Our Role in the Environment

Major Topic: Resources

Length of Unit: 4 – 90 minute classes

Unit Summary: Students will work together discussing, writing and completing activities concerning today's major environmental challenge to recycle, reduce and reuse. They will also reflect and respond to these challenges through real world connections.

Interdisciplinary Connections: Students will complete reading and written language activities for each lesson covering science and mathematics topics. They will actively participate in each lesson using technology to research and compare the utility bills for their school, home, as well as other schools in the district.

Understanding Goals: The information learned from this lesson should assist in identifying our roles to help our environment, starting in our homes and our school.

Essential Questions:

- What is being done to solve today's environmental challenges?
- What can both individuals and the government do to affect each area of concern?
- What will different forms of action cost and how will we pay?

Student Objectives:

Students will be able to:

ES.6 investigate and understand the differences between renewable and nonrenewable resource.
d) environmental costs and benefits.

Blooms Taxonomy	21st Century Skills
Evaluating	Critical Thinking
Analyzing	Problem Solving
Applying	Communication
Understanding	Collaboration
Remembering	Information & Media Contextual Research

Performance Tasks:

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Students will:

- Explain steps individuals, homes and schools could take to conserve natural resources and protect our environment.
- Outline today's major environmental challenges.
- Complete group activities and discussions for each lesson.
- Complete individual reading and writing assignments for each lesson.
- Complete an end of unit assessment.

Evidence of formative assessment:

Students will earn a daily participation grade for working independently and in their groups as observed by their teacher. Students will complete reading and writing assignments for each lesson in the unit which will be graded for completion. Students will complete activities on each lesson for a grade. At the completion of the unit, students will complete an objective assessment with a final essay with suggestions for energy conservation at home and at our school.

Evidence of Summative Assessment:

Students will complete an objective assessment including multiple choice questions, matching questions and true/false questions. Each student will complete an essay for the final assessment with suggestions on how we can conserve energy at home and at our school.

Technology

Hardware	Software
Computers Digital Camera Equipment Printer Internet Connection Calculators	Multimedia Word Processing Internet Web Browser

Resources from the web:

- Students will complete research on their school division to find documentation (usually covered at school board meetings) on each school's utility bill for a specific month.

Supplies:

- Worksheets
- Paper
- Pencils

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- utility bills from student's homes
- utility bills from school
- Computer
- Internet

Vocabulary: sustainable, conservation, ecology, environmentalist, climate change, global warming, landfill, hazardous waste, fossil fuels, renewable energy, biofuels, nonrenewable energy, biodegradable, recycle, composting

Lesson 1: Environmental Challenges - (1 - 90 minute class)

- Students receive the vocabulary for the unit and discuss as a group each term for understanding and discussing prior knowledge.
- Students complete a Reality Check worksheet independently for prior involvement in saving our environment and afterwards discuss their answers in the group
- Students complete the anticipation guide for "Where has all the gasoline gone?" Then students read the scenario independently and write up a response using questions supplied with the sheet while comparing their responses to the anticipation guide.
- In closing, students lead a discussion on the material covered in the lesson and review the essential questions.

Lesson 2: Utility Bills and Landfills - (1 - 90 minute class)

- Students/parents have been requested to bring in a recent home utility bill.
- Students research to find recent school board documents and print them off for comparison to their home utility bill.
- Students calculate the difference from their home utility bill to the school utility bill for a specific month. What is the annual bill if the bill was the same for each month? Home? School?
- Students complete an Energy Conservation worksheet together to list ways to save energy at home and at school.
- Students complete an anticipation guide prior to reading a case study - Town Meeting: "When the Landfill is Full"
- Students read the case study and reflect on the anticipation guide answers they supplied as a group discussion.
- Students write up a response to the case study using the case review questions supplied at the bottom of the page.
- In closing, students discuss the lesson and the essential questions together.

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Lesson 3: One can make a difference - (1 - 90 minute class)

- Students complete a double entry draft as a group after reading a case study titled "One can make a difference."
- Students independently complete an essay using the information they completed on the double entry draft.
- Students survey the school documenting with photos ways the school is recycling and discuss what could have been recycled.
- Students share their essays with the group at the end of the class period discussing each student's ideas.
- In closing, students discuss today's lessons and essential questions together.

