
Science

This unit will develop concepts involved in understanding relationships of organisms within their physical environment. Students will explore simple food chains, prey and predator relationships, and environmental change. In engaging students in this process, a number of film clips from major motion pictures will serve as a catalyst for class discussions and help to take students' understandings deeper.

The following McRel Science Standards will provide the foundation for learning into which the identified 21st Century Skills will be immersed:¹²

Science

Standard 6. Understands relationships among organisms and their physical environment

Level II (Grades 3-5)

Benchmark 1. Knows the organization of simple food chains and food webs (e.g., green plants make their own food with sunlight, water, and air; some animals eat the plants; some animals eat the animals that eat the plants)

Benchmark 2. Knows that the transfer of energy (e.g., through the consumption of food) is essential to all living organisms

Benchmark 3. Knows that an organism's patterns of behavior are related to the nature of that organism's environment (e.g., kinds and numbers of other organisms present, availability of food and resources, physical characteristics of the environment)

Benchmark 4. Knows that changes in the environment can have different effects on different organisms (e.g., some organisms move in, others move out; some organisms survive and reproduce, others die)

Benchmark 5. Knows that all organisms (including humans) cause changes in their environments, and these changes can be beneficial or detrimental

Essential questions that might be explored through this unit of study include:

In what ways do living things adapt to survive?

Why is balance in an ecosystem important?

What evidence exists that humans impact the natural environment?

Are human needs more important than the needs of other living things?

¹² Mid-continent Research for Education and Learning (2007). 4th Edition Standards and Benchmarks. Retrieved December 30, 2007, from <http://www.mcrel.org/compendium/browse.asp>.

Suggested performance tasks for collecting evidence of learning:

Students will identify a local environmental issue that involves balance within and/or between ecosystems and conduct research on the issue, analyzing the root causes and subsequent impacts on the community. Based on this research, they will develop and implement a service-learning project that will result in a healthier environment.

Use the following resources from Film Clips for 21st Century Education series to illustrate and stimulate discussion of the key concepts identified above:

Finding Nemo (Episode 2, Self-Control)

Synopsis:

Marlin, an overprotective clownfish, has lost his son, Nemo, and will do anything to find him and bring him safely home. In his search for his son, Marlin finds himself surrounded by three sharks who are determined to break their instinctive habit of eating fish "Fish are friends, not food." This sounds good until a drop of blood sets Bruce the Shark into an uncontrollable frenzy.

Instructional connections:

Use this clip to engage students in a discussion of food webs and prey and predator relationships. Pose questions such as: What is the ecosystem depicted in this clip? How do the different species interact in the clip? How is that similar/different than the actual habitat? What are the predators of each of the species? What is each of the species' prey? What other creatures exist in this ecosystem and how do they co-exist?

Babe (Episode 1, Respect)

Synopsis:

When an orphaned piglet finds itself on a farm with a collie for an adopted mother and a nervous duck for a friend, the adventures, and the lessons, begin. Even as the pig Babe helps a lonely farmer learn how to think in new ways, so an elderly sheep teaches Babe a thing or two about gaining respect by showing respect.

Instructional connections:

Using the notions of leadership and pecking order within groups of animals that are depicted in this clip, draw out the connections between where various species fall on the food chain. What is the relationship between being higher on the food chain and exerting dominance? Compare human dominance with prey and predator relationships in the natural environment. What examples exist of species being interdependent and how does this compare to a prey/predator relationship? What factors exist that create an interdependent relationship between different species?

Ice Age (Episode 1, Cooperation)

Synopsis:

In a prehistoric age, three unlikely allies: a woolly mammoth, a loopy sloth, and a saber-toothed tiger join forces and brave dangers to return a small human baby to its people. Along the way they discover an amazing friendship, but all appears lost when it is revealed that one of them has betrayed the others. Once trust has been shattered, cooperation appears to be impossible...or is it?

Instructional connections:

Bring together the discussions from the previous two clips to identify the prey and predator relationships in this clip. Which species is dependent upon another? Does this clip demonstrate interdependence, or is one species completely dependent upon another? What is the difference between those relationships? Lead into a discussion of the necessity of some species to live in a herd or pack and discuss how this relates to the prey/predator relationship. When is it safer for an animal to exist on its own rather than in a group? How does the presence of humans impact the natural environment?

Service-Learning Project Connections

The process of integrating a service-learning project into a curricular unit involves what students are learning in the classroom and providing opportunities for them to use that knowledge to better their local and/or global community by taking action on issues that matter to them. For the purposes of this unit, focus students' discussion on environmental issues, specifically those involving ecological balance and human impact on the natural environment. Students may discover, for example, that local lakes are being harmed by invasive species that are not natural to that area, causing damage to the balance of the lakes' ecosystem. They might work with the state Department of Natural Resources to enforce laws that require boaters to clean the bottom of their boats in order to prevent species from being inadvertently moved from one lake to another. In an urban community, students might discover that the pigeon or seagull populations are out of balance. Using the knowledge gained in their science class, they might seek to better understand the causes of this problem and work to develop a sustainable solution.

One effective way to involve students meaningfully in this process is to engage them in a community mapping exercise early in the unit. Community mapping is the process of researching, analyzing, and documenting the resources that exist within an identified community. This exercise will connect the topic of balance in ecosystems with relevant issues that students identify in their community. Through the community mapping process, students are engaged in defining their community, analyzing the resources that exist in the community, and assessing how these resources can be utilized to address issues that they identify. It is through this process that students begin to learn how community assets are connected and how their experiences in school can relate to the larger world.

Community Mapping

Step 1:

After dividing the class into small groups, ask each group to define the community they will focus on for their community map. This definition may be shaped by the teacher based upon the unit objectives, or may be left open for the students to decide. A community may range from the school, a particular neighborhood, the town/city, or even the global community, but for the purposes of this unit, students' focus should be on the natural environment within the community.

Step 2:

Based on the community identified by the group, brainstorm a list of all the different types of resources that exist in a community. Encourage students to be as thorough in this list as possible, including manmade and natural resources, community agencies, government entities, businesses, individuals or groups, etc. Attention should be drawn to how each of these assets connect to or impact the natural environment.

Step 3:

Using this brainstormed list, students are to create a visual depiction of their community on a large sheet of butcher paper. This representation may look like a physical map, or may take the form of a concept map. In either case, the goal is to depict as accurately as possible, all of the assets that make the natural environment in the community what it is and how these assets intersect in providing for the needs of the community. The teacher may elect to make this process more detailed by engaging students in researching community assets, conducting interviews in the community, and/or inviting community partners to join students in the process. As such, community mapping can take as little as a class period or two for a general overview, or can be extended to a much more in-depth study of the community's natural environment.

Step 4:

In reflecting on the community mapping process, students will begin to see areas of need within the community. For example, in this science unit, any issue that involves how human needs have impacted the current conditions in the natural environment would be relevant. Ask students to identify the top two or three needs that they would like to take action on through a service-learning project.

Step 5:

Bring the class back together as a whole group. Ask each small group to share their community map and the issues they identified as priorities. Reflect on each group's overview, finding community assets and issues that each group has in common. Through this dialogue, develop a list of three to five issue areas that the whole class is interested in addressing. Finally, use consensus-building strategies to determine the one issue that everyone can agree on as their top priority for this unit. Be sure to engage everyone in this process and incorporate as many perspectives as possible. The result should be agreement among all class members on one issue that encompasses the diverse viewpoints of all class members.

Envision Change

As a class, develop a vision statement that will serve as the goal for the service-learning project that they will be completing. Use the following statements to guide the development of this goal-setting. Be sure to make the final goal something that is concrete and achievable.

We will help to make our community a place where...

This change is important to us because it will...

Issue Exploration

Once an issue area has been addressed, students will need to engage in research to gain an understanding of how this issue has developed, determine the root causes and symptoms of problems associated with this need, and identify possible options for steps they might take in addressing this need. It is important to take the time to fully develop this process so that students engage in a thoughtful decision-making process as they seek solutions that are substantive and that will make a lasting difference in this issue. Seek to engage your students in deeper understanding of the problem, using critical thinking to fully analyze the complexity of variables that contribute to the issue at hand.

After determining multiple solutions to the identified problem, ask students to use a formal decision-making process in guiding them to select a project to help them achieve their identified goal. One such process is to ask students to write or present a proposal for the solution they believe will best help them to achieve their goal using the following criteria:

Saleable (*Can you convince others that this is a good idea?)*

Affordable (*Do we have or can we find sufficient funding to carry out this project?)*

Workable (*Is it appropriate and are we able to do it?)*

Effective (*Will it help us be successful in meeting the identified need?)*

Ask the class to assess each proposal based on these criteria and select the one service-learning project that they will implement in order to achieve their vision. In planning this project, it is important to have students identify how they will use the skills they are learning in this unit to raise awareness about the identified need in the community, and the steps they would like to take in developing a solution. The service-learning project should help to take their understanding of ecological balance to a higher level, engaging students in analysis, evaluation, and synthesis, while applying knowledge in a real-world, unpredictable situation. In planning for successful project implementation, you may find it to be helpful to utilize a service-learning project planning form, such as the one found on page 31 in the *Wave Action Team Implementation Guide* which can be downloaded online on the Wisconsin Department of Public Instruction website at <http://www.dpi.state.wi.us/fscp/sl-teach-tools.html>.

This unit will develop concepts involved in understanding relationships of organisms within their physical environment. Students will explore simple food chains, prey and predator relationships, and environmental change. In engaging students in this process, a number of film clips from major motion pictures will serve as a catalyst for class discussions and help to take students' understandings deeper.

The following McRel Science Standards will provide the foundation for learning into which the identified 21st Century Skills will be immersed:¹³

Standard 13. Understands the scientific enterprise

Level III (Grades 6-8)

Benchmark 1. Knows that people of all backgrounds and with diverse interests, talents, qualities, and motivations engage in fields of science and engineering; some of these people work in teams and others work alone, but all communicate extensively with others

Benchmark 2. Knows that the work of science requires a variety of human abilities, qualities, and habits of mind (e.g., reasoning, insight, energy, skill, creativity, intellectual honesty, tolerance of ambiguity, skepticism, openness to new ideas)

Benchmark 3. Knows various settings in which scientists and engineers may work (e.g., colleges and universities, businesses and industries, research institutes, government agencies)

Benchmark 4. Understands ethics associated with scientific study (e.g., potential subjects must be fully informed of the risks and benefits associated with the research and their right to refuse to participate; potential subjects must be fully informed of possible risks to community and property)

Benchmark 5. Knows that throughout history, many scientific innovators have had difficulty breaking through accepted ideas of their time to reach conclusions that are now considered to be common knowledge

Benchmark 6. Knows ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social and economic forces strongly influence which science research programs are pursued and funded)

Essential questions that might be explored through this unit of study include:

How are new scientific discoveries made?

Should new advances in science always be pursued?

¹³ Mid-continent Research for Education and Learning (2007). 4th Edition Standards and Benchmarks. Retrieved December 30, 2007, from <http://www.mcrel.org/compendium/browse.asp>.

What factors determine whether or not to continue to pursue a new idea?
How do science and society influence one another?

Suggested performance tasks for collecting evidence of learning:

Students will develop a position paper about a recent scientific discovery, presenting a substantiated argument for whether this discovery is good for society or not.

Use the following resources from Film Clips for 21st Century Education series to illustrate and stimulate discussion of the key concepts identified above:

Star Trek: First Contact (Episode 5, Pride)

Synopsis:

The crew of the enterprise has traveled back in time from the 24th century to make sure that a pivotal moment in their history occurs, the warp drive rocket launch that would lead to human's first contact with aliens. The inventor of warp drive and captain of that crucial launch, Zephraim Cochrane is destined to be a great hero...even if he says he wants nothing to do with that destiny.

Instructional connections:

Use this clip to engage students in a discussion of the impact of scientific discovery. Pose questions such as: How does science contribute to the good of the world? What does an individual gain from scientific discovery? Does a new discovery always have its intended outcome? How can we use science to achieve the vision of our world becoming globally sustainable? What sacrifices might we need to make?

War Games (Episode 5, Honor)

Synopsis:

David is a computer hacker who has no problem using his online skills to change his grades. And he doesn't stop there. In order to impress his new girlfriend Jennifer, David decides to change her biology grade from an "F" to a "C." When Jennifer makes it clear that she does not want to be involved in something this dangerous, David assures her that no one will ever know. But does that make it right?

Instructional connections:

Use this clip to stimulate a discussion of ethics in science. Should we always use the technology we have available? Just because you can do something, should you or do you have a right to do it? How do these concepts apply to such issues as stem cell research, nuclear weapons, or wind farms?

Star Trek IV: The Voyage Home (Episode 5, Citizenship)

Synopsis:

Spock, the half-Vulcan, half-human Starfleet officer who believes in logic above emotion, is challenged by his human mother to consider the fact that his teammates made an emotional decision to risk their own lives in order to save him. "The good of the one," she says, "outweighed the good of the man." Spock struggles to understand.

Instructional connections:

Bring together the discussions from the previous two clips to engage students in a discussion of the balance between the good of the many and the good of an individual. Does the good of the many always outweigh the good of the few? How do scientific discoveries maintain the balance between the needs of the larger society and the needs of an individual or isolated group? What is the balance between cost and scientific advancement? Are scientific advancements always good for society?

Service-Learning Project Connections

The process of integrating a service-learning project into a curricular unit involves what students are learning in the classroom and providing opportunities for them to use that knowledge to better their local and/or global community by taking action on issues that matter to them. For the purposes of this unit, focus students' discussion on issues surrounding the ethics of science. Engage students in exploring recent discoveries that are controversial, researching both the pros and cons to the discovery, and determining the impact on the community.

One effective way to involve students meaningfully in this process is to engage them in a community mapping exercise early in the unit. Community mapping is the process of researching, analyzing, and documenting the resources that exist within an identified community. This exercise will connect recent scientific advancements with relevant issues that students identify in their community. Through the community mapping process, students are engaged in defining their community, analyzing the resources that exist in the community, and assessing how these resources can be utilized to address issues that they identify. It is through this process that students begin to learn how community assets are connected and how their experiences in school can relate to the larger world.

Community Mapping

Step 1:

After dividing the class into small groups, ask each group to define the community they will focus on for their community map. This definition may be shaped by the teacher based upon the unit objectives, or may be left open for the students to decide. A community may range from the school, a particular neighborhood, the town/city, or even the global community, but for the purposes of this unit, students' focus should be on recent scientific advancements and their impact on the community.

Step 2:

Based on the community identified by the group, brainstorm a list of all the different types of resources that exist in a community. Encourage students to be as thorough in this list as possible, including manmade and natural resources, community agencies, government entities, businesses, individuals or groups, etc. Attention should be drawn to how each of these assets connect to or are impacted by the selected recent scientific advancement.

Step 3:

Using this brainstormed list, students are to create a visual depiction of their community on a large sheet of butcher paper. This representation may look like a physical map, or may take the form of a concept map. In either case, the goal is to depict as accurately as possible, all of the assets that make the community what it is and how these assets intersect in providing for the needs of the community. The teacher may elect to make this process more detailed by engaging students in researching community assets, conducting interviews in the community, and/or inviting community partners to join students in the process. As such, community mapping can take as little as a class period or two for a general overview, or can be extended to a much more in-depth study of the community's natural environment.

Step 4:

In reflecting on the community mapping process, students will begin to see areas of need within the community. For example, in this science unit, any issue that involves how human needs have impacted or been impacted by the scientific advancement being studied would be relevant. Ask students to identify the top two or three needs that they would like to take action on through a service-learning project.

Step 5:

Bring the class back together as a whole group. Ask each small group to share their community map and the issues they identified as priorities. Reflect on each group's overview, finding community assets and issues that each group has in common. Through this dialogue, develop a list of three to five issue areas that the whole class is interested in addressing. Finally, use consensus-building strategies to determine the one issue that everyone can agree on as their top priority for this unit. Be sure to engage everyone in this process and incorporate as many perspectives as possible. The result should be agreement among all class members on one issue that encompasses the diverse viewpoints of all class members.

Envision Change

As a class, develop a vision statement that will serve as the goal for the service-learning project that they will be completing. Use the following statements to guide the development of this goal-setting. Be sure to make the final goal something that is concrete and achievable.

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This change is important to us because it will...

Issue Exploration

Once an issue area has been addressed, students will need to engage in research to gain an understanding of how scientific discovery came about, determine the problems associated with this scientific advancement, and identify possible options for steps they might take in addressing this issue. It is important to take the time to fully develop this process so that students engage in a thoughtful decision-making process as they seek solutions that are substantive and that will make a lasting difference in this issue. Seek to engage your students in deeper understanding of the problem, using critical thinking to fully analyze the complexity of variables that contribute to the issue at hand.

After determining multiple solutions to the identified problem, ask students to use a formal decision-making process in guiding them to select a project to help them achieve their identified goal. One such process is to ask students to write or present a proposal for the solution they believe will best help them to achieve their goal using the following criteria:

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Affordable (*Do we have or can we find sufficient funding to carry out this project?*)

Workable (*Is it appropriate and are we able to do it?*)

Effective (*Will it help us be successful in meeting the identified need?*)

Ask the class to assess each proposal based on these criteria and select the one service-learning project that they will implement in order to achieve their vision. In planning this project, it is important to have students identify how they will use the skills they are learning in this unit to raise awareness about the identified need in the community, and the steps they would like to take in developing a solution. The service-learning project should help to take their understanding of ecological balance to a higher level, engaging students in analysis, evaluation, and synthesis, while applying knowledge in a real-world, unpredictable situation. In planning for successful project implementation, you may find it to be helpful to utilize a service-learning project planning form, such as the one found on page 31 in the *Wave Action Team Implementation Guide* which can be downloaded online on the Wisconsin Department of Public Instruction website at <http://www.dpi.state.wi.us/fscp/sl-teach-tools.html>.

This unit will develop physics concepts related to force and the laws of motion. Students will explore how. In engaging students in this process, a number of film clips from major motion pictures will serve as a catalyst for class discussions and help to take students' understandings deeper.

The following McRel Science Standards will provide the foundation for learning into which the identified 21st Century Skills will be immersed:¹⁴

Science

Standard 10. Understands forces and motion

Level IV (Grades 9-12)

Benchmark 3. Knows that the strength of the gravitational force between two masses is proportional to the masses and inversely proportional to the square of the distance between them

Benchmark 8. Knows that laws of motion can be used to determine the effects of forces on the motion of objects (e.g., objects change their motion only when a net force is applied; whenever one object exerts force on another, a force equal in magnitude and opposite in direction is exerted on the first object; the magnitude of the change in motion can be calculated using the relationship $F=ma$, which is independent of the nature of the force)

Benchmark 10. Understands general concepts related to the theory of special relativity (e.g., in contrast to other moving things, the speed of light is the same for all observers, no matter how they or the light source happen to be moving; the laws of physics are the same in any inertial frame of reference)

Essential questions that might be explored through this unit of study include:

How can having an understanding of force and the laws of motion be useful?

What elements affect the effect of force on the motion of an object?

What are the limits of the laws of motion?

How do the various forces interact?

Suggested performance tasks for collecting evidence of learning:

Students will develop a module which could be used to teach one element of driver safety using the concepts of force and the laws of motion to explain the importance of the driving principle. This module will include activities and exercises to help students understand the principle, as well as advocacy materials to help encourage drivers to practice safe driving.

¹⁴ Mid-continent Research for Education and Learning (2007). 4th Edition Standards and Benchmarks. Retrieved December 30, 2007, from <http://www.mcrel.org/compendium/browse.asp>.

Use the following resources from Film Clips for 21st Century Education series to illustrate and stimulate discussion of the key concepts identified above:

Apollo 13 (Episode 1, Cooperation)

Synopsis:

They are stranded over 200,000 miles away from earth, trapped in a spacecraft that is crippled, without power, and losing breathable air by the minute. It will take all the skills and teamwork of three Apollo astronauts, along with the support of the ground crew in Mission Control, to survive. In the process, the concepts of force, drag, drift, and acceleration come into play as they guide the spacecraft to align with their target.

Instructional connections:

Use this clip to engage students in a discussion of force and the laws of motion. Point out the lack of gravitational force and the implications that are apparent in this scene. Pose questions such as: How do the astronauts use their understanding of physics to make the necessary adjustments to their course? How would this scene be different if it took place within earth's atmosphere? What physics concepts did you see play themselves out in this clip?

Antz (Episode 1, Cooperation)

Synopsis:

"Every ant has his day." At least that is what Z hopes. He feels utterly insignificant and out of touch with the rest of the colony. While they appear content to cart around dirt all day, Z keeps looking for a better place and a better life. When his fellow workers rely on him to hold them together, Z's heart is not in the task. This clip demonstrates the concepts of gravitational force, air resistance, and momentum as we watch the ant ball swing into motion.

Instructional connections:

Ask students to identify the physics concepts that come into play in this clip. How can we use what we know about the laws of motion to understand why the ant wrecking ball didn't work? What caused Z to let go? What would have happened if Z had been able to hang on? What adjustments would you make to this process if you were the ant in charge of design? When is it safer for an animal to exist on its own rather than in a group? How does the presence of humans impact the natural environment?

Service-Learning Project Connections

The process of integrating a service-learning project into a curricular unit involves what students are learning in the classroom and providing opportunities for them to use that knowledge to better their local and/or global community by taking action on issues that matter to them. For the purposes of this unit, focus students' discussion on issues surrounding driver safety. Students may identify specific driving situations that require an understanding of force and the laws of motion, driving practices that can reduce

accidents or keep passengers safer in the event of an accident, or even changes that could be made to driving laws that would increase road safety.

One effective way to involve students meaningfully in this process is to engage them in a community mapping exercise early in the unit. Community mapping is the process of researching, analyzing, and documenting the resources that exist within an identified community. This exercise will connect the concepts of force and the laws of motion with driver safety education in their community. Through the community mapping process, students are engaged in defining their community, analyzing the resources that exist in the community related to driver safety, and assessing how these resources can be utilized to address issues that they identify. It is through this process that students begin to learn how community assets are connected and how their experiences in school can relate to the larger world.

Community Mapping

Step 1:

After dividing the class into small groups, ask each group to define the community they will focus on for their community map. This definition may be shaped by the teacher based upon the unit objectives, or may be left open for the students to decide. A community may range from the school, a particular neighborhood, the town/city, or even the global community, but for the purposes of this unit, students' focus should be on safe driving practices.

Step 2:

Based on the community identified by the group, brainstorm a list of all the different types of resources that exist in a community. Encourage students to be as thorough in this list as possible, including manmade and natural resources, community agencies, government entities, businesses, individuals or groups, etc. Attention should be drawn to how each of these assets connect to or impact driver safety.

Step 3:

Using this brainstormed list, students are to create a visual depiction of their community on a large sheet of butcher paper. This representation may look like a physical map, or may take the form of a concept map. In either case, the goal is to depict as accurately as possible, all of the assets that contribute to driving conditions in the community and how these assets intersect in making the roadways in the community safe. The teacher may elect to make this process more detailed by engaging students in researching community assets, conducting interviews in the community, and/or inviting community partners to join students in the process. As such, community mapping can take as little as a class period or two for a general overview, or can be extended to a much more in-depth study of the community's natural environment.

Step 4:

In reflecting on the community mapping process, students will begin to see areas of need within the community. For example, in this science unit, any issue that involves how laws or driving practices that affect safety issues would be relevant. Ask students to identify the top two or three needs that they would like to take action on through a service-learning project.

Step 5:

Bring the class back together as a whole group. Ask each small group to share their community map and the issues they identified as priorities. Reflect on each group's overview, finding community assets and issues that each group has in common. Through this dialogue, develop a list of three to five issue areas that the whole class is interested in addressing. Finally, use consensus-building strategies to determine the one issue that everyone can agree on as their top priority for this unit. Be sure to engage everyone in this process and incorporate as many perspectives as possible. The result should be agreement among all class members on one issue that encompasses the diverse viewpoints of all class members.

Envision Change

As a class, develop a vision statement that will serve as the goal for the service-learning project that they will be completing. Use the following statements to guide the development of this goal-setting. Be sure to make the final goal something that is concrete and achievable.

We will help to make our community a place where...

This change is important to us because it will...

Issue Exploration

Once an issue area has been addressed, students will need to engage in research to gain an understanding of how this issue has developed, determine the root causes and symptoms of problems associated with this need, and identify possible options for steps they might take in addressing this need. It is important to take the time to fully develop this process so that students engage in a thoughtful decision-making process as they seek solutions that are substantive and that will make a lasting difference in this issue. Seek to engage your students in deeper understanding of the problem, using critical thinking to fully analyze the complexity of variables that contribute to the issue at hand.

After determining multiple solutions to the identified problem, ask students to use a formal decision-making process in guiding them to select a project to help them achieve their identified goal. One such process is to ask students to write or present a proposal for the solution they believe will best help them to achieve their goal using the following criteria:

Saleable (*Can you convince others that this is a good idea?*)

Affordable (*Do we have or can we find sufficient funding to carry out this project?*)

Workable (*Is it appropriate and are we able to do it?*)

Effective (*Will it help us be successful in meeting the identified need?*)

Ask the class to assess each proposal based on these criteria and select the one service-learning project that they will implement in order to achieve their vision. In planning this project, it is important to have students identify how they will use the skills they are learning in this unit to raise awareness about the identified need in the

community, and the steps they would like to take in developing a solution. The service-learning project should help to take their understanding of ecological balance to a higher level, engaging students in analysis, evaluation, and synthesis, while applying knowledge in a real-world, unpredictable situation. In planning for successful project implementation, you may find it to be helpful to utilize a service-learning project planning form, such as the one found on page 31 in the *Wave Action Team Implementation Guide* which can be downloaded online on the Wisconsin Department of Public Instruction website at <http://www.dpi.state.wi.us/fscp/sl-teach-tools.html>.