scientists, policy-makers, and thinkers are calling for a new definition of security which takes into account the pressing need to defend ourselves against a new and indisputable enemy, the erosion of our global "commons." Securing the peace, they tell us, must begin with making peace with our environment.

Addressing our environmental problems requires first their accurate diagnosis. Thanks to the work of concerned scientists in the 70's and 80's, we have by now a wealth of compelling and disturbing data on the environmental trends of the late 20th century. To facilitate discussion in activity 2 of this lesson, an attempt is made here to summarize the most striking of these trends.

1) Global warming. This phenomenon, perhaps the most troubling of the crises facing our planet, is described in the "fossil fuel" handout. The "greenhouse effect," thus named because the heat-trapping properties of atmospheric carbon dioxide resemble that of the glass surrounding a greenhouse, is the chief culprit behind global warming. Carbon dioxide (mainly from the burning of fossil fuels but also from the continual burning of large tracts of savannah and rainforest), along with nitrogen oxides (an industrial and motor vehicle pollutant), methane (from landfills, termite mounds, and cattle digestion), and chlorofluorocarbons (CFCs) are the major greenhouse gases. The U.S. continues to emit by far the most greenhouse gases, followed by the (now defunct) Soviet Union, Brazil, and China. Proposals to reduce greenhouse gas emission include 1)improving motor vehicle engines to increase energy efficiency and lower emissions, 2) tax gas use to reduce consumption, 3) improve mass transit, 4) find alternatives to burning fossil (solar, geothermal, wind power), 5) increase conservation efforts. The necessary scientific and policy means to accomplish all these goals are presently available and feasible, given the willingness to make the necessary adjustments to address a problem which, left unchecked, will create huge economic problems down the road.

2) Ozone depletion. The ozone layer in the upper atmosphere makes life on earth possible by blocking dangerous ultraviolet radiation from reaching the ground. As the ozone layer is steadily depleted by man-made chemicals known as chlorofluorocarbons, increased levels of ultraviolet radiation dramatically exacerbate the threats

of skin cancer, sunburn, and retinal blindness, as well as seriously damaging crop yields. Interestingly, ozone in the lower atmosphere contributes to smog and is dangerous to breathe.

CFCs are widely used in industry, refrigeration, aerosols, and air-conditioning. In addition to depleting the ozone layer, they are potent greenhouse gases. Recent initiatives, most notably the 1987 Montreal Protocol, show some signs of reducing CFC emissions, but in the view of many experts these reductions are too little to make much difference. Scientists are currently working on technology aimed at "re-seeding" the upper atmosphere with ozone.

3) Air/Water/Soil Pollution. This is a huge and complex topic which really incorporates all the other crises in our list. Students looking at this topic should choose one of the three to examine rather than trying to cover it all.

Traditionally, the air, waterways, and in some cases land have been considered to be publically-owned. In non-industrial societies, this conception amounted to something of a stewardship ethic, in which the earth was seen as a common source of nourishment and life. In our industrial society of today, however, the dark side of common ownership has surfaced: the earth has become a common dumping ground for the great quantities of toxic waste we produce. As we enter the twenty-first century, the convenient notion that the earth can absorb all our abuses dissolves away as one ecological crisis after another forces us to acknowledge the planet's vulnerability--and our vulnerability with it.

Pollution of the atmosphere is largely associated with emissions of greenhouse gases by motor vehicles and industry. Toxic metals and radioactive materials introduced into the atmosphere contribute to the public health threat of air pollution, and industry-generated acid rain does great damage to forests and cropland alike. An estimated $40 billion worth of air pollution damage is suffered in crop losses and medical expenses in the U.S. alone. And as developing nations continue to industrialize and drive more cars, the problem grows, especially given the difficulty impoverished countries have affording or maintaining effective pollution control technology.

Water pollution results from industrial waste dumping, pesticide and fertilizer run-off, landfill waste and garbage, among other sources. In less developed countries where water purification procedures are spotty, millions drink contaminated and disease-spreading water every day. In this country, drinking water is often tainted with toxic organic compounds and metals, and irrigation waters are increasingly contaminated with salt and pollutants. Water pollution threatens public drinking supplies, destroys wildlife, and degrades agriculture.

Soil pollution involves the effects of garbage, toxic wastes, pesticides and fertilizers, and nuclear waste. These effects can include contamination of water sources, loss of agricultural land, threats to crop safety, and degradation of the planet's natural beauty. Recycling and solid waste incineration are attempts to reduce the world's copious waste stream while conserving raw material resources. Industrial and agricultural pollutants,

however, can be reduced only by stemming the outflow at its source, that is, by developing cleaner technologies and switching to more environmentally sound farming practices.

4) Radioactive waste. This topic is discussed in some depth in the "weapons production" and "effects of nuclear weapons" lessons. Radioactive waste constitutes a special category of pollution, insofar as its effects are so much more potent than those of chemical waste and its toxicity can persist for tens of thousands of years. The risks involved in nuclear power generation and nuclear weapons production include accidental release of radioactive materials and the still-unsolved problem of safe waste disposal. On the other hand, nuclear power advocates stress that, for all its liabilities, nuclear power generation does not produce greenhouse gases.

5) Loss of rainforest. The tropical rainforests of Latin America, Africa, and Southeast Asia have been aptly called "the lungs of the world", for within their photosynthetic lushness great quantities of CO2 is absorbed and transformed into oxygen. When these great forests are destroyed, whether by the slash-and-burn subsistence agriculture practiced by millions of landless Third World farmers, by ruthless logging of profitable hardwoods, or to clear land for cattle ranching, the environmental impact is felt worldwide.

Indeed, the burning of the rainforest has a double impact on the problem of global warming. The less forest there is, the less CO2 absorption will take place, and as it burns, it releases great quantities of greenhouse gases into the atmosphere. The world's tropical rainforests are also home to fully 50-80% of all plant and animal species. The extinction of great numbers of these species, tragic in its own right, robs our species of many invaluable pharmaceutical and chemical sources, and reduces our chances of developing strategies for sustainable economic use of the rainforest. In the process, we rid the world of one of nature's most awesome and intricate creations, the tropical rainforest.

6) Species depletion and loss of genetic diversity. Intimately tied to the destruction of the tropical rainforest is the rapid depletion of species, many of which hold great promise for medical science and agriculture if they can be saved before it is too late. Of the 2 million species expected to be extinguished by the year 2000, one-half to two-thirds will be dwellers of the dwindling rainforest. Closer to home, the dwindling of songbird populations and species diversity in North America, poignantly predicted in Rachel Carson's 1962 warning Silent Spring, is long since underway. Around the world, freshwater and marine species are also threatened by pollution and alterations of sensitive aquatic environments.

A related problem is the loss of genetic diversity around the globe. This is of particular concern in agriculture, as the replacement of locally-adapted crop species by standardized monoculture crops depletes the genetic stock from which strains resistant to pests or epidemics can be bred. Thus, the practice of monoculture farming encouraged by the "green revolution" in

fact makes the world's food supply increasingly vulnerable to sudden failure, a dangerous situation given the already insufficient or barely adequate food supply available to much of the world's 5 billion human inhabitants.

7) Depletion of natural resources and arable land. In our modern technological lifestyles it is easy to lose sight of the fact that we are still completely dependent on the earth's basic life-support systems. The natural cycles of growth and decay, consumption and replenishment, constitute a complex and intricately balanced system at once tremendously resilient and dangerously vulnerable to human activities. Three biological systems, croplands, forest, and grasslands, along with the world's oceans and, of course, fresh water supplies, keep us alive. Non-renewable resources, such as fossil fuels and minerals, allow our societies to continue functioning. While societal changes, policy shifts, and technological innovations may help reduce our dependence on diminishing non-renewable resources, the decline of the earth's food-generating capacities is a far more troubling development.

In short, biologically productive land is shrinking, while wasteland and human settlement is expanding. The world's forests are shrinking rapidly, croplands are losing ground to development, and grasslands are being reduced by overgrazing. At the same time, the actual productivity of the remaining lands is reduced by pollution, topsoil erosion, and worsening regional water shortages. Combined with the world's unchecked population growth, the earth's declining productivity makes hunger an ever-increasing reality for many, and a growing threat for the rest.

SOURCES

Barash, David. Introduction to Peace Studies. Belmont, CA: Wadsworth Publishing Co., 1991.

Barney, Gerald O. Global 2000: The Report to the President. Washington, D.C.: Seven Locks Press, 1988.

Brown, Lester ed. State of the World 1990. New York: W.W. Norton and Co., 1990.

Caldwell, Lynton K. U.S. Interests and the Global Environment. Muscatine, Iowa: The Stanley Foundation, 1985.

Leggett, Jeremy ed. Global Warming: The Greenpeace Report. New York: Oxford University Press, 1990.

World Resources Institute. World Resources: A Guide to the Global Environment, 1990-91. New York: Oxford University Press, 1990.

RETHINKING SECURITY IN THE 'NEW WORLD ORDER'

"And is not peace, in the last analysis, basically a matter of human rights--the right to live out our lives without devastation, the right to breathe air as nature provided it, the right of future generations to a healthy existence?"

John F. Kennedy, 1963

"Squandering a quarter of our budget on military expenditures, we ruined the country. If things went on like this, we would have no need for defense, as a ruined country and an impoverished people have no need for an army."

Former Soviet Foreign Minister
Eduard Shevardnadze, 1991

Overview

This lesson surveys the momentous political changes of 1991, asking in particular what implications and opportunities these changes hold in the quest for genuine security. Students examine various levels of security and insecurity as they experience it in their lives, and evaluate a variety of approaches to world security proposed by political leaders and thinkers.

Objectives

Students will:
1) be able to describe the major political developments of 1991 and their security implications.
2) be able to articulate their understandings of "security".
3) be able to write their own prescriptions for security in the 90's.

Materials

Political cartoons handout, "Make the Connection" handout, "The Many Levels of Security" handout, homework sheet.

Procedures

1) Survey of 1991 events (15 min.). Teacher hands out cartoon sheet. Class discussion: students offer various interpretations of each cartoon as a way of describing and understanding the basic event being discussed. Teacher should fill in the gaps as needed.

2) "Make the Connection" exercise (10 min.). Teacher distributes "Make the Connection" worksheet for students to complete at desks. Briefly discuss.

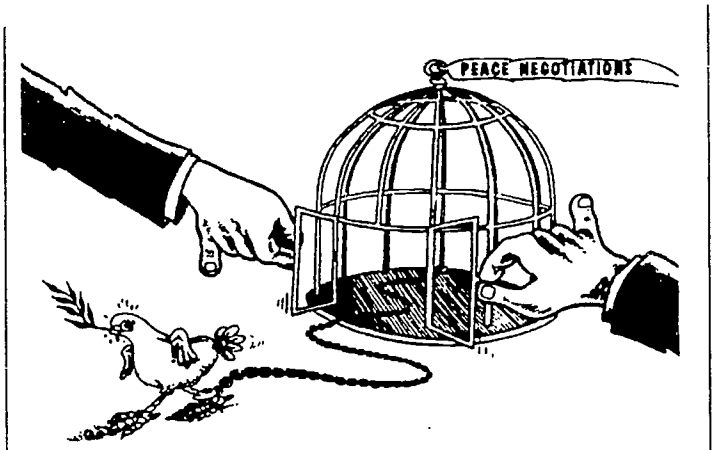
3) Paired discussions (20 min.). Have students individually

complete "The Many Levels of Security" handout, then come together in pairs to discuss their responses.

Homework
"Differing Interpretations of Security" worksheet.

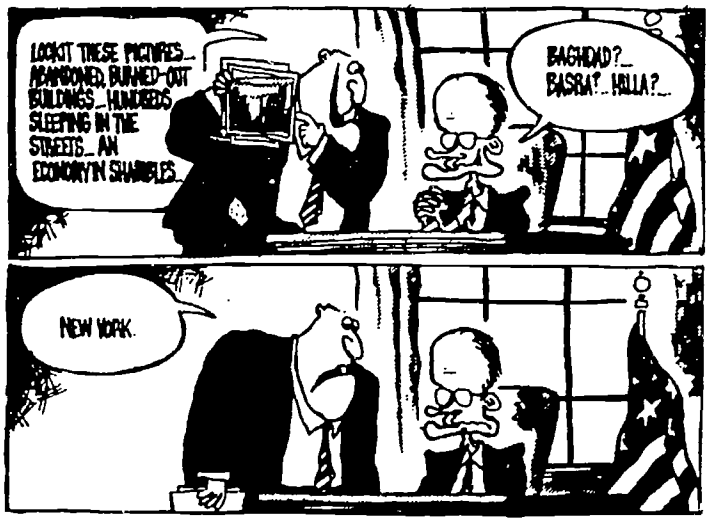
© 1991 MIKE PETERS—DAYTON DAILY NEWS

© 1991 SUMMERS—ORLANDO SENTINEL



Kaheel/Al-Sharq al-Awsat/Jidda, Saudi Arabia

© 1990 GORRELL—RICHMOND NEWS LEADER



Raeside/Times-Colonist/Victoria, B.C.

MAKE THE CONNECTION

Events of 1991 opened up dramatic new possibilities for shaping a more just and peaceful world, as well as creating sometimes painful new uncertainties. Connect the developments above with the "openings" below.

___ 1) START Treaty (July 31) The U.S. and the Soviet Union sign the historic START Treaty, cutting each side's nuclear arsenal by about one-third. This is followed up in the fall by additional voluntary cuts on both sides.

___ 2) Mideast Peace Talks (October) Israel and its Arab neighbors sit at the same negotiating table for the first time.

___ 3) Failing economies. Recession in the U.S. and economic collapse in the former Soviet Union create suffering and uncertainty for the people of both regions.

___ 4) The Failed Coup (August 19-22) Discontent over the collapse of the Soviet Union drives conservative leaders in the Kremlin to launch a military takeover of the Soviet government. Popular resistance and poor coup organization result in the failure of the coup and the return to power of Gorbachev.

___ 5) Persian Gulf War (January) Responding to Iraqi leader Saddam Hussein's invasion of neighboring Kuwait, the United Nations Security Council authorized first tough sanctions and then a successful U.S.-led military attack on Iraqi forces.

___ 6) European Union The twelve nations of the European Community took major steps toward economic and political union that will make Western Europe an integrated and powerful world trading partner.

___ 7) Disintegration of the Soviet Union (December) After the failed coup, the disintegration of the Soviet Union dramatically accelerated, resulting in the creation of a "Commonwealth" linking 11 former Soviet republics as independent states.

- -

a) The United Nations gains credibility as an effective forum for the resolution of international disputes.

b) The former Soviet Empire moves dramatically toward normalized relations with the West and greater democracy for its people.

c) Hopes rise for a settlement allowing common security for all the peoples of this troubled region.

d) New-found enthusiasm and strategies for nuclear disarmament between the superpowers open dramatic possibilities for further large-scale reductions.

e) Old rivalries dissolve as nations recognize their economic interdependence and the power of mutual cooperation.

f) Eyes are opened to the economic costs of heavy investment in the arms race, and new policies emphasizing common security and basic human needs are explored.

g) Forces of liberalization and democracy establish a firm foothold in the Soviet Union.

"THE MANY LEVELS OF SECURITY"

The term "security" can apply at many levels. Briefly describe what you consider necessary for a feeling of security at each level.

1) Personal

2) Economic

3) Family

4) National

5) Global

6) Environmental

In pairs, compare and discuss your responses. Can you arrive together at a definition for the word "security"?

"DIFFERING INTERPRETATIONS OF NATIONAL SECURITY"

(A military interpretation) "National security: a military or defense advantage over any foreign nation or group of nations...a defense posture capable of successfully resisting hostile or destructive action from within or without."

(A conventional interpretation) "National security: the ability to preserve the nation's physical integrity and territory; to maintain its economic relations with the rest of the world on reasonable terms; to protect its nature, institutions, and governance from disruptions from outside; and to control its borders."

(A collective security interpretation) "We can increase the nation's security against external military threats by moving more vigorously to end the arms race, reducing the world's stockpile of weapons, limiting arms sales, encouraging everywhere the policy of defense sufficiency and furthering peaceful resolution of conflict."

(A comprehensive security interpretation) "Our nation's security--any nation's security--depends upon much more than having a protective military shield...Common security is based not only on legitimate defense measures but also on all people having an opportunity to meet their basic needs for food, shelter, health care, education, and work with dignity; to live in a safe and healthful environment; and to enjoy human rights, including the right to participate in decisions affecting their lives."

(A Third World interpretation) "The object of a security policy is to reduce insecurity...The first origin of insecurity in our region (Latin America) is poverty...In our region, 170 million people are living in extreme poverty. It is an enormous amount of people. This generates insecurity for the poor, because of the abject conditions in which they live, but it also generates insecurity for the rich, who are worried about when all these people are going to get organized to overturn the situation."

(An environmental interpretation) Environmental issues pose planetary dangers of such a magnitude in scope and severity that they constitute the most serious long-range security problem in the world today...Life-support systems for the entire human species face profound and uncertain threats from pollution, resource depletion, population pressure, and species extinction...Cooperation in one security area, such as managing environmental problems, of course suggests models and establishes trust for carrying out alternative security policies in other areas, such as arms reduction and global police enforcement."

Essay options:
1) Choose one of the perspectives above, explain it in your own words, and evaluate its strong and weak points.

2) After reading all the quotations above, evaluate the following statement: "Increasing military strength makes a country more secure."

3) Write your own definition of national security and prescribe a security policy for the United States.

REPORT TO TEACHERS

The events of 1991, building on developments through the late 80's, transformed drastically the shape of the world we live in. With the old certainties of the Cold War no longer applicable, new and rapidly shifting power balances are evolving to fill the vacuum. Regional peace initiatives, often bolstered by a newly strengthened United Nations, are flourishing, and prospects appear brighter than ever for a slowdown to the massive global buildup of arms. The nuclear threat has diminished considerably, freeing the superpowers to concentrate on the cooperative dismantling of their nuclear stockpiles and the curtailment of nuclear proliferation elsewhere. Europe and Japan continue their economic surge, forcing both the U.S. and the former Soviet Union to take a hard look at their own failing economies. In all, it was a year of tremendous upheaval and ferment, setting the stage for a decade as full of promise as it is of risks.

For the purposes of this curriculum unit, the events of 1991 provide a stimulus for rethinking the idea of "national security". How do we define security in a world moving rapidly toward increased cooperation, interdependence, and common vulnerability? Do the old notions of security as the military protection of the sovereign nation-state apply as readily in this world? Does the accumulation of weapons necessarily increase or decrease national security today? What are the most pressing threats to our security in this day and age? What are some of the approaches to national security being proposed in the light of recent changes?

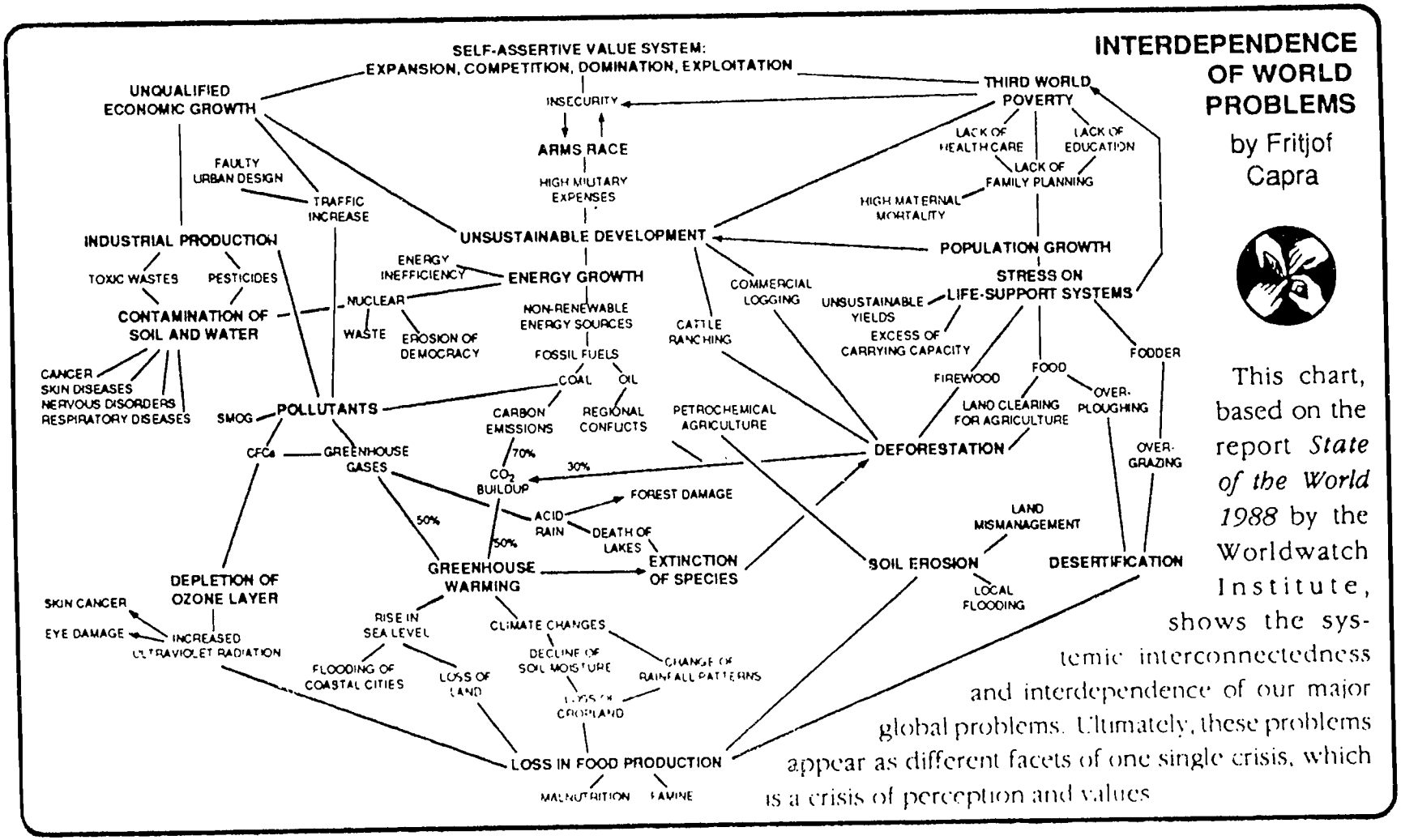
Students can grapple with these questions in all three of the exercises in this lesson. The first examines the actual changes in the world as of 1991 and asks what possibilities these changes offer for the just and peaceful resolution of political conflict. The second exercise, "The Many Levels of Security," stimulates students to think about the interlocking dimensions of security and how those dimensions apply to them as multi-dimensional human beings, as members all at once of a family, a city, a country, and a planet. The homework, "Differing Interpretations of Security", presents students with some alternative views of security and asks them to evaluate and build upon these ideas. The teacher may want to bring to students' attention the idea of "interpretation" as it is used here: national security is not a fixed quantity, nor can it be unanimously defined; rather it is a fluid concept open to differing interpretations depending on one's view of the world and one's priorities.

Sources of quotations in "Differing Interpretations of Security":

1) David Barash, Introduction to Peace Studies (Belmont: Wadsworth, 1991), p. 334.
2) Harold Brown, Thinking About National Security (Boulder: Westview Press, 1983), p. 4.

3) Arthur Simon, Harvesting Peace: The Arms Race and Human Need (Kansas City: Sheed and Ward, 1990), p. 130.
4) ibid., p. 108.
5) Juan Sonoria, in Disarmament: Possibilities III (New York: United Nations Publishing, 1990), p. 67.
6) Robert C. Johansen, "Toward Post-Nuclear Global Security: An Overview", in Alternative Security: Living Without Nuclear Deterrence, ed. Burns H. Weston (Boulder: Westview Press, 1990), p. 247.

Answers to "Make the Connection" worksheet:
1.d
2.c
3.f
4.g
5.a
6.e
7.b



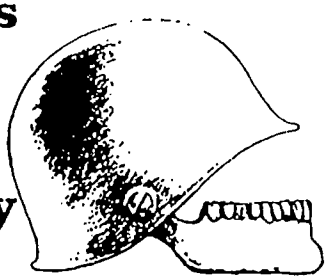
INTERDEPENDENCE OF WORLD PROBLEMS

by Fritjof Capra

This chart, based on the report *State of the World 1988* by the Worldwatch Institute, shows the systemic interconnectedness and interdependence of our major global problems. Ultimately, these problems appear as different facets of one single crisis, which is a crisis of perception and values

The money required to provide adequate food, water, education, health and housing for everyone in the world has been estimated at $21 billion a year. It is a huge sum of money

...about as much as the world spends on arms every two weeks.



ECONOMIC, SOCIAL, AND ENVIRONMENTAL COSTS OF MILITARIZATION

"Every gun that is made, every warship launched, every rocket fired signifies, in the final sense, a theft from those who hunger and are not fed, those who are cold and are not clothed. The world in arms is not spending money alone. It is spending the sweat of its laborers, the genius of its scientists, the hopes of its children."

--Dwight D. Eisenhower

"A billion here, and a billion there, and pretty soon you're talking about real money."

--Senator Everett Dirksen

OVERVIEW: In this lesson, students are introduced to the concept that governmental choices to invest funds in military and nuclear expenditures mean choices not to invest in increasingly urgent domestic needs. In particular, we will be looking at these opportunity costs as they apply to environmental protection efforts. We will also look at claims that military spending decreases economic competitiveness and thus has an adverse effect on a given economy, which in turn has consequences for the environment. In sum, students will learn that a country's priorities (i.e. its ideas on what constitutes "security") are reflected in its spending patterns, and in turn those spending patterns shape the country's economic, social, and environmental well-being. Students also will examine their role as citizens in guiding these spending patterns.

OBJECTIVES:

Students will:

1) Be able to define "opportunity cost" using examples from their own lives and the arms race.
2) Be able to describe the impact of military spending on domestic economies.
3) Be able to trace the connections between military research/spending and environmental degradation.
4) Develop their capacity to read and interpret graphs and tables.

MATERIALS: Six group worksheets and one homework sheet.

PROCEDURES:

1) (5 min.) Individual exercise on the meaning of "opportunity cost". Have each student list all the things he or she would like to purchase in a given week, then circle those things that, given the student's weekly income, he or she is actually able to purchase.

2) (10-15 min.) Class discussion: were you able to purchase everything on your list? How did you decide which items to choose and which to leave out? Teacher introduces the notion of "opportunity costs" as the things we would like but can not spend our money on when we choose to spend it on other things.

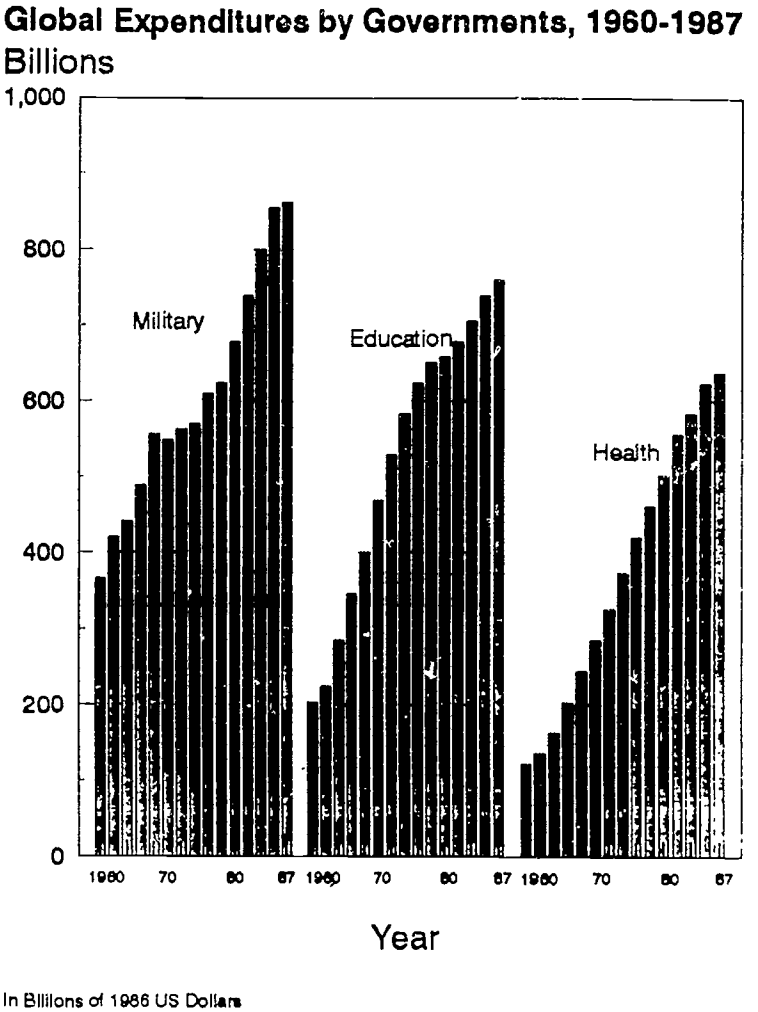
Teacher then has class list on the board things a national government would like to include in its budget--list should include education, health care, transportation, defense, housing, social security, law enforcement, development of industry and agriculture, job training, welfare programs, environmental protection, etc. Questions: can the government spend as much as it wants on each of these? How does it choose? What are the opportunity costs when a government chooses to spend most of its money on the military? Who profits from this and who suffers? Can anyone think of a country where military spending has led to the collapse of the domestic economy (the Soviet Union is the clear example, but many Third World countries and even the U.S. are also candidates)?

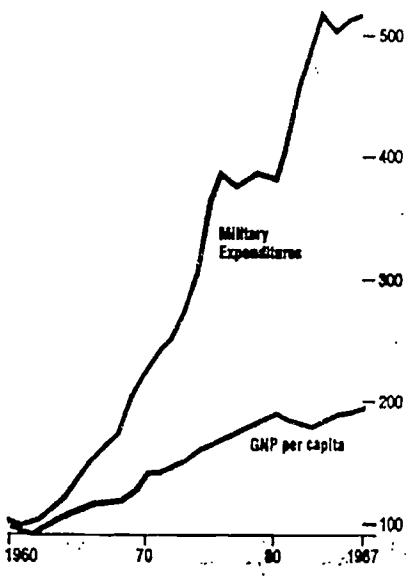
3) (20-min.) Group learning case studies. Have students quickly divide into six groups. Each group is given one of the attached case studies. Groups discuss their case (no more than ten minutes) and then report to the class their conclusions. Teacher lists these conclusions on the board under "Impact of Military Spending on the Economy".

4) (10 min.) For each of the conclusions, have the class brainstorm possible consequences for the environment and society (e.g. #5: Research and Development resources devoted to military matters can not be used to research alternative energy sources and pollution control methods. #6: more resources devoted to health care can make the U.S. a healthier society, and people are more likely to attend to larger environmental issues when they are healthy than when they are struggling just to survive.

HOMEWORK: Hand out attached homework sheet.

GROUP #1





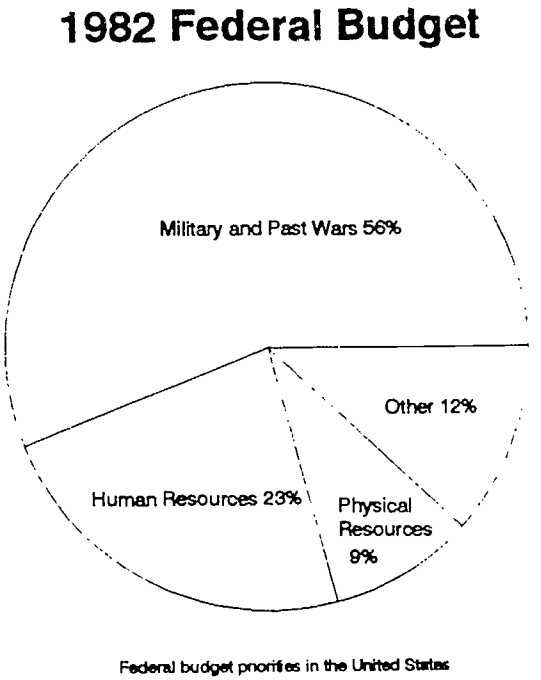
MILITARY VS. ECONOMIC GROWTH IN DEVELOPING COUNTRIES, 1960-87 (in dollars)

GROUP #2

SHIFTS IN FEDERAL EXPENDITURES IN THE EARLY EIGHTIES

Area of expenditure	Shift (billion $)		Change (%)
	1981	1985	
Military	159.7	272	+70
Veterans' Medical Care	6.9	9.6	+38
Transportation	17.1	18.6	+12
Education	7.1	7.1	0
Community Development	5	4.8	-5
Pollution Control	5.2	4.2	-19
Energy Conservation	.7	.4	-44
Conservation/Land Management	1.2	.3	-73

(Source: Congressional Budget Office)

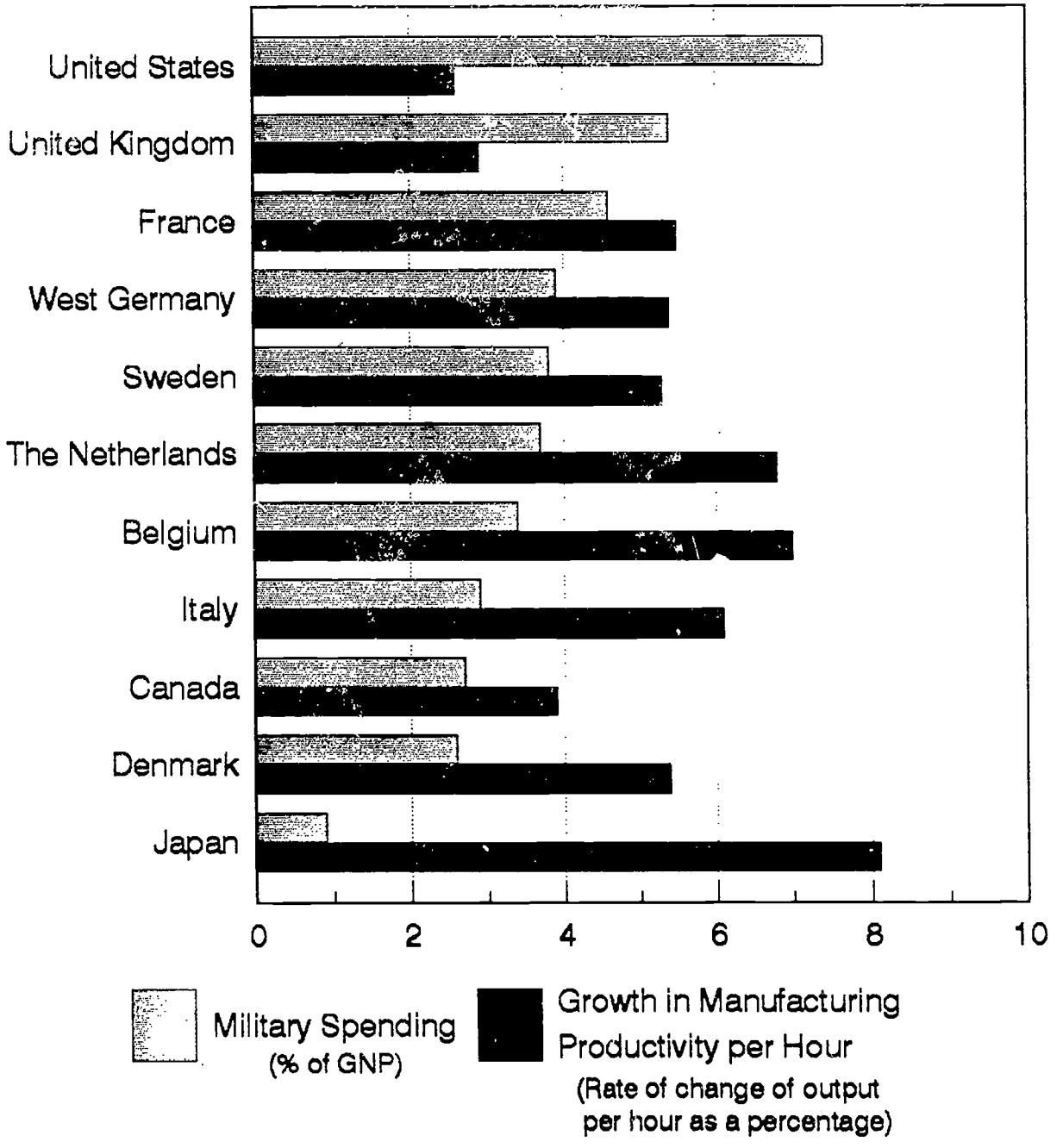


Federal budget priorities in the United States

GROUP #3

Military spending and economic productivity in 11 industrialized nations

(average percentages for 1960-1979)



GROUP #4

WHAT $50,000,000,000 CAN BUY

($50,000,000,000 represents approx. 5% of the world's annual military budget)

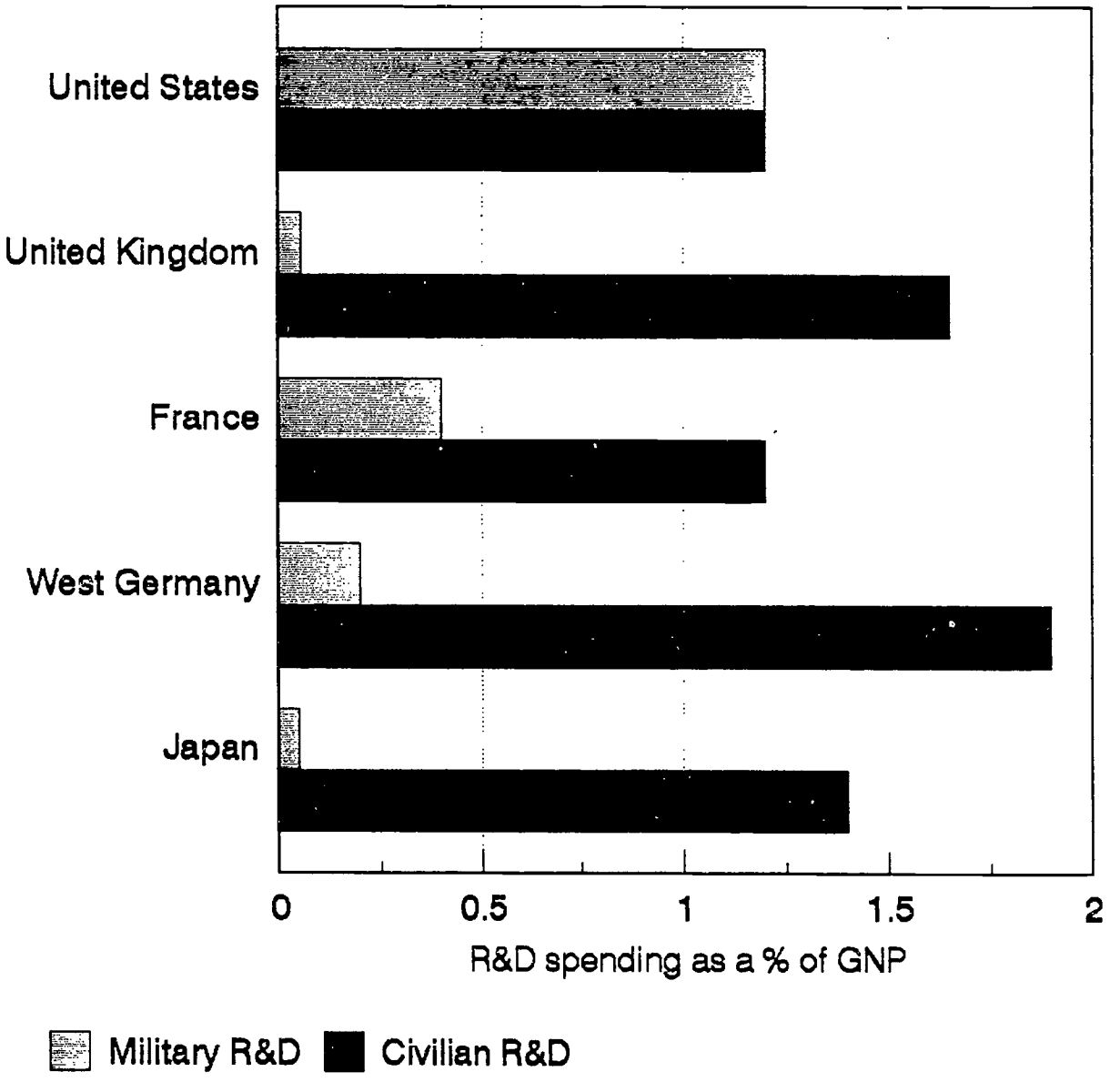
MILITARY	HEALTH AND ENVIRONMENTAL
20 advanced tactical jet fighters, 10 vertical take-off combat aircraft, 90 B-2 Stealth aircraft	Adequate funding for all of the below: Environmental clean-up of nuclear bomb plants
or	Safe water and sanitation for the world
2 Sea-wolf attack submarines, 10 Aegis cruisers, 10 Trident submarines, 5 nuclear-powered aircraft carriers, 243 Trident missiles, 1700 Tomahawk missiles	Maternal health and education
or	Health research
1990 combined U.S. military and space research	Supplementary feeding programs
	Community health posts
	Immunization for all children
	Funding the World Health Organization
	Health-related education

GROUP #5

Correlations of military R&D/GNP and civilian R&D/GNP

(average percentages for 1960-1976)

Note that the US, with relatively high military R&D expenditures, expends proportionately less on civilian R&D, whereas the UK, France, West Germany, and Japan, with relatively low military R&D expenditures, expend proportionately more on civilian R&D.



"R&D" means "research and development" and "GNP" means "Gross National Product."

GROUP #6

UNITED STATES RANK AMONG 142 COUNTRIES

MILITARY POWER

- Military expenditures----------1
- Military technology----------1
- Military bases world-wide----------1
- Military training of foreign forces-------1
- Military aid to foreign countries---------1
- Naval fleet----------1
- Combat aircraft----------1
- Nuclear reactors----------1
- Nuclear warheads and bombs----------1

SOCIAL DEVELOPMENT

- Percent population with safe water----------1
- Percent births attended by trained personnel-----1
- GNP per capita----------2
- Literacy rate----------4
- Percent school-age children in school----------6
- Maternal mortality rate----------13
- Life expectancy (years)----------14
- Percent population with access to sanitation-----15
- Infant mortality rate----------17
- Under 5 mortality rate----------21
- Population per physician----------24
- Percent infants immunized against measles--------32

HOMEWORK

"The problem in defense is how far you can go without destroying from within what you are trying to protect from without."

Dwight D. Eisenhower
Jan. 18, 1953

What does Eisenhower mean by this? List three ways a country can destroy from within what it is trying to protect from without. Describe what you see as a proper balance between defense spending and spending on domestic needs today. What can you do to encourage our democratic government to arrive at that balance?

REPORT TO TEACHERS

The economics of the arms race is an issue that, however complex, is essential to an understanding of the impact of armaments on today's world. The literature on the topic focusses on three main issues: 1) the opportunity costs of military spending, 2) the influence of military spending on productivity, and 3) the degree of employment generated by military spending as compared to that generated by the same amount invested in the civilian sector. We have tried to present these themes to students in as accessible a manner as possible, allowing them to draw their own conclusions based on their own readings of a variety of indicators and statistics.

Ruth Sivard's authoritative annual report, World Military and Social Expenditures (from which charts for groups 1,3,4,5,and 6 are adapted), is highly recommended as a classroom resource for use in this regard, and indeed for use throughout the year. Its 60-plus charts, diagrams, maps, and figures provide readers a wealth of detailed, accessible, and suggestive data on the multi-dimensional impact of the arms race on the world's well-being. Also recommended is David Barash's book, The Arms Race and Nuclear War.

The first theme, the so-called "guns or butter" opportunity costs of military spending, is perhaps the most poignant of these economic issues. It is especially striking when the Third World is included in the analysis, as it is in World Military and Social Expenditures. Sivard makes the point that every minute 15 children die for want of food and inexpensive vaccines, while in that same minute the world's governments spend $1,900,000 on weaponry. At the same time, the sharp rise in "defense" spending over the last three decades has presided over more, not less, deaths in war, with a rising proportion of these being civilian. 1

The concept of budgetary opportunity costs is an essential one for any study of economics. As it applies in our examination of the arms race, it refers not only to the amount of money spent on weapons that could be spent on unmet domestic and global priorities, but also to the brainpower and material resources consumed in the development of newer and more effective instruments of destruction. The U.S., for instance, spends about 70% of its federal research and development money on the military2. Similarly, on the global level, six times as much public research money goes into research for weapons as for research on health protection.3

While there is no economic law dictating that money not spent on military pursuits must go to civilian needs instead, it is increasingly apparent that as world resources become ever more scarce, governmental budgets must make clear choices between the two. The Soviet Union is a good case in point, for that country's current economic unrest appears largely to have been generated by the burdensome portion of their resources expended in participating in the arms race. That economic distress in turn contributes greatly to the political instability currently plaguing the Soviet Union and jeopardizing superpower relations and world markets. The U.S. budget of the 1980's is also revealing, as for example in

1983, when $33 billion military spending increases were accompanied by large cuts in health care, education, energy conservation, mass transit, community development grants, etc. The two countries, first in military power, ranked 17th (U.S.) and 45th (U.S.S.R.) in infant mortality rates.

The productivity issue is a question of the relationship between military spending and overall economic vitality. Numerous studies indicate that while military spending can have positive economic impact in the short run, the long-term impact is to decrease domestic investment, personal consumption, productivity growth, and international competitiveness. An example of the reverse of this phenomenon comes from Japan, which with its low military expenditures is able to devote that much more of its resources to the technological and financial enterprises that have made it the world's strongest economy.

Similarly, while military spending is one means by which pockets or slumps of unemployment may be alleviated, the number of jobs produced by that spending is considerably less than the number generated by the same amount spent in the civilian sector. Part of this is due to the fact that the products of military spending do not contribute to domestic consumption, and therefore their "multiplier effect", that is, the degree to which additional jobs are created by the initial stimulus, is low.4 Also, employment generated by military spending tends to favor highly skilled labor, with accompanying increases in unemployment among certain sectors, a concern raised by unions such as the International Association of Machinists.

Scenarios for conversion from a military economy to a civilian economy build on all these considerations in advancing the long-run economic and social benefits of such a conversion. Yet short-term employment losses, as well as the great political power wielded by the military-industrial complex, makes resistance to such thinking inevitable and stiff. The intentional distribution of federal military contracts throughout all 50 states, for instance, makes it very difficult for elected officials to support military cuts without alienating a jobs-conscious electorate. Nonetheless, conversion advocacy is growing, especially in light of the decline of Cold War justifications for militarism. Economic conversion may at first mean a painful jolt to a military-dependent economy, they argue, but the economic and social benefits that would ensue, as well as the strengthening of international bonds, may prove well worth the initial difficulties.

The nuclear component of these economic considerations is at first deceptive. Accounting for only 20-25% of the current military budget, nuclear arms clearly provide "more bang for the buck" than conventional forces. Looking at the overall impact of nuclear arms on modern warfare, however, we realize that the immediacy and potency of nuclear weapons compel nations to be on continual emergency alert status. In other words, military preparedness has to be maintained at wartime levels because it is no longer feasible for a modern nation "to rely on a powerful military-industrial effort to be mounted only after a declaration of war."5 Thus, nuclear weapons have the peculiar effect of necessitating the creation of chronic semi-wartime economies. In

addition, far more nuclear weapons are currently deployed than are actually required for deterrence, so that if the superpowers were to decrease their arsenals to the basic deterrent requirement (about 400 strategic warheads, according to former Secretary of Defense Robert McNamara), many billions of dollars would be saved.

As much as $3 trillion of the world's resources have already been spent on the development of nuclear weapons.6 Each missile costs anywhere from a few million dollars for sea-launched cruise missiles, to $123 million for the MX, while research and delivery systems costs add considerably to these sums.
In fact, nuclearism costs U.S. taxpayers around $100 billion a year7. Funds freed up by a significant reduction in nuclear and military expenditures would go far toward establishing increasingly urgent international environmental protection efforts, as worksheet #4 ("what $50,000,000,000 can buy") clearly indicates. International cooperation on this common concern would, in turn, further reduce political tensions, thereby making military expenditures less and less necessary.

Finally, some notes on the lesson itself. The varied data available on these subjects provide us with an excellent opportunity to improve students' graph-reading and interpretive skills. Emphasis should be put not so much on the correctness of students' interpretations, but on the reasoning they used to arrive there. In the brainstorming session on the environmental and social costs of the arms race, students should be encouraged to think as broadly and as creatively as possible. The homework provides students an opportunity to arrive at their own ideal balance between defense spending and domestic spending, and to reflect on the participatory means by which they have a say in government priorities.

REFERENCES:

1Ruth Leger Sivard, World Military and Social Expenditures. Washington, D.C.: World Priorities, 1989, p. 5.

2David Barash, The Arms Race and Nuclear War. Belmont, CA: Wadsworth, Inc., 1987, p. 293.

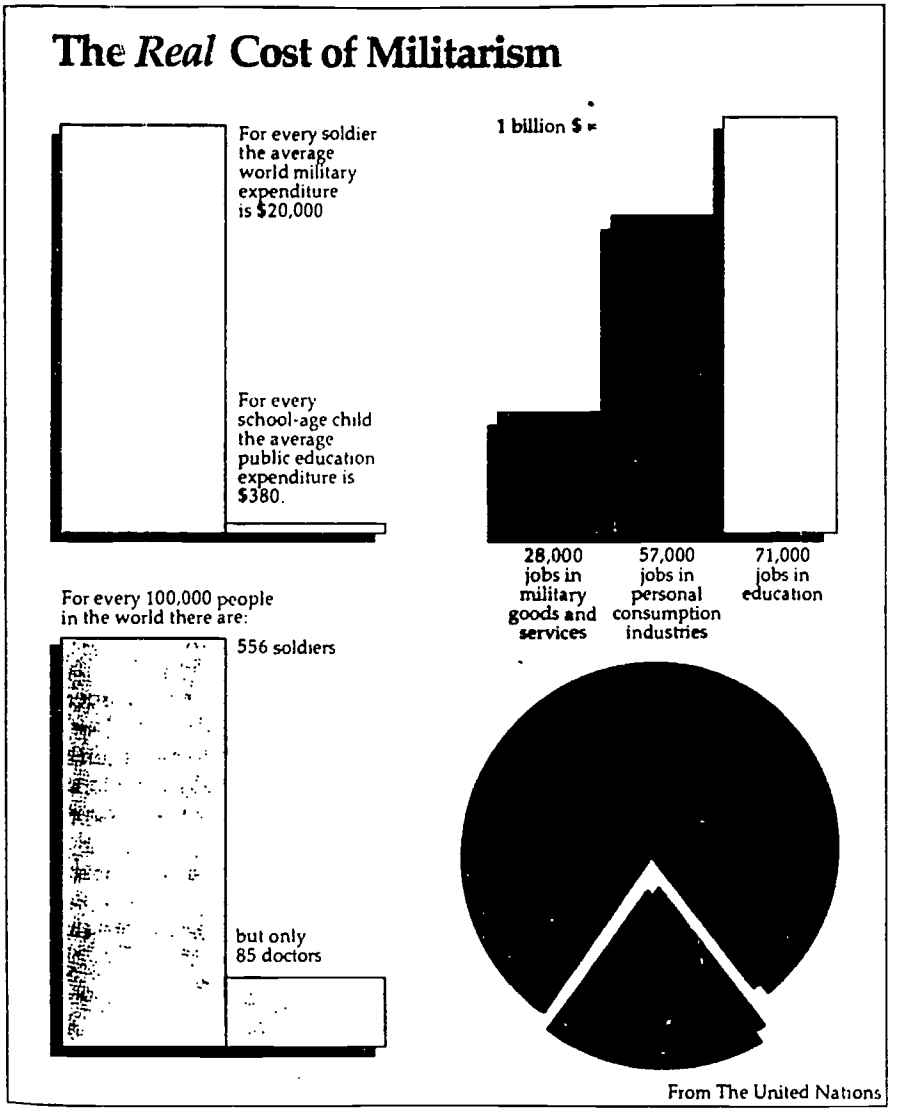
3Sivard, p. 5.

4The great American economist Adam Smith himself wrote the following in The Wealth of Nations: "The whole army and navy are unproductive laborers. They are the servants of the public, and are maintained by a part of the annual produce of the industry of other people. Their service, how honorable, how useful, or how necessary soever, produces nothing for which an equal quantity of services can afterwards be produced." Quoted in Barash, p. 301.

5Barash, p. 288.

6Sivard, p. 14.

7"Nuclearism and Global Economic Justice", James Stegenga in Thought: A Review of Culture and Ideas. Volume 66, #260, p.25.



Buying Insecurity

Military consumption has increased spectacularly over time, as fleets and armies in Europe and elsewhere become more expensive and more destructive. World military expenditure is more than twelve times as great in real terms as it was fifty years ago; it is more than twenty-eight times as great as it was in 1908.

Yet such expenditure has failed in its objective of buying "security." The process of military spending yields decreasing returns to increasing "inputs" of money. Even the richest military powers buy something less than security with their immense resources: military forces which may be useless in real crises; military equipment which may be matched by an enemy who emulates their military exertions. In many developing countries, the price of military "security" is increased human misery. . . .

Since the colonial wars of the 1750s ...re, rapid increases in military ...ng have been associated with rising prices. The "peacetime" wars since 1945 were times of inflation in Western countries. In 1950-51, the year of sharply increased weapons procurement for the Korean War, the increase in the consumer price index in the U.S. went from less than one per cent a year to 7.9 per cent, and in Britain from 2.8 per cent to 9.7 per cent. . . .

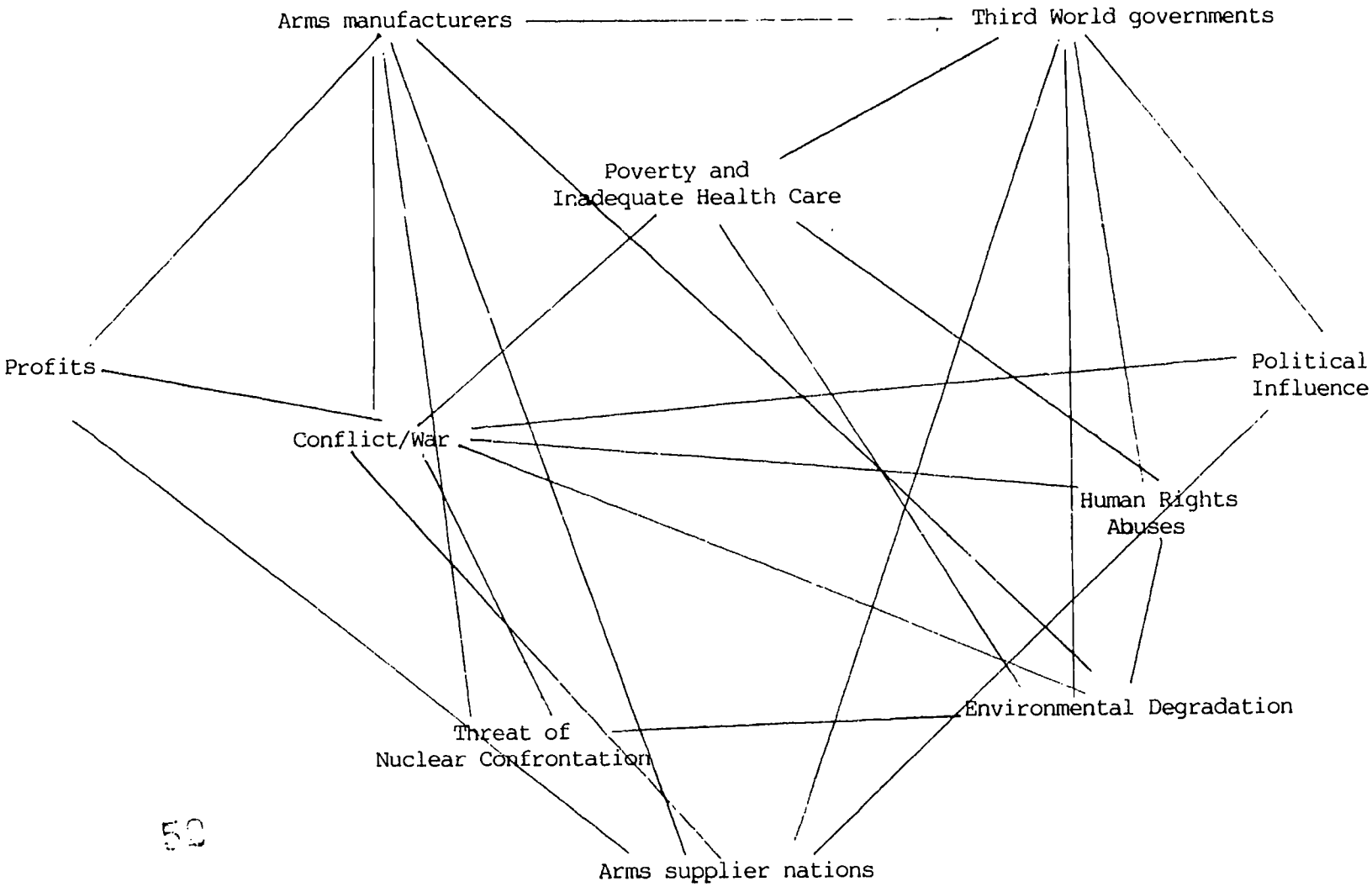
It is possible, too, that military involvement may alter the character of a country's scientific institutions, even when it provides extra resources for scientific work. Military science requires qualities – secrecy and the isolation of scientists – which are not necessarily favourable to civilian research, or to the civilian diffusion of discoveries. The most spectacular applications of American research in military electronics have come not in the U.S but in a country – Japan – with a different and impeccably civilian organization of science, technology, and commercial innovation; whose military industry is about the size of its toy industry; and which, with an economy over half the size of that of the U.S, spends less than one hundredth as much public money on military research. . . .

The import and export of weapons have become an essential feature of international trade in the last ten years. This commerce is likely to have serious economic costs for arms-importing developing countries. It has evident benefits for exporting countries But in the long term it may not be in the economic self-interest of either group, or of the world economy as a whole. . . .

Military spending is a charge on the economic future of all countries, the richest and the poorest, those who import and those who export arms, the East and the West. Its economic consequences are in certain respects similar in the most diverse countries. Everywhere, it demands resources which are already scarce and which are becoming yet more scarce in the early 1980s

United Nations report, 1982

THE WEB OF INTERNATIONAL MILITARIZATION



50

WHAT ARE NUCLEAR WEAPONS?

"If I had known, I would have been a locksmith."
Albert Einstein

"I tell you that in the arts of life, man invents nothing; but in the arts of death he cutdoes Nature herself, and produces by chemistry and machinery all the slaughter of plague, pestilence, and famine... In the arts of peace, man is a bungler...His heart is in his weapons."
The Devil, in George Bernard Shaw's play "Man and Superman"

OVERVIEW: This lesson introduces students to the basic types of nuclear weapons deployed today. Students learn about warheads, delivery systems, and the destructive capacities of today's weapons. In the homework, students consider the historical changes in the nature and use of weapons.

OBJECTIVES: Students will:

1) Be able to identify the major classes of nuclear weapons and their delivery vehicles.
2) Be able to describe and calculate kiloton and megaton values.
3) Interpret changing patterns of weapons design and usage through history.

MATERIALS: "Nuclear Arsenal" handout, "Weapons Through The Ages" handout, homework article ("Effects of Nuclear War").

PROCEDURES:

1) (5-10 minutes) Very brief introduction to fission and fusion: the main point here is that nuclear reactions, because they involve an alteration of the basic nuclear structure of the atom, release about one million times the energy (read explosive force) of conventional explosive chemical reactions (like TNT), in which atoms only recombine with one another but do not change their basic structure.

2) (10-15 min.) Lecture and note-taking on "Kiloton" and "megaton" concepts. Nuclear weapons are often described in terms of the tons of TNT their explosion is equivalent to. Thus, a one kiloton warhead would have the blast effect of 1000 tons of TNT, and a one megaton warhead would be equivalent to one million tons, enough to flatten New York City. Today's arsenal includes bombs in the one kiloton range all the way to about 10 megatons. The total firepower of today's arsenal of about 12,000 warheads is about 15,000 megatons, or 3 tons of TNT for every person on earth. It should be stressed, however, that kiloton and megaton values represent only the immediate blast effects of a nuclear explosion, when in reality a nuclear event's destructive powers extend far beyond the initial blast (see "Effects" lesson).

3) (10-15 min.) Discussion of "Nuclear Arsenal" handout and diagram. Using classroom world map, teacher can trace the approximate range of each type of missile (see Teacher Report).

4) (remaining time) Hand out "Weapons through the Ages" exercise for completion in class.

HOMEWORK: Read "Effects" article.

REPORT TO TEACHERS

This lesson introduces students to the weapons made possible by the discovery of nuclear fission and fusion. Today's nuclear arsenal contains an astonishing variety of weapons, from one-kiloton land mines to 10 megaton ICBMs. Detailed scenarios for the use of every type are thought out by strategic planners, yet many observers feel that due to the extreme uncertainty and insecurity associated with vulnerability to nuclear attack, nuclear warfare would be extremely difficult to manage rationally. By studying numbers and types of weapons available in today's nuclear arsenal, students will be better able to follow and participate in the on-going arms control debate. In the process, they will critically examine the need for such an abundance of mass destruction weapons in the post-Cold War "new world order."

Previously, most discussions of nuclear weapons have examined the strategic balance between the U.S. and U.S.S.R. Today, in the wake of the break-up of the Soviet Union and the proliferation of nuclear technology in the Third World, the "good bombs" vs. "bad bombs" mentality makes less sense than an evaluation of the danger that all these weapons pose to the planet itself. This point will become increasingly clear in the next lesson, as the environmental impact of nuclear explosions is explored. Thus, in this lesson we examine the weapons themselves, without attaching nationalities or national names to them. Emphasis is placed on the weapons' unprecedented destructive powers, and on the distinctive threat they pose.

The lesson includes several activities, perhaps more than can be squeezed into one class period, in which case the teacher will have to pick and choose activities. In the discussion of the "nuclear arsenal" handout, it will be helpful to use the world map to point out the range of today's missiles. Tactical nuclear weapons are designed for short-range battlefield use and have been drastically reduced by both the superpowers as of 1991. Theater nuclear weapons are designed for intermediate distances within a broader "theater" of war (typically Europe). While this class of missiles has now been virtually eliminated from Europe by the 1987 INF treaty, other countries such as Israel and South Africa are widely suspected of possessing them for use in their own respective "theaters". Strategic nuclear weapons are those capable of intercontinental flight between North America and Russia (at least 5500 km.), and make up the bulk of nuclear firepower today.

Students interested in extra credit reports might look at topics such as the Strategic Defense Initiative, neutron bombs, the history of nuclear weapons design, and the possible presence of nuclear stockpiles or production plants near their area.

RESOURCES:

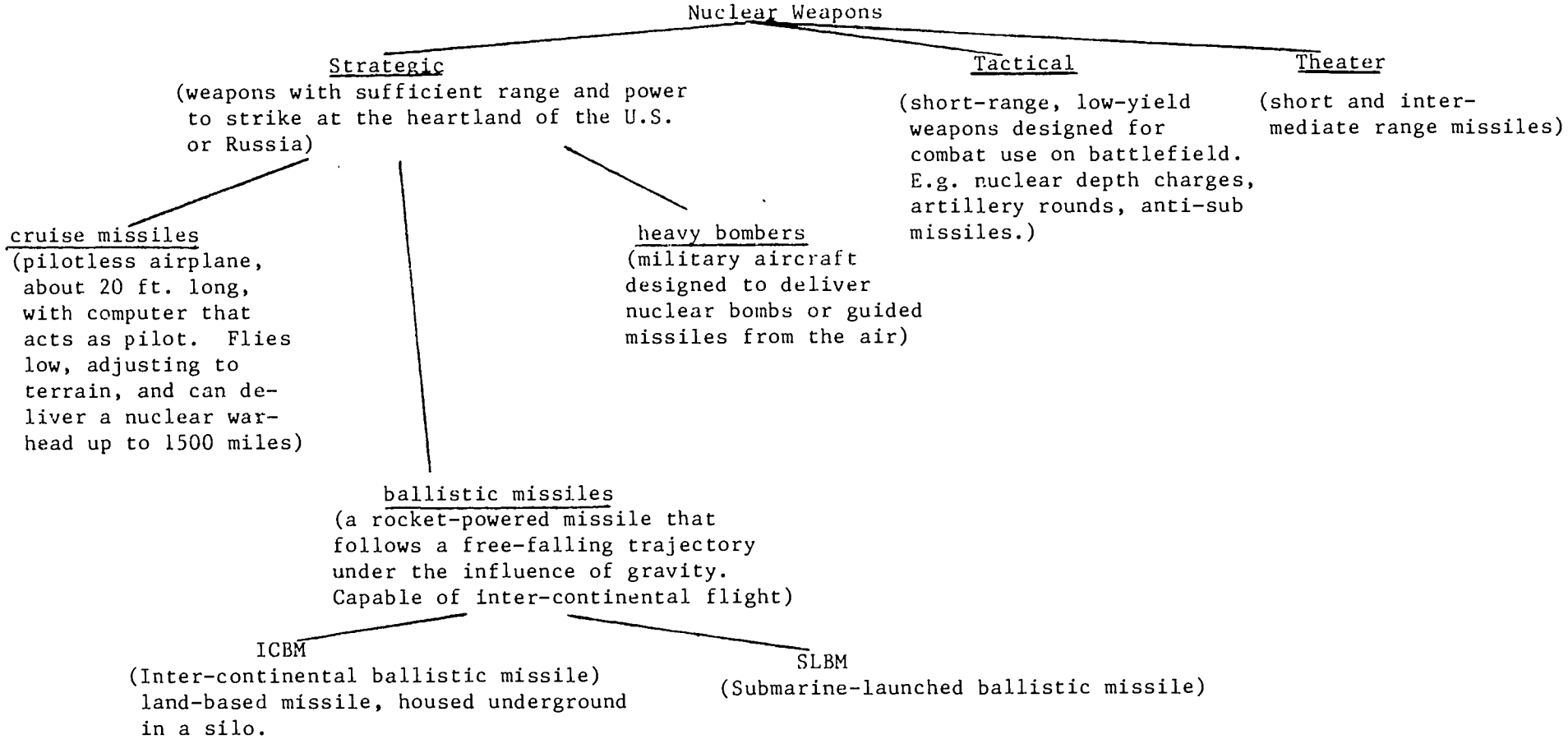
Barash, David. The Arms Race and Nuclear War. Belmont, CA: Wadsworth Publishing Co., 1987.

Craig, Paul and Jungerman, John. Nuclear Arms Race: Technology and Society. New York: McGraw-Hill Book Co., 1986.

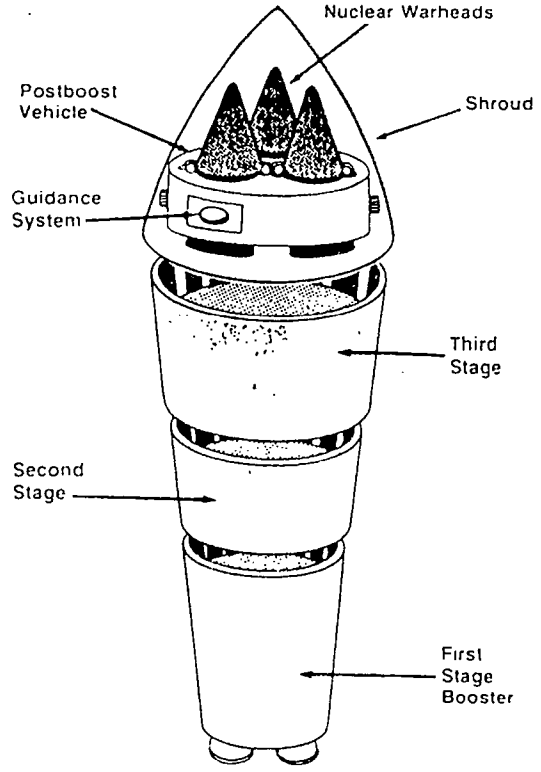
Mayers, Teena. Understanding Nuclear Weapons and Arms Control. Arlington, VA: Education in World Issues, 1983.

Suddaby, Adam. The Nuclear War Game. London: Longman, 1983.

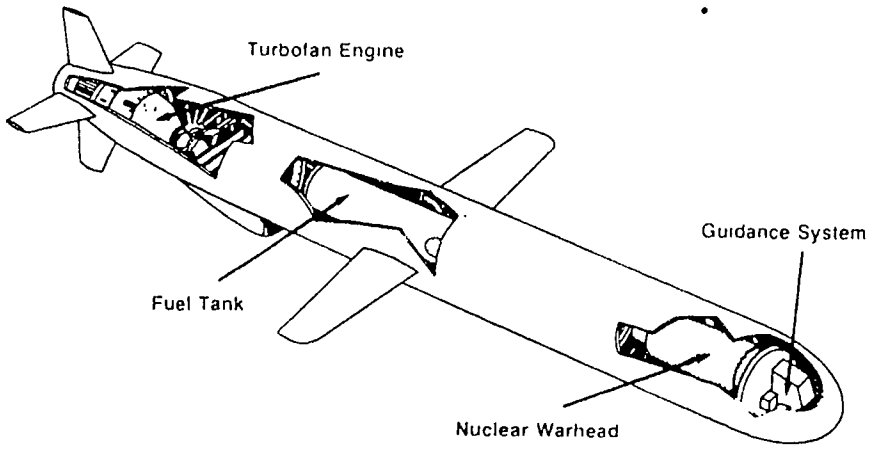
TODAY'S NUCLEAR ARSENAL



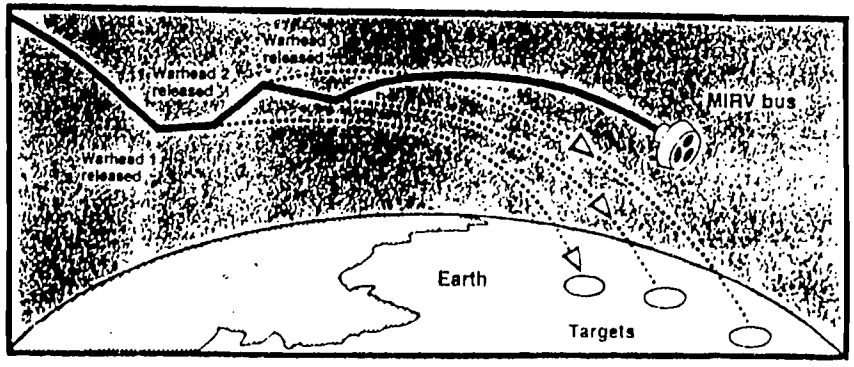
Ballistic Missile



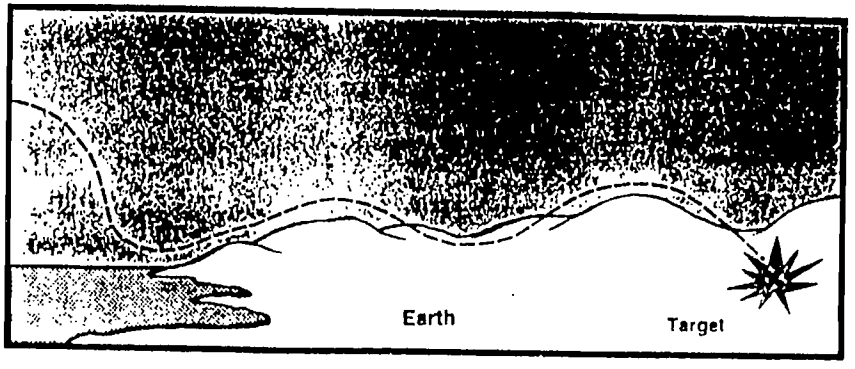
Cruise Missile



Trajectory (Path)



Trajectory (Path)



HOMEWORK

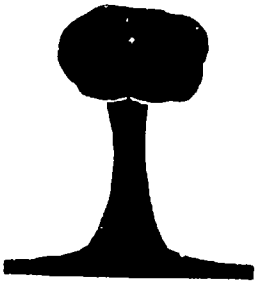
In humanity's long history of making war on itself, weapons have "evolved" all the way from fists and rocks to nuclear weapons. In the process, weapons have become more complex, costly, and deadly. Choose any of the weapons listed below and compare it to today's nuclear weapons. Consider the weapons' purpose, range, effect, and victims.