Lesson 4: Wrap it up - (1 - 90 minute class)

- Students complete an anticipation guide for a case study/town meeting: "The Well Runs Dry"
- Students read the case study and then reflect on the anticipation guide and how they might change their answers now.
- Students write an essay using the anticipation guide and the case review questions.
- Students use their calculators to compute a 20% increase in their home and school utility bills according to one of the suggestions from the case study to reduce water usage. What would this mean to their parents financially? What if the same happened to our school?
- Students complete a unit review, "Your Role in the Environment".
- In closing, students share and reflect on this unit using the essential questions as a guide.

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Your Role in the Environment

Name _____

Date _____ Period _____ Score _____

Matching: Match the following terms and identifying phrases.

_____ 1. Responsibly using environmental resources to prevent depletion or permanent damage.

_____ 2. The protection and management of the environment and valuable natural resources.

_____ 3. The study of the relationship between living things and their environment.

_____ 4. Shifts in measurements of climate—such as temperature, precipitation, or wind—that last decades or longer.

_____ 5. Substances—liquids, solids, and gases—that are dangerous or potentially harmful to health or the environment.

_____ 6. A fuel derived from the decomposed remains of animals and plants that lived in prehistoric times.

_____ 7. A source of energy that is continually available or can be replenished, such as wind, water, and the sun.

_____ 8. A fuel composed of or produced from biological raw material.

_____ 9. A source of energy that can be used up or that cannot be used again, such as petroleum, natural gas, and coal.

_____ 10. Describes a material that can be broken down naturally by microorganisms into harmless elements.

A. biodegradable
B. biofuels
C. climate change
D. conservation
E. ecology
F. fossil fuels
G. global warming
H. hazardous waste
I. nonrenewable energy
J. renewable energy
K. sustainable

True/False: Circle *T* if the statement is true or *F* if the statement is false.

T F 11. The most economical and practical step in lessening the problems of solid waste is to produce less waste.

T F 12. Existing landfill sites for disposal of nonhazardous solid waste are running out of capacity.

T F 13. The United States produces enough fuel to meet almost 90 percent of its fuel requirements.

T F 14. Dependence on foreign sources of fuel has helped create both economic and political problems in the United States.

T F 15. There is almost nothing an individual can do alone to protect the environment.

T F 16. Most consumers could conserve a considerable amount of energy without major inconvenience.

T F 17. Adequate home insulation reduces heat loss and lowers heating bills significantly.

Name _____

T F 18. Transportation accounts for almost two-thirds of the petroleum used in the United States.

T F 19. Citizen groups can be a very powerful force in dealing with environmental issues.

T F 20. Product stewardship requires businesses to reduce the health and environmental impacts of consumer products.

Multiple Choice: Choose the best response. Write the letter in the space provided.

_____ 21. The forms of energy we use most at the present time are _____.

A. hydro and geothermal energy
B. nuclear and wind power
C. petroleum and natural gas
D. solar and biofuels

_____ 22. Development of nuclear energy has been slow and controversial because it _____.

A. cannot be stored
B. is an inadequate source of energy
C. is too costly
D. presents problems with safety and waste disposal

_____ 23. Solar energy is the most desirable source of fuel _____.

A. economically
B. environmentally
C. technically
D. All of the above.

_____ 24. The disadvantages of unplanned development and urban sprawl include all *except* _____.

A. more roads
B. more public services
C. greater shopping convenience
D. increased environmental pollution from driving

_____ 25. Doing your part to protect the environment and conserve natural resources involves all *except* _____.

A. making conservation a way of life
B. leaving environmental issues for government to solve
C. recognizing the cumulative effect of small acts of litter and waste
D. participating in community environmental protection programs

_____ 26. The greatest share of energy used in homes is for _____.

A. heating and cooling
B. lighting
C. major appliances
D. small appliances

(Continued)

Name _____

_____ 27. The best time to water your yard is _____.

A. in the early evening
B. throughout the day at two-hour intervals
C. when sunlight is at its peak
D. whenever it is convenient

_____ 28. Which of the following is *not* a good way to protect the environment?

A. Avoiding unnecessary use of insecticides.
B. Buying things in disposable rather than returnable containers.
C. Taking care not to litter.
D. Taking papers, bottles, and cans to recycling centers.

_____ 29. You can increase gas mileage by _____.

A. letting your car idle when stopped for several minutes
B. driving at moderate speeds
C. quick starts and stops
D. switching from bus to car

_____ 30. The purpose of a green tax is to _____.

A. charge the cost of pollution to the polluter
B. create environmental jobs
C. set energy efficiency standards
D. stop urban sprawl

Essay: Please write an essay on conserving energy at home and at school. List specific examples of how we could lower our utility bills both at home and at school as well as suggestions for conserving/recycling.

Reality Check

Name _____

Date _____ Period _____

How much are you really doing for the environment? Check all that apply.

_____ 1. I keep myself informed about local environmental issues.

_____ 2. I realize that small acts, such as tossing one wrapper out of the car window, can lead to big environmental problems.

_____ 3. I avoid wasting water, food, gas, and electricity.

_____ 4. I recycle newspapers, magazines, glass, and plastics.

_____ 5. I make an effort to reduce noise pollution.

_____ 6. I participate in community projects that enhance and protect the environment.

_____ 7. I avoid unnecessary and careless use of pesticides and harsh chemicals.

_____ 8. When shopping, I look for products that can be recycled and avoid overpackaged products.

_____ 9. I support candidates who take stands on environmental issues.

_____ 10. I respect natural resources as economic assets.

_____ 11. My home is well-insulated to conserve energy.

_____ 12. I turn off electrical equipment when not in use.

_____ 13. I avoid running water unnecessarily, such as when I brush my teeth.

_____ 14. I avoid using dishwashers, clothes washers, and dryers during peak energy usage times.

_____ 15. I walk or bike when possible.

_____ 16. I carpool when possible.

_____ 17. I follow fuel-conserving driving practices.

_____ 18. I take care to repair leaky faucets promptly.

_____ 19. When buying appliances, I look for energy- and water-saving features.

_____ 20. I conserve water used in the yard by watering in the early morning or evening.

Count the number of statements you checked. Do you consider yourself a friend to the environment? Why or why not? _____

_____

_____

Our Role in Our Environment Vocabulary

Where Has All the Gasoline Gone?

Anticipation Guide

1. Our nation is running out of fuel.
   Agree: _____ Disagree: _____

   Explanation:

2. Alternatives to fuel need to be enforced.
   Agree: _____ Disagree: _____

   Explanation:

3. Citizens should be fined if they do not carpool.
   Agree: _____ Disagree: _____

   Explanation:

Where Has All the Gasoline Gone?

Name _____

Date _____ Period _____

Read the scenario and answer the discussion questions.

Suppose our nation is facing a severe fuel shortage. Lines at service stations are two and three blocks long. Most stations close on weekends, and many run out of gasoline by Thursday afternoon. Supplies that are available are sold on a first-come, first-served basis. This creates problems for all the people who must drive to work. In many areas, the public transit system is neither adequate nor reliable enough to replace private cars.

Listed below are some possible alternatives for dealing with this situation.

a. Strictly enforce a 55 miles per hour speed limit.

b. Raise the price of gasoline to lower demand. At the same time, develop a gas stamp program to aid the needy and those who must drive to work.

c. Allocate more funds for further development of synthetic fuels.

d. Improve relations with countries that export petroleum and make whatever agreements are necessary to get more fuel.

e. Raise the driving age.

f. Close shopping centers, service stations, and other facilities on Sundays to reduce unnecessary driving.

g. Penalize families that own more than one car.

h. Increase costs connected with driving and car ownership, such as licenses, parking fees, and permits.

i. Reward carpooling by requiring all single passenger auto commuters to buy special permits.

j. Place a heavy tax on automobiles that do not meet high fuel economy standards.

k. Restrict the sale of private cars and require auto owner permits based on transportation needs.

l. Allocate more funds to develop fuel-efficient public transportation.

1. Consider the costs, benefits, and consequences of each alternative. What choices would you make? Which do you think would be most effective? _____

_____

_____

_____

_____

_____

_____

(Continued)

Name _____

2. Which alternatives would be the most costly for government? _____

3. Which alternatives would be the most costly for consumers? _____

4. Which alternatives would be the most inconvenient? _____

5. What other possible alternatives can you suggest? _____

6. Which alternatives would affect you personally? Explain. _____

Energy Conservation

Name _____

Date _____ Period _____

In each column below, list nine ways that you and your family can conserve energy. Place a star next to the things you do routinely. Underline those that you have not done in the past, but would be willing to do.

Energy Savers

In the home:	In school:
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.

"When the Landfill is Full" Anticipation Guide

1. Recycling is necessary for our environment.
   Agree: _____ Disagree: _____
   Explanation:

2. City residents and the city landfill have nothing in common.
   Agree: _____ Disagree: _____
   Explanation:

3. The city should charge homes an additional fee for producing too much waste.
   Agree: _____ Disagree: _____
   Explanation:

4. Curbside recycling should only be voluntary for homeowners.
   Agree: _____ Disagree: _____
   Explanation:

5. Conservation and our home utility bills have nothing in common.
   Agree: _____ Disagree: _____

Case Study: Town Meeting

When the Landfill Is Full

Devon is president of the town council. He inherited a number of community problems, including a landfill almost filled to capacity. A sanitation report calls for closing the landfill in three years.

To extend the use of the landfill, Devon and the town council want to find another place to dispose of solid waste. Transporting waste to a distant landfill will be very costly. Increases may run as much as $200 to $300 annually per household.

Devon suggests the following approaches to the problem:

- Promote voluntary recycling with curbside pickup of recyclable materials.
- Establish mandatory recycling with curbside pickup and fines for failure to recycle.
- Charge a fee-per-pound of waste over a specified minimum to encourage recycling and composting of yard wastes. Establish a community-based compost program for yard wastes.
- Assist households with composting of both yard and food waste.
- Designate convenient drop-off centers for all recyclable waste.
- Levy a special tax per household to pay for solid waste disposal.
- Require local merchants to recycle packing materials and other recyclable waste.
- Organize an awareness campaign to encourage residents and merchants to reduce, reuse, and recycle solid waste materials.

Case Review

1. Which three ideas would you favor most? Explain.
2. Which three ideas would you favor least? Explain.
3. What other actions can you think of for reducing, recycling, and disposing of solid waste?
4. Which of the above would be the most and least costly for individuals, businesses, and local government? the most and least convenient?
5. Choose one of the alternatives and prepare a report describing the environmental pros and cons of the action and the costs for individuals, merchants, and the local government.
6. Which of the described actions have been carried out in your area and how well do they work?

Case Study: Town Meeting

One Can Make a Difference

Maxine recently attended a community presentation titled "Survival on Planet Earth." The speaker outlined five critical environmental issues:

- solid waste disposal
- energy conservation
- climate change
- water purity and conservation
- hazardous waste disposal

The speaker also shared powerful "what you can do" directives. After the presentation, Maxine started forming a "Mother Earth" action group at her high school. Within a week's time, Maxine had 25 enthusiastic members. The group wants to take steps in each of the five areas. They hope to gain both individual and community participation.

Case Review

1. Choose two environmental issues and outline at least three actions the Mother Earth group could take in each area. Include individual and community projects.
2. Discuss environmental protection and conservation projects that might work in your home, school, and community.

Case Study: Town Meeting

One Can Make a Difference

Maxine recently attended a community presentation titled "Survival on Planet Earth." The speaker outlined five critical environmental issues listed below on the left side of the paper. The speaker also shared powerful "what you can do" alternatives. After the presentation, Maxine started forming a "Mother Earth" action group at her high school. Within a week's time, Maxine had 25 enthusiastic members. The group wants to take steps in each of the five areas. They hope to gain both individual and community participation. Read through the five issues and work with a partner to reflect and outline at least three actions the Mother Earth group could take in each area. Include individual and community projects.

Name_____ Course_____ Date_____	Reflect on class discussions we had covering utility bills at home and school as well as how we can recycle, reuse, reduce, and respond to this issue.
-solid waste disposal -energy conservation -climate change -Water purity and conservation Hazardous waste disposal	

Case Study: Town Meeting

The Well Runs Dry

Two summers after Devon became town council president, a drought hit the area and the water table dropped substantially. The town needed to reduce its water usage.

Devon suggested raising water rates by 20 percent. A town council member recommended a ban on watering lawns, trees, shrubs, and gardens. Other council members advised limiting watering to evening and early morning hours.

Council members also suggested educating residents about taking shorter showers and finding ways to reduce water use. Another idea mandated low-flow toilets, showerheads, and appliances in new and remodeled bathrooms and kitchens. Members also discussed installing a water-rationing system to limit water usage in each household.

Case Review

1. What other steps can you think of for conserving water?
2. How would each of the council's suggestions affect you and your family?
3. Which idea do you think would be most effective? Why?
4. How would you be willing to change your own habits to help conserve water and other resources in a crisis situation?
5. What are some important considerations for government bodies to think about when passing laws and policies to deal with resource shortages?

Case Study: Town Meeting Anticipation Guide

The Well Runs Dry

1. Citizens will be mandated to attend information sessions on water conservation.
   Agree: _____ Disagree: _____

   Explanation:

2. To help with water conservation the city will mandate home to install low-flow toilets, showerheads and appliances in new and remodeled bathrooms and kitchens.
   Agree: _____ Disagree: _____

   Explanation:

3. Water will be rationed to limit water usage in each household.
   Agree: _____ Disagree: _____

   Explanation: