Environmentally Sensitive Worldviews: What Are They, Why Are They Necessary, and How Can They Be Fostered?

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Dedication

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Detailed Lesson Plans

Possible Unit Plan

Detailed Lesson Plans

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Abstract

We are currently faced with compelling scientific evidence that humans are impacting the earth in many negative manners at rates previously unheard of. In an effort to understand the cultural origin of this degradation and find hope in a bleak situation, the prominent worldview of the citizens of the United States is examined as well as worldviews that might better serve both humanity and the planet. The ultimate goal is to help high school students understand and develop their own worldview; to this end a possible unit plan based on current pedagogy is presented with sample lesson plans.
Introduction

As science teacher and an environmentalist I feel I am well informed regarding the multitude of issues earth currently faces due to increased human population and resource consumption. As a resident of the greater Madison, Wisconsin area, I feel I am inundated with information about not only the global environmental crisis, but also things I can do to help address the crisis. It is easy to forget that not everyone has this body of knowledge. In fact, when speaking with colleagues and friends in the rest of the U.S., I am amazed at their lack of exposure to many of the environmental issues we are currently facing. This should not surprise me, while this information is accessible on the internet there is little mention of the growing environmental crisis in the national mainstream media. According to the State of the News Media 2008, stories about the environment receive between 1 and 3% of the news reported depending on the type of media outlet. This means that very little of the information available to the public, via network evening news, cable news, newspapers or from on-line news outlets, is dedicated to discussing the environmental issues of the day.

Although there was limited coverage of it in the media, in the past year the International Panel on Climate Change again reported that global warming is real and humans are major contributors to it; the International Union for Conservation of Nature World Conservation Congress’ 2008 Red List stated about 50% of the world’s mammals are facing declining populations and more than a third are facing extinction; and the United Nations Children’s Fund (2008) told us the water 884 million people drink is unsafe. These statements, and the many others like them, inform those who seek out knowledge we are
facing a global environmental crisis. All of these changes to our planet are happening at unprecedented rates. In order to ensure the future of earth, actions to combat these changes must also happen within a relatively small time frame.

Unlike the majority of the United States, those of us living in Dane County, Wisconsin find it next to impossible to turn on the television, open a local newspaper, or listen to the radio without being exposed to information about the global environmental crisis. Local coverage of the 2008 Beijing Olympics included information on the air pollution issues in Beijing and all that was done to mitigate the problems, the local news websites have sections dedicated to living in a sustainable manner, home improvement shows are helping people remodel and decorate “green,” and with gas prices climbing people are talking about increasing fuel efficiency and even considering different options for transportation. The manner in which many people in Dane County view their place in the world is beginning to change to one that encompasses the new state of affairs.

Of course, while all of these positive efforts are occurring there are contradictions as well. Car companies are offering inexpensive gas with the sale of large SUVs, single serving foods and over-packaged groceries are being sold in ever-increasing amounts, and new “green” items are advertised without any discussion of decreasing consumption. In a global poll by American Gas (2008), which examined attitudes and behaviors in regards to energy consumption, it was found that “seventy-nine percent [slightly below the world average] of Americans agree that lifestyles in the United States will have to change; 65% [slightly above the world average] say energy costs will have to rise.” This indicates Americans know lifestyle changes are required. However, Dietz, Dan, and Shwom (2007) found that public
willingness to make changes to combat environmental degradation decreases with the difficulty and/or cost of the proposed action. Changes that require people to alter their lifestyles are less likely to take place and remain in place because they will go against the cultural ideas, or worldview, of the country.

Nowhere are these ingrained cultural ideas more apparent than in my high school science class. Many juniors at Monona Grove High School, students with strong academic backgrounds and thoughtful natures, have difficulty connecting the problems in our environment to our lifestyle. Very few can make the next step to see that lifestyle change is needed to solve these problems. This disconnect is concerning because people in Dane County are exposed to far more information than the rest of the country regarding sustainability, global climate change, local invasive species, safe water issues, and many other aspects of the current environmental crisis. If students here cannot see the need for lifestyle change, how can we hope there will be a willingness in the rest of the country to do something positive to help stem even one aspect of the crisis?

In order to begin to highlight the environmental problems as well as to begin to solve them, people must have a grasp of how the values and viewpoints of mainstream America contribute to our current environmental crisis. Once they can see the potential problems with the current viewpoints, people can determine if and how they could change to make a positive impact on current global problems. This will not happen on a large scale without focused guidance from others in the community. A perfect place to begin the process of a guided examination of the cultural causes of our environmental crisis and to examine new ways to view the world to improve our global future is the high school classroom. Students are
required by law to attend public schools. Patton and Mondale (2001) identified the following as American’s reasons for compulsory public education: to prepare children to be good citizens, skilled members of the workforce, culturally literate, critical thinkers, and competitive in the global marketplace. Becoming aware of how the current cultural milieu contributes to environmental problems satisfies many of the purposes of public schooling including requiring critical thought, discussing what makes a good citizen, and being literate in the ideas of the culture.

The information found within this manuscript is presented for a number of reasons, 1) to provide the background and basis for the understanding that cultural ideas or worldviews do influence our behavior, 2) to show these worldviews can be changed and how they might be changed, 3) to provide alternative worldviews that could be used in the high school classroom to explore other manners of viewing our place in the world, and 4) to illustrate one possible manner in which all of this could be accomplished in a high school classroom. Reasons 1 and 2 are important because they provide critical background while reasons 3 and 4 apply this background information in a practical manner.

What are Environmentally Sensitive Worldviews?

Each and every person has his or her own unique manner of looking at the world, interpreting what they see, and determining how to act on such interpretations. In lay terms this would be considered the individual's worldview. When a group of people hold similar individual worldviews we would consider that a communal worldview. At every level of human organization there are broad beliefs that tie groups together, this would be the
collective worldview. Understanding the predominant worldview of the United States and examining what an environmentally sensitive worldview might look like are the first steps in helping to solve many of the environmental problems we currently face. Without acknowledging the cultural air we breath we can never critically examine and comprehend it. However, in order to do this we must first understand what we mean when we use the term worldview.

*What is a worldview?*

When examining the research on worldviews there are many fields that use the term in different manners. For example, within psychology the idea of worldview as proposed by Janoff-Bulman (1991) is one drawing together the view of the world and the view of the self by examining three distinct areas, the perceived benevolence of the world, the meaningfulness of the world and the worthiness of the self. In sociology, Hunter (1991) described worldviews as assumptions used to order reality and make moral judgments that cannot be proved in any scientific manner. Geographer Curry (2000) defined worldview as a communal view of the way things are that provides a comprehensive idea of how the world is ordered.

For the purposes of this paper science ethicist Carvalho's (2006) definition of worldview will be used: "a belief system concerning the nature of reality and how one acts as a subject in reality" (p. 113). This means a worldview is the way a person or group believes the world works and how they act in the world based on those beliefs. The many alternate definitions are limited by being applicable to specific fields of study, such as Janoff-Bulman, or are too confining and do not allow room for finding one's own viewpoint within them. Carvalho's definition was chosen for two reasons: 1) it is relatively simple yet broad and
Therefore, it will be understandable and usable for high school students, and 2) it connects the ideas about the world to the actions people take within the course of their lives. Helping students identify what they think and how that makes them act is an important component of this undertaking and therefore should be part of the definition of the worldview.

In order to best understand the roots of a person's worldview; it is useful to examine the salient factors that are likely involved in its development. Carvalho insists that for a worldview to be effective and truly useful it must encompass both the rationality and process of modern science and the morality of religious and community values. While the entire worldview of a person and its development is important and interesting, it is too broad to be useful in the context of environmental issues. Therefore, this manuscript will focus on the subset of a person's worldview related to the environment. Understanding a person's views toward the environment and environmental decision-making requires examining five factors. These factors are consistent with Carvalho's as they encompass both the scientific and the moral. They address the same factors many environmentalists consider important to the development of their thinking. Additionally, they are relevant and understandable to the lives of high school students. These areas are religious beliefs, family values, educational experiences, living circumstances, and community values.

Religion

When religious scholars discuss the concept of worldview they are often discussing the common cosmology shared by members of the same faith. Carvalho used the idea of religion to ask the questions that science does not, those that have to do with value and ethics, not simply data. To examine the implications of religion on worldview one should turn to
Foltz (2003), who is prolific in writing on the religious aspects of an environmental worldview. Foltz states a person's worldview is in large part the ideas they hold as to the relative importance of different things in their life. He acknowledges religion as a significant informant to a person's worldview but not the only factor. For many people their religion plays an important role in their thinking as well as helping them to determine how and when they act. Therefore to address worldview in relation to the environment and understand how a person acts, one must consider their religious upbringing, or lack thereof.

Family

A person's family has a large effect on the way they interpret the world. For example, the family structure is very important to the development of resilience in adolescence. Because resilience is closely related to adaptive skills, it connects well to the idea of a worldview; it is a manner in which the world is viewed and acted upon. Siedman and Pederson (2003) found in families in which problems are high and support and involvement are low there is a high correlation to anti-social behaviors. Because Carvalho believes a comprehensive worldview helps determine ethical behavior, the findings of Siedman and Pederson show the importance of the family on comprehensive worldview development. Clearly the influence of the family on the ways in which a family member behaves is significant.

Education

The type and level of education a person takes part in throughout his or her life will also impact the type of worldview he or she develops. A study done by McMillan, Wright, and Beazley (2004) determined that students taking an environmental studies class found
their attitudes regarding the environment changed over the course of the year. In the interviews done during the study, students indicated the environmental studies course helped deepen their environmental values. This is but one example of how education can influence and shape a person's worldview. Carvalho notes that a comprehensive worldview must encompass both the scientific and the philosophical. Therefore the exposure to both science and philosophy, through course study, is imperative for the development of a comprehensive worldview.

Living Circumstances

The social and economic circumstances within which a person lives will also have a significant impact on their worldview. The concept that a person's basic survival needs must be met before they can attend to less concrete needs, such as examining their place in the world, has been discussed by many, including naturalist Henry David Thoreau. In his work “Walking” (Thoreau, 2007) he stated that only once a person has taken care of his physical needs can he begin to truly find his place in the world.

American psychologist Abraham Maslow put forth a straightforward and academic discussion of personal circumstance. Maslow (1943) developed a hierarchy of needs in which the needs at the bottom of the pyramid must be met prior to a person working to meet the needs further up. The bottom of the hierarchy includes clean air and water, food, shelter, and adequate sleep. As these needs are met a person can then contend with other needs, eventually reaching the stage of self-actualization where personal growth is the goal. A person who is struggling to meet the basic needs at the bottom of Maslow's hierarchy, such as food and shelter, may have a worldview that differs greatly from someone who is wealthy and
has all their basic needs taken care of without giving them a thought.

Community

The place in which a person lives and the people they surround themselves with also affects worldview. In a study conducted in five rural Iowa communities, Curry (2000) found the values of a community were strongly influenced by the physical geography of their community. Where they lived and the resources available to them affected the worldview they developed. In addition, he found there were two types of worldviews that each of the communities fell into, individualistic and communal, and people’s individual responses to various dilemmas, personal, professional and communal, were determined in large part by the type of community in which they lived. This shows how the community can contribute to ethical behavior, a key element of Carvalho’s idea of worldview, by providing the norms in which a person feels free to act.

What is the current worldview in the United States?

Ours is a consumer culture in which we are told that buying the next new thing can solve many of our personal problems as well as the problems of our communities. Bill McKibbon (2007) notes that as a country we have tied ourselves to the idea that more and better are the same, that we can fix problems and be happy if we simply have more. This description of the American culture as one focusing on quantity and growth over quality and progress is not new and did not begin with McKibbon; Roderick Nash proposed this in his discussion of the importance of wilderness in the 1967 book Wilderness and the American Mind. In the 40 years between Nash’s publication and McKibbon’s the idea that more is better has taken root in the American mind.
Even within the consumer driven culture of the United States there is still considerable variability in individual worldviews. For this reason the focus of this manuscript will be on the larger environmental ethic represented by choices made by the majority of Americans; one based in a worldview that Dietz et al. (2007) identified as founded on our faith in “progress and development, science and technology, and a laissez-faire economy” (p. 189). Matutinović (2007) identified important components of the worldview of a capitalist democracy; a strong work ethic and a rational attitude toward nature. He went on to discuss how this rational attitude toward nature results in a society that treats nature as a resource base rather than something that has value in and of itself.

Dietz et al., Matutinović and Carvalho point out that one of the most prevalent ideas in the western worldview is the faith in science and the belief that technology and science will solve all our problems. This idea has its roots in the Enlightenment and is only beginning to loosen its grip in western thought. According to Carvalho (2006) this worldview believes that all things in the world are detectable and explainable, and has an immense faith in the human intellect. Because of this, many philosophers consider the scientific worldview not to be comprehensive because there are things that cannot be accounted for in the hypothesis- and data-driven scientific worldview. The scientific worldview cannot explain what it is that makes people happy, it cannot answer what the proper action in a situation is, and it cannot address any questions related to a higher power. The idea that we can categorize and classify everything leads many Americans to feel superior to the things that we categorize and assign hierarchy to, nature being one of those things. As Americans place themselves at the top of any natural order they are able to view the multitude of other things,
living and non-living, as simply there for their purposes and therefore beneath them.

In addition to a faith in hard work, science, and progress, the western worldview is rooted heavily in the Christian tradition. The Christian worldview is broad and varied, and many Christian congregations do not subscribe to the worldview presented here. However, the following sections show the roots of the Christian worldview. The issue of dominion in Christianity is one in which humans rule over the rest of nature. This is based in large part on the idea that humans are the only beings created in God’s image; therefore, the only beings capable of ruling over all of the earth (McDaniel, 1994). Many within the Christian worldview believe, as Peterson (2003) states, that God gave humans dominion over the earth, therefore nature exists solely for their benefit; Christians then use this information to “legitimize human dominion over and utilization of the natural world” (p. 321).

The concept of hierarchy is evident in Christianity. McDaniel (1994) discussed the idea that there is more to love in more complex beings. By virtue of being more complex than other beings, humans are more deserving of love. She then goes on to say that because of this God does not love all things equally or similarly. If humans are to emulate God’s love for the world, the suggestion that complex beings are more deserving of love will likely lead to an anthropocentric worldview in which humans are the ultimate creation to which all other beings are subjugated.

According to White (1967) the Christian worldview is anthropocentric, placing human needs above those of the rest of the planet. It does not look at our earth as the ultimate home for the human race; according to Christians we are bound for a non-earthly heaven and our time on earth is simply a stopping point en route to heaven (Peterson, 2003). Augustine posits
that the soul is ultimately far more valuable than the body and life on earth, and that there is no great significance in the physical earth. This is an important tenant in much of Christianity that does not result in a deep concern for the other living beings on our planet.

What are possible environmentally sensitive worldviews?

There are many individuals and groups working toward developing environmentally sensitive worldviews. These range from Christians reinterpreting the Bible in a more Christ-like manner to professors in colleges encouraging their students to think independently and use their critical thinking skills to examine the choices they make. For the purposes of this paper three possible environmentally sensitive worldviews will be examined, all of which have been developed for a number of years and which were conceived with thoughts toward the practical applications for western society. The three worldviews that will be examined are those of Christopher Stone, Aldo Leopold, and Holmes Rolston III. These three worldviews will be examined because they are a) at least 25 years old and therefore have shown to have some staying power in our cultural thinking, b) ideas that high school students can understand without too much additional background and therefore will be usable in the high school classroom, and c) worldviews that, while significantly different from our own, are not so radical that they will be immediately written off as impossible to adhere to. Within each presentation there will be a brief overview of the relevant components of each worldview, a discussion as to how this particular worldview is environmentally sensitive, and an example of its practical applicability.
Stone

Christopher Stone (1972) took the idea of rights discussed by many previous thinkers such as Thomas Jefferson and John Stewart Mill and extended them considerably in his work *Should Trees Have Standing?* Because he is a lawyer and not a philosopher, theologian, or scientist, Stone used the legal framework to discuss the granting of rights to non-human entities. He spent time discussing the particular manner in which this needs be done as well as the ethical implications.

The main idea that Stone put forth is that nature has rights in its own account not simply based on its use to humans. His argument is that of moral pluralism; there should be different ethical principals for different activities. Unlike many more radical philosophies, this allows human needs to be considered above those of the non-human entities while still insisting those rights are considered. He believes protection of the non-human entities should be strictly for the sake of those entities, not for any human purpose. This idea was just as groundbreaking when published in 1972 as it is today.

This leads one to an environmentally sensitive worldview because it extends the legal rights we are accustomed to granting only to human beings to trees, bodies of water, and natural areas. With this worldview we would consider and have legal recourse for the rights of natural areas as well as individual animals or species. There are already practical applications of this worldview in action today. Lawsuits are brought against corporations on behalf of endangered species and people are sued based on their treatment of land. It is currently a minority worldview but since its proposal in 1972, it has been gaining ground in the legal community.
Leopold

Aldo Leopold’s philosophy regarding humans and the land is best stated in his seminal work, *A Sand County Almanac and Sketches Here and There*. Published after Leopold’s untimely death, the book consists of three distinct parts. The first is a series of essays written about inhabiting the land, in particular the land in central Wisconsin where his shack was located. This section illustrates Leopold’s love for nature as well as the thoroughness of his observations. Essays from many of Leopold’s travels addressing the numerous events that shaped his thinking make up the second section of the book. The third section consists of essays that are more philosophical in nature; it is in this section of the book that Leopold lays out his idea of a land ethic.

Leopold’s philosophy is most clearly discussed in the chapter aptly titled “The Land Ethic” where he succinctly explained how people should behave in regards to the land. The chapter begins with a discussion of the evolution of ethics from something pertaining only to individuals to one evolving to communities and societies. He then expanded the idea of human-to-human ethical behavior to human interactions with the land. As he wrote, “the land ethic simply enlarges the boundaries of the community to include soils, water, plants, and animals, or collectively: the land” (1989, p. 204).

This ethic describes the responsibilities and obligations humans have towards the land such as protecting it and its healthy functioning. After establishing the idea of land as an important consideration in ethical decision making, Leopold (1989) went on to define the role of humans in this greater community as moving from that of “conqueror of the land-community to plain member and citizen of it” (p. 204). Finally he provided guidance as to
how one would go about determining if an action will be ethical in this broader defined community. To this end Leopold (1989) wrote a basic summary of the land ethic and one of his most quoted passages; “[a] thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise” (p. 224-5). With this statement, Aldo Leopold sowed the seeds of the modern environmental movement, which began the long and arduous process of changing the minds of people regarding their relationship to the land.

Living by this ethic is very possible. Leopold and his family did it and many people in today's world are able to do so as well. It simply demands that the other beings with which we come in to contact are treated with equal respect and importance as our wants and needs. This is not to say that a person must subjugate his or her own needs, simply that he or she considers how their actions will impact the larger biotic community and works to keep that community functioning effectively and efficiently.

Rolston III

Holmes Rolston III posits that humans have duty to the natural world based simply on its existence. He explained this argument in detail in Environmental Ethics, a cornerstone book in the field of environmental ethics. As a philosopher with a background in both science and religion, Rolston created a rich and robust worldview. Like Leopold, Rolston believes in the importance of valuing species and systems. However, unlike Leopold, Rolston does allow for the individual to be considered above the system.

Rolston (1988) argued that the natural world carries intrinsic values that human beings should recognize. He suggested we must move from a position of respect for the natural
world to one of reverence. This reverence must guide us in our decision making by allowing us to value things we cannot understand. In this regard Rolston is an objectivist, much like Aristotle, believing that values exist whether or not humans are present to acknowledge them and with these values come protective duties.

This leads us to a worldview that is environmentally sensitive because it forces us to consider the value of both organisms and systems, as well as to evaluate our duties towards them. In a world guided by Rolston's worldview, we would value the systems because they produce the individual who is valuable. Because of this we would be encouraged to protect the system, sometimes at the expense of other individuals. Another advantage of this worldview is it speaks in a language people of religion can understand. The idea of reverence for nature is something religious people can relate to and perhaps will result in a greater acceptance of this worldview.

Why are Environmentally Sensitive Worldviews Necessary?

American citizens and industry contribute approximately one quarter of the global warming gases to the atmosphere while only having 4% of the world population (Woolf & Brown, 2005). Therefore, actions taken by Americans to change usage patterns and reduce their greenhouse gas emissions can have a significant effect on reducing global warming and other environmental problems, such as air pollution and habitat destruction. As we have such a possibility for positive change, it is important that citizens understand what is happening. Dietz et al. (2007) found that people who do not understand the causes of issues like climate change are unlikely to be interested in supporting policies or actions that will reduce the
If Americans are major contributors to many of our current environmental problems, such as global warming, and studies have shown that understanding is the first step to behavior change, then it is imperative that we have an American citizenry that understands these complex issues. Zaikowski and Garrett (2004) stressed the importance of a competent lay public in order for the democratic process to function properly. They noted the importance of “full representation of all groups” in discussions regarding environmental degradation and note that this requires a public that can evaluate scientific evidence. Azevedo (2005) also noted the importance of understanding scientific topics in all their complexity as essential for solving the environmental problems we are faced with today.

We are currently beginning to see the myriad environmental problems confronting us. Diamond (2005) distinguished three stages of human behavior regarding problems and change: a) recognition of a problem; b) generation of ideas about how to resolve the problem; and c) acting toward a solution. In regards to environmental issues, the majority of the U.S. population’s mindset seems to be between the first two steps. We are beginning to accept there is a problem and some people are developing ideas about how to resolve the problem. Of course, within the scientific community people are considerably farther along. In the case of global warming, scientists are already well into the search for ways to slow the effects of global climate change and it is the general public and policy makers who are lagging behind. There are small groups of people taking action to solve the problem but the action is currently neither widespread nor coordinated.
How do worldviews determine action?

As discussed previously, a worldview is a general collection of beliefs about how the world operates. Clearly the way we think about the world affects the manner in which we interact with it. Dietz et al. (2007) and Matutinović (2007) both discussed the idea that our values or worldviews determine our responses to environmental problems and can help us make difficult decisions regarding the environment and sustainability. If one considers the dominant western worldview, where nature is a resource and science has the answer to our problems with no negative consequence, it becomes clearer how things came to be the way they are today.

A person living within the dominant western worldview would be likely to place their needs before the needs of other non-human organisms due to the view of nature as a resource. In addition, the dominant western worldview encourages a blind faith in science. Scientists can solve any problems society encounters with new technology and increased scientific knowledge. This worldview can be damaging to the environment; people are unlikely to question the effects of the latest scientific advance, even if we can look at history and see many negative effects from past technological and scientific developments.

There are many religious leaders, philosophers, teachers, and citizens who believe, as Lee (2005) stated that “being informs character, and character informs doing” (p. 58). In this regard, the members of a faith know what their worldview tells them to believe and therefore they know the right action in a given situation. Knowing what is right helps them to begin acting in the way that is right. In theory this is all well and good, however this does not explain what inspires action in members.
Studies that have examined religious action in church members note that effective action depends on personal involvement. It follows then that as religious people hear more and more about environmental issues in the media and see how they affect their communities and families they might be more willing to take action. Sherkat and Ellison (2007) found that “beliefs about the seriousness of environmental problems influence willingness to sacrifice for the environment” (p. 81). When considering this information and the changing public opinion discussed earlier, it makes sense that action among members of various worldviews would be increasing because without knowledge there can be no worldview change.

When looking at how worldview shapes environmental decision making Dietz, Fitzgerald, and Shwom (2005) found that humanistic altruism, biospheric altruism and self-interest were the most fixed psychological influences on behavior as well as the hardest to change. Dietz et al. (2007) found that these same values, or parts of a person’s worldview, were also the most likely to positively impact environmental decision making if the worldview became more ecocentric and less anthropocentric. Studies by Joierman, Lasane, Bennett, Richards and Solaimani (2001); Joierman, VanLange, and VanVugt (2004); and Lindsay and Strathman (1997) as reported in Dietz et al. (2007) indicated one of the best ways to help foster the long term changes is to be sure people have an awareness of the consequences of their actions. This awareness makes people more likely to behave in a manner that is supportive of the larger environment.

Can worldviews be changed?

Worldview change is possible; individual worldviews are constantly being challenged as people are exposed to new ideas and situations. These challenges may cause a change in
worldview or they may simply cause a person to reject the new information because it does not fit within the current worldview. The type of worldview change that needs to occur to keep our planet from destruction is large-scale change. A shift in the worldview of the majority of U.S. citizens resulting in changes in the economic and governmental realms is required. These worldview shifts may happen as a slow evolution in which change is incremental, gradual, and oftentimes unnoticeable to the individuals because it occurs over many lifetimes or as revolutions in which the change happens more quickly and with more intellectual and emotional violence. For the purposes of solving the global climate crisis and many other environmental issues we need to move from an evolutionary change to a revolutionary change in order to solve our planet's problems in time.

Matutinović (2007) noted that changing worldviews is not an immediate process and does not follow a script that is the same with every change. He noted “the process of worldview change may be slow and take centuries...in other times and places the change was rather abrupt and it may have taken only a couple of decades for a new worldview to impose itself” (p.1111). Matutinović suggests the Maoist revolution in China is an example of a rapid, revolutionary change, whereas the worldview change that occurred in Western Europe post-Roman Empire and pre-industrial revolution was an evolutionary change. In addition to the temporal variability of worldview change, he also posited that the onset of awareness may be caused by a variety of pressures but that worldview change will only occur when there has been sufficient questioning of the current worldview amongst a majority of the members of the group.

In addition to sufficient questioning being necessary, Hochachka (2005) stated that
worldview change from our current worldview to an environmentally sensitive worldview requires people to move away from an egocentric focus. In order to foster a worldview that will help us to remedy our current environmental situation we must be able to take the perspective of not only our friends and family but also other nations and species. To make this happen an integral approach to worldview development is required in which equal amounts of action, dialog, and reflection are all involved.

*How can worldviews be changed?*

As we have seen and will see, worldviews can be changed so we must understand how to foster that change in individuals as well as groups. When examining how worldviews can change it is important to first have a framework in which to understand change. There are many theories on how individuals, groups, and even institutions change and each has a different level of depth and sophistication. The Bridges Model of Transition (1991) is a simple model that looks at how organizations can change their culture. This model certainly can be applied to groups of citizens as well as companies because both are aggregations of people within a framework. The model of transition begins with an ending; in order to make change Bridges believed that first we must let go of our current beliefs. This is a difficult process that requires strong leadership within the organization or group for the transition to be successful. In terms of changing worldviews this model does not provide the best framework as it is unlikely that there will be a leader in the near future that will place a premium on changing our environmental worldview rather than changing our actions and who will be able to devote his or her energies primarily to that cause.

Apps (1994) described the process of transformation as a four element cycle. The four
elements are awareness, or knowing that there is something that must be changed; alternative identification, which means exploring options and examining alternatives; transition, where one is making a decision about the method of change; and action, or implementing the decision and new ideas. Once a decision is made the process is not over, it simply begins the cycle again. This model involves the questioning of core values and is a slow and difficult process that ultimately leads to a way of viewing the world for the group. The Apps model of transformation is a more applicable model for the change from our current worldview to an environmentally sensitive worldview because it focuses on individual change, assuming that as individuals change it pushes other individuals to change, eventually changing the majority of the people in our society. This method may be possible but the rate of change would likely be evolutionary rather than revolutionary and therefore may not be enough.

Prochaska and Velicer (1997) developed a model of change based on people’s response to health care issues that is more involved than both the Bridges and Apps models. In their Transtheoretical Model, Prochaska and Velicer identify six stages people go through in the change process: precontemplation, contemplation, preparation, action, maintenance, and relapse. These stages are given names that describe what would be happening within each stage. This is an interesting model to use in terms of worldview change because it speaks to the difficulty of maintaining a new worldview when those around you might still cling to the old worldview. Only in the Transtheoretical Model is the possibility of moving backwards addressed, within the relapse stage. For this reason, it is likely this is the most realistic model of worldview change, one in which the inconsistencies of human actions are best addressed.
Conclusion

In order to make change happen, it is important for people to realize what they currently think, reflect on that thinking, and take action based on that reflection. As Hochachka (2005) said, fostering change in worldviews is “about creating a space to explore self-in-relation – enabling self-expression and self-awareness as well as collective compassionate action” (p. 122). This time and space is difficult to find in our busy and full days, therefore one of the best places to begin the change process could be in high school classrooms. High school students have both the capacity to reflect and the capacity to change. Younger students can still easily change their views but do not have the developmental capacity for reflection whereas adults can be reflective but often have difficulty thinking beyond their own viewpoint. These reasons, coupled with the current compulsory education system, make high school an excellent place to foster worldview development. Students are required to be at school; there are no other groups of people that by law have to be somewhere where they can be asked to systematically reflect and be metacognative.

It is important that students receive help developing their personal worldviews. They will then be able to tackle environmental issues with a thorough understanding of where their opinions have originated and where they might lead them. This process will help students identify their current worldview, expose them to alternative worldviews, and help them to make changes to their worldview if they choose. It is important students know and understand there is no effort to indoctrinate them; the goal of each activity or instruction will be thinking and reflecting.

In the typical American high school there is little effort to help students develop their
worldview. There is also a lack of emphasis on seeing ecological and environmental issues in the big picture. One could argue that in addition to not teaching students about the world in context and preventing them from becoming thoughtful citizens, the public school system is actually stripping the community of value by removing students from a contextual knowledge and into a purely intellectual way of knowing (LeFay, 2006). This places a value on rational, data driven knowledge and removes value from the idea of knowing a place or thing sensorally and sensually. This is an important idea in the development of the ethic of Aldo Leopold. He believed that in order to learn about and protect a stand of trees one first had to truly know a tree, to love and appreciate it. Until that love and appreciation occurred there could be no real knowledge of trees in general.

Some efforts have been made to bring a more holistic view to the education of our youth through environmental education. There is little agreement in educational, ethical, scientific, and general circles as to what environmental education is and what it should be. There are many who feel this is simply the pervue of the sciences; there is no need for social studies, English or math teachers to worry about teaching environmental studies. There are other camps that view environmental education as a framework within which all subjects can be taught. González-Gaudiano (2006) wrote of environmental education as relational. It is really the study of relationships and the “fusion of features and elements also belonging to other fields” (p. 296). This is a richer and more effective manner to view the idea of environmental education. This method of integration will provide students with the tools they need to respond to the many issues they will certainly have to face in their lifetime.

In order to provide this richer educational experience to students there would have to
be a significant change to the current educational paradigm in which students are taught subjects separate from one another and any context. In order to look at systems processes like worldviews and ecological issues schools must be designed with a systems view. LeFay (2006) argued this is imperative, that we must design our schools with the principals of ecology in terms of curriculum, pedagogy, physical plant, community relations, management, and relationship to the larger environment. In other words, a successful environmental education program cannot simply be a science class in which ecology is studied; it must be infused into all curriculum along with the ethical implications of any environmental choices students make. Embedding ethics in an environmental and science education curriculum will not only help students better understand their own thinking; it will also promote environmental citizenship which Hungerford (2005) identified as important in a substantial environmental education curriculum.

How Can Environmentally Sensitive Worldviews Be Fostered?

When looking for manners in which the environmental worldviews of high school students can be fostered there are few specific, empirical studies. There are anecdotal articles where educators indicate what has worked from their perspective in their classroom, there are calls to action by members of various professional and educational organizations indicating we should add the teaching of scientific or environmental ethics in the undergraduate curriculum, and there are articles about the pedagogy of environmental science and many differing viewpoints regarding what it is and how it can best be taught. Even with the lack of concrete, scientific information available, it is still possible to see themes in the varying
manners of examining environmental education and fostering of worldview development.

**Important Pedagogy**

There are a number of pedagogical themes that are apparent in these articles, although the language used to discuss the ideas is not always the same. The many themes that appeared in the literature are as follows: a) the value of dialog in examining and changing worldviews, b) the need for personal and individual reflection in many forms, c) the importance of personal experience both in terms of field work and local case studies, d) the need to stress the complexity and interdisciplinary nature of the issues while at the same time assuring students there is no correct answer, e) the modeling of thinking and change in an open and constructivist classroom, f) the feeling of control over themselves that must be fostered in order to build the resilience needed to change, and finally g) the ability to present students with examples of success as well as personal success. Each of these themes will be addressed in its own section in the following pages. Within each section an explanation of the pedagogy will be provided as well as a discussion of its applicability in the high school classroom.

A significant problem with much of the writing on pedagogy is that while it indicates what sorts of techniques work, there is little advice or instruction as to how to implement said techniques. Because of this, many of the items that are grouped together in this manuscript may not be exactly consistent with the original authors’ text. Similar pedagogical ideas were grouped together for the purposes of this manuscript. In addition to an explanation of the pedagogical technique and a review of the literature regarding said technique, an explanation of what each group of techniques might look like in a high school classroom and a critique of its applicability will be provided.
Dialog

The importance of dialog in helping students to better articulate and understand their own worldview cannot be underestimated. Dialog is important in two manners, it helps students to develop metacognitive skills and it exposes them to a variety of viewpoints and interpretations they might not otherwise experience. Nadge (2005) found that a classroom climate that promotes the discussion of learning as a process helps build educational resilience in students. Educational resilience is important in that it helps students to feel confident with tackling difficult material and issues, as those surrounding both the environment and ethics. Taking time within the classroom for metacognition is imperative in building educational resilience. Li, L. (2006) stated that dialog is an essential component of fostering eco-justice in students. In the same article, a meaningful educational dialog is said to depend on the humility of the teacher and his or her willingness to not assume an air of epistemological authority. That is to say, the teacher needs to be an equal participant in the classroom dialog rather than the person to whom the students look for the correct answer.

While there are many authors who point to encouraging open and honest dialog in the classroom, there are few that can provide a way to do this. It seems many educational researchers view the ability to create an open classroom as an innate ability teachers either have or do not have.

Within the high school classroom the use of dialog might be incorporated through large class discussions, activities such as the think-pair-share in which students respond individually to a prompt, share their thoughts with a partner, and then share out to the rest of the class, or through blogs or other manners of communicating and sharing ideas in a written
manner. These are simply a few of the ways that a teacher might incorporate dialog into his or her classroom for the benefit of the students. Regardless of the method of execution, the most important item is that all students feel heard and in a class of 25 or 30 students it is often difficult to be sure all students are heard.

**Personal Experience**

The most common theme in the research on pedagogy, whether it is environmental education or ethics, was that of personal experience. Li, L. (2006), Zaikowski and Garrett (2004), Macauley (2006), and Smith-Sebasto and Cavern (2006) all noted the importance of personal experience in successful educational endeavors. Maton, as reported in Waller Okamoto and Hankerson (2002), found students are more successful when they perceive the curriculum as personally meaningful. Students need to have a reason to care about what they are learning and teachers need to be cognizant of that in order to build educational resilience. In terms of environmental ethics that reason varies based on the learning style and mindset of the student; some may be interested because they want to better understand their place in the world, others because they want to take action against a frightening and unsure future, and still others because they want to convince someone else their viewpoint is “right.” The teacher must address all of these motivations, and many more, when preparing and teaching lessons designed to help students understand their relationship to the world they live in.

In addition to using personal experience to help increase student motivation, personal experience can also be used to help students better understand the topics they are studying (Smith-Sebasto & Cavern, 2006). Fisman (2005) found that explicitly asking students to apply their learning to their personal environment effectively builds environmental awareness.
and knowledge. This requires students to take information and apply it rather than simply memorize and regurgitate the information on a test.

Macauley (2006) specifically discusses the importance of “reinhabiting place” and “seeking active membership in a biotic community” (p. 199). This goes beyond the typical pedagogical idea of making the curriculum relevant to the students lives, this actually asks students to connect with both the human community they are part of as well as the larger ecosystem they live in. The need for personal connection to the natural world is imperative to developing a personal worldview that values nature. As Aldo Leopold himself indicated time and time again, we must know and love a small piece of the earth, something we can experience directly, in order to truly care about the whole earth. Of course this idea has little empirical evidence behind it as Li, L. (2006) pointed out, but most educators assume that knowing more about the world we live in will cause us to want to protect it.

Finally, there is evidence in the research on student resilience that students with high levels of positive engagement in multiple experiential contexts, such as religion, academics, athletics, and/or community-based organizations, are related to greater adaptation (Siedman & Pederson, 2003). That is to say that students who are involved in their communities are more likely to experience academic success. This has obvious implications in the teaching of environmental ethics. Students with more personal experiences that connect them to the community will not only better understand the ethical implications of their actions, but they may also see increased success in other academic endeavors.

Summary projects, service learning, problem solving and field trips are wonderful ways in which students can connect the classroom learning to their personal experience.
Through each of these methods of learning the students have an opportunity for authentic experiences within the course material. This is a time consuming manner of teaching and therefore teachers must make the difficult decision about what curriculum is essential and what can be cut. In addition, many service learning opportunities and field trips have monetary costs associated with them that are difficult to budget for given the current state of school funding. Finally, not all communities have the necessary problems or opportunities close to the school that would allow students have an authentic, hands-on experience.

*Complex and Interdisciplinary*

The issues that are part of any type of environmental education are very complex and require the ability to think in a broad and interdisciplinary manner. A multi- or interdisciplinary approach to the subject of environmental ethics is thought to help students better understand the ethical implications of the many possible actions in a given situation (Goldin, 2004; De Laplante, 2004).

As reported in Li, H. (2006) this has been acknowledged by the state of Wisconsin Department of Public Instruction since 1943 when they indicated that understanding and protecting our environment is “an art of learning, a way of living” (p. 2456) and not simply another subject in which facts can be memorized and regurgitated. It is likely that this statement was in some regard the result of Aldo Leopold himself and his activism in developing a conservation-minded population in order to be better inhabitants of the land.

Hoff and Polack (1993) also noted there is danger in reducing environmental issues to simply science or economics. Although these disciplines must be considered it is important to incorporate other ways of knowing beyond the intellectual knowledge to gain an intimate
knowledge of something. This can be gained by experience in any type of environmental education. Li, H. (2006) also recognized the need to interweave the ecological, economic and political through their mutual relationships. This means that science teachers must expand their classrooms to include economic, ethical, aesthetic and other issues when discussing the complex world in which we live.

Many of the ways in which curriculum can be made meaningful for students through personal experience are complex and interdisciplinary in nature. In the increasingly complex world that we live in, it is rare that a problem we face is strictly a science or an ethics problem. Oftentimes our problems have scientific, ethical, economic, legal, moral, and psychological components. Because of this we need to give students opportunities to experience such complex puzzles. Many teachers shy away from such problems because they do not feel they have the requisite background in each of the possible areas to adequately teach the students in all of them.

Reflection

Kyle (2008) found that anonymized reflection, the process of developing new insight through small group discussion and personal reflection, was effective in helping students understand their relationship to the environment. Many students are still developing themselves intellectually and ethically, therefore providing them with varied manners of thinking about and discussing their own ideas is beneficial in making environmental topics more accessible and personal.

Along the same lines as Kyle, Li L. (2006) advocated the use of narratives as a pedagogical tool in regards to developing a successful environmental education program. In
this article it is noted that students are better able to understand the position of other authors as well as their own ideas when narratives of some sort are used.

Students in high school are rarely asked to reflect on their learning and its impact on their life. In teaching worldviews it is imperative that students be given the opportunity to reflect. This can be done through the use of student journals, small group discussions and large class discussions. Of course, having time to read all the students' reflections can be difficult but many times the reflection is as important as the feedback.

*Control*

Research on student learning in general as well as effective environmental and ethical educational programs show that students who feel in control of what they are learning are more likely to be successful as well as more resilient. Sandler, Wolchik, Davis, Haine and Ayers (2003) noted students who feel they have personal control of the events of their lives are more likely to regulate their emotions and view challenges positively. Helping to foster a sense of control and therefore a positive point of view is important to the teaching of environmental ethics because a positive outlook will also likely result in a positive worldview. A hopeful worldview may then result in the student taking action to improve one of the many issues our planet currently faces. In addition, McMillan et al. (2004) found, “People who act in an environmentally responsible manner are generally found to have an internal locus of control” (p. 22). Any work to develop a feeling of control will have long-term ethical benefits.

Helping students to develop a feeling of control involves many simple things such as providing choice in assignments, giving students a voice in the classroom rules, and being a
co-learner with the students rather than an authority with all the answers. Kellner and Share (2005) asserted that in order to effectively develop critical thinking and media literacy the teacher must be a co-learner along with the student and there should be no implied right answer. Allowing the students to see the teacher making mistakes and not knowing the answer will give them a better sense of ownership of their class. Also, “the complexity and incomprehensibility of interrelated ecological issues foster a necessary mutual humility between teachers and students and between professionals and laity” (Li, H., 2006, p. 2467).

Additionally, teachers can provide students with a feeling of control in many simple ways such as asking for feedback on assignments through class discussion and anonymous surveys, allowing student choice in the manner they demonstrate their knowledge through assessments with many choices, and by taking the role of learner along with the students by allowing some of the class direction to come from the students themselves.

Success

Research on student motivation shows that success breeds success, when students do well on an assignment, they tend to continue to have that success when provided with appropriate tasks. The success also helps motivate the students to work on a more difficult problem that in the past they may have given up on.

In addition to personal success on assignments Corson (1995) noted that in order for effective social change to occur there must be examples of “success stories” where people are making effective change. In his discussion of environmental education, James (2007) noted the importance of successful service learning opportunities. He indicated these opportunities “energize and empower” the students and allow them to feel they can be effective and there is
a reason to continue fighting the dominant paradigm.

Providing students with success is easy for a classroom teacher. This can be done by building assessments so the early questions are easier than subsequent questions, scaffolding assignments so students receive the level of assistance appropriate to their skill level, celebrating achievements within the classroom, and allowing students to see they are important members of the community. This is one of the easiest strategies to implement; it costs nothing extra and simply requires a restructuring of existing work.

*Constructivist*

DiEnno & Hilton (2005) found that environmental education was most effective when constructivist learning, groups of students exploring ideas and helping to teach one another, was a primary method of learning. Constructivist learning, as the name implies, consists of students using what they already know along with new information they are provided to construct meaning. This is not a specific teaching style but rather one that encourages students to connect the concepts they are learning in class to their life outside class. An important component of any constructivist classroom is honoring and recognizing student worldviews.

*Conclusion*

As was seen above, there are a number of ways that educators can foster worldview development and change in students. As with most educational ideas, there is no one size fits all solution to this dilemma. One thing is clear however; in order to help students develop their worldviews instruction is necessary. Ideally this would be infused within all subject areas across the curriculum at best, or unit within a course at least. Given the pressures on
classroom teachers it is unlikely that these ideas could be infused across the curriculum. Therefore a course or unit of some sort would be easier to implement. Such instruction should be a graduation requirement in all US high schools. This course could take on many forms and could be taught in many subject areas as it incorporates standards from science, social studies, civics, language arts, and technology. The important components of the course are the manner in which it is taught more so than the specifics of what is taught. As explained above, there are a number of important pedagogies that should be incorporated in order for a course such as this to be successful.

Possible Unit Plan

As discussed previously, the ideal situation to foster the development of an environmentally sensitive worldview would be to have the instruction infused in every class a student would take. This would require such a change it does not seem like a feasible option. Instead a course or unit within a course is the ideal situation for helping guide students to finding their worldview and determining their relationship to the environment. Based on the current courses offered at Monona Grove High School, the location where this would first be implemented, the best option is a quarter long unit within an environmental studies class.

Of course, it is important to acknowledge the values of the family in any public school endeavor in order to keep the support of the community. To this end it needs to be made explicitly clear that this course is not designed to indoctrinate students or to tell them what they think is wrong. Rather the goal is to help students see the origins and influences on their thinking. They will be able to take that knowledge and use it to examine how their actions and their thinking are aligned or misaligned. Only if a student is ready and interested in
change would a worldview change come from taking this class. As long as the communication between the school and community is open, clear, and forthright, any possible problems should be stopped before they begin.

Included below is a unit plan designed to illustrate one possible manner in which an environmentally sensitive worldview might be fostered. The unit is designed for 90-minute periods, during the course of one quarter in a public high school class. The lessons should be rigorous enough they could also be used in an introductory environmental ethics course at a college or university.

Within the unit are five highlighted days for which detailed lesson plans are provided. The lesson plans provide a detailed discussion of the goals, class activities, assessments, and relevant pedagogy used to develop the plan. This level of detail is not provided for every lesson, however the five lessons chosen are representative of the other 27 days of the unit.
Course Goals
Students will understand the concept of a worldview and how it influences behavior.
Students will be able to evaluate various worldviews to determine their environmental sensitivity.
Students will articulate their personal worldview based on their understanding of various worldviews.

<table>
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<tr>
<th>Day</th>
<th>Activities</th>
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<tbody>
<tr>
<td><strong>Day 1</strong>&lt;br&gt;Team Building Activities (15 min)&lt;br&gt;Course/Class Expectations (15 min)&lt;br&gt;Current Environmental Situation Brainstorm – individual, small group, large group (45 min)&lt;br&gt;Introduce Current Situation Project and sign up (15 min)</td>
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<td><strong>Day 2</strong>&lt;br&gt;Team Building Activities (10 min)&lt;br&gt;See sample project presentation and use rubric to evaluate and comment (35 min)&lt;br&gt;Learn about databases for project from school librarian (20 min)&lt;br&gt;Begin research on project (25 min)</td>
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<td><strong>Day 3</strong>&lt;br&gt;Team Building Activities (10 min)&lt;br&gt;Introduction to social networking site and use for response (25 min)&lt;br&gt;Continue research on project/begin designing presentation (55 min)</td>
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<td><strong>Day 4</strong>&lt;br&gt;Team Building Activities (15 min)&lt;br&gt;Work on presentation (65 min)&lt;br&gt;Reminders, go over presentation schedule, team building activity (10 min)</td>
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<td><strong>Day 5</strong>&lt;br&gt;Student Presentations (45 min – 2 presentations)&lt;br&gt;Team Building Activity (20 min)&lt;br&gt;Student Presentation (25 min – 1 presentation)</td>
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<td>Day</td>
<td>Activities</td>
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<td>6</td>
<td>Student Presentations (45 min – 2 presentations)</td>
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<td></td>
<td>Team Building Activity (10 min)</td>
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<td>Video about topic not chosen by students (35 min)</td>
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<td>7</td>
<td>Student Presentations (45 min – 2 presentations)</td>
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<td></td>
<td>Team Building Activity (20 min)</td>
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<td>Student Presentation (25 min – 1 presentation)</td>
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<td>8</td>
<td>Student Presentations (45 min – 2 presentations)</td>
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<td></td>
<td>Team Building Activity (10 min)</td>
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<td></td>
<td>Reading about topic not chosen by students (35 min)</td>
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<td>9</td>
<td>Student Presentations (45 min – 2 presentations)</td>
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<td>Team Building Activity (20 min)</td>
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<td>Student Presentation (25 min – 1 presentation)</td>
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<td>10</td>
<td>Team Building Activities (10 min)</td>
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<td>Social Network response to presentations (45 min)</td>
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<td></td>
<td>Brainstorm possible causes/solutions to current situation – small group, large group (35 min)</td>
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<td>11</td>
<td>Team Building Activities (10 min)</td>
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<td>Connect causes and solutions to the idea of worldview (10 min)</td>
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<td>Mini lecture – what is a worldview? (20 min)</td>
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<td>Journal – what is the US worldview? (15 min)</td>
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<td>Visual representation of US worldview in small groups (35 min)</td>
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<tr>
<td>12</td>
<td>Team Building Activities (10 min)</td>
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<td></td>
<td>Share visual representations (15 min)</td>
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<td>Discuss common threads in visual representations (10 min)</td>
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<td></td>
<td>Begin to develop large categories that make up/influence worldview (30 min)</td>
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<td></td>
<td>Watch clips from television that show US worldview and categorize (15 min)</td>
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<tr>
<td></td>
<td>Journal – what is your worldview (10 min)</td>
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</tbody>
</table>
| Day 13 | Team Building Activities (10 min)  
|        | Introduce historical worldviews (15 min)  
|        | Begin in depth study of historical worldview - Old Testament (65 min) |
| Day 14 | Team Building Activities (20 min)  
|        | Begin in depth study of historical worldview - Aristotle (70 min) |
| Day 15 | Team Building Activities (10 min)  
|        | Introduce current alternative worldviews (15 min)  
|        | Begin in depth study of alternate worldview - Stone (65 min) |
| Day 16 | Team Building Activities (15 min)  
|        | Begin in depth study of alternate worldview - Leopold (75 min) |
| Day 17 | Team Building Activities (15 min)  
|        | Trip to Aldo Leopold Nature Center (75 min) |
| Day 18 | Team Building Activities (15 min)  
|        | Begin in depth study of alternate worldview – Rolston (75 min) |
| Day 19 | Team Building Activities (20 min)  
|        | Summative Assessment on Worldviews (70 min) |
| Day 20 | Team Building Activities (10 min)  
|        | Introduction to change models – Bridges, Apps, Prochaska & Velicer (15 min)  
|        | Group study of change models (35 min)  
|        | Practice with change models (30 min) |
| Day 21      | Team Building Activities (10 min)  |
|            | Actions being taken by individuals, groups, governments (30 min)  |
|            | Introduction to project on actions taken (15 min)  |
|            | Begin work on project (35 min)  |
| Day 22     | Team Building Activities (20 min)  |
|            | Work on project (70 min)  |
| Day 23     | Team Building Activities (20 min)  |
|            | Work on project (70 min)  |
| Day 24     | Team Building Activities (10 min)  |
|            | Project exhibit and comment session (35 min)  |
|            | Wrap up actions being taken – categorize by change categories (15 min)  |
|            | Review for final exam (30 min)  |
| Day 25     | Team Building Activities (15 min)  |
|            | Practice Final Exam (75 min)  |
| Day 26     | Team Building Activities (15 min)  |
|            | Review for final exam (30 min)  |
|            | Reflection on Unit (20 min)  |
|            | Additional Review for final exam (25 min)  |
| Day 27     | Final Exam (90 min)  |
### Day 1

<table>
<thead>
<tr>
<th>Essential Outcome</th>
<th>Students will have an understanding we are facing significant environmental problems here in the United States and around the world.</th>
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<tbody>
<tr>
<td>Learning Goals</td>
<td>At the end of the class students will be able to make the following “I can” statements:</td>
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<td>- I can understand expectations of me within this classroom.</td>
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<td>- I can list 5 more environmental issues currently in action in the US.</td>
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</tbody>
</table>
| Activities        | **Team Building Activities** (15 min)  
We will work to learn one another’s names as well as find out about each other through paired introductions. Students will pair up with the students sitting next to them and spend 3 minutes learning about each other by answering a series of questions placed on the board (see Handout 1 for the questions). They will then be asked to introduce their partner to the class using the information from the 3 minutes of questions.  
**Course/Class Expectations** (15 min)  
Through teacher presentation the expectations of the course will be presented along with a syllabus for the course (see Handout 2). The students themselves will then develop classroom norms. They will work in small groups to develop the ideal classmate and then the groups will share their ideas and discuss them until they can come to agreement, facilitated by the teacher, as to how they should expect each other to behave. This list of three to five positively stated behaviors will be posted within the classroom and students will be encouraged to help each other attend to the norms they developed.  
**Current Environmental Situation Brainstorm** (45 min)  
Students will be asked to spend two minutes individually brainstorming ideas about our current environmental situation, they will be encouraged to think of both local and global ideas, positive and negative situations, anything that might be related. It will be clear there are no wrong answers at this point. Once the students have developed their own list they will be asked to compile their list with the people sitting with them in their small groups. They will have about 10 minutes to do this and add any additional information they think of after seeing each other’s answers. This information will then be shared with the large group through informal presentations of each small group. The information will be compiled on large pieces of paper that will be posted around the room throughout the quarter. During this
time the teacher will also keep track of any questions students may have but will not attempt to answer any of the questions.

**Introduce Current Situation Project and sign up** (15 min)

The Current Situation project will be introduced by explaining the project handout and rubric (see Handouts 3 and 4). Students will have the opportunity to ask any questions they have regarding the assignment and then will be asked to sign up for a current issue as well as a presentation date. Those that are having trouble coming up with an idea will be directed to look at the many issues the class brainstormed and find one that they find interesting. Only one person may do each topic, as they will be presenting the results of their investigation to the class.

**Assessments**

*Formative:* Student understanding will be assessed by listening to small and large group discussions as well as by asking for questions along the way.

*Summative:* There will be no summative assessment on this day.

**Connection to Relevant Pedagogy**

*Dialog:* The team building activity and the brainstorming both connect to the idea of dialog by encouraging students to express themselves and to help them become comfortable expressing themselves in the classroom environment.

*Personal Experience:* The brainstorming connects to personal experience because it asks the students to draw on their prior knowledge in order to contribute to the class discussion. In addition, the project will contribute to connecting students’ personal experience to the class by allowing them the option of choosing something that is meaningful and relevant to them.

*Complex and Interdisciplinary:* The project connects to this part of the pedagogy in that it asks students to examine the issue from both a scientific and historical point of view.

*Reflection:* This day does not explicitly incorporate any reflection.

*Control:* Students are given a sense of control both through the development of the class expectations as well as through the ability to choose the topic they are interested in for the project.

*Success:* The brainstorming contributes to students feeling success in that they are able to immediately identify things they know about the topics being covered in class due to prior knowledge.

*Constructivist:* A constructivist atmosphere is created by the brainstorming, allowing students to be the experts, as well as by the class creation of class norms and expectations.
### Day 11

<table>
<thead>
<tr>
<th>Essential Outcome</th>
<th>Students will be able to articulate the worldview of the United States.</th>
</tr>
</thead>
</table>
| Learning Goals    | At the end of the class students will be able to make the following “I can” statements:  
                    - I can explain the concept of worldview.  
                    - I can clearly communicate my vision of the prominent worldview of the United States.  
                    - I can expand my vision of a worldview in order to encompass the ideas of others when appropriate. |
| Activities        | **Team Building Activities** (10 min)  
                    Students and teacher will each write two movie titles on a small slip of paper and add slips of paper into bowl. One student will then draw a slip of paper and have to act out the movie title for the other students to guess. The purpose of this activity is to encourage non-verbal communication as well as to help students become comfortable with one another and feel supported by the class.  
                    **Connect causes and solutions to the idea of worldview** (10 min)  
                    The list of causes and solutions brainstormed in the previous class will be revisited and students will be asked to examine the roots of the causes and the reasons some of the solutions are effective and others are not. This will be done through the manner of a large group discussion. If the students do not come to the ideas of values, principles and priorities the teacher should gently guide them there to ensure the ideas can be connected back to the idea of worldview.  
                    **Mini lecture – what is a worldview?** (20 min)  
                    The teacher will ask the students to break up the word worldview and attempt to determine what they think it means. Most students will likely come up with something along the lines of the way someone views the world, a definition that is not very useful as it simply rearranges the word. Then the teacher will provide a number of different definitions of worldview for students to examine in the form of a mini-lecture with notes (see Handout 5). The class will then discuss which definition they think is the most useful for the purposes of connecting to environmental problems, causes and solutions.  
                    **Journal – what is the US worldview?** (15 min)  
                    Students will use their journal (which they have been using to reflect on what they have learned each class) to do some in class writing. They will be asked to describe as best they can the worldview of the typical US citizen. In describing the worldview, the students
should be sure to provide examples of how they see this worldview manifest itself and reasons they believe this particular worldview is that of a typical US citizen. They will be asked to brainstorm in their journal for about 3 minutes, write for 10 minutes and then share for 2 minutes with the person sitting next to them.

**Visual representation of US worldview in small groups** (35 min)

Students will get together in groups of 3 or 4 to make some sort of visual representation of their idea of the US worldview. They will first have to compare the components they feel are essential to the US worldview from each group member and then determine how to go about representing those ideas. Students will be provided with colored paper, markers, old magazines, scissors, glue, and other art materials. The visual representations will need to be completed by the time the students come to their next class. Students using class time wisely should not have to do too much work outside of class.

| Assessments | Formative: Student understanding will be assessed by reading their journal entries to determine if they present reasonable ideas regarding the US worldview. In addition, very informal formative assessment will occur while the students are working on their visual representations, the teacher will speak to the groups about what they are including and why it is being included.  
Summative: There will be no summative assessment on this day. |
| --- | --- |
| Connection to Relevant Pedagogy | Dialog: The team building activity, making connections, and what is a worldview are all opportunities for students to dialog with one another in both large and small groups.  
*Personal Experience:* Students will be asked to draw on their personal experience of the world to develop their idea of a worldview and the worldview of the United States as viewed from their eyes.  
*Complex and Interdisciplinary:* The visual representation of the worldview is interdisciplinary in that it asks students to use artistic skills to exhibit ideas that fall in to the social science categories. In addition, the many factors that go into making up a worldview are complex as well as from many disciplines.  
*Reflection:* When students are asked to complete the journal article, this is an opportunity for them to reflect on their thinking.  
*Control:* Students are given choices in the visual representation they are asked to make and therefore will feel a sense of control regarding the assignment.  
*Success:* Success will be built during the class discussions because those students that contribute answers will be provided positive feedback about their ideas. |
**Constructivist:** A constructivist atmosphere is created by allowing students to be the experts and valuing their ideas.
Day 16

<table>
<thead>
<tr>
<th>Essential Outcome</th>
<th>Students will be able to explain Aldo Leopold's worldview and compare and contrast it with that of the United States.</th>
</tr>
</thead>
</table>
| Learning Goals   | At the end of the class students will be able to make the following I can statements:  
  ➔ I can describe the worldview Aldo Leopold developed.  
  ➔ I can understand the factors that contributed to the development of this worldview.  
  ➔ I can use a visual organizer to help compare worldview. |
| Activities       | **Team Building Activities** (15 min)  
  Students will work together to problem solve in small groups by playing a game of Dr. Tangle. This requires students to stand in a circle, reach their hands in the middle of the circle and grab hands with two different people who are not standing next to them. They then have to use their communication skills to untangle themselves. We will start in 4 groups of 5 or 6 then progress to three groups of 7 or 8, then 2 groups of 10-12 and finally try to untangle the entire class in one large tangle.  

**Begin in depth study of alternate worldview – Leopold** (75 min)  
Within the 75 minutes of the Leopold worldview students will be doing a number of different activities. First there will be a mini lecture on who Aldo Leopold was and what factors went into the development of his worldview. The students will take notes on this using a provided outline (Handout 6). Then quotes from Aldo Leopold will be placed around the room and students will be asked to read all the quotes and stand near the one they find most interesting and relevant to their lives. This will serve as an introduction to Leopold’s writing and ideas. The students will then be asked to read a selection from *The Land Ethic* that best lays out the ideas that Leopold believed we as a society should adopt. This reading will be accompanied by discussion questions (Handout 7) the students will respond to in their journal. Once they have responded individually they will then discuss the concepts in their small groups. Finally, we will have a short large group discussion to address any questions the students might have. Once the students have completed their understanding of Leopold’s worldview we will compare and contrast it with the current worldview to determine which might be more environmentally sensitive. This will be done primarily through the use of a life size Venn diagram in which students will place note cards with ideas from each worldview. This will be followed with a brief formative assessment to help determine the students’ understanding of Leopold’s worldview (Handout 8).
### Assessments

**Formative:** Student understanding will be assessed by a short formal formative assessment at the end of class. This ticket out will ask for the big ideas in Leopold’s worldview. In addition, very informal formative assessment will occur while the students are having their small group discussion as well as during the life size Venn diagram work, the teacher will speak to the students about what they are understanding.

**Summative:** There will be no summative assessment on this day.

### Connection to Relevant Pedagogy

**Dialog:** The team building activity and Aldo Leopold discussion are opportunities for students to dialog with one another in both large and small groups.

**Personal Experience:** This day does not explicitly incorporate any personal experience, however some students may feel more connected to Aldo Leopold with they learn he was active in Southern Wisconsin.

**Complex and Interdisciplinary:** The team building activity requires the students to solve an increasingly complex problem and the discussion of Aldo Leopold’s worldview is one that will incorporate a significant number of influences.

**Reflection:** Students will be asked to be reflective in the activity with the Leopold quotes as well as the journaling activity.

**Control:** Students will have choices in the quotes they visit giving them the sense of control and choice.

**Success:** The team building activity provides an opportunity for tangible and immediate success for the students.

**Constructivist:** A constructivist atmosphere is created by the teacher participating in activities with the students and valuing their ideas.
### Day 21

<table>
<thead>
<tr>
<th>Essential Outcome</th>
<th>Students will understand there are actions being taken to bring us to a more environmentally sensitive worldview.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Goals</td>
<td>At the end of the class students will be able to make the following I can statements:</td>
</tr>
<tr>
<td></td>
<td>→ I can identify actions that could have a positive impact on the majority worldview.</td>
</tr>
<tr>
<td></td>
<td>→ I can conduct research that involves making personal contact with an individual or group taking positive action.</td>
</tr>
<tr>
<td></td>
<td>→ I can present information in an organized and visually pleasing manner.</td>
</tr>
<tr>
<td>Activities</td>
<td><strong>Team Building Activities</strong> (10 min)</td>
</tr>
<tr>
<td></td>
<td>Students will play a game of “bingo” where the bingo cards have traits a classmate might have. They will have to get classmates to initial their bingo cards and will be trying to get bingo. We will play as many rounds as time allows. A sample bingo card is included as Handout 9.</td>
</tr>
<tr>
<td></td>
<td><strong>Actions being taken by individuals, groups, governments</strong> (30 min)</td>
</tr>
<tr>
<td></td>
<td>Students will brainstorm actions that are being taken by individuals first by responding individually to guiding questions (Handout 10) to help prime them for the group brainstorming. Groups will then be given a stack of note cards on which they will write all the actions being taken they can come up with. We will then have groups categorize their note cards on the board as individual responses, group responses and government responses.</td>
</tr>
<tr>
<td></td>
<td><strong>Introduction to project on actions taken</strong> (15 min)</td>
</tr>
<tr>
<td></td>
<td>Students will choose one action being taken to research in further depth. The project that the students will be completing will be a summative assessment and will be individual. The students will create a public information display about the action being taken either in the form of a tri-fold poster, a website or an informative video. Regardless of the form of the project it will be graded based on the rubric attached as Handout 11.</td>
</tr>
<tr>
<td></td>
<td><strong>Begin work on project</strong> (35 min)</td>
</tr>
<tr>
<td></td>
<td>Students will have the remainder of the class period to work on their project. Part of the work will involve making contact via telephone or email with a person involved with the action they are researching.</td>
</tr>
</tbody>
</table>
| Assessments | **Formative:** Student understanding will be assessed by listening to small and large group discussions as well as by asking for questions along the way.  
**Summative:** There will be no summative assessment on this day. |
| --- | --- |
| Connection to Relevant Pedagogy | **Dialog:** The team building activity as well as the categorization of actions being taken will encourage dialog within the classroom.  
**Personal Experience:** Team building, brainstorming, and the project are all activities in which the students will be connecting the classroom to the greater world in a manner that helps to create meaning.  
**Complex and Interdisciplinary:** The brainstorming of actions taken, the categorization of those actions, and the project based on the actions all involve many disciplines as well as complex ideas examined in their fullest.  
**Reflection:** This day does not explicitly incorporate any reflection.  
**Control:** The students will have a choice as to the topic they research for their project as well as the manner they present the information they gather during the course of their research.  
**Success:** The team building activity, as well as the brainstorming, provide opportunities for students to receive positive feedback and see immediate success.  
**Constructivist:** A constructivist atmosphere is created by allowing students to be the experts and valuing their ideas. |
<table>
<thead>
<tr>
<th><strong>Day 24</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Essential Outcome</strong></td>
<td>Students will understand there are many positive changes taking place in the world and be able to identify those changes.</td>
</tr>
</tbody>
</table>
| **Learning Goals** | At the end of the class students will be able to make the following I can statements:  
  → I can provide constructive criticism of the work of others.  
  → I can understand the major types of actions being taken to promote an environmentally sensitive worldview. |
| **Activities** | **Team Building Activities** (10 min)  
Students will be asked to spend time writing something they like about each of their classmates (Handout 12). Each student will then get all the nice things that were written about them during the next class period.  

**Project exhibit and comment session** (35 min)  
Students will have the opportunity to view other projects from their class and others. During this time they will be expected to critique three projects using Handout 13.  

**Wrap up actions being taken – categorize by change categories** (15 min)  
A large group discussion will be held in which students will be able to discuss the common threads they saw in various projects. The teacher will help students organize the information into categories based on the type of change that is the result of the action being taken.  

**Review for final exam** (30 min)  
Students will be provided with a list of topics that will be included on the final exam (Handout 14). After they have a chance to look at the list of items, they will be asked to write possible exam questions about those topics. Each student should write and answer 5 multiple-choice questions, 5 vocabulary questions, 5 short answer questions, and 2 essay questions. Their questions will be due the next class period. |
| **Assessments** | **Formative:** Student understanding will be assessed based on the critique forms they will turn in as well as the exam questions they write.  
**Summative:** The project exhibition will be the summative assessment for this day. Student projects will be assessed based on the rubric presented on Day 21. |
| **Connection to Relevant Pedagogy** | **Dialog:** The feedback on the project exhibit and the change categorization will allow students an opportunity for meaningful... |
dialog.

*Personal Experience:* Displaying the projects in the exhibit will allow the students to display their work in an authentic manner particularly when the projects are left up for the school and greater community to see.

*Complex and Interdisciplinary:* The projects students will be examining and critiquing will be complex and interdisciplinary. In addition, categorizing the change will require students to tackle complex ideas and find similarities in them.

*Reflection:* The team building activity asks students to be reflective, as does the exam review activity.

*Control:* Students will feel a sense of control when they are asked to help construct their final exam and final exam review.

*Success:* Students will see their success by the positive feedback they receive from their classmates through the project critique as well as the team building activity.

*Constructivist:* A constructivist atmosphere is created by allowing students to be the experts and valuing their ideas.
Handout 1

Team Building Questions

Get to know your neighbor by using the following questions. If you have other questions that you would like to ask, feel free! You will be using the answers to these questions to introduce your neighbor to the rest of the class so be sure to get any details you think might be important! Also, write down things you think you might not remember – you don’t want to have to ask your neighbor something while you are introducing her/him to the class!

- What are three things you are good at?
- What is something you are trying to learn?
- Who are your heroes?
- What are you scared of?
- What is your favorite movie?
- What is your favorite song?
- What is your favorite TV show?
- What do you do outside of school?
- Where do you like to hang out?
- What is your favorite food?
**Handout 2**

*Environmental Worldviews Course Syllabus and Expectations*

This course is designed to help you understand how our responses to the environmental issues that we are facing make a difference in what happens. During this course we will examine the current western worldview, the roots of that worldview, and possible alternative worldviews that will help ensure a better future for both your generation as well as those to come.

This course will be largely based on your participation, if you do not participate, the course will not work. Because of this you will receive participation points each class period. You will also be assessed informally through journal entries, use of a social networking site, small formative quizzes and by your group members. Formal assessments will consist of 2 projects and a final exam. These will be the only summative assessments you will have during the quarter.

The topics that we will be addressing are as follows along with the readings that we will be using to address the topics:

- **What is our Current Situation in regards to the environment?**
- **What is a Worldview?**
- **What is the Predominant Worldview in the United States?**
- **What Historical Worldviews Influenced Our Current Worldview Related to the Environment?**
  - Old Testament – Excerpts from “Genesis”
  - Aristotle – Excerpts from *Politics*
- **What are Possible Environmentally Friendly Worldviews?**
  - Stone – Excerpts from *Should Trees Have Standing?*
  - Leopold – “The Land Ethic”
  - Rolston – Excerpts from various articles
- **What are Models of Change to Use for Worldview Transition?**
  - Bridges – Excerpts from *Transitions*
  - Apps - Excerpts from *Leadership for the Emerging Age*
- **What are People Doing to Promote the Change to Environmentally Friendly Worldviews?**
Handout 3

Current Situation Project Description

This project is one in which you will be working either alone or with one other person. If you choose to work with another person you will each receive the same grade. Once you have decided to work alone or with a partner you will need to choose a topic. Your topic choice should be something you are interested in but do not already know a lot about, you are here to learn after all!

The project will be a presentation about the environmental issue you chose. The presentation must include background information about the problem, an activity that the class does to help them better understand the problem, and details about how the problem became a problem. You will need to have visuals along with the presentation, I would recommend a PowerPoint presentation but you can choose something else if you would like. The presentation should be between 15-25 minutes long (remember this includes a class activity).

Remember the goal of the project is to help your classmates better understand the issue you chose and begin thinking about the implications of their actions on this problem. This will be a summative assessment graded using the rubric you will be provided so be sure you get any questions that you might have addressed before you present.

Finally, have fun and be creative!

My Topic is __________________________

My presentation date is ____________________
# Handout 4

## Current Situation Project Rubric

<table>
<thead>
<tr>
<th></th>
<th>Score</th>
<th>Weight</th>
<th>Excellent</th>
<th>Good</th>
<th>Adequate</th>
<th>Deficient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>x1</td>
<td>4</td>
<td>Clear statement of purpose, topic is addressed, explanation of how the rest of the presentation will proceed</td>
<td>Two of three ideas from the presentation are presented OR statement of purpose is unclear, topic is addressed, and explanation of rest of presentation provided</td>
<td>Purpose of presentation is unclear and either topic is addressed or an explanation of the rest of the presentation is provided</td>
<td>Only one of the three ideas from 4 are presented</td>
</tr>
<tr>
<td><strong>Background Information</strong></td>
<td>x3</td>
<td>4</td>
<td>Detailed background information on the problem is presented, a clear understanding of the problem is shown, the effects of the problem are thoroughly addressed</td>
<td>Background information on the problem is presented, a clear understanding of the problem is shown, the effects of the problem are addressed</td>
<td>Background information on the problem is presented, an unclear understanding of the problem is shown, the effects of the problem are partially addressed</td>
<td>Only 2 of the three options in the 2 category are present</td>
</tr>
<tr>
<td><strong>Class Activity</strong></td>
<td>x2</td>
<td>4</td>
<td>Class is involved in activity, instructions to activity are clear, connection between activity and issue understanding is readily apparent, activity is original and thoughtful</td>
<td>Class is involved in activity, instructions to activity are provided, connection between activity and issue understanding apparent, activity is original or thoughtful</td>
<td>Class is involved in activity, instructions to activity are unclear, connection between activity and issue understanding unclear, activity is similar to one done in class</td>
<td>Class is involved in activity, instructions to activity are unclear, no connection between activity and issue, activity is one done in class</td>
</tr>
<tr>
<td><strong>How the Problem Got to Be This Way</strong></td>
<td>x3</td>
<td>4</td>
<td>Detailed causes of the problem are presented, various players in causing the problem are discussed in detail including their motivations</td>
<td>Detailed causes of the problem are presented, various players in causing the problem are discussed in detail.</td>
<td>Causes of the problem are presented, various players in causing the problem are discussed.</td>
<td>Causes of the problem are presented, various players in causing the problem are discussed.</td>
</tr>
<tr>
<td><strong>Conclusion</strong></td>
<td>x1</td>
<td>4</td>
<td>Comprehensive summary statement about the problem is made, audience questions are requested, questions are answered thoughtfully.</td>
<td>Summary statement about the problem is made, audience questions are requested, questions are answered thoughtfully.</td>
<td>Summary statement about the problem is made, audience questions are requested, questions are answered thoughtfully.</td>
<td>Summary statement about the problem is made, audience questions are requested, questions cannot be answered</td>
</tr>
<tr>
<td><strong>Presentation Skills</strong></td>
<td>x2</td>
<td>4</td>
<td>Speech is clear and volume is good, eye contact is made often with audience, presentation shows significant rehearsal.</td>
<td>Speech is clear and volume is good, eye contact is made with audience, presentation shows rehearsal.</td>
<td>Speech is clear and volume is good, eye contact is made with audience.</td>
<td>Speech is clear OR volume is good, very little eye contact is made with audience</td>
</tr>
<tr>
<td><strong>Visuals</strong></td>
<td>x1</td>
<td>4</td>
<td>Visuals are easy to read, contain no spelling or grammar errors, and are an integral part of presentation.</td>
<td>Visuals are easy to read, contain no spelling or grammar errors.</td>
<td>Visuals are easy to read, contain few spelling or grammar errors.</td>
<td>Visuals are easy to read, contain many spelling or grammar errors.</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>/52</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Handout 5

What is a Worldview? Note Guide

Worldview – What does it mean to you?

Different Disciplines Definition of Worldview:
  Psychology
    What is the area of study?
    Their definition:

  Geography
    What is the area of study?
    Their definition:

  Social Work
    What is the area of study?
    Their definition:

  Religion
    What is the area of study?
    Their definition:

  Philosophy
    What is the area of study?
    Their definition:

Our Definition of WORLDVIEW (hint – its not the view of the world)
Handout 6

Leopold Background Note Guide

Aldo Leopold

Family  Education  Profession  Land Restoration
Handout 7

Land Ethic Reading Questions

While reading “The Land Ethic” answer the following questions in your journal.

1. What is the “land ethic” Aldo Leopold proposes?

2. What are some of the arguments that he uses to explain why we should adopt this way of thinking?

3. Where is an example of where you see this kind of thinking in your life?

4. How might your life be different if you implemented this type of thinking? What decisions would you make differently?
Leopold Formative Assessment

Put it all together! In the first puzzle piece write three things that influenced Aldo Leopold in the creation of his land ethic, in the second puzzle piece use your own words to describe Aldo Leopold’s Land Ethic.
### Handout 9

#### Know Your Classmates BINGO

<table>
<thead>
<tr>
<th>I like to play the violin, cello or viola</th>
<th>I have a job</th>
<th>I have gotten a car related ticket</th>
<th>I like to read in my spare time</th>
<th>I am a vegetarian</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am a member of 2 clubs here at school</td>
<td>I like reggae music</td>
<td>I play at least one high school sport</td>
<td>I can change a tire</td>
<td>I got an A last semester in at least one class</td>
</tr>
<tr>
<td>I can roll my tongue</td>
<td>I can play more than 3 instruments</td>
<td>I know the lyrics to the school song</td>
<td>I know the names of 4 local birds</td>
<td>I have broken a bone</td>
</tr>
<tr>
<td>I plan to go to a 4 year college</td>
<td>I have an older sibling who I was in high school with</td>
<td>I can count to 10 in two languages other than English</td>
<td>I don’t watch much TV (less than ½ hour a day)</td>
<td>I am in show choir or like to sing loud in the shower</td>
</tr>
<tr>
<td>I like country music</td>
<td>I can tell you the element symbol for tin</td>
<td>I work at a fast food restaurant</td>
<td>I like the Badgers</td>
<td>I plan to go to a technical school</td>
</tr>
</tbody>
</table>
Handout 10

Actions Taken Priming Questions

Answer the following questions in your journal:

1. What do you do to help save species, energy, water, or resources?

2. What does your family do to help save species, energy, water, or resources?

3. What does the school do to help save species, energy, water, or resources?

4. What does Dane County do to help save species, energy, water, or resources?

5. What does the federal government do to help save species, energy, water, or resources?
## Handout 11

### Actions Taken Rubric

<table>
<thead>
<tr>
<th></th>
<th>Score Weight</th>
<th>Excellent</th>
<th>Good</th>
<th>Adequate</th>
<th>Deficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction of Action</td>
<td>x2</td>
<td>Thorough description of what is being done, includes details about how the action impacts those taking it</td>
<td>Description of what is being done, includes details about how the action impacts those taking it</td>
<td>Description of what is being done</td>
<td>Description of what is being done</td>
</tr>
<tr>
<td>Who is Taking Action</td>
<td>x2</td>
<td>All actors involved in the action are discussed in detail, the role of each actor is also discussed</td>
<td>All actors involved in the action are discussed in detail, the role of each actor is also discussed</td>
<td>Actors involved in the action are discussed, the role of each actor is also discussed</td>
<td>Some actors involved in the action are discussed, the role of some actors is also discussed</td>
</tr>
<tr>
<td>Purpose of Action</td>
<td>x3</td>
<td>The goals of the action are explained thoroughly and are easy to understand</td>
<td>The goals of the action are explained and are easy to understand</td>
<td>The goals of the action are explained thoroughly</td>
<td>The goals of the action are explained</td>
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<tr>
<td>Results of Action</td>
<td>x2</td>
<td>What has happened because of the actions is clearly and thoroughly stated, the positive and negative results are addressed</td>
<td>What has happened because of the actions is clearly stated, the positive and negative results are addressed</td>
<td>What has happened because of the actions is stated, the positive OR negative results are addressed</td>
<td>What has happened because of the actions is stated</td>
</tr>
<tr>
<td>Spelling and Grammar</td>
<td>x1</td>
<td>There are no spelling or grammar errors</td>
<td>Two or fewer spelling or grammar errors</td>
<td>Three to six spelling or grammar errors</td>
<td>More than 7 spelling or grammar errors</td>
</tr>
<tr>
<td>Visuals</td>
<td>x2</td>
<td>The pictures and diagrams make the actions more understandable and are neat and creative</td>
<td>The pictures and diagrams make the actions more understandable and are neat</td>
<td>The pictures and diagrams make the actions more understandable</td>
<td>There are pictures and diagrams</td>
</tr>
</tbody>
</table>

TOTAL /48
## Handout 12

### Nice Thoughts

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<tr>
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## Project Critique

### Project 1 Creators Name

Summarize the main points of the project.

- What are the three things you liked best about this project (be specific)?

- What are three things that you think the creator could have done to make the project even better (again, be specific)?

### Project 2 Creators Name

Summarize the main points of the project.

- What are the three things you liked best about this project (be specific)?

- What are three things that you think the creator could have done to make the project even better (again, be specific)?

### Project 3 Creators Name

Summarize the main points of the project.

- What are the three things you liked best about this project (be specific)?

- What are three things that you think the creator could have done to make the project even better (again, be specific)?
Handout 14

Exam Review - Topics Covered

The following topics will be covered on the final exam. They may be covered in a multiple choice question, a true false question, a vocabulary matching question, a fill in the blank question, a short answer question, or an essay question.

- Environmental Situations (will vary based on class presentations)
  - global warming
  - acid rain
  - endangered species
  - invasive species
  - fossil fuel depletion
  - deforestation
  - urbanization
  - habitat loss
  - nuclear waste
  - population growth
  - mining
  - factory farming
  - lawn chemicals
  - pesticides
  - herbicides
  - fertilizer use
  - landfills
  - dams
  - genetic modifications
  - ozone depletion

- Contributors to US worldview
  - family
  - religion
  - economy
  - education
  - community

- Old Testament worldview
- Aristotle's worldview
- Stone's worldview
- Leopold's worldview
- Rolston's worldview
- Change Models
  - Bridges
  - Apps
  - Prochaska and Velicer

- Actions being taken (will vary based on class presentations)
  - personal
  - families
  - environmental organizations
  - churches
  - schools
  - neighborhoods
  - builders
  - businesses
  - communities
  - states
  - US government
References


PA: Jessica Kingsley.


vulnerability: Adaptation in the contexts of childhood adversities (318-342).
Cambridge: Cambridge University Press.