CLUB

SWORD

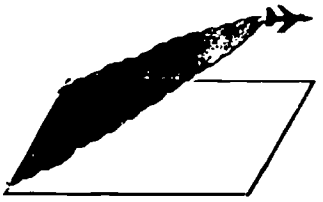
RIFLE

NUCLEAR WEAPON



TANK

CHEMICAL WEAPON



CONVENTIONAL BOMB

HIROSHIMA AND NAGASAKI: INITIATION INTO THE NUCLEAR AGE

"Compared to the extinction prospects of nuclear war today, the A-bomb damages suffered by Hiroshima and Nagasaki forty years ago seem small, indeed. Yet, those damages, even if limited by today's standards, provide the only concrete experiential basis for assessing what really happens to people and societies subjected to nuclear attack."

Soichi Ijima, M.D.1

OVERVIEW:

This lesson presents students with the specter of Hiroshima and Nagasaki as an introduction to the terrible moral ambiguities of the nuclear age. The lesson is designed to provide an historical context for the dropping of the bomb and for the arms race that followed, as well as to give students an idea of what that decision means to those on the ground. The lesson's activities give students the opportunity, in an atmosphere of mutual respect and shared concern, to explore the difficult feelings and opinions that arise when we confront these issues.

OBJECTIVES:

Students will:

1) Be able to describe the historical circumstances and possible motives leading to the bombings of Hiroshima and Nagasaki.
2) Be able to describe the effects of the bombing on real-life people and societies.
3) Increase their capacity for empathetic concern for those who suffer the horrors of war.
4) Evaluate and express their own feelings about the bombings.
5) Develop their ability to make inferences and predictions based on statistical trends (in this case having to do with the increasing role of civilian deaths in modern warfare).

MATERIALS:

Two homework assignments (one pre-lesson, one post-lesson), and in-class worksheet.

PROCEDURES:

1) In preparation for today's class, students should have received and completed homework assignment #1 the day before.

2) (15 min.) Class begins with students getting together in pairs to share their reflections on the homework. Class comes together again and teacher asks students if anyone would like to share a new perspective that they had gained from their discussion partner.

3) (20 min.) Class activity. Distribute Handout (Voices of Hiroshima and Nagasaki) to entire class. Seven students are chosen

or volunteer to read out loud the "Voices of H and N". Discussion: do any of these voices challenge your views on the bombings? With whom do you identify most? Least? Why? What can we learn from the experience of Hiroshima and Nagasaki?

4) (Time remaining) In-class journaling. Students each choose one of the characters in "Voices of H. and N." and draw a picture of that person's experience of the bomb as the student imagines it.

HOMEWORK: Homework assignment #2 (Using Statistics).

HOMEWORK #1: THE DECISION TO DROP THE BOMB

By early August, 1945, WWII was drawing to a close. Germany had surrendered. Yet Japan continued to put up a fierce fight, and an Allied invasion force was preparing to take the Japanese mainland. Estimates of likely casualties in such an invasion ranged from a few thousand to hundreds of thousands of soldiers on both sides.

President Truman faced a difficult decision. Some of his advisors argued that he must choose between invading Japan with U.S. troops and using nuclear weapons on Japanese cities to frighten Japan into surrender. Other advisors said that Japan was close to surrender anyway, and that if nuclear weapons must be used, they should be used in an unpopulated area as a demonstration of force. In the end, President Truman decided to use the bomb. On August 6, 1945, the U.S. dropped a 12.5 kiloton uranium bomb on the city of Hiroshima, and three days later dropped a 22 kiloton plutonium bomb on Nagasaki. Japan surrendered on August 14.

By today's standards, the bombs dropped on Hiroshima and Nagasaki were small ones. Yet each was more than sufficient to level its target city within seconds. Of Hiroshima's 300,000 residents, between 130,000 and 150,000 were dead within four months. By 1950, delayed deaths caused by the bombing had reached about 200,000. Nagasaki lost approximately 75,000 inhabitants. The heaviest casualties were among children. Those who weren't immediately burned, blasted, or crushed to death often died soon afterwards of painful radiation sickness. Over the years, high rates of cancer, birth defects, cataracts, and sterility began to show up in the surviving populations of these cities. Today, Hiroshima and Nagasaki have been rebuilt and are flourishing, but the memories remain vivid. Every year since 1952, these cities have observed the anniversary of their bombings by sponsoring peace ceremonies and issuing peace declarations to the entire world.

Opinion is divided as to whether these bombings, the only times nuclear weapons have ever been used against human beings, were "necessary". General Eisenhower and chairman of the Joint Chiefs of Staff Admiral Leahy were strongly opposed to the bombings. Many U.S. soldiers, who would have risked death in the invasion of the Japanese mainland, were extremely thankful that the A-bomb was used to put an end to the war. Historians and political scientists suggest that the decision to drop the bombs was based on one or more of the following motivations: 1) to put a quick end to the war, 2) to test the newly-developed A-bomb and to justify the Manhattan Project's two billion dollar pricetag, 3) to impress the Soviet Union with the United States' nuclear capacity, thus giving the U.S. an edge in the anticipated Cold War with Russia.

REFLECTION QUESTIONS:
If you were in President Truman's shoes, what would you have done? Why? Under what circumstances do you think the use of nuclear weapons is justified?

HOMEWORK ASSIGNMENT #2

1) Analyze the following trend:

The ratio of military to civilian deaths in wars of this century:

WWI 20:1
WWII 1:1
Korean War 1:5
Vietnam War 1:20

Describe the trend you see and comment on possible explanations for it.

2) The ratio of military to civilian deaths in the Hiroshima and Nagasaki bombings was approximately 1:23. As we know, the destructive power of an average nuclear weapon today is many hundreds of times greater than the 12.5 and 22 kiloton bombs dropped on Japan. What can you predict about the military to civilian deaths ratio that would occur in a nuclear war? Where is the "battlefield" of a nuclear war? Would citizens of non-combatant countries be safe in a nuclear war? Why or why not?

VOICES OF HIROSHIMA AND NAGASAKI

1) The 6th of August, 1945--which I do not forget--the things that happened this day are deeply carved in my heart. That cruel war that snatched away so many precious human lives in one second--even now I shudder when I think of it. I am all alone after losing my father and mother and all my brothers and sisters. And no one can take their place. All of them, as a result of that A-bomb, were struck down one after another. My oldest brother was never found after he left for work with the Labor Service Group. My second brother's whole body was covered with burns and he died the next day at the Koi Grammar School. We left his body there at the Koi School and Father and Mother and the rest of us returned to the country. Since there were no good doctors in the country, my mother returned to town for treatment. At night a man came saying that she had suddenly become worse and called us back to town. When we arrived, a strange, bad odor was rising everywhere, and the sights we saw! Everything imaginable was in ruins. You could not see a trace of the former Hiroshima. When we somehow managed to reach home we found that Mother had breathed her last a few minutes before. I cried for all I was worth. We cremated Mother's corpse on the stony river bed. Here and there all along the shore people were cremating corpses. And that evening just after we arrived back at my uncle's house in the country with Mother's ashes, my big sister died...They all died like this one after another...Before he died, Father often said "Father doesn't want to die. Since our house and clothes have all been burned by the A-bomb, let's both of us go in our rags to the country and become farmers." He said this often.

Takako Okimoto, in 2nd grade in 1945. Quoted in Children of the A-Bomb, by Dr. Arata Osada.

2) A column of smoke rising fast. It has a fiery red core. A bubbling mass, purple-grey in color, with that red core. It's turbulent. Fires are springing up everywhere, like flames shooting out of a huge bed of coals. I am starting to count the fires. One, two, three, four, five, six...fourteen, fifteen...it's impossible. There are too many to count. Here it comes, the mushroom shape that Captain Parsons talked about. It's coming this way. It's like a mass of bubbling molasses. The mushroom is spreading out. It's maybe a mile or two wide and half a mile high. It's growing up and up. It's nearly level with us and climbing. It's very black, but there is a purplish tint to the cloud. The base of the mushroom looks like a heavy undercast that is shot through with flames. The city must be below that. The flames and smoke are billowing out, whirling out into the foothills. The hills are disappearing under the smoke.

Tail-gunner of the Enola Gay as he watched the bomb explode over Hiroshima.

3) The police chief of Hiroshima...took me to hospitals where the victims of the bombs are still being treated. In these hospitals I found people who, when the bomb fell, suffered absolutely no injuries, but now are dying from the uncanny after-effects. For no apparent reason, their health began to fail. They lose appetite. Their hair fell out. Bluish spots appeared on their bodies. And bleeding began from the ears, nose, and mouth.

Peter Burchett, Daily Express, September 5, 1945

4) Unless you've experienced it, you can't really understand the horror of the atom bomb. I've told my grandchildren about it again and again, but they don't take it seriously. I'm an old woman now and I haven't got much longer to live, but I could die with an easy mind if only people could understand how terrible the atom bomb is.

Sada Tatsumoto, quoted in 1982 in Widows of Hiroshima, edited by Mikio Kanda.

5) For some 1000 yards, or three-fifths of a mile, in all directions from the epicenter...it was as if a malevolent god had suddenly focused a gigantic blowtorch on a small section of our planet. Within that perimeter, nearly all unprotected living organisms--birds, insects, horses, cats, chickens--perished instantly. Flowers, trees, grass, plants, all shriveled and died. Wood burst into flames. Metal beams and galvanized iron roofs began to bubble, and the soft gooey masses twisted into grotesque shapes. Stones were pulverized, and for a second every last bit of air was burned away. The people exposed within that doomed section neither knew nor felt anything, and their blackened, unrecognizable forms dropped silently where they stood.

from F. Chinook, Nagasaki: The Forgotten Bomb.

6) When the atom bombs were dropped and news began to circulate that "Operation Olympic" would not, after all, be necessary, when we learned to our astonishment that we would not be obliged in a few months to rush up the beaches near Tokyo assault-firing while being machine-gunned, mortared, and shelled, for all the practiced phlegm of our tough facades we broke down and cried with relief and joy. We were going to live. We were going to grow to adulthood after all. The killing was all going to be over, and peace was actually going to be the state of things.

Paul Fussell, in Thank God for the Atom Bomb.

7) Suddenly I wondered what had happened to my mother and sister. My mother was then 45 and my sister 5 years old. When the darkness began to fade I found that there was nothing around me. My house, the next door neighbor's house, and the next had all vanished. I was standing amid the ruins of my house. No one was around. It was quiet, very quiet, an eerie moment. I discovered my mother in a water tank. She had fainted. Crying out, "Mamma, Mamma," I shook her back to her senses. After coming to, my mother began to shout madly for my sister, "Eiko, Eiko."

Child survivor account from Unforgettable Fire.

REPORT TO TEACHERS

This lesson is designed with two complementary purposes in mind. The first, to acquaint students with the historical context of the Hiroshima and Nagasaki bombings, is largely covered in homework assignment #1. The second purpose, to impress upon students the practical realities of actual nuclear attack, is a painful but necessary task for the nuclear arms educator. In a 1983 survey, Dan B. Fleming found that American textbooks give this crucial episode in world history scant attention, and what attention is given often neglects the results of the bomb in favor of its creation and military role.1 Without shortchanging either of these, which are covered in previous lessons in this curriculum, this lesson attempts to correct that imbalance.

If students are to come to informed decisions about nuclear arms, they must become conscious of those arms as instruments of death and destruction as well as of international diplomacy. Helping students broaden their outlook on the world involves decreasing ethnocentric perceptions, which in turn means developing the ability to empathize. This lesson strives to bring students to an empathetic awareness of the innocent Japanese victims of the bombings, regardless of the rights and wrongs of World War II. Students who have "heard" the voices of human beings irradiated because their leaders can not agree will perhaps find it more problematic to separate the technical and political aspects of the arms race from its human and social consequences. Perhaps they will also be moved to seek out constructive resolutions to conflict that will bypass the need for more Hiroshimas and Nagasakis.

This lesson, then, sets the stage for class exploration of the nuclear age. Discussion of the bombings of Hiroshima and Nagasaki is less a history lesson (though it functions in that capacity, too) than a look ahead to the themes of the remainder of this curriculum: what are the origins of the nuclear age? what are its political, sociological, and moral dimensions? what are its environmental, social, and human consequences? What are some visions and strategies leading to alternative methods of conflict resolution?

Students are likely to feel conflicting and often powerful emotions as they confront this material. This, we feel, is natural and desirable if our social studies classrooms aspire to more than sterile academic exercises, if indeed they are to "focus on the social world as it is, its flaws, its strengths, its dangers, and its promise"2. There are better and worse methods for teachers to incorporate these emotions into the task at hand, however. One of the most effective of these is through journaling, where creative expression can be encouraged through non-verbal as well as verbal assignments. Drawing pictures of bombing victims' experience may not appear at first to have great pedagogical value, but given the variety of modalities available to us to represent and confront different realities, we suggest that students may find this activity quite useful in understanding what it means to be a victim of war, and this is surely a desirable objective in the "global classroom."

REFERENCES:

1"Nuclear War: What Do High School History Textbooks Tell Us?", by Dan B. Fleming, in Social Education, November/December, 1983, pp. 480-484.

2 ibid. p. 480. (NCSS Social Studies Curriculum Guidelines of 1979).

USEFUL REFERENCES ON HIROSHIMA AND NAGASAKI:

Hersey, John. Hiroshima. NY: Knopf, 1946.

Committee for the Compilation of Materials on Damage Caused by the Atomic Bombs in Hiroshima and Nagasaki. The Impact of the A-Bomb. Tokyo: Iwani Shoten Pub., 1985.

Kanda, Mikio, ed. Widows of Hiroshima. NY: St. Martin's Press, 1989.

Fussell, Paul. Thank God for the Atom Bomb and Other Essays. NY: Ballantine, 1988.

WHO'S GOT THE BOMB?

"The splitting of the atom has changed everything, save our mode of thinking, and thus we drift toward unparalleled catastrophe."
Albert Einstein

Overview

As the risk of nuclear confrontation between the superpowers dissolves in the 90's, world attention is turning to the spread of nuclear weapons in the developing world as a growing threat to world security. This lesson is designed to introduce students to this horizontal proliferation, both in its implications for world peace and as a lesson in North-South relations. Students will map the spread of nuclear weapons technology, and will assess the 1968 Nuclear Non-Proliferation Treaty (NPT). As homework, students will examine the role of a comprehensive test ban in stemming further proliferation.

Objectives

Students will:

1) be able to list the nations possessing nuclear weapons or nuclear weapons capability.
2) be able to locate those nations on the map and identify Developed World/Developing World patterns in their distribution.
3) be able to describe the NPT and its strengths and weaknesses.
4) be able to suggest some implications of horizontal proliferation.
5) be able to describe the shape and implications of the CTB debate.

Materials

Handout on NPT, blank map, homework sheet on CTB.

Procedures

1) (10 min) Quick review of nuclear weapons unit. This being the last lesson in the unit, teacher may want to briefly review what has been discussed: atomic physics, nuclear weapons themselves, the effects of nuclear explosions.

2) (20 min) "Who's Got the Bomb?" mapping exercise. Teacher hands out world map, and asks students to find and check off each country as it appears on the board. Teacher asks class to help fill in chart below. Completed list on board should appear as follows:

"Nuclear Weapons Club"	Countries strongly suspected of having nuclear weapons	Countries suspected of working to develop nuclear weapons
U.S.	Israel	Brazil
Russia	India	Argentina
Britain	Pakistan	Iraq
France	South Africa	Iran
China		Libya
		Taiwan
		North Korea
		South Korea

Teacher next asks students if they notice any patterns in these groupings? What might account for the North/South split? (nuclear technology was first developed in advanced Western nations and only gradually has it found its way to less-developed Third World countries). Discuss briefly some of the more interesting cases (Israel, South Africa, Iraq, Soviet republics). Questions: why do these countries find nuclear weapons desirable? Why might they not want to develop nuclear weapons? Why haven't more European states developed nuclear weapons when they are easily capable of doing so?

3) (15-20 min) Discussion of Nuclear Non-Proliferation Treaty. Hand out copies of NPT and briefly explain its relevance. Have each student read it and circle the article he or she finds most important in promoting global security. Have students explain their choices. Questions: what are the responsibilities of the nuclear weapons states? What are the responsibilities of the non-weapons states? What incentives are there in the treaty to encourage non-weapons states to sign (see article 4)? How well do you think the nuclear weapons states have held up their end of the treaty?

Homework
CTB "Policy-Making Exercise"handout. Briefly discuss the role of the CTB in stemming proliferation.

REPORT TO TEACHERS

The issue of horizontal proliferation is a pressing, and, at times, a touchy one. Since 1945, when only the United States possessed nuclear weapons, the Soviet Union (1949), Britain (1950), France (1960), and China (1964) have all joined the "nuclear club", and the nations of India, Pakistan, South Africa, and Israel are all considered de facto members of the club as well. Several other countries appear to be seeking nuclear weapons capabilities, and now, of course, we are faced with a new proliferation threat, the possible acquisition of Soviet weapons by breakaway Russian republics.

From the perspective of this curriculum, the threats to global security posed by this proliferation are several. That so many countries still see nuclear weapons as contributing to their national security is in itself indicative of continuing weaknesses in the world's system of international relations. Beyond the threat posed by the superpowers' nuclear arsenals (approx. 98% of the world's nuclear weapons), the acquisition of these weapons by developing countries logically increases the chances that someday these weapons will be used, whether in anger or by accident. Concerns about the emergence of unstable leaders in control of nuclear weapons, about the use of nuclear weapons in regional conflicts, and about nuclear terrorism all motivate the world community in its attempts to limit this spread.

Yet the world community is by no means unified in its views of proliferation, despite the 140-odd member nations of the 1968 Nuclear Non-Proliferation Treaty (NPT). The movement to delegitimize nuclear weapons as a military tool is jeopardized by what many in the developing world and elsewhere see as the hypocritical, discriminatory stance held by the "nuclear club." So long as the nuclear powers' arsenals are considered "necessary" for their security, it is claimed, there is little reason other nations should not follow suit. While the NPT does require the nuclear powers to pursue nuclear disarmament, progress on this front has until very recently been negligible, and the size of the superpowers' arsenals continues to far exceed the spirit of the NPT. As the 1995 NPT Extension Conference approaches, many developing nations are demanding greater consistency in the treaty's application and greater incentives for abstaining from developing nuclear weapons for themselves. What benefits, they ask, do signatories of the treaty receive when non-signatories, such as Israel and Pakistan, are free to build nuclear weapons as they please.

Yet for all its weaknesses, there is no doubt that the Treaty has significantly slowed horizontal proliferation. It has helped promote the international norm that nuclear weapons are a liability to world peace. The recent case of Iraq's confrontation with the International Atomic Energy Agency, the U.N. group which oversees the NPT, is instructive as to the treaty's strengths and weaknesses. Many nuclear-capable states in Europe and elsewhere have chosen not to pursue nuclear weapons, whether because they feel adequately covered by NATO's umbrella, because of costs, or

because of the threat to internal and regional stability that such weapons can present.

Further concerns are the growing global market in nuclear materials and technology, and the possibilities of nuclear terrorism. The NPT allows, even encourages, the nuclear powers to share this technology with treaty signatories to assist in the development of nuclear energy. Yet the line between nuclear energy and nuclear weapons production can now be crossed rather easily. States desiring nuclear weapons can now amass the necessary fissile materials through reprocessing of spent uranium or through the flourishing "grey" or "black" market in nuclear supplies.

Nuclear terrorism, that is, the possibility of terrorists or renegade states acquiring enough of the world's unaccounted-for plutonium to threaten the world with nuclear terror, is also a growing concern. In sum, then, horizontal proliferation of nuclear weapons has been slowed but by no means stopped in the years since the signing of the NPT, and as we enter a new era of change and uncertainty, their spread will need to be checked with bold new measures and strong leadership from the "nuclear club".

According to many observers, one of the most effective means of stemming proliferation both horizontal and vertical would be a comprehensive test ban treaty (CTB). The effect of such a ban will hopefully be to inhibit the research and development of nuclear weapons, thereby diminishing the nuclear threat and boosting international cooperation in the realm of mutual verification and confidence-building measures. The Soviet Union and the United Nations were actively seeking a CTB for years, while the United States has only recently indicated a willingness to examine the possibilities. Opponents of the CTB, including the Bush administration and officials at weapons laboratories, argued that continued testing is necessary to ensure reliability of U.S. stockpiles and to continue their development. Proponents of the CTB argue in turn that Russia and all other nuclear powers would be under the same easily verifiable constraints as the U.S., thus limiting and eventually rendering obsolete the continued escalation of nuclear weapons development. Since the Limited Test Ban Treaty of 1963, virtually all nuclear testing has been underground, which has drastically reduced testing's environmental impact while also allowing a greater frequency of tests. In the summer of 1992, the U.S. announced a temporary moratorium on testing, which President Clinton recently extended until July, 1994, creating a very favorable climate for the enactment of a CTB in the near future.

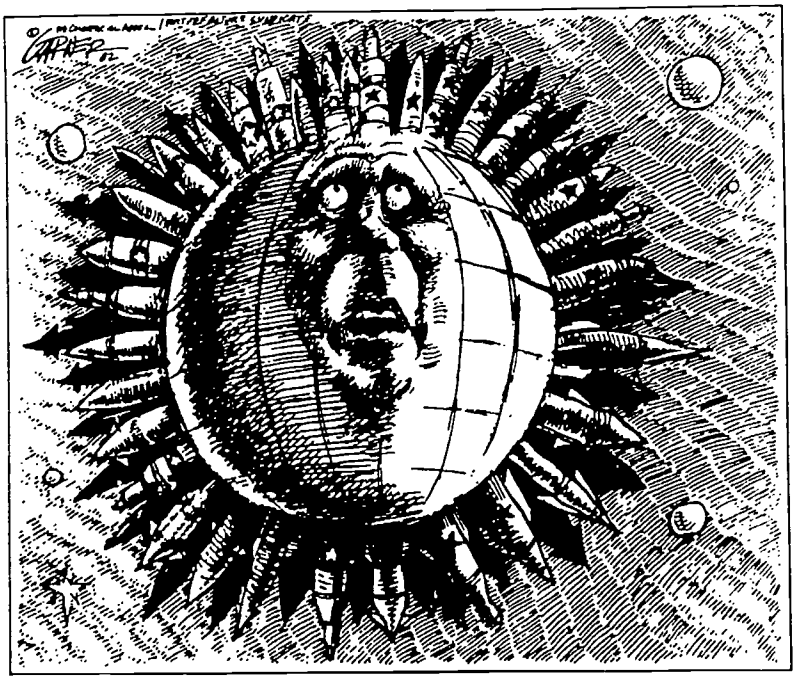
Resources

Barash, David. The Arms Race and Nuclear War. Belmont: Wadsworth Publishing Co., 1987.

Albright, David and Zamora, Tom. "Stopping the Proliferation of Nuclear Weapons." Federation of American Scientists Public Interest Report, Sept., 1990.

Stockholm International Peace Research Institute. SIPRI Yearbook 1990: World Armaments and Disarmaments. New York: Oxford University Press, 1990.

Spector, Leonard. Going Nuclear. Cambridge, MA: Ballinger Publishing Co., 1987.



THE NUCLEAR NON-PROLIFERATION TREATY

The Nuclear Non-Proliferation Treaty was signed on July 1, 1968 by 62 nations, including three nuclear powers, U.S., Britain, and U.S.S.R. Since then, the list of signatories has grown to 140 nations, but several key states continue to refuse to sign, including Argentina, Brazil, India, Pakistan, and Israel. France and China, two of the original nuclear powers, have recently moved closer to signing.

The NPT is evaluated every five years at an international review conference. In 1995, the conference must decide whether to extend it, reject it, or amend it to meet today's proliferation challenges.

The treaty consists of eleven articles, the last four of which are largely administrative. The first seven:

Article 1) Nuclear weapons states pledge not to transfer nuclear explosive devices or the means to produce them to non-weapons states.

Article 2) Non-weapons states pledge not to receive nuclear explosive devices or the means to produce them.

Article 3) Non-weapons states agree to International Atomic Energy Agency (IAEA) safeguards--inspection of nuclear facilities and accounting of nuclear materials.

Article 4) Materials related to the production of nuclear energy are excluded from the ban on the transfers of explosive-related materials.

Article 5) "Peaceful nuclear explosions" are permitted, and their potential benefits will be made available on a non-discriminatory basis.

Article 6) The signatories pledge to work toward universal nuclear disarmament.

Article 7) Regional associations have the right to declare their regions nuclear-free zones.

POLICY-MAKING EXERCISE

It is 1996 and you are the President of the United States. The arms race between the superpowers has diminished, but nuclear proliferation elsewhere in the world is a growing problem. The United Nations and Russia have proposed a Comprehensive Test Ban that would eliminate all testing of nuclear weapons in all countries, thus putting a strong limitation on the development of nuclear devices. You know that testing anywhere can be detected even at very low levels in very remote areas, so that cheating on the Ban is very unlikely. What is your response to the United Nations and to Russia? Justify your answer.

WEAPONS PRODUCTION AND THE ENVIRONMENT

"The problem in defense is how far you can go without destroying from within what you are trying to defend from without."
Dwight D. Eisenhower, 1953

OVERVIEW: Our examination of the health and environmental effects of today's weaponry must include the existing threats inherent in the creation of these weapons. The world's armed forces are probably the world's greatest polluters. In this lesson we look at the environmental impact of the production and dismantling of nuclear weapons as an especially troubling form of military pollution. The lesson introduces students to the concept of a product's life-cycle, and to the process of reasoned cost-benefit analysis as a method of making decisions about our priorities.

MATERIALS: 1) Four handouts, each describing one phase in the production of a nuclear weapon.
2) "Pathways of Radioactive Contamination" handout.

OBJECTIVES:

Students will:
1) Be able to define the concept of a product's life-cycle as it begins in raw materials and ends in waste remains.
2) Be able to describe the life-cycle of a nuclear weapon.
3) Recognize the environmental and health effects associated with nuclear weapons production.
4) Explore options for increased safety at plants.
5) Develop problem-solving skills.

PROCEDURE: 1) Brainstorming (15 min): Health and Safety Threats in Today's World. Students think of technological developments in their world that have both advantages and risks (e.g. cars, pesticides, guns). Teacher lists all these on the board, then returns to the list to discuss the benefits and risks of each one (benefits can include impact on local economy, risks can include health and safety threats to workers). How do we decide whether the benefits outweigh the costs? How do we minimize the risks? If we decide the costs outweigh the benefits, what can we do? Who decides, and why?

2) Brief discussion of production life-cycles. Can you describe the production life-cycle of some products you are familiar with (e.g. bread, down jacket, car tire)? Nuclear weapons have a production life-cycle, too, and each step contains health and environmental hazards that must be weighed against the potential benefits of the end product.

3) Group activity on the nuclear weapon life-cycle:

a. Teacher divides the class into four groups. Each group is assigned one phase of the nuclear weapon production cycle, and is given the handout describing that phase. This handout is for use in the group and for individual homework. Groups discuss their phase and its environmental hazards for 10-15 minutes. Each group should choose a student to take notes and another to report to the class. Each group is to determine what it considers the chief environmental threat posed by their phase, and what might be done to minimize that threat.

b. Groups report their findings to the class in sequence (mining, production, deployment, and waste). Discuss feelings and concerns about military-generated pollution.

HOMEWORK: Answer the homework questions found on your group's production sheet using the "pathways of nuclear contamination" handout as an added resource. See Teacher Report for "conscience-searching" journal exercise option.

REPORT TO TEACHER

The environmental impact of already existing nuclear weapons, whether they are used or not, is a legacy the country is only now starting to confront. Years of sloppy production practices, testing, and accidents with weapons have left a radioactive trail of tremendous environmental damage and health and safety threats worldwide. This lesson's overall goal is to help students grasp the vulnerability of our environment, and of our health and safety, to practices that continue despite the lessened probability of nuclear war.

This lesson provides an excellent opportunity to explore several key issues with students. Chief among these is the very definition of environment. When we discuss "the environment" in the context of radioactivity, we no longer mean simply the availability of greenspace or the survivability of certain rare species. Rather, we are looking at "the environment" in its largest sense, the very habitability of the world in which we as biological beings have no choice but to live. Radioactive waste and fallout spreads indiscriminately through field, forest, city, air, water, food chains. Once released, it can contaminate for thousands of years the environment on which we depend for all our biological needs. Students by this point will have learned just what that radiation does to human tissue and reproductive capacity. "Environment" in this context is thus inseparable from human health, safety, and even survival.

Every human being on earth now holds in his or her bones a quantity of Strontium-90 released over the years into the environment by atmospheric testing. The world-wide burden of plutonium, the most toxic element known, has increased dramatically since the splitting of the atom in 1942. Estimates of the number of radiation casualties world-wide run from 16-32 million1, though in a sense we are all casualties in one way or another. Painful stories of suffering and death are told by survivors of nuclear testing in the American West, the South Pacific, and Russian test sites. The official veil of secrecy surrounding these tests cannot hide their human consequences, the cancers, mutations, and deaths of those damaged by radiation2. In a very real sense, then, we can say that the effects of nuclear war are already known to us in the suffering and damage created around certain areas of weapons production, testing, and nuclear accidents.

There are at least two other basic issues that arise in the context of this lesson. In the awareness of weapons' environmental impact, students will begin assessing threats to our security in a broader framework than the purely military. Part of this is the realization that increased safety is a value that everyone can agree on, a value that must come to the fore as we realize our common vulnerability to a contaminated environment. Students will thus examine in these lessons not only the environmental hazards, but also procedures by which military production may be made safer.

Another issue is the role of conscience in the production and testing of nuclear devices. While this is a highly personal and

subjective issue with little room for teacher bias, it is nonetheless one that educators should help students explore. We recommend that teachers bring it up as a question for students to confront individually in their journals. The teacher can simply state that, as with any job, one needs to be aware of the overall enterprise one is involved in and needs to search one's conscience as to whether that is something one wants to contribute to. Examples of jobs in which conscience is an especially important factor might be: work in a chemical firm known to pollute the environment, work for a food company known to mistreat its migrant workers, and participation in an unjust war.

It is interesting to note that in 1983 the Roman Catholic bishop of Amarillo, Texas, the site of a major nuclear weapons production facility, declared his view that the making of nuclear weapons is unacceptable within the teachings of Christian tradition3. A hypothetical dilemma comparable to the one Catholic workers in Amarillo faced might be an effective way to explore this issue with students. Two provocative examples from WWII of the role of conscience in military matters are the opposition to the H-bomb expressed by Robert Oppenheimer, one of the scientists most intimately involved in its development, and the Nuremburg Trials, which established that "just following orders" is not a sufficient defense for war crimes.

Much of the lesson is designed around the concept that nuclear weapons are an economic product both like and unlike other products in our economy. With this lesson, students begin to examine the costs and benefits entailed in producing and owning nuclear weapons, and the roles they can play as citizens in acting on the results of such cost-benefit analysis.

Essential teacher information for this lesson is for the most part provided in the student group handouts. The teacher may want to explore reasons for the acceptance of hazards in military nuclear plants that are unacceptable in commercial plants. For example, in the U.S., living areas surrounding military plants are allowed twenty times the radiation exposure allowed areas surrounding commercial power plants4. The "production-at-any-cost" mentality at nuclear weapons plants is coming under some fire, however. Citizen and governmental lawsuits against plants for improper storage and dumping are becoming more common. The Department of Energy has shut down military reactors in Hanford, WA and Savannah River, SC for unsafe operating procedures. In the former Soviet Union, plant and testing site shutdowns have occurred in response to public pressure and earthquake threats.

Still, the cost of military nuclear plant cleanup in the U.S. is estimated by the General Accounting Office to be at least $150 billion, and in the meantime waste continues to be generated without adequate means of disposal. An excellent resource on plant safety is the short film, Deadly Deception, (see Resource List) which documents the extraordinary rates of cancer and reproductive disorders among "downwinders" and workers at several nuclear weapons production facilities around the country. The film is also recommended for its examination of citizen action strategies.

USEFUL REFERENCES

Social Education 54: 151-155, 159-160.

International News (publication of Women's International League for Peace and Freedom): March 1990.

Mallory, Maria. "Dropping a Bomb on Radioactive Junkyards." Business Week (3 July, 1989): 29-30.

Ahearne, John. "Fixing the Nation's Nuclear-Weapons Plants." Technology Review 92: 24-29.

Warf, James C. All Things Nuclear. Los Angeles: The Southern California Federation of Scientists, 1989.

FOOTNOTES
1International News, p. 1
2ibid., p. 2
3Lester Kurtz, The Nuclear Cage, p. 86
4Social Education 54, p. 151.

MINING HANDOUT

The first step in the production of a nuclear weapon is the mining of its raw material, uranium ore. Uranium is extracted from the mines, processed, and then transported to an enrichment plant, where it is refined to bomb-grade quality.

Residue of the processing, known as mill tailings, contains radioactive uranium and thorium. Radioactive radon gas is also released by the mill tailings, and can accumulate inside the mines as well. Mill tailings were for years simply dumped on the ground, exposed to the elements. Today they are covered only by dirt.

Uranium mines are found all over the world. In the U.S., they are often located on Native American lands, outside the reach of Environmental Protection Agency regulations. In Australia, mines are often located on aboriginal lands. Native Americans and aborigines often work at these mines, and have for years shown high rates of cancer. Mill tailings in the Western U.S. are estimated at 140 million tons, some in piles 100 feet high.

HOMEWORK QUESTIONS

QUESTIONS FOR UNDERSTANDING:

What are some of the ways that mill tailings affect the environment? How are miners at risk? How are people in surrounding areas at risk?

QUESTIONS FOR REFLECTION:

Can you think of any analogous threats to the environment in your area? How do these threats to the environment and to health compare to the possible benefits we receive from nuclear weapons? Would you feel differently if you lived in a town near a mining operation? Would you accept a job at the mine? Why or why not?

QUESTIONS FOR ACTION:

How can uranium mining be made safer? How can citizens challenge mining operations that threaten their local environments?

PRODUCTION HANDOUT

After delivery from the mine, natural uranium (99.3% U-238 and .7% U-235) is transformed into bomb-grade U-235 at the enrichment plant. Next it is transported to the weapon factory, where some of it is transformed to Plutonium, the most toxic element known. Plutonium and U-235 become the fission material in nuclear warheads. The construction of nuclear warheads is a complex operation with many steps and components, depending on the type of bomb desired.

Though many problems are associated with the handling of plutonium, weapons-producing plants are not regulated by the Nuclear Regulatory Commission and are subject to less stringent standards than are civilian nuclear power plants. Currently, several of these plants have been shut down or are under review by the Department of Energy for unsafe operating procedures. Nuclear weapons plants are located across the United States, Russia, and Europe, and have a tremendous impact on local economies.

HOMEWORK QUESTIONS

QUESTIONS FOR UNDERSTANDING:

What are some of the risks involved in the production phase of nuclear weapons? How important are plant safety factors and the potential for human error? Why must plutonium be strictly guarded? What are some possible hazards involved in the transportation of plutonium?

QUESTIONS FOR REFLECTION:

How do these threats to the environment and to safety compare to possible benefits we receive from nuclear weapons? Would you feel differently if you lived in a town near a weapons plant? Would you accept a job at the plant? Why or why not?

QUESTIONS FOR ACTION:

How can production facilities be made safer? What role does the government have in this? How can citizens challenge production plants that are threatening their local environments?

DEPLOYMENT HANDOUT

Deployment means the transport of nuclear weapons from production plant to military base, and from base to base, for installation in delivery systems. Weapons are transported by truck, train, aircraft, and ships. Nuclear submarines move weapons all over the world continually. Lifting, transferring, and installing nuclear weapons are complex and hazardous operations, and though great caution is generally used, accidents have occurred at this phase for a variety of reasons.

HOMEWORK QUESTIONS

QUESTIONS FOR UNDERSTANDING:

What are some possible accidents that could occur in the deployment phase? How are human error and the unpredictability of travel factors in deployment safety? What hazards are presented by nuclear submarines docked in city ports? What are some ways that the possibility of accidental detonation of nuclear weapons during deployment might be lessened?

QUESTIONS FOR REFLECTION:

Can you think of any similar threats to the environment in your area? How do the threats to the environment and to health and safety compare to the possible benefits we receive from nuclear weapons? Would you feel differently if you lived in a town near a nuclear missile base? Would you accept a job at that base? Why or why not?

QUESTIONS FOR ACTION:

How can the deployment phase be made safer? How can citizens challenge deployment operations that affect their environment?

WASTE HANDOUT

Radioactive waste, much of which remains hazardous for thousands of years, is released into the environment at each step of the production cycle. The processing of uranium at mines results in huge quantities of radioactive mill tailings. Illegal dumping and release of uranium gas continue to threaten health and the environment in several areas surrounding nuclear weapons plants. Radioactive liquid wastes from plants have entered rivers and groundwater in several areas. Radiation levels increase in harbors visited by nuclear submarines.

Storage facilities must keep wastes out of the environment for thousands of years. No completely dependable process of doing this is yet known. In the meantime, some existing storage facilities are proving unsafe. It is estimated that at least $150 billion will be necessary to clean up current military nuclear waste sites.

A related problem involves the dismantling of some nuclear weapons, now that treaties between the U.S. and the former U.S.S.R. call for the "retiring" of about 40,000 nuclear warheads. Weapons to be "retired" are stored and then shipped to a disassembly plant, where their nuclear cores are stored or recycled into new weapons. The Plutonium and Uranium that make up these cores remain highly radioactive, and storage and guarding of these materials is highly problematic.

HOMEWORK QUESTIONS

QUESTIONS FOR UNDERSTANDING:

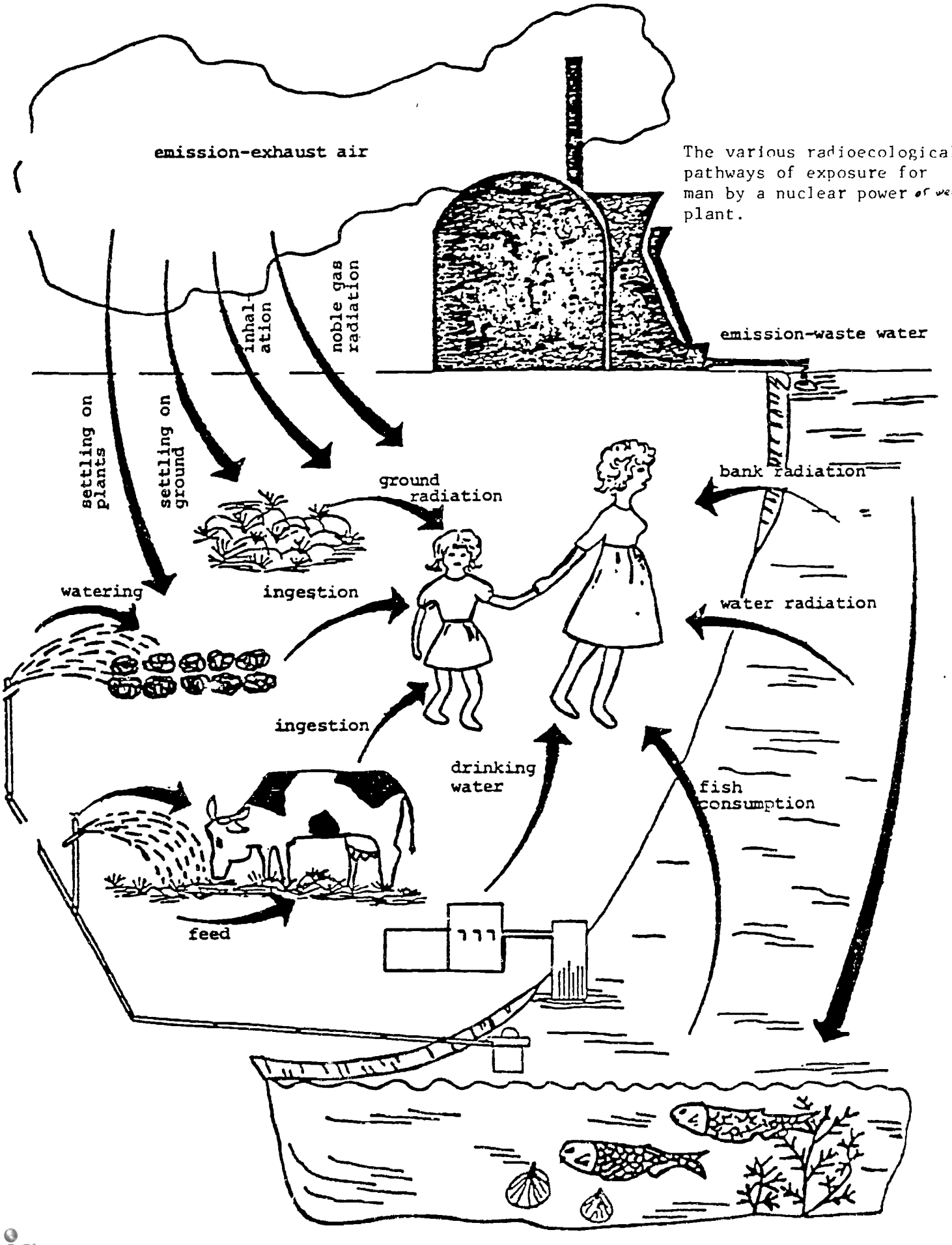
What forms can radioactive waste take, and how is each dispersed through the environment? What are some of the hazards to people living near nuclear sites? What factors must designs for storage facilities take into consideration? Why is it so difficult to find communities willing to accept storage facilities in their area?

QUESTIONS FOR REFLECTION:

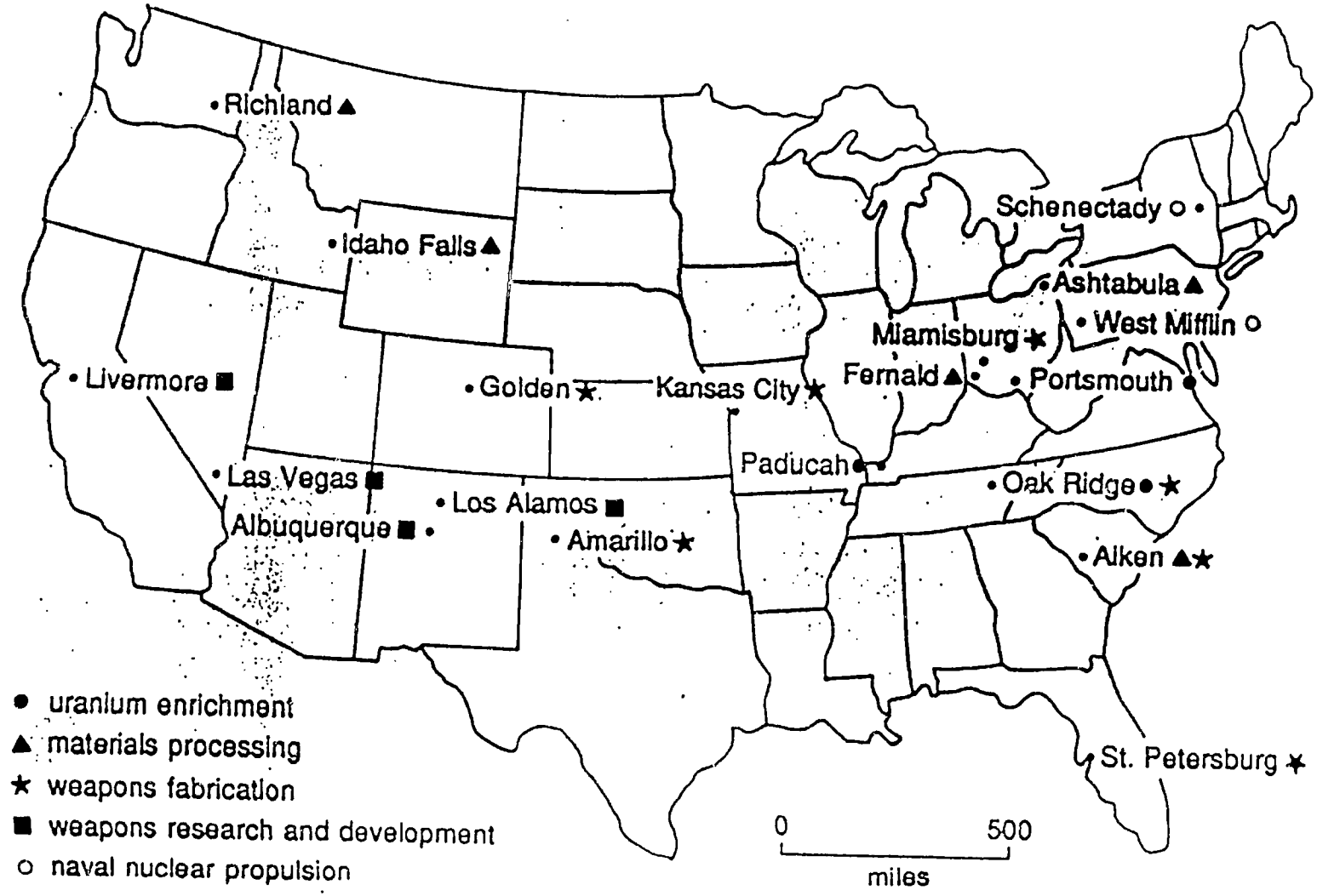
Can you think of any analogous waste hazards in your area? How do these threats to the environment and to health and safety compare to the possible benefits we receive from nuclear weapons? Should "retired" nuclear weapons be destroyed or just recycled?

QUESTIONS FOR ACTION:

How can nuclear waste disposal and nuclear weapons dissembly be made safer? What role does the government have in this? How can citizens challenge unsafe nuclear waste disposal procedures in their area?



The various radioecological pathways of exposure for man by a nuclear power of water plant.


• Richland ▲
• Idaho Falls ▲
• Livermore ■
• Golden ★
Kansas City ★
Schenectady o •
• Ashtabula ▲
Miamisburg ★
• West Mifflin o
Fernald ▲
• Portsmouth
Paducah •
• Las Vegas ■
• Los Alamos ■
Albuquerque ■ •
• Amarillo ★
• Oak Ridge • ★
• Aiken ▲★
St. Petersburg ★
• uranium enrichment
▲ materials processing
★ weapons fabrication
■ weapons research and development
o naval nuclear propulsion
0
500
miles

WAR ON NATURE

The world's armed forces generate huge amounts of toxic waste, yet they are largely exempt from environmental laws.

BY MICHAEL G. RENNER

"We can no longer grow our gardens, we can no longer safely bathe, and we have no water to drink." This is how Mountainview, New Mexico, resident Laraine Hofstetter described her community's plight at a Congressional field hearing in late 1987. The groundwater in Mountainview, a small town southwest of Albuquerque, has nitrate levels as much as 50 times above legal limits. Nitroglycerine (an explosive poisonous liquid) and other toxic substances are feared to be present as well.

Mountainview residents think Kirtland Air Force Base, located three miles from town, is causing the pollution. It is the only logical candidate in this otherwise rural area. Yet, furnishing conclusive evidence has proven elusive, primarily because the suspect activities—the storage and testing of explosives—no longer continue at the base. "It's like we are looking for a needle in a haystack," Hofstetter said.

Mountainview residents have lived on edge since 1980, when an infant almost died after ingesting baby formula mixed with nitrate-contaminated water. The town's incidences of certain cancers, miscarriages, and learning disabilities appear to be higher than normal, but this low-income community lacks the clout necessary to convince state or federal agencies to conduct a health study.

Afraid to use their well water, many residents have hooked up to the Albuquerque municipal water system. Because the Environmental Protection Agency's Superfund program for hazardous waste problems does not cover nitrate contamination and because Kirtland's involvement remains a contested issue, the residents had to do so at their own expense even though they could ill afford the cost.

Mountainview's fate—to be exposed, often unknowingly, to the wastes and hazardous substances generated by a neighboring military installation—is shared by hundreds of towns across the United States and untold numbers of communities around the world. The end of the Cold War and removal of its convenient cloak of "national security" has revealed many examples of the military's disregard for the environment.

Immense quantities of toxic and radioactive substances are generated in producing and testing weapons systems, and maintaining and operating them worldwide. This involves such routine activities as fueling jet fighters, stripping paint off of tanks and repainting them, and degreasing equipment. For decades, the armed forces have handled

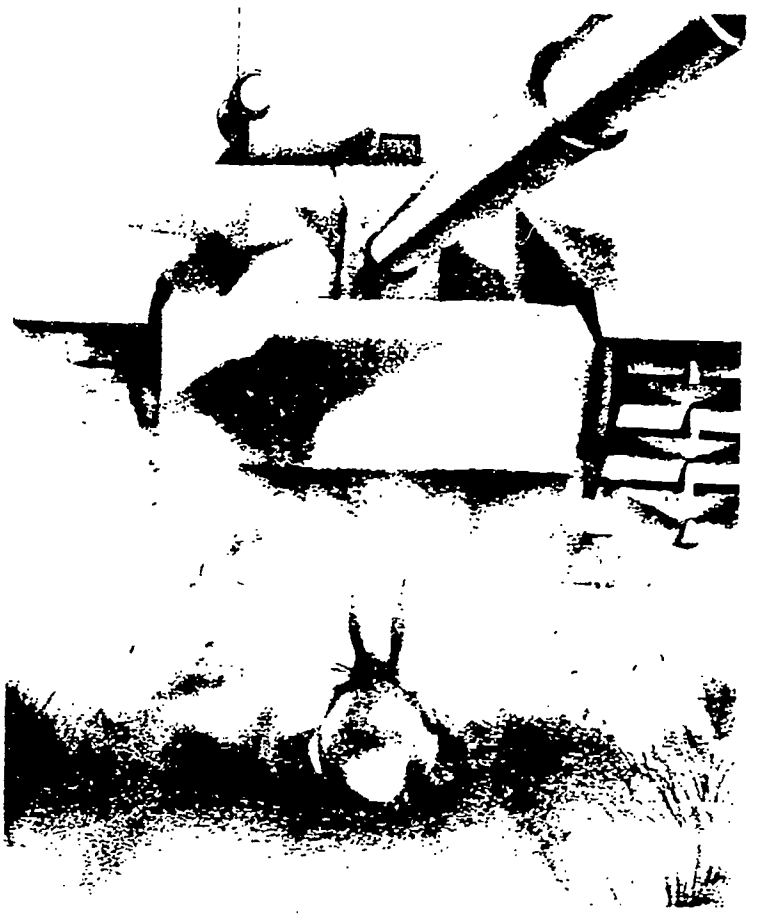
these substances improperly—often dumping them carelessly into unlined pits or even directly into the ground or bodies of water. Recent revelations of the terrible price of such practices are forcing governments to acknowledge the problem of military pollution and begin to address it.

Toxic Menace

The military is the single largest generator of hazardous wastes in the United States. According to the General Accounting Office (GAO), the Department of Defense (DOD) generates some 500,000 tons of toxics annually, more than the top five U.S. chemical companies combined. In addition, by the Pentagon's own reckoning, DOD generated some 8.5 million tons of waste water in 1989, much of it contaminated by toxic chemicals. These estimates do not even include the abundance of toxics—including fuels, solvents, heavy metals, pesticides, polychlorinated biphenyls (PCBs), cyanides, acids, propellants, and explosives—spewing from the Department of Energy's (DOE) nuclear weapons complex.

According to the Pentagon's February 1990 report to Congress on the progress of its "Defense Environmental Restoration Program," more than 17,482 sites on 1,855 military installations were not in compliance with federal environmental laws. In addition, program agents are investigating more than 7,000 former military properties. Some 97 bases are so severely contaminated that they have been put on the EPA Superfund national priorities list. Lenny Siegel, co-author of "The U.S. Military's Toxic Legacy," a new report by the National Toxic Campaign Fund (NTCF), says the number of military facilities on that list could well double.

Many sites owned or run by the Pentagon's contractors are similarly among the most contaminated in the country. According to the NTCF report, the top 10 weapons contractors are listed 133 times by the EPA as "potentially responsible parties" at the nation's 100 most serious Superfund sites. Boeing, maker of missiles and aircraft, has dumped some 24 million gallons of toxic waste in two landfills in the Seattle area during the past 30 years. Sixty of the Department of Defense's 66 so called GOCO (government-owned contractor operated) facilities also need cleanup.



Virtually every military base shows signs of contamination, but some stand out from the crowd. The Rocky Mountain Arsenal outside Denver, Colorado, where 125 different kinds of chemicals have been dumped during 30 years of nerve gas and pesticide production, has been called "the most contaminated square mile on earth" by the Army Corps of Engineers. Groundwater at the Picatinny Arsenal in Dover, New Jersey, shows levels of the solvent trichloroethylene (TCE), a carcinogen, at 5,000 times EPA standards.

Another carcinogen, benzene, has been found at McChord Air Force Base (AFB) in Tacoma, Washington, at concentrations that surpass state limits by 1,000 times. In towns adjacent to Otis AFB in Falmouth, Massachusetts, where the groundwater has been contaminated with TCE and other toxins, lung cancer and leukemia rates are 80 percent above the state average.

Knowledge about the full range of the toxic substances' health effects remains lim

ILLUSTRATIONS BY STEPHANIE CAUSEY

ited, but scientists suspect that exposure through drinking, skin absorption, or inhalation may cause various forms of cancer, birth defects, and chromosome damage or may damage the liver, kidneys, blood, and central nervous system. Despite the hazards they pose, these chemicals are being cleaned up at a snail's pace, and the efforts appear aimed primarily at containing rather than eliminating the contamination.

The military is the single largest producer of hazardous wastes in the United States, generating some 500,000 tons of toxics annually.

Over time, these toxics migrate underground from their dump sites, tainting the water that adjacent communities such as Mountainview rely upon for drinking or irrigation. However, it is the base personnel handling these materials on a day-to-day basis who are most at risk. According to one study by the National Cancer Institute, 14,500 civilian employees at Hill AFB near Ogden, Utah, exposed to TCE, carbon tetrachloride, and other solvents during the mid-1950s suffered a higher death rate from certain cancers than other civilians in their age group.

Foreign Secrets

The extent of pollution at the Pentagon's 375 major foreign bases remains shrouded in secrecy. Defense and State department officials suppressed publication of a 1986 GAO study that identified significant contamination at U.S. bases in Italy, the United Kingdom, and West Germany. A second GAO report, completed in the fall of 1990, was classified as well. Although these reports were commissioned by Congress, the Department of Defense has review powers that can amount to a virtual "veto" over the publication of anything deemed a threat to national security.

The U.S. Army alone has identified 358 contaminated sites in the former West Germany, where half of all U.S. bases abroad are located. As the Army diminishes its presence in that country in the coming years, it plans to turn over vacated facilities to the German government without a major cleanup effort. The Air Force, meanwhile, acknowledges that it has polluted soil and groundwater at every one of its 49 airfields in Europe.

Problems abound elsewhere. Landowners in Iceland are seeking restitution for damage caused by toxic wastes dumped at a U.S. radar site more than 20 years ago. In Japan, heavy metals such as lead and mercury have been detected in a dump at the U.S. Atsugi Naval Air Station, located at the entrance to Tokyo Bay. PCBs, used in radar installations and insulation for electrical equipment, have polluted U.S. bases—and possibly adjacent land—in Guam, South Korea, and the Philippines. At Subic Bay in the Philippines, one of the largest U.S. bases abroad, large quantities of chemical wastes have been released into the bay. On Guam, the U.S. Air Force and Navy dumped large quantities of the solvent TCE and untreated antifreeze solutions onto the ground and into storm drains, contaminating the aquifer that supplies drinking water for three-quarters of the island's population. Tests showed groundwater TCE levels in the area to be as much as six times the permissible limit.

U.S. military installations abroad are exempt from the 1970 National Environmental Policy Act, which requires government agencies to prepare environmental impact statements for major projects. Although U.S. forces on foreign soil should in theory comply with all pertinent host-nation laws, including environmental regulations, in practice they are exempt, because the host government and the local population have no means of enforcement. Foreign governments, however, are beginning to demand

compliance. As the U.S. military prepares to withdraw from some of its European bases, the question of who will shoulder the cleanup costs looms large. Currently, the Pentagon has neither a program nor a budget for environmental restoration on its foreign bases.

The United States, of course, is not alone in confronting military contamination. Every advanced nation relies on hazardous substances to keep its military machine running. But information on this issue is more closely guarded in other nations, particularly in the Soviet Union.

While it is difficult to know the extent of the toxic problem inside the U.S.S.R., the impact of the Soviet military on their former East European allies is becoming obvious as the Red Army withdraws. For example, the groundwater is so contaminated where Soviet troops ran a tank maintenance depot in Frenstat, Czechoslovakia, that "you could practically drill for diesel there," says Deputy Environment Minister Jaroslav Vlcek. As much as 3,000 square miles—6 percent of Czechoslovakia's territory—have been polluted or despoiled by the Red Army.

In September 1990, inspectors from the Polish government's environment department were for the first time given access to two Soviet military facilities in their country. In Swinoujscie, site of the largest Soviet naval base in Poland, they found groundwater supplies contaminated by fuel. The inspectors also discovered sewage from Chojno airfield flowing untreated into the Rurzyca River and large amounts of jet fuel that had leaked into the soil. A number of lakes, including Lake Miedwie near Szczecin on the Baltic Sea, had also been contaminated by the indiscriminate dumping of oil and other wastes.

In Hungary, parts of Kiskunsag National Park had been used as firing ranges and ammunition dumping grounds. The full effects are not yet known, but the soil and groundwater in shooting ranges are typically contaminated with lead and other toxic residues from exploded and unexploded missiles, bombs, and bullets. In the former East Germany, at least 90 Soviet installations are severely polluted. At Lärz Air Base in Mecklenburg, for example, more than 50,000 tons of fuel leaked into the soil. All told, an estimated 10 percent of east German territory has been fouled by Soviet military operations, according to the German magazine *Der Spiegel*.

Nuclear Wasteland

During the Cold War, staying ahead in the feverish nuclear arms race between the U.S. and U.S.S.R. took precedence over the health and safety of those involved in producing and testing the weapons. For decades, officials in the two countries knowingly subjected their unsuspecting citizens to the dangers of radioactivity in the name of national security. Now, nuclear production facilities are so contaminated and unreliable that several of them are closed, and the Bush administration is gradually scaling down plans for reputedly safer new plants.

The nuclear weapons industry is truly colossal. Since the 1940s, the United States alone has spent close to $300 billion (in 1990 dollars) on designing, testing, and manufacturing nuclear warheads. Over that time, approximately 60,000 warheads were produced in more than 100 facilities in 32 states, employing some 600,000 workers. The resulting stockpile of weapons contains 90 to 100 tons of weapons-grade plutonium and 500 tons of highly enriched uranium. Similar stockpiles are believed to exist in the Soviet Union, while those of the other nuclear powers—China, France, and the United Kingdom—are much smaller.

Every step in the bomb-making process involves severe environmental threats. At the now-closed Purex plant at the Hanford Reservation in south-central Washington, the production of a single pound of plutonium generated about 150 gallons of high-level radioactive waste laced with hazardous chemicals, more than 25,000 gallons of low- to intermediate-level waste; and more than 1.1 million gallons of contaminated cooling water.

By 1989, more than 3,200 sites in about 100 locations across the United States owned by the DOE (the agency in charge of nuclear weapons development) had been identified as having tainted soil, groundwater, or both. Decades of deliberate and accidental releases of radioactive material and

toxic substances make for a modern-day horror story (see Table 1). More than 50 Nagasaki-sized bombs could be manufactured from the waste that has leaked just from Hanford's underground tanks. At Rocky Flats, Colorado, the DOE facility that assembles triggers for nuclear weapons, enough plutonium has accumulated in ventilation ducts to make seven nuclear bombs. After a large fire there in 1969, investigators found in the surrounding neighborhoods the highest concentrations of plutonium ever measured near an urban area, including Nagasaki in 1945.

Radiation is known to cause cancer, leukemia, thyroid disorders, sterility, miscarriages, and birth defects. Damage to the human body depends on the size and type of the radiation dose and on how fast it is absorbed. It is difficult to establish a causal link between a specific radiation exposure and adverse health effects, but there is growing belief among scientists that no level of exposure is safe.

Two measures gauge the exposure of humans to radiation. A "rad" measures the amount of radiation absorbed by the human body but not the biological damage. A "rem," by contrast, recognizes that different types of radiation have different biological effects. One rem is roughly equivalent to seven to eight x-rays; a 500-rem dose is usually fatal, while 100 to 200 rem could produce cancer in the long run.

According to reports in the *New York Times*, some 300,000 people, or half of those who ever worked in the U.S. nuclear weapons complex, are believed to have been affected by exposure to radiation. A study by the late Carl Johnson, a Colorado public health official, of almost 4,000 Rocky Flats workers found elevated incidences of brain tumors, malignant melanoma, respiratory cancer, and chromosome aberrations, even though they had been exposed to only billionths of a curie of radioactivity. (Curies measure the radiation's intensity. An estimated 50 million curies were released during the Chernobyl accident.) Hundreds of workers at Hanford were absorbing a quantity of plutonium every six months equal to the recommended lifetime limit. The question of health effects on workers remains contentious, however, largely due to the DOE's refusal to release relevant health data.

A February 1991 Office of Technology Assessment report, "Complex Cleanup," notes the lack of sufficient data about off-site human exposure and concludes that "published reports and available data can neither demonstrate nor rule out the possibility that adverse public health impacts have occurred or will occur as a result of weapons site pollution."

Still, it is clear that a quarter-million people living near the Hanford Reservation in Washington State have received some of the largest amounts of airborne radiation in the world, though stretched out over more than a decade. Between 1943 and 1956, about 14,000 of those people received doses of 33 rads and some up to 2,900 rads. In the name of "national security," their health and lives were put at risk. Today, the Hanford-area population shows an unusually high number of cancers, miscarriages, and other ailments.

Atomic *Glasnost*

Glasnost has given the world a limited, and frightening, look into the consequences of the Soviet nuclear weapons program. In the southeastern Ural mountains, at Kyshtym—the Soviet counterpart to Hanford—perhaps more than 6,000 workers were exposed to radiation doses of more than 100 rems; 2 percent of the workers received more than 400 rems. Apparently, these doses were accumulated over the space of a few months or years.

Cesium, strontium, and other liquid radioactive wastes were dumped indiscriminately into the nearby Techa River until 1952—eventually showing up in the Arctic Ocean, nearly 1,000 miles away. Those living along the Techa had to be evacuated because of the contamination.

From 1952 on, nuclear waste was dumped into nearby Lake Karachay. The heat of the substances began to dry out the four-square-mile body of water until it all but evaporated. By 1988, it contained radioactive waste emitting 120 million curies, two-and-a-half times more than was released at Chernobyl. The radioactivity on the lake shore is so high that any person exposed to it for just one

Table 1: United States: Radioactive and Toxic Contamination at Major Nuclear Weapons Production Facilities, 1990

Facility (Task)	Observation
Feed Materials Production Center, Ohio (converts uranium into metal ingots)	Since plant's opening, at least 550,000 lbs. of uranium oxide (or perhaps six times as much) released into the air. Off-site surface and groundwater contaminated with uranium, cesium, thorium. High levels of radon gas emitted.
Hanford Reservation, Washington (recycles uranium and extracts plutonium)	Since 1944, 200 billion gallons of contaminated water (enough to create a 40-foot-deep lake the size of Manhattan) have entered groundwater and Columbia River; 1.2 million gallons of high-level radioactive waste leaked from underground tanks.
Savannah River, South Carolina (produces plutonium and tritium)	Radioactive substances and chemicals found in the Tuscaloosa aquifer at levels 400 times greater than the government considers safe. Released millions of curies of tritium gas into atmosphere since 1954.
Rocky Flats, Colorado (assembles plutonium triggers)	Since 1952, 200 fires have contaminated the Denver region with unknown amount of plutonium, Strontium, cesium, and cancer-causing chemicals leaked into underground water.
Oak Ridge Reservation, Tennessee (produces lithium-deuteride and highly enriched uranium)	Since 1943, thousands of pounds of uranium emitted into atmosphere. Radioactive and hazardous wastes have severely polluted local streams flowing into the Clinch River. Watts Bar Reservoir, a recreational lake, is contaminated with at least 46 million gallons of mercury and cesium.

Sources: "Status of Major Nuclear Weapons Production Facilities: 1990," *PSR Monitor*, September 1990; Robert Alvarez and Arjun Makhijani, "Hidden Legacy of the Arms Race: Radioactive Waste," *Technology Review*, August/September 1989; and other sources.

hour would die within a few weeks. Thomas Cochran, a senior staff scientist at the Natural Resources Defense Council in Washington, D.C., commented that "this has got to be the most polluted spot on the planet." The lake is now being covered by a thick layer of concrete to contain the radiation.

In 1989, Soviet authorities finally confirmed that a chemical explosion had occurred at Kyshtym in September 1957, spreading high-level nuclear waste over 5,800 square miles. The explosion released about a third as much overall radiation as at Chernobyl, and forced the evacuation of 10,000 residents. Soviet officials assert that the accident did not cause any deaths, but Zhores Medvedev, a dissident Soviet biologist who first publicized the event in a 1980 book, *Nuclear Disaster in the Urals*, believes hundreds may have died from radiation exposure.

Living Downwind

Warhead testing is the final phase in the development of nuclear arms, but it was the activity that elicited the earliest health concerns. From 1945 to 1989, more than 1,800 bombs were exploded in tests at more than 35 sites around the world—virtually all of them on the land of native peoples, including the western Shoshones, Aleutians, Kazakhs, Uygurs, Australian aborigines, and Pacific islanders. Currently, most testing takes place in Nevada and Kazakhstan.

Roughly a quarter of all tests were conducted above ground, most of them before 1963, injecting far more radioactive debris into the atmosphere than the Chernobyl accident. According to Barry Commoner, the director of the Queens College Center for the Biology of Natural Systems in New York City, the fallout may have caused as many as 86,000 birth defects worldwide before 1963 and, according to a 1977 U.N. publication, "Sources and Facts of Ionizing Radiation," could lead to some 150,000 premature deaths. Although underground testing has cut down on radiation, some still

escapes into the atmosphere (a process known as "venting"). Citizens' groups opposed to testing contend that radioactive debris is leaching into groundwater.

The Soviet Academy of Medical Sciences determined in 1989 that residents of Semipalatinsk, near the main test site in Kazakhstan, had experienced excess cancers, genetic diseases, and child mortality because of radiation exposure from pre-1963 atmospheric tests. In 1988, the incidence of cancer there was 70 percent above the national average. Bowing to strong citizen opposition, the Soviet government canceled 11 tests in 1989 and decided to end nuclear testing near Semipalatinsk by 1993.

In the United States, there are 400,000 "atomic veterans"—soldiers ordered to observe atmospheric testing, test-site workers, and "downwinders" living in parts of Nevada, Arizona, and Utah. Since 1961, leukemia cases began to appear with increasing frequency in U.S. communities downwind from test sites. Today, thyroid and bone cancer rates in southwestern Utah are, respectively, 8 and 12 times the national average.

Between 1946 and 1958, the U.S. government conducted 66 nuclear bomb tests in the Marshall Islands. High levels of radioactivity in the soil and crops have rendered Bikini atoll, site of 23 of these tests, uninhabitable since 1954. Many inhabitants of Rongelap—located downwind from Bikini—have developed thyroid tumors. From the early 1980s on, increases in the number of leukemia cases, brain tumors, and thyroid cancers have been registered in French Polynesia, the site of more than 160 French nuclear tests since 1966.

Making Peace With the Environment

As the East-West confrontation fades, governments are slowly beginning to formulate policies to redress the environmental legacy of the Cold War. The cost of repairing the damage will be staggering. In the United States, nuclear decontamination costs alone may run to about $200 billion. Coping with hazardous wastes at U.S. military bases could reach between $100 and $200 billion, according to estimates from the Department of Defense Inspector General's office. In addition, U.S. forces stationed in Western Europe would need to spend at least $400 to $500 million to reduce water pollution at their bases.

Cleaning up Soviet bases in Czechoslovakia has been estimated to cost $2 million per site, or more than $250 million for all 132 installations. In Hungary, the cleanup bill could run in the tens of millions of dollars. These costs are hardly affordable to the financially strapped nations of Eastern Europe.

In the United States, funding still lags well behind assessed needs. The Pentagon's budget for the "Defense Environmental Restoration Program" for 1991 is just over $1 billion—less than 0.4 percent of the military budget. The DOE's budget for coping with contamination of the nuclear weapons complex has more than quadrupled between 1986 and 1991 to $4.3 billion, but is still overshadowed by the department's outlays for weapons production.

The programs now being put in place are primarily designed to survey the extent of the contamination; there is very little actual cleanup work. The time required for decontaminating polluted sites may have to be measured in decades, and the most severely poisoned areas may prove impossible to restore. Fenced off and unsuitable for any use, these sites could become "national sacrifice zones," ghastly monuments to the Cold War.

Invocation of "national security" still hampers efforts to remedy the situation. Under the Reagan and Bush administrations, the Justice Department has prevented the EPA from suing other federal agencies, from imposing cleanup orders on them without their consent, or from fining them. The Justice Department also has gone to court several times to restrain state agencies from fining military installations for violating environmental laws. As a result, the EPA has had to settle for dubious "voluntary compliance agreements" with the Pentagon. H.R. 1056, a bill to give the EPA and the states clear authority to enforce hazardous waste laws, was passed overwhelmingly by the House in 1989. But its Senate counterpart, S. 1140, was never brought to a vote.

Similar conditions exist in other countries. For example, almost every law in Germany

that regulates land use, waste disposal, and pollution contains some loopholes for the armed forces. In a classic example of the fox guarding the henhouse, the German army has the exclusive right to inspect its own compliance with federal air pollution laws.

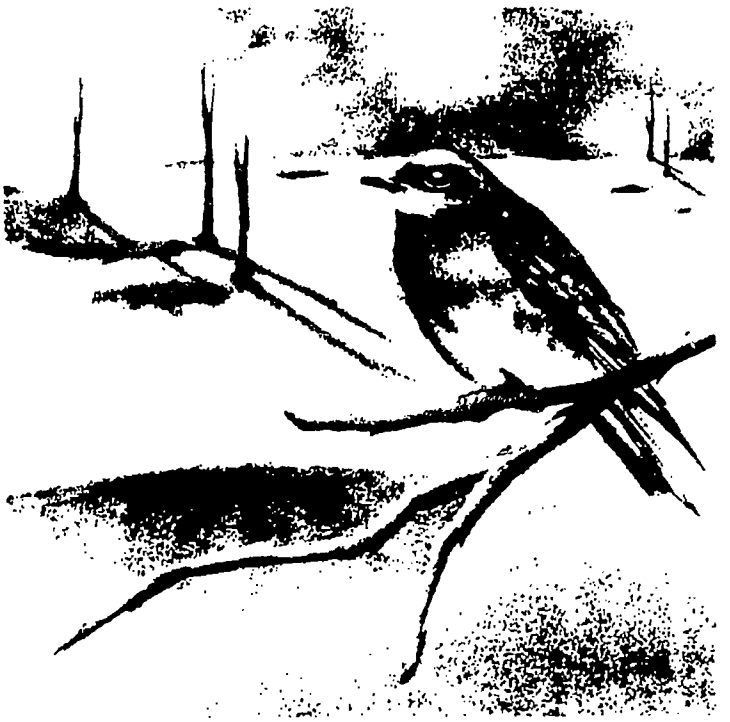
That the People Shall Know

Public awareness of environmental problems caused by the military is important if government agencies and their private contractors are to be held accountable. Community groups have been struggling for many years to identify the source of their contamination problems. Chief among their goals are a speedy cleanup effort and the monitoring of toxic releases by the military.

Grass-roots coalitions have sprung up across the United States to assist communities in confronting military pollution in their own backyards. The Military Toxics Network in Seattle, Washington, is calling for a national "Environmental Security Fund" that would provide money for the investigation and cleanup of toxic contamination at military facilities. It also wants a fund to compensate communities for the harm they have suffered. The Arms Control Research Center in San Francisco is providing investigative and analytical support to community efforts. And the Washington, D.C.-based Military Production Network brings together groups concerned about the effects of nuclear weapons production.

Topping the grass-roots groups' agendas are a number of demands that could help to change the military's attitude toward the environment. These include an end to the Pentagon's exemption from environmental law enforcement; changes in the procurement specifications that require contractors to use highly dangerous materials; and a requirement for defense agencies and military contractors alike to prepare and make publicly available detailed reports on their handling of hazardous substances. Although the U.S. Congress passed legislation in 1986 requiring companies to report their release of toxic substances into the air, water, and land, the DOD has effectively exempted itself from this requirement.

The White House has used the Persian Gulf Crisis as an excuse for exempting the military from another of the few restraints on its actions—environmental impact statements. These statements are an important way to identify potential adverse impacts before they happen, but war with Iraq has brought at least a temporary waiver of the military's filing requirement.



Cleaning up the military's accumulated toxic and nuclear wastes—the legacy of the past half-century—poses a formidable challenge. There is no easy means of disposal for materials that will be lethal for decades, centuries, even millennia. And even if these problems are addressed, only half the battle is won. The armed forces continue to handle large amounts of hazardous substances every day.

The essence of all military operations is to achieve a margin of superiority over real or perceived enemies, at whatever environmental or other cost. Unless humanity can find less violent ways of settling disputes, the fundamental incompatibility between the environment and the military will continue to confront us. ●

Michael G. Renner is a senior researcher at the Worldwatch Institute. His work focuses on the links between military activities and the environment.

WAR, PEACE, AND "VIOLENCE"

"True peace is not merely the absence of tension but it is the presence of justice and brotherhood."
--Martin Luther King

(NOTE: This lesson may take up to two class periods)

OVERVIEW:

The ultimate objective of both the advocates and opponents of "peace through strength" policies is the securing of peace. Definitions differ, however, as to the nature and implications of peace. This lesson encourages students to rigorously examine their concepts of peace and violence as part of their evaluation of the role of militarization in today's world. Factors such as ecological balance and social justice are considered in working toward an understanding of peace which embraces harmonious co-existence as much as absence of war. Similarly, students consider the nature of violence not only in its traditional sense as physical injury, but also in its psychological, social, and environmental manifestations.

OBJECTIVES:

Students will:

1) Be able to define the terms "positive peace" and "negative peace."
2) Define their conceptions of peace as it applies in the military, social, and environmental senses.
3) Be able to describe patterns of thinking and behavior that lead to peaceful and to violent situations.
4) Propose their own prescriptions for making the world a more peaceful place.

MATERIALS: One handout ("Xenobia") and one homework sheet.

PROCEDURES:

1) Definitions of peace and violence (15 min.). Teacher opens class by asking students to write down their definitions of "peace" and "violence". Allow several minutes of reflective silence for this. Teacher then invites students to offer their definitions, writes them on the board, and then offers his or her own definition as one among many. Teacher's definition should touch on notions of positive and negative peace (see "Report to Teacher"), perhaps something like, "peace is a state of human relations free of violence and supportive of every person's right to full development of his or her potential." The following two exercises are designed to help flesh out these concepts.

2) "Xenobia" exercise (20-25 min.). Teacher hands out description of Xenobia. Students read it to themselves, underlining important points, and then one or more students read it aloud for the class. Class discusses the phenomena of "peace" and "violence" in Xenobia. In what ways is Xenobia "peaceful"? In

what ways is it "violent"? Teacher should encourage students to look at the more subtle forms of violence in addition to the overt violence of its military invasions and suppression of dissent. Factors to consider include the violence of avoidable poverty and hunger, the violence of fear, the violence of justice and opportunity denied, and violence against nature and the planet. Finally, the class can discuss whether the "peace" in Xenobia is genuine or illusory. Discuss "positive" vs. "negative" peace and ask for some hypothetical and/or real examples of each.

3) Factors leading to peace and to violence (15-20 min.) Teacher introduces on the board a chart of the basic oppositions between peaceful and violent patterns of thought and behavior. Building on the Xenobia exercise, students are asked to think first of the categories of violence: personal, socio-economic, international, and environmental. Empty chart should look something like this:

"PATTERNS OF THINKING AND BEHAVIOR"

	Violent	Peaceful
1.Personal		
2. Socio-economic		
3.Inter-national		
4.Environmental		

Class can then fill in the chart together. Some suggestions that the teacher might want to include are listed in the chart below:

"PATTERNS OF THINKING AND BEHAVIOR"

	Violent	Peaceful
1.Personal	conflicts solved by force	conflicts solved by dialogue and mutual understanding
	overly competitive	cooperative
	selfish	altruistic
2.Socio-economic	society is individualistic	society is community-minded and interdependent
	society is segregated	society is open and inclusive
	poverty and hunger are accepted as inevitable	society strives to overcome poverty and hunger
3.Inter-national	nations compete and act only in their own interest	nations cooperate and act in the planet's interest
	national prestige and superiority are priorities	interdependence and common security are priorities
	citizens think in terms of "us" vs. "them"	citizens think in terms of global identity
	conflicts are addressed by military force	conflicts are addressed by dialogue and diplomacy
4.Environmental	consumption and waste	conservation and sustainability
	short-term economic gain is the priority	global and mutual survival is the priority
	humanity is above and apart from nature	humanity is part of nature (holistic thinking)

HOMEWORK: see attached sheet

XENOBIA

Once upon a time there was an island country called Xenobia. Xenobia was a rich country, but its wealth was all controlled by the Big Shots, who, though small in numbers, were very powerful. The country's one political party, the Freedom Party, was made up of Big Shots who held mock elections every ten years. The Middlers, who lived comfortably, all hoped to become Big Shots one day, while the Grunts, who lived in poverty and illiteracy, hoped only to live to the next day. In the past, the Grunts had risen up in rebellion against the Big Shots, but they had been put down by the Middler secret police and militia.

Since the last rebellion fifty years ago, in which 5000 Grunts had been killed, no political violence had occurred in Xenobia. The Big Shots continued to run the country, while the Middlers kept order and the Grunts did most of the work. The Grunts' poverty was terrible, but their fear of the Middlers was worse. The Big Shots pointed to the smooth functioning of the Xenobia economy, which was the richest in the world, and to the absence of war in Xenobia, to show that their system was the best.

Living on an island, the rulers of Xenobia saw no need to cooperate with the other countries of the world. Instead, they used their Middler military to invade any country that had resources Xenobia needed to sustain its economy. Xenobia also had a secret weapon, which it threatened to use against any country that opposed it. While the rest of the world lived in poverty to keep Xenobia wealthy, Xenobia's policy of "keeping the peace" had all but eliminated war for thirty years. Again, Xenobia's rulers claimed that the absence of outright war proved Xenobia's greatness and commitment to peace.

Xenobia was beginning to notice some cracks under the surface, however. Because the Big Shots and the Middlers consumed and wasted so much, the world was starting to run out of food and resources. Also, because Xenobia polluted its environment, most non-human species had disappeared from the island and air and water quality was becoming hazardous. The people of Xenobia, even some of the Big Shots, were starting to feel uneasy and discontented. Some of the Big Shots proposed invading nearby Accordia to start a new colony there. Others suggested developing a "miracle drug" to free people from dependence on the natural environment. Certain of Xenobia's citizens were starting to question Xenobia's most cherished beliefs. All was not well in Xenobia after all.

HOMEWORK

John F. Kennedy said in 1963: "And is not peace, in the last analysis, basically a matter of human rights--the right to live out our lives without devastation, the right to breathe air as nature provided it, the right of future generations to a healthy environment?"

Building on Kennedy's definition of peace, and your own definition, write a one-page essay on peace in today's world. How peaceful is our world? Can you envision ways of establishing a more peaceful world? What would a truly peaceful world look like? Take into consideration economic, environmental, and political factors in your discussion.

REPORT TO TEACHERS

As we examine the role of the military in securing the peace in today's world, we need to think carefully about what we mean by "peace." Clearly, a suspension of overt hostilities, enforced by a military balance of power or by threat of force, is a different sort of peace from that found when the sources of that hostility are minimized and people live in relative harmony and equality. The former is often termed negative peace, that is, merely the absence of war, while the latter is termed positive or just peace. As we broaden our understanding of the nature of peace, we can also consider our stance toward the natural world. Do our lifestyles and economic systems strive for harmony and integration with the environment, or do they do violence to the world around us? Indeed, the word for peace in other cultures often implies that comprehensive state of relations in which intrapersonal, interpersonal, community, international, and environmental harmony are all highly valued and integrated.*

The discipline of Peace Studies addresses these issues in a multi-context, cross-disciplinary approach. Building on post-WWI attempts to make sense of the carnage of that war, Peace Studies as an academic discipline examines the causes of war, the nature of peace and of violence, the ethics of war, and strategies for achieving peace at many levels. Such analysis is conducted at the personal, socio-economic, international, and ecological levels, and questions such as the role of "human nature", the inevitability of conflict, the nature of the state, and the impact of poverty are probed in depth. Peace Studies is a pioneering discipline in the growing awareness of the need to address such issues in a global, holistic, multi-disciplinary manner. A comprehensive and useful introduction to the field can be found in David Barash's text, Introduction to Peace Studies.

An area of particular interest in the field of Peace Studies is the nature of violence. Physical violence obviously can occur at the personal, group, and international level. A form of violence that is less obvious but no less real is what eminent peace researcher Johan Galtung terms structural violence. Structural violence refers to systematic inequalities in power and economic opportunity, built into a given society, which lead to poverty, hunger, and the denial of human rights. Structural violence has enormous impact on the psychological well-being and self-esteem of its victims, as well. Thus, the hierarchical feudal society of the Medieval period functioned smoothly and relatively free of internal violence for extended periods, but the orderliness of such a system was clearly bought at the cost of great injustice, repression, and suffering. On the other hand, structural violence often leads to direct, revolutionary violence, as we have seen in South Africa and Rumania, for instance.

Structural violence can be so deeply rooted in a society as to be virtually unrecognizable to the members of that society. The huge bureaucratic effort involved in the Nazi holocaust, for instance, was manned by ordinary, ostensibly peace-loving German citizens. Similarly, violence to nature can become built into socio-economic systems which neglect environmental needs in the

interest of short-term economic gain. In short, structural violence occurs when suffering that is clearly avoidable is tolerated by a society and/or its government.

In the search for a just peace relatively free of overt and structural violence, we return to the issue of nuclear weapons. Leaving aside the question of whether nuclear weapons have in fact maintained peace in the post-WWII world (this issue is covered in a previous lesson), we can ask instead about the nature of a deterrence-based peace. Does the mutual fear of massive nuclear destruction constitute "peace"? Are there possibilities for international peace free of the psychological, economic, and environmental costs of nuclear deterrence? Can the world, in its present environmental crisis, afford to maintain multiple foreign policies predicated on enforcing separate, negative peaces, or is there a need today for international cooperation to foster a sustainable and comprehensive positive peace? These are the kind of questions proposed by this lesson and indeed by the entire field of global education.

This lesson's chart activity is intended to encourage students to think about some of the more subtle differences between peace and violence. The contents of the completed chart given in the lesson are only suggestions; students and teachers may come up with entirely different ideas. The point is not so much to identify the specific differences (although this is important) as to recognize that such differences exist, that is, that the ways we think about ourselves and the world have implications for the degrees of peace and violence we create in our lives.

*For instance, the Arabic salaam and the Hebrew shalom, the Greek irene, the Sanskrit shanti, and the Chinese ping.

USEFUL REFERENCES:

Barash, David. Introduction To Peace Studies. Belmont, CA: Wadsworth Publishing Co., 1991.

Bok, Sissela. A Strategy for Peace. New York: Pantheon, 1990.

Boulding, Kenneth. Stable Peace. Austin: University of Texas Press, 1978.

Ferencz, Benjamin and Keyes, Ken Jr. PlanetHood. Coos Bay, Oregon: Love Line Books, 1991.

Galtung, Johan. "Violence, Peace, and Peace Research", in Journal of Peace Research VI, 1969, #3.

North, Robert C. War, Peace, Survival: Global Politics and Conceptual Synthesis. Boulder: Westview Press, 1990.

Reardon, Betty. Comprehensive Peace Education: Educating for Global Citizenship. New York: Teachers College Press, 1988.

CONFLICT RESOLUTION (A Two-Day Lesson)

"The love of one's country is a splendid thing, but why should love stop at the border?"
Pablo Casals, cellist (1876-1973)

OVERVIEW:
This two-day lesson introduces students to the whys and hows of conflict resolution. Beginning with techniques of conflict resolution at the inter-personal level, the lesson moves on to examine mechanisms for resolving conflict at the international level, such as dialogue, cooperation, international law, economic ties, and the workings of the United Nations. Cooperative efforts to reduce the likelihood of nuclear disaster and to address the environmental crisis are emphasized.

OBJECTIVES: Students will:
1) be able to list some of the sources of conflict in the world today.
2) be able to describe various approaches to conflict resolution.
3) be able to describe existing mechanisms for conflict resolution at the international level.
4) employ techniques of conflict resolution in hypothetical situations.

MATERIALS:
"Three Conflict Situations" worksheet, U.N. homework reading packet, "Some Strategies for Maintaining International Peace" handout, homework questionnaire.

PROCEDURES:
DAY 1:

1) Thinking about Conflict (10-15 min.) Have students brainstorm sources of conflict (at any and all levels). Some possibilities: ownership, jealousy, boundaries and turf, misunderstandings and misperception of the other, resources, political and religious beliefs, economic pressures (money, inequalities), long-standing antagonisms (the Hatfield-McCoy feud), etc. List on board.

Next, have class brainstorm ways conflict can be addressed. Some possibilities: fighting, fleeing (avoidance or capitulation), dialogue and compromise, third-party mediation, cooperation (win-win). Briefly discuss each option, emphasizing the diversity of perspectives and solutions possible in any conflict.

2) Role-Playing and Analysis (30-35 min.) Distribute and explain "Three Conflict Situations" worksheet. Students work together in pairs on worksheet. Afterwards, discuss each conflict situation with class. Possible discussion points: was it possible

to find a "win-win" solution for each conflict? What strategies did you find most useful in resolving a conflict to both parties' satisfaction? What is the difference between debate and dialogue? How can conflict be used to actually open up opportunities for growth and progress?

HOMEWORK: U.N. reading packet.

DAY 2

3) International Relations Role-Playing: The Law of Force or the Force of Law? (20 min.) Distribute "Some Strategies" handout. Allow students several minutes to study handout, then read aloud the following conflict situation:

> The year is 1997. Udonia, a poor but heavily-armed state, has moved its army across the border into Farland, its wealthy neighbor and long-standing rival. Udonia claims that for years Farland has been mistreating Udonian workers in Farland's gold mines, and that Udonia is simply taking it upon itself to protect its citizens. Farland claims that Udonia is simply interested in taking over the gold mines to pay the huge debt it has accumulated buying all its weapons from the major arms supplier nations. Neighboring countries are worried that if war breaks out, the region's common water supply, Lake Limpid, will become polluted beyond use.

Class discussion: How could this conflict be resolved without further bloodshed? How could it have been avoided in the first place? Imagine that the class is the U.N. General Assembly: put together a plan to address this crisis.

4) Win-Win Games (remaining time).
(Adapted from Dialogue, a teaching guide produced by Educators for Social Responsibility)

The idea of "Win-Win" games is that everybody wins. In the two games detailed here, the students do not know from the beginning that the games are cooperative; they simply play them in the way they choose to interpret the rules. Most will assume the game is competitive. This leads to follow-up discussion about the nearly automatic assumption that in any game situation, there are adversaries; the way to win is to make the other person lose.

THE KISSES GAME

The point, which students should not be told, is that it is not against the rules to allow their hands to touch the desk without resistance nor for both players to win kisses.

Setting up: Teacher provides a couple bags of Hershey's kisses or other small candy. Tell the students the game will involve sitting across the table from a partner, left arm resting in lap and right elbow on the table. Ask them to clasp their partner's right hand.

(Avoid using the term "arm wrestling", as it connotes competition: simply describe the position. If students mention arm wrestling, say the position is the same but the game is different.)

Make sure the students are set up in the proper position before giving them the rules, and allow no talking once you have explained them.

The rules:

1) No talking.
2) You will receive one chocolate kiss for each time the back of your partner's hand touches the desk.
3) Keep track of the kisses you have won.

Say "begin" and allow 30 seconds of play.

Follow-up:

1. Before the "win-win" concept is explained, ask students to describe in detail how they played the game. Ask them to write their reactions and method of playing. Students might ask themselves if the way they behaved in this game reflects the way they behave in other situations. What parallels do they see?

2. Still before explaining the concept of "win-win", teacher might communicate the concept non-verbally by choosing a partner, assuming the arm-wrestling position and offering no resistance. Eventually the class should realize that one does not lose any kisses by allowing the other to win some--and it's much easier.

3. Go over the rules and explain the way in which both partners can win kisses through cooperation. Ask students to notice the language of the rules, especially the use of the word "partner". Why did people assume it was a game of competition?

TUG OF PEACE

Setting up: The point, which students should not be told in advance, is that it is not against the rules to allow themselves to be pulled over the line, nor for both sides to win prizes.

Divide the class into two groups. Draw a line in the middle of the floor. Set up the groups as in Tug of War (again, avoid using the term "tug of war", as it implies adversaries). Get the groups into position before reading the rest of the rules, and allow no talking after they are set up.

The Rules:

1) No talking during the game.
2) Every person on each line must hold the rope.
3) Each time the first person at the front of the lines goes over the line drawn on the floor, the other line receives a prize (Hershey's Kisses or some other prize).

Say "begin" and allow a couple minutes of play.

Follow-up: see Kisses follow-up. Extend the discussion to

other life situations and to the international sphere. Some possible discussion points:

1. Some students think the "win-win" approach takes the fun out of playing. What is the "fun" that is missing? Is it possible to redefine "fun"?

2. Why do we hear adversary language when there are two groups or two individuals? What leads us to see others as natural adversaries? Consider in each game how neutral parties, even friends, become adversaries.

3. What are the lessons of "win-win" for the governments of the world? What are some ways nations could apply cooperation in place of competition? What would the world look like if governments took a "win-win" rather than adversarial approach to other nations?

HOMEWORK: Distribute Questionnaire for use in next class.

THREE CONFLICT SITUATIONS

#1. You and your discussion partner share a locker. Each one feels the other is crowding the locker with unnecessary and bulky items.

Conflict Management Option	What It Would Look Like	Consequences
1. Fight		
2. Flight		
3. Dialogue and Compromise		
4. Third-Party Mediation		
5. Win-win Cooperation		

#2. You and your discussion partner are the leaders of a student environmental group. Your group has been trying to convince all the school's teachers to set up recycling bins in their classrooms, but one teacher ridicules your plan and bad-mouths you to the other teachers.

Option	What It Would Look Like	Consequences
1.Fight		
2. Flight		
3. Dialogue and Compromise		
4. Third-Party Mediation		
5. Win-Win Cooperation		

#3. You are both the leaders of neighboring countries. Recently, one country has started industrializing so heavily that the pollution and acid rain from their smokestacks is damaging the other country's crops.

Option	* What It Would Look Like	* Consequences
	*	*
1. Fight	*	*
	*	*
	*	*
2. Flight	*	*
	*	*
	*	*
3. Dialogue	*	*
and Compromise	*	*
	*	*
	*	*
4. Third-Party	*	*
Mediation	*	*
	*	*
	*	*
5. Win-Win	*	*
Cooperation	*	*
	*	*
	*	*

SOME STRATEGIES FOR MAINTAINING INTERNATIONAL PEACE

1. The United Nations--an international body consisting of nearly all the countries of the world. The U.N.'s main mission is to secure peace in the world. the U.N. and its many agencies work to:
    1. provide an international forum for the discussion and non-violent resolution of issues and conflicts.
    2. act as a third-party mediator between conflicting parties.
    3. provide peacekeeping troops to act as a buffer between warring parties.
    4. guarantee human rights and global economic and social advancement.
    5. further scientific, health, environmental, and cultural goals around the world.

2. International Law--a loose collection of international treaties and International Court of Justice rulings on issues typically having to do with human rights, the global environment, and treaty enforcement. Examples: The Law of the Sea, the Nuremberg Principles.

3. Fostering Interdependence--through the development of economic, political, and cultural ties, countries come to better understand their neighbors and to have a stake in each other's stability. Examples: Scientific and cultural exchanges between the U.S. and the U.S.S.R. during the late 1980's.

4. Cooperative responses to shared problems--working together, sharing resources and expertise to address common problems, countries come to better appreciate their economic, environmental, and security interdependence. Examples: the U.S. helping Russian republics dismantle their nuclear weapons, international cooperation to restrict the use of ozone-depleting chemicals around the world.

5. Non-Provocative Defense (including Nuclear-Free Zones)--non-provocative defense allows a country to protect its territory and its independence, but not attack or occupy another country. This strategy relies on defensive, as opposed to offensive, weapons, such as mine fields and anti-tank and anti-aircraft guns. Non-provocative defense contributes to common security by making it difficult if not impossible to justify and execute an attack on another country. Another strategy is for countries, states, or cities to declare themselves Nuclear-Free Zones, thereby refusing to allow any nuclear weapons or facilities for nuclear weapons production on their territory.

REPORT TO TEACHERS

In our examination of the ravages of war and militarization, it would be irresponsible not to devote a good deal of attention to the search for alternatives to armed conflict. While conflict is a natural part of daily life at many levels, there are better and worse ways to address that conflict. Indeed, handled openly and constructively, conflict can often present differing parties the opportunity to expand their relationship and reach arrangements of advantage to all involved.

Though the realities of interpersonal and international conflict may seem worlds apart, in fact several basic principles of conflict management apply no matter what the conflict. These begin in the necessity for first "clearing the air": establishing a constructive atmosphere for conflict resolution, clarifying perceptions, and striving to honestly and openly understand the other's perspective. Because our perspectives and priorities are so closely tied to our positions and experiences in life, it is only natural that every issue is surrounded by a variety of perspectives. Accepting diversity and acknowledging the perspectives of others is central to conflict resolution, as it is to the development of a healthy global orientation.

There are several models of conflict management available to conflicting parties. The first, conquest, involves a forced victory of one over the other, often resulting in bloodshed and loss for both parties, and rarely if ever addresses the underlying source of conflict. The second, accommodation and compromise, is a step in the right direction, with each side winning and losing a little. Sometimes this is the best option available, but its weakness lies in the fact that it still pits each side against the other, stressing (like the conquest model) the goal of gaining as much as possible over and against the opponent. The third model, third-party mediation, often settles a dispute but can also neglect the truth of the loser's position, and, again, rarely allows an opening for genuine reconciliation between parties.

The fourth and preferred option goes by many names; here we will call it conflict partnership to emphasize the orientation of the differing parties in this approach. In conflict partnership, all parties engage directly with one another in a common pursuit of mutual benefits. An attempt is made, through creative exploration of alternatives, to provide each conflict partner with something of value and to do so in a way that improves the overall relationship between conflict partners for the future. In this way, the underlying stress between parties is addressed and the possibility for mutual acceptance and even cooperation is opened in a way unlikely in the other models of conflict management. Too often we assume that one party must win and one lose, when very often "win-win" arrangements that lift up both parties are available if we look hard enough. The "win-win" games included in the second lesson on conflict resolution are designed to help students break through the win-lose mindset to see the benefits of cooperation over competition.

Of course, conflict resolution is a skill which takes more than a couple class periods to master. In a very real sense, it is a life-long process. It is the hope of this lesson to open students' eyes to the fact that the options available to them--and to governments--include far more than the "fight-or-flight" "choice" typically presented in our culture. Toward this end, the lesson explores various mechanisms in place at the international level designed to prevent the devastation of war. Chief among these is the U.N., which in the last few years has enjoyed a dramatic expansion of its international prestige and influence. Indeed, most signs point toward a central role for the U.N. in the pursuit of peace in the "New World Order."

All but the last of the "strategies for maintaining international peace" described in exercise 3 make use of the distinction between "dissociative" and "associative" security options. The former depends on military strength and political separation to ensure sovereignty; the latter involves the effort to tear down walls between nations so that conflict can give way to recognition of interdependence and cooperation (the successful growth of the European Community is a good example of this latter approach). Typically, there is a mixture of both options in nations' dealings with one another, but it is clear that there is much room for the expansion of the associative approach in world affairs. This need becomes especially urgent as environmental and nuclear issues emerge as transboundary threats resolvable only through international cooperative efforts.

USEFUL REFERENCES:

Barash, David. Introduction to Peace Studies. Belmont, CA: Wadsworth, 1991.

Juergensmeyer, Mark. Fighting With Gandhi: A Step-By-Step Strategy for Resolving Everyday Conflicts. San Francisco: Harper and Row, 1984.

Keyes, Ken Jr. and Ferencz, Benjamin. PlanetHood. Coos Bay, OR: Love Line Books, 1991.

Kome, Penney and Crean, Patrick, eds. Peace: A Dream Unfolding. Toronto: Lester and Orpen Dennys Lmt., 1986.

Starke, Linda. Signs of Hope: Working Toward Our Common Future. Oxford: Oxford University Press, 1990.

Weeks, Dudley. Conflict Partnership. Orange, CA: TransWorld Productions, 1984.

The Harmony of Nations

The Purposes of the United Nations are:

- To maintain international peace and security, and to that end: to take effective collective measures for the prevention and removal of threats to the peace, and for the suppression of acts of aggression or other breaches of the peace, and to bring about by peaceful means, and in conformity with the principles of justice and international law, adjustment or settlement of international disputes or situations which might lead to a breach of the peace;
- To develop friendly relations among nations based on respect for the principle of equal rights and self-determination of peoples, and to take other appropriate measures to strengthen universal peace.
- To achieve international co-operation in solving international problems of an economic, social, cultural, or humanitarian character, and in promoting and encouraging respect for human rights and for fundamental freedoms for all without distinction as to race, sex, language or religion; and
- To be a centre for harmonizing the actions of nations in the attainment of these common ends.

From the Charter of the United Nations

A Blueprint for Co-operation

The Governments of the States Parties to this Constitution on behalf of their peoples declare:

That since wars begin in the minds of men, it is in the minds of men that the defenses of peace must be constructed;

That ignorance of each other's ways and lives has been a common cause, throughout the history of mankind, of that suspicion and mistrust between the peoples of the world through which their differences have all too often broken into war;

That the great and terrible war which has now ended was a war made possible by the denial of the democratic principles of the dignity, equality and mutual respect of men, and by the propagation, in their place, through ignorance and prejudice, of the doctrine of the inequality of men and races;

That the wide diffusion of culture, and the education of humanity for justice and liberty and peace are indispensable to the dignity of man and constitute a sacred duty which all the nations must fulfil in a spirit of mutual assistance and concern;

That a peace based exclusively upon the political and economic arrangements of governments would not be a peace which could secure the unanimous, lasting and sincere support of the peoples of the world, and that the peace must therefore be founded, if it is not to fail, upon the intellectual and moral solidarity of mankind.

For these reasons, the States Parties to this Constitution, believing in full and equal opportunities for education for all, in the unrestricted pursuit of objective truth, and in the free exchange of ideas and knowledge, are agreed and determined to develop and to increase the means of communication between their peoples and to employ these means for the purposes of mutual understanding and a truer and more perfect knowledge of each other's lives....

In consequence whereof they do hereby create the United Nations Educational, Scientific and Cultural Organization for the purpose of advancing, through the educational and scientific and cultural relations of the peoples of the world, the objectives of international peace and of the common welfare of mankind for which the United Nations Organization was established and which its Charter proclaims.

UNESCO Constitution (1945)

Box 2–1. The 'Green' Summit of Industrial Nations

In July 1989 the leaders of Canada, France, Italy, Japan, the United Kingdom, the United States, and West Germany met for their fifteenth annual economic summit. Environmental threats, they acknow' dged, deserve as much attention as economic ones:

- There is growing awareness throughout the world of the necessity to preserve better the global ecological balance This includes serious threats to the atmosphere, which could lead to future climate changes We note with great concern the growing pollution of air, lakes, rivers, oceans and seas; acid rain, dangerous substances; and the rapid desertification and deforestation. Such environmental degradation endangers species and undermines the well-being of individuals and societies.
- Decisive action is urgently needed to understand and protect the earth's ecological balance. We will work together to achieve the common goals of preserving a healthy and balanced global environment in order to meet shared economic and social objectives and to carry out obligations to future generations. . . .
- The persisting uncertainty on some of these issues should not unduly delay our action. In this connection, we ask all countries to combine their efforts in order to improve observation and monitoring on a global scale. . .
- Environmental protection is integral to issues such as trade, development, energy, transport, agriculture and economic planning. Therefore, environmental considerations must be taken into account in economic decision-making. In fact good economic policies and good environmental policies are mutually reinforcing. In order to achieve sustainable development, we shall ensure the compatibility of economic growth and development with the protection of the environment Environmental protection and related investment should contribute to economic growth
- To help developing countries deal with past damage and to encourage them to take environmentally desirable action, economic incentives may include the use of aid mechanisms and specific transfer of technology In special cases, ODA [official development assistance] debt forgiveness and debt for nature swaps can play a useful role in environmental protection We also emphasize the necessity to take into account the interests and needs of developing countries in sustaining the growth of their economies and the financial and technological requirements to meet environmental challenges . .
- We strongly advocate common efforts to limit emissions of carbon dioxide and other greenhouse gases, which threaten to induce climate change, endangering the environment and ultimately the economy .
- The increasing complexity of the issues related to the protection of the atmosphere calls for innovative solutions New instruments may be contemplated We believe that the conclusion of a framework or umbrella convention on climate change to set out general principles or guidelines is urgently required to mobilize and rationalize the efforts made by the international community
- We advocate that existing environment institutions be strengthened with the United Nations system In particular, the United Nations Environment Program urgently requires strengthening and increased financial support Some of us have agreed that the establishment within the United Nations of a new institution may also be worth considering

Source Excerpted from 'Economic Declaration Summit of the Arch Paris 16 July 1989

Declaration of Interdependence

We have arrived at a place in history where decisive action must be taken to avoid a general environmental disaster. With nuclear reactors proliferating and over 900 species on the endangered list, there can be no further delay or our children will be denied their future.

The Greenpeace Foundation hopes to stimulate practical, intelligent, non-violent actions to stem the tide of planetary destruction. We are "rainbow people" representing every race, every species, every living creature. We are patriots, not of any one nation state or military alliance, but of the entire earth. . . .

Ecology teaches us that mankind is not the center of life on this planet. Each species has its function in the scheme of life Each has a role, however obscure that role may be

Ecology has taught us that the entire earth is part of our "body" and that we must learn to respect it as much as we respect ourselves. As we love ourselves, we must also love all forms of life in the planetary system – the whales, the seals, the forests and the seas. The tremendous beauty of ecological thought is that it shows us a pathway back to an understanding of the natural world – an understanding that is imperative if we are to avoid a total collapse of the global ecosystem. . . .

If we ignore the logical implications of ecology we will continue to be guilty of crimes against the earth We will not be judged by people for these crimes, but with a justice meted out by the earth itself The destruction of the earth will lead, inevitably, to the destruction of ourselves

So let us work together to put an end to the destruction of the earth by the forces of human greed and ignorance Through an understanding of the principles of ecology we must find new directions for the evolution of human values and human institutions Short-term economics must be replaced with actions based on the need for conservation and preservation of the entire global ecosystem We must learn to live in harmony, not only with our fellow humans, but with all the beautiful creatures on this planet

Greenpeace

WHAT CAN WE DO?

"A journey of a thousand miles begins with a single step."
Ancient Taoist saying

Overview:
In this final lesson, students reflect on what they have learned and how their understandings of these issues have changed since the beginning of the unit. Building on the theme of understanding leading to action, students explore the many avenues available to them for personal and civic action toward the world they would like to grow up in.

Objectives:
Students will:
1. Intellectually and emotionally process what they have learned in this curriculum.
2. Explore the practical options available to them to act upon what they have learned.
3. Be able to articulate their vision of a secure future.

Materials:
Six group brainstorming worksheets.

Procedures:
1. Questionnaire results comparison (20-25 min.). Pass out students' pre-unit questionnaires and allow time for students to compare pre-unit and post-unit questionnaire results. Reflect together on what the class has learned, how it has grown, and the emotional impact of confronting this material. (Students should also be encouraged to re-examine their "Views on War and Peace" questionnaire).
2. Group brainstorming activity (20-25 min.). Have one or two students read aloud Margaret Mead quote and directions, then have students divide into 5-6 groups (depending on size of class). Groups should be given only one worksheet per group, and should select one student to record ideas and report to class. In class discussion, teacher might bring up ways the environment is being addressed today in the media and in popular entertainment (see "Delivering the Message" supplementary material).
3. (Remaining time). Hand in and discuss research papers.

Homework: In journals, students reflect on 1) "my vision of a secure future", and 2) "what did I get out of this unit and what am I going to do with it?"

REPORT TO TEACHER

This final lesson provides the class an opportunity to process the material of this unit and brainstorm ideas for acting upon what has been learned. The opening exercise, comparing results of the "questionnaire" taken at the beginning and at the end of the unit, lets students see for themselves how their understanding and perception has changed over the last few weeks. In discussing these changes, the teacher might want to emphasize the emotional impact of the material: how did students feel as they confronted these issues and how did they cope with these feelings?

The brainstorming exercise puts students into 5-6 groups, each group focussing on a different avenue of change. As each group reports its ideas, teacher should list them on the board, and include any ideas of his or her own that didn't come up in the group. An extensive list of ideas is provided with this report, along with supplementary material on the environment in the media from Signs of Hope.

Useful References:

Bennett Group. The Green Pages: Your Everyday Shopping Guide To Environmentally Safe Products. New York: Random House, 1990.

Educators for Social Responsibility. Dialogue: A Teaching Guide to Nuclear Issues. Cambridge, MA: ESR, 1982 (see esp. pp. 185-94).

Earth Works Group. 50 Simple Things You Can Do to Save The Planet. Berkeley: The Earth Works Press, 1989.

Kome, Penney and Crean, Patrick, eds. Peace: A Dream Unfolding. Toronto: Lester & Orpen Dennys Lmt., 1986.

Starke, Linda. Signs of Hope: Working Toward Our Common Future. Oxford: Oxford University Press, 1990.

#1

BRAINSTORMING FOR ACTION

"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has."

Margaret Mead

DIRECTIONS:

As we look at the threats that war and environmental degradation pose to our future, we must also look at ways we can act to preserve the planet. As a group, brainstorm things you can do to meet the challenge through education and raising awareness.

#2

BRAINSTORMING FOR ACTION

"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has."

Margaret Mead

DIRECTIONS:

As we look at the threats that war and environmental degradation pose to our future, we must also look at ways we can act to preserve the planet. As a group, brainstorm things you can do to meet the challenge through personal lifestyle changes.

#3

BRAINSTORMING FOR ACTION

"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has."

Margaret Mead

DIRECTIONS:

As we look at the threats that war and environmental degradation pose to our future, we must also look at ways we can act to preserve the planet. As a group, brainstorm things you can do to meet the challenge through participation in the democratic process.

#4

BRAINSTORMING FOR ACTION

"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has."

Margaret Mead

DIRECTIONS:

As we look at the threats that war and environmental degradation pose to our future, we must also look at ways we can act to preserve the planet. As a group, brainstorm things you can do to foster change through the arts.

#5

BRAINSTORMING FOR ACTION

"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has."

Margaret Mead

DIRECTIONS:

As we look at the threats that war and environmental degradation pose to our future, we must also look at ways we can act to preserve the planet. As a group, brainstorm things you can do to meet the challenge through direct action for change.

#6

BRAINSTORMING FOR ACTION

"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has."

Margaret Mead

DIRECTIONS:

As we look at the threats that war and environmental degradation pose to our future, we must also look at ways we can act to preserve the planet. As a group, brainstorm things you can do to meet the challenge through letter-writing.

SOME METHODS OF NON-VIOLENT ACTION (teacher reference)

1. Education and raising awareness. Personal study, discussion with family and friends, write letters to the editor, start or join a group concerned with the issues, hold a "teach-in", talk with administrators and teachers to encourage wider discussion of these issues in the classroom, encourage library to acquire more relevant materials, hold fund-raising activities.

2. Lifestyle changes. (see also 50 Simple Ways to Save the Earth) Recycle, reduce consumption, avoid over-packaged products, eat organic foods, boycott products made by environmental offenders.

3. Participation in the democratic process. Join a national group lobbying for change (see "Groups" section of Resource Guide), vote, write letters to representatives expressing your views, educate self, take a poll and report the results to the local newspaper.

4. Change through the arts. Write a poem, story, or song expressing your feelings about the state of the world, put on a play dealing with these issues, create a work of art (painting, collage, photo-montage) around these issues, organize a public reading of relevant poetry, create and wear t-shirts expressing your views.

5. Direct action for change. Participate in marches and protests, boycott products made by environmental offenders. Study and practice: civil disobedience, non-violent confrontation of environmental offenders and government officials, strikes, conscientious objection to serving in the armed forces.

6. Letter-writing. (see "Suggestions for Letter-writing") Write to representatives and editors, begin correspondence with a pen-pal.

SOME SUGGESTIONS FOR SUCCESSFUL LETTER-WRITING

Public officials consistently affirm that sincere and respectful letters do make a difference in the stands they take on issues of the day. Similarly, representatives and citizens alike are often moved by informative and persuasive letters to the editor of the local paper. Citizen sentiment on issues local, national, and global is heeded closely by election-conscious officials. Some tips for successful letter-writing:

1. Above all, be respectful. Insults, demands, and threats do not work.
2. Write clearly or type.
3. Be brief and to the point. Cover only one issue per letter.
4. Draw on personal experience in justifying your position (personal insights, experiences, conversations, reactions to a film or book).
5. Affirm the positive, if possible adding some praise for the representative's positions or openness to public input.
6. Suggest sources of reliable information for further investigation of the issues you are raising.

SOME USEFUL RESOURCES FOR "THINKING ABOUT OUR FUTURE"

Recommended books:
*=Highly recommended

(Fiction)

Becerra de Jenkins, Lyll. The Honorable Prison. Lodestar, 1988. A teenage girl and her father in a courageous resistance to an oppressive military government.

Hersey, John. Hiroshima. New York: Knopf, 1946. Classic journalistic account of the Hiroshima bombing and its aftermath.

Ibuse, Masuji. Black Rain. New York: Bantam, 1985. Fictionalized account of the Hiroshima bombing.

Moeiri, Louise. The Forty-Third War. Houghton-Mifflin, 1989. In an unnamed, composite country torn by chronic oppression and guerrilla warfare, a 12-year-old village boy and his friends are forced to serve as soldiers.

Prochnau, William. Trinity's Child. New York: Berkley, 1985. Well-researched thriller about the threat of accidental war.

Rardin, Susan Lowry. Captives in a Foreign Land. Houghton Mifflin, 1984. Six American kids, kidnapped by an extremist group, come to reflect on their captors' demands for disarmament and begin to question their own society's assumptions.

Shute, Nevil. On the Beach. 1957. Classic story of the last days of a group of Australians waiting for post-nuclear war radioactivity to reach them.

(Background on nuclear weapons and the Cold War)

* Barash, David. The Arms Race and Nuclear War. Belmont: Wadsworth Publishing Co., 1987.

* Beckman, Peter et. al. The Nuclear Predicament: Nuclear Weapons on the Cold War and Beyond. Englewood Cliffs: Prentice-Hall, 1992.

Craig, Paul P. and Jungerman, John A. Nuclear Arms Race: Technology and Society. New York: McGraw-Hill, 1986.

Caldicott, Dr. Helen. Missile Envy: The Arms Race and Nuclear War. New York: Bantam, 1986.

Holroyd, Fred (ed.) Thinking About Nuclear Weapons: Analyses and Prescriptions. London: Croom Helm, 1985.

* Kurtz, Lester. The Nuclear Cage: A Sociology of the Arms Race. Englewood Cliffs: Prentice-Hall, 1988.

Mayers, Teena. Understanding Nuclear Weapons and Arms Control. Arlington: Education in World Issues, 1983.

Schell, Jonathon. The Fate of the Earth. New York: Avon, 1982.

Suddaby, Adam. The Nuclear War Game. London: Longman, 1983. (Military and Security Issues)

* Barash, David. Introduction to Peace Studies. Belmont: Wadsworth, 1991.

Bok, Sissela. A Strategy for Peace. New York: Pantheon, 1990.

* Ferencz, Benjamin and Keyes, Ken Jr. PlanetHood. Coos Bay: Love Line Books, 1991.

Hollins, Harry. The Conquest of War: Alternative Strategies for Global Security. Boulder: Westview Press, 1989.

Holmes, Robert (ed.). Non-Violence in Theory and Practice. Belmont: Wadsworth, 1990.

** Kidron, Michael and Segal, Ronald. State of the World Atlas. New York: Touchstone, 1991.

O'Connell, Robert L. Of Arms and Men: A History of War, Weapons, and Aggression. New York: Oxford University Press, 1989.

** Sivard, Ruth. World Military and Social Expenditures. Washington D.C.: World Priorities (published annually).

Stockholm International Peace Research Institute. Yearbook 1990: World Armaments and Disarmaments. New York: Oxford University Press, 1990.

* Turner, John. The Arms Race. Cambridge: Cambridge University Press, 1983.

vanCrevald, Martin. Technology and War: From 2000 B.C. to the Present. New York: Macmillan, 1989.

Weeks, Dudley. Conflict Partnership. Orange, CA: Trans World Publications, 1984.

Weston, Burns H. (ed.) Alternative Security: Living Without Nuclear Deterrence. Boulder: Westview Press, 1990.

(The Environment)

Barney, Gerald O. Global 2000: The Report to the President. Washington D.C.: Seven Locks Press, 1988.

* Bennett Information Group. The Green Pages: Your Everyday Shopping Guide to Environmentally-Safe Products. New York: Random House, 1990.

** Brown, Lester (ed.) State of the World. New York: W.W. Norton & Co., published annually.

Earth Works Group. 50 Simple Things You Can Do To Save the Earth. Berkeley: The Earth Works Press, 1989.

* Ferencz, Benjamin and Keyes, Ken Jr. PlanetHood. Coos Bay, Oregon, Love Line Books, 1991.

Meyers, Dr. Norman. Gaia: An Atlas of Planet Management. New York: Anchor Books (Doubleday), 1984.

** Seager, Joni (ed.) State of the Earth Atlas. New York: Touchstone, 1990.

World Resources Institute. World Resources: A Guide to the Global Environment 1990-91. New York: Oxford University Press, 1990.

Journals, Newspapers, and Magazines

Bulletin of the Atomic Scientists. Well-established and highly reputable journal on nuclear and security issues. Produced by leading atomic scientists but accessible to the general public.

*The Christian Science Monitor. Daily newpaper with consistently forward-looking and accessible features on global issues.

The Defense Monitor. Produced by The Center for Defense Information. A periodic review of America's security priorities from the perspective of progressive retired military personnel.

Garbage. Innovative journal exploring ways out of the environmental crisis.

*Greenpeace. Widest-circulation environmental magazine, action-oriented.

International News and Pax et Libertas. Both published by the Womens' International League for Peace and Freedom. Progressive treatment of international issues from a feminist perspective.

*Nuclear Times. Global perspective on nuclear, military, and security issues. Published four times a year.

U.N. Chronicle. Accessible review of global issues from the perspective of the United Nations.

U.S. News and World Report. Weekly newsmagazine with reliable reports on major military and U.S. foreign policy developments.

World Monitor. Monthly review of national and international issues, published by the Christian Science Monitor.

*World Watch. Environmental focus on global security issues. Published bimonthly by the World Watch Institute.

Videos

In the Nuclear Shadow: What the Children Can Tell Us. Educational Film and Video Project. 1529 Josephine St. Berkeley, CA 94703. (415) 849-1649.

Deadly Deception: G.E., Nuclear Weapons, and the Environment. INFACT (Womens' Education Media, Inc.). 1991, 29 min.

Organizations

American Friends Service Committee. 1501 Cherry St. Philadelphia, PA 19102. Well-established Quaker group known for its progressive peace efforts.

Educators for Social Responsibility. 23 Garden St. Cambridge, MA 02138. (617) 492-1764. Excellent teaching resources available.

Environmental Policy Center. 307 Penn. Ave. SE Washington, D.C. 20003. Studies nuclear and military issues in an environmental light.

Greenpeace. Major, wide-ranging environmental group. 1436 U St. NW Washington, D.C. 20009.

International Student Pugwash. I.S.P. Center, 305 Mass. Ave. NW Washington, D.C. 20002. Student branch of worldwide organization concerned with the interplay of science, society, and security.

Nuclear Information Resource Service. 1346 Connecticut Ave. NW 4th Fl. Washington, D.C. 20036. (202) 296-7552.

Social Studies School Services. Global Education Catalog. 10200 Jefferson Blvd. Rm 4 P.O. Box 802 Culver City, CA 90232-0802. Excellent teaching materials available.

U.N. Association of the U.S.A. 485 5th Ave. NY, NY 10017. Participatory local-chapter-based organization committed to building support in this country for the U.N.

U.S. Department of Defense. The Pentagon Washington, D.C. 20301. Good source for speakers on U.S. military policy.

Women's International League for Peace and Freedom. 1213 Race St. Philadelphia, PA 19107. Progressive organization working toward disarmament and collective security policies from a feminist perspective.

Worldwatch Institute. 1776 Mass. Ave. NW Washington, D.C. 20036. Global environmental and security issues.

Young Americans for Freedom. Conservative group promoting a vigorous national defense policy. Rte. 1, Box 1002, Woodland Rd. Sterling, VA 22170.