

green
STEM

science

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technology

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engineering

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math

GreenSTEM@VCU Unit Plan

Developed by:
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Henrico County Public Schools
Henrico, Virginia

Grow Local – Eat Local: Growing a Sustainable Community

Unit Description

Unit Overview

This unit will focus on the impact rising fuel consumption/costs have on the local food market and what students can do to alleviate this burden in their local community, such as starting a Grow Local, Eat Local initiative in order to provide their community with a sustainable alternative. The main learning goals will be an increased knowledge of the Global Oil Crisis and how that affects the Global Food Crisis. Also and understanding of how the increasing cost of fuel leads to an increase in food prices, ultimately resulting in many families in the local community having to struggle to feed their families and many of our local students going hungry. Throughout this unit, students will learn how to create charts, analyze data, brainstorm, facilitate group discussions, and present a variety of information in appropriate formats. Students will also learn many of the aspects of the agricultural sector through hands-on experiences at local farms and food production sites. They will learn about Green jobs as well as agricultural jobs that they may have not been aware of before. This unit will culminate in a student service-learning project that will apply the knowledge gained through these lessons to better serve their communities food needs. Students will determine the final project based on the needs of the community and the resources available. This project will be student facilitated and centered on the Fairfield Middle School (FMS) school garden and student Grow Local-Eat Local initiative.

Unit Context

The unit begins with an overview and introduction of the Global Oil Crisis and continues through the Global Oil Crisis's impact on the global and local food supply. Lesson discussions include topics such as society's use of non-renewable energy resources, how the use of these resources affect our daily lives, how energy consumption effects necessities such as food in our local communities, and what we can do as citizens to promote sustainability. Lessons focus on non-renewable resources and energy consumption, the rising costs of food products and how that impacts our local community and families, green jobs and technological practices that promote sustainability for the future, modern agricultural practices and how



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these practices impact our local communities (both positive and negative), how to effectively work in a group and present research to a larger audience, public speaking skills, and how students can make a difference. The project will integrate STEM disciplines by placing a focus, throughout the lessons, on research, data analysis, calculations, the scientific method, alternative energy sources, applying new, green technologies for best practices, and creation/use of models to aid in creating solutions for now and in the future. In order to guide students toward a better understanding of global, national, and local issues related to energy and food, this unit will address the following essential questions:

- How does the Global Oil Crisis affect global food supply?
- How do rising food costs impact the local community?
- What are some green solutions to this problem?
- How can we facilitate these solutions in our own community?

Standards & Goals

Service-Learning Standards

Duration & Intensity

The lessons in this unit and student service-learning project will be implemented over a six month timeframe, allowing students ample time to research the issues presented, design and facilitate their chosen community project, reflect on the process and outcome, and celebrate their achievements.

Meaningful Service

The lessons in this unit are appropriately based on the intellectual, social, and emotional development of the participating students – middle school students between the ages of 11-14 in grades 6-8. This unit also applies a real-world, meaningful context as the lessons address a real need in the community that the majority of our students can relate to. Our student population is part of a low socio-economic region with over 70% of our students eligible for free/reduced lunches. Food costs and food supplies are a very real issue to our student population and our community at large. This unit also provided numerous hands-on activities that allow students to see first-hand the impact of their efforts.

Links to Curriculum

Although the students participating in this service-learning project are members of a voluntary school club and will not be graded on a school/district level, all lessons and activities are based on relevant academic and 21st century standards. Through participation in this unit, students will gain a solid knowledge base of STEM standards that will easily flow within their “class” standards. These lessons will allow students to gain a real-world understanding of principles addressed in core content, as this unit is designed to be interdisciplinary and to reinforce curricular content from a wide variety of disciplines.

Youth Voice

This unit allows students to express their opinions, thoughts, and ideas in a variety of ways: class discussions, student work groups, presentations, community surveys, and student reflections. The service-learning project will be student-created, student-centered, and student-facilitated. After completing the initial lessons, students will determine the community need and how best to address this need. Youth voice will be a major component of this unit as it empowers students to reflect on issues as citizens, take action to make a difference, and evaluate their own progress...this leads to life-long learners equipped with the skills to positively and effectively tackle challenges in the future.

Partnerships

Community partners will play an important role in this unit, most importantly by sharing our vision helping us to work towards a common goal. Henrico PALs will provide information on group facilitation, public speaking, and helping the community. The Backyard Farmer will provide information relevant to agriculture, sustainable farming techniques, growing your own food, and community outreach, as well as construction and maintenance of the school garden. VCU Campus Kitchen will provide opportunities for students to see their hard work in action, by providing an opportunity to supply the kitchen with food from the garden in exchange for student volunteer hours at the kitchen. These and other community partners will provide monetary funds, volunteer hours, community publicity and support, and/or guidance for our students. Guest speakers, farm visits, volunteers, etc....partnerships will form the foundation of this unit and our service-learning project. We are partnering with Friends of the Rappahannock, a non-profit conservation organization based in

Diversity

This unit will allow students to work together on many issues that often produce varying views and opinions. Students will learn to collaborate and how to compromise for the greater good. Students will also learn that issues they face as a community are also being faced by many communities nationally and globally, regardless of socio-economic, ethnic, or political background. Students will begin to understand how to listen to other's views objectively and how to effectively state their own opinions in a respectful, positive manner.

Reflection

The activities in this unit promote student reflection as an ongoing process. The lessons and activities will encourage students to reflect on issues and impacts that they may not have thought about before. Students will have a reflection journal in which they will write their own thoughts and ideas, as well as reflect on the broader, more socially challenging ideas presented. As students' progress into the project phase, the reflection journal will become a progress journal where they can record and reflect on the project's progress, the project's impact on the community, their ideas or suggestions for improvement, etc. Throughout the unit, students will also have the opportunity to express their reflections in creative ways, such as creation of a public service announcements, websites, blogs, posters, informative brochures, etc. Through reflection, students should be able to conclude this unit with a greater sense of purpose and a stronger desire to be civically responsible.

Assessing Impacts

This unit allows students and facilitators to assess the impacts through self-reflection, community surveys, student surveys, and community interviews. Impacts will also be assessed through student and community feedback throughout the unit.

Sharing & Celebrating

Throughout the unit and after the service-learning project is complete, students will be able to share their ideas, work, and impact with their peers and the community. Students will be able to create an "impact documentary" that details their project from start to finish and share this with the local community. They will also create a memory book that allows them to reflect, share, and celebrate their accomplishments as a group...to document their contribution. Incorporating an "all on the wall" celebration banner and a "legacy mural" near the school garden would also be great ways for our students to celebrate their efforts. As a final culminating event, students will be given a celebration banquet, attended by local community leaders, volunteers, community partners, students, and families. This banquet will show our appreciation for a job well done!

Learning-Service Goals

The goals of this unit include educating our students and the community on the health, economic, and environmental benefits of Grow Local -Eat Local. Our goals include providing fresh food for our community, increasing knowledge and vocational skills related to alternative energy and agriculture, providing volunteer opportunities within our community, and creating a positive, hands-on, outdoor classroom for our students and surrounding schools. The main objective is for students to understand the importance of agriculture, energy consumption, and poverty in our daily lives and to explore issues such as the impacts of fuel consumption on local food prices, the global food crisis, the loss of agricultural production due to urban sprawl, the health benefits of eating fresh foods, the use of sustainable agriculture and alternative energy related to local and future food supplies, and vocational skills necessary to create a sustainable future.

It is our hope that, through this unit and the resulting service-learning project, students will gain a better understanding of what it means to be a responsible citizen, to contribute to the common good, and how to live better now in order to create a better community for future generations. Students should also gain an increased perspective of their own community's needs and assets and knowledgeable foundation on which to address these needs.

Assessment Plan

Student Progress

Student progress will be assessed using a variety of tools including, but not limited to, observations, class discussions, student presentations, group surveys, community involvement, questions and answer sessions, student reflections, and oral/written responses.

Impact on the Community

The impact of this unit and service-learning project will be assessed using community surveys, community and school feedback, the amount of community involvement and support, and the number of people served by the project. Impact will be measured using both quantitative and qualitative methods created and implemented by both students and educators.

Impact on Partners

Success of this project will be measured by the willingness of partners to continue support in the future, through general and specific partner feedback gained through surveys and questionnaires, and through partner participation in reflection and celebration.

Unit Lesson Plans

Lesson 1: Research Methods and Group Work - Scientific Research and 21st Century Skills – How do you know?

During this lesson, students will gain a clearer understanding of research methods. They will also gain knowledge of effective group communication, oral presentation dos and don'ts, and community communication from a local community partner. This lesson will provide the foundation necessary for students to move forward with following lessons.

Standards of Learning Objectives:

Virginia Standards of Learning: N/A

National STEM Standards:

Science Standards 11, 12, and 13

Technology Standards 1, 2, 3 and 6

Language Arts Standards 1-10

Life Skills – Thinking and Reasoning Standards 1-6

Life Skills – Working with Others Standards 1-5

Methods and Activities:

Students will effectively learn how to conduct research and will be guided by the FMS Librarian on the appropriate way to search databases, take notes, filter information, appropriate technology use, and accurate citations.

Students will be engaged by a guest speaker from the Henrico Police Athletic League (PALs). The speaker will demonstrate how to effectively conduct group communication, how to delegate within a group, and how to make persuasive or informative community presentations. He will also discuss “taking action” as he presents various ways to get involved in the local community.

Students will divide into groups for upcoming lessons. Students will discuss their own strengths and weaknesses and delegate responsibilities accordingly.

Lastly, students will reflect in their journals on why it is important for a group to work effectively together.

Materials/Resources/Partners:

FMS Librarian

Henrico PALS

Computer with Internet access

Whiteboard with markers

Student brainstorming materials (paper, pencils, markers, etc.)

Student journals

Lesson 2: Global/National Impact - What would we do...in a World Without Oil?

In this lesson, students will participate in a “World Without Oil” simulation game provided by <http://worldwithoutoil.org>. As a class, students will review Global Oil Crisis news briefs, watch videos, and participate in reflection blog activities. This lesson will introduce students to the Global Oil Crisis and raise awareness about how a lack of oil will ultimately affect their daily lives.

Standards of Learning:

Virginia Standards of Learning:

Science-ES.1, ES.3, ES.7, ES.9, PS.1, PS.6, PS.7, LS.1, LS.6, LS.7, LS.12, 6.1, 6.2, 6.5, 6.6, 6.9

History – CE.1, CE.11

National STEM Standards:

Science Standards 11, 12, and 13

Technology Standards 1, 2, 3 and 6

Economics 1, 3, 4 and 5

Language Arts Standards 1-10

Life Skills – Thinking and Reasoning Standards 1-6

Life Skills – Working with Others Standards 1-5

Methods and Activities:

NEWSFLASH: Starting today there is a global oil crisis and you are caught in the middle of it! What will happen now? This is how the lesson begins...students are introduced to the Global Oil Crisis through the online simulation site <http://worldwithoutoil.org>. They will follow the first lesson of this 32-day simulation as a class, role-playing as if the crisis were actually going on. Students will read news stories, read and respond to blogs from other participants, and in small groups, discuss the upcoming impacts of a World Without Oil. Student groups will report to the class what they have discovered and how they think the loss of oil will impact the world, their community, and their daily lives. Students will end the lesson with a personal journal reflection on the class discussion and list at least 3 ways the loss of oil would impact their daily lives.

Materials/Resources/Partners:

Computer with Internet access

Website <http://worldwithoutoil.org> lesson plan 1 with simulation links

Whiteboard with markers

Student brainstorming materials (paper, pencils, markers, etc.)

Student journals

Lesson 3: Local Impact - What would we eat...in a World Without Oil?

In this lesson, students will continue their quest in a “World Without Oil” simulation game provided by <http://worldwithoutoil.org>. What happens to our food supply if there is no oil? This lesson addresses the oil crisis through the lens of energy/fuel consumption, how the resulting food shortage would be felt in the local community, and what types of food choices must be made in order to meet this basic necessity in the middle of a crisis. This lesson will be used to introduce students to a main unit objective: How does energy consumption and cost affect food supplies and costs in the local community?

Standards of Learning:

Virginia Standards of Learning:

Science-ES.1, ES.3, ES.7, ES.9, PS.1, PS.6, PS.7, LS.1, LS.6, LS.7, LS.12, 6.1, 6.2, 6.5, 6.6, 6.9

Math-6.9, 6.10, 6.14, 7.4, 7.5, 7.12, 8.3, 8.6, 8.13, 8.14

History – CE.1, CE.11

National STEM Standards:

Science Standards 11, 12, and 13

Technology Standards 1, 2, 3 and 6

Engineering Education Standards 5, 6, and 7

Mathematics Standards 1, 2, 3, 4, 6 and 9

Agricultural Education Standards 1 and 2

Economics 1, 3, 4 and 5

Language Arts Standards 1-10

Life Skills – Thinking and Reasoning Standards 1-6

Life Skills – Working with Others Standards 1-5

Methods and Activities:

The Oil Crisis is getting worse and now our food supplies are threatened...what are we going to do!?!?

Students will continue on to lesson 6 Food Without Oil of the “World Without Oil” simulation game.

Students will watch a video on food shopping without oil, read an account of how the loss of oil will impact the local community, and read/respond to blog posts from other players (including teacher). After the intro, students will get into their small groups and choose 5 food products that they feel will be the first to

go in a world without oil. They will discuss their choice with the class. Next, the teacher will present 5 products to the class that are common food items found in most households. Students will guess how far each product travelled to reach the local market. Answers will be recorded on a chart on the board. Student groups will then be assigned one of the products and will use the Internet to determine the actual number of miles the product travelled. Lastly, students will use current fuel cost averages to determine the cost of transporting that product to their local grocery store. At the end of the lesson, students will use their personal journal to reflect on the impact energy resources have on food supplies in their own community. Extension: Students can research the impact of energy consumption on the current Global Food Crisis and make a fact sheet/awareness brochure or PSA for peers.

Materials/Resources/Partners:

Computer with Internet access

Website <http://worldwithoutoil.org> lesson plan 6 with simulation links

Website www.Mapquest.com to find grocery store/facility locations

Website <http://www.zenithair.com/misc/distance.html> to calculate miles travelled

Whiteboard with markers

Student brainstorming materials (paper, pencils, markers, etc.)

Student journals

5 Food Products (can of tuna, can of pineapples, cookies, bag of potato chips, apple)

Lesson 4: Local Impact - What's the cost?

In this lesson, students will determine the current cost of the food they eat the most. Students will survey their households to determine which 10 food products they eat the most of, where those foods are purchased, and how much their families spend on these foods per month. Students will then calculate the average cost of food per year. Students will research and calculate the rising costs of these foods in the future and discuss ways to alleviate these costs. What things may they have to sacrifice in the future in order for their families to have these foods? What are the alternatives?

Standards of Learning:

Virginia Standards of Learning:

Science-ES.1, ES.3, ES.7, ES.9, PS.1, PS.6, PS.7, LS.1, LS.6, LS.7, LS.12, 6.1, 6.2, 6.5, 6.6, 6.9

Math-6.9, 6.10, 6.14, 7.4, 7.5, 7.12, 8.3, 8.6, 8.13, 8.14

National STEM Standards:

Science Standards 11, 12, and 13

Technology Standards 1, 2, 3 and 6

Engineering Education Standards 5, 6, and 7

Mathematics Standards 1, 2, 3, 4, 6 and 9

Agricultural Education Standards 1 and 2

Economics 1, 3, 4 and 5

Language Arts Standards 1-10

Life Skills – Thinking and Reasoning Standards 1-6

Life Skills – Working with Others Standards 1-5

Methods and Activities:

Students will use information obtained through the previous lessons to understand the rising costs of common foods in relation to rising fuel costs. Students will complete a survey addressing the following questions:

List 10 foods that you purchase the most every month

Where do you purchase these foods? (grocery store, big box store, food bank, etc.)

What is the average cost of each item?

How much do you spend monthly on each item?

Students will use the data collected to determine the average annual cost per household of purchasing these foods. Students will then use the current cost of fuel and food miles from last lesson to determine the actual cost of these foods. Students will research how much the cost of these items has risen in the past year. Students will conduct research using online resources to determine the economic challenges already present in their local community and what impacts rising foods costs could have on those challenges. Students will use this data to discuss local community needs and offer alternatives such as buying local, growing their own food, etc. Students will present research, data, and solutions using the media outlet they deem most effective (ppt, website, blog, brochure, poster, etc.)

Materials/Resources/Partners:

Computer with Internet access
Presentation software such as ppt, weebly, etc.
Whiteboard with markers
Poster materials (poster board, pictures, markers, etc.)

Lesson 5: Service Project Selection - Have we got what you need?

In this lesson, students will participate in activities that will allow them to identify a food-based need in the local community through class discussions, group discussions, and community interviews. Based on the previous lesson, students will determine the extent of rising food costs on the local community through a series of community interviews. Once the interview responses are collected and analyzed, students will brainstorm and determine their meaningful, community service-learning project.

***Note: Students will begin planting their school garden this week in preparation for their service-learning project.

Standards of Learning:

Virginia Standards of Learning:

Science-ES.1, ES.3, ES.7, ES.9, PS.1, PS.6, PS.7, LS.1, LS.6, LS.7, LS.12, 6.1, 6.2, 6.5, 6.6, 6.9

National STEM Standards:

Science Standards 11, 12, and 13
Technology Standards 1, 2, 3 and 6
Language Arts Standards 1-10
Life Skills – Thinking and Reasoning Standards 1-6
Life Skills – Working with Others Standards 1-5

Methods and Activities:

During this lesson, student groups will use the guided activity of “community mapping” to assess the local communities needs and assets. Groups will then present these findings to the class for a whole group discussion and analysis of the greatest needs. The greatest community resources that may be able to help address these needs are also discussed. Once students have identified the community resources (such as the local food bank, religious organizations that provide meals, etc.), each group will choose one organization/person to interview. Students will complete the guided worksheet provided by YouthServe America’s Semester of Strategy Guide. Students will then conduct the interviews either in person, via phone, or email correspondence. All interview responses will be documented in a student “book” and used to guide their service-learning project. Students will write a personal reflection based on discussion questions presented in the above mentioned worksheet packet.

Materials/Resources/Partners:

Computer with Internet access
Interview template with sample questions from YouthServe America’s Semester of Service Strategy Guide 2011 (pg. 36-40)
Whiteboard with markers
Student brainstorming materials (paper, pencils, markers, etc.)

Student journals

Lesson 6: Green Jobs - You mean they will pay me to do this?!?!

Students will take a field trip to a local organic farm to learn about agricultural jobs and the demand of green “best practices” and technology in this sector. Students will also be able to see “from farm to table” in action and experience the benefits of grow local-eat local. After the field trip, students will attend a mock “community fair” where they will have the opportunity to discuss green vocations with real workers in the field.

Standards of Learning:

Virginia Standards of Learning:

Science-ES.1, ES.3, ES.7, ES.9, PS.1, PS.6, PS.7, LS.1, LS.6, LS.7, LS.12, 6.1, 6.2, 6.5, 6.6, 6.9

Math-6.9, 6.10, 6.14, 7.4, 7.5, 7.12, 8.3, 8.6, 8.13, 8.14

History – CE.1, CE.11

National STEM Standards:

Science Standards 11, 12, and 13

Engineering Education Standards 5, 6, and 7

Agricultural Education Standards 1 and 2

Economics 1, 3, 4 and 5

Language Arts Standards 1-10

Methods and Activities:

Part 1 of this lesson involves students attending a field day at a local organic farm. Students will learn about farming and what types of jobs are available in this sector. Students will also learn how trends have changed over the years and what types of education they will need to pursue careers in this sector. During Part 2 of this lesson, students will attend a mock “career fair” and be exposed to a number of green careers. Students will meet and interview workers from a variety of green jobs in the Richmond area. Students will be able to reflect on their own educational goals, career paths, and how they can make a difference just by choosing a certain career.

Materials/Resources/Partners:

Transportation to organic farm (farm site TBD)

Professionals from various green career fields (TBD)

Student journals

Additional Resources

Mid-continent Research for Education and Learning 2011 <http://www.mcrel.org/standards-benchmarks/index.asp>

World Without Oil – presented by ITVS Interactive <http://worldwithouthoil.org>

Oxfam Education – Resources http://www.oxfam.org.uk/education/resources/world_food_crisis/?284

Youth Serve America. (2011). *Semester of service strategy guide*. DOI: www.ysa.org/semester

Partners

The Backyard Farmer – <http://www.backyardfarmer.us/>

Henrico PALs – <http://www.henricopal.org/>

VCU Campus Kitchen – <http://vcu.collegiatelink.net/organization/ramsfedrichmond>

School Partners/Parent Volunteers – Fairfield Middle School

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Service-Learning

What

According to the National Service-Learning Clearinghouse, "Service-learning is a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities...The distinctive element of service-learning is that it enhances the community through the service provided, but it also has powerful learning consequences for the students or others participating in providing a service."

- Service-learning
 - is positive, meaningful and real to the participants
 - involves cooperation rather than competition
 - promotes deeper learning because it involves complex problems in complex settings rather than simplified problems in isolation
 - requires the participants to research issues, evaluate data and propose solutions which helps them to develop the habits of inquiry and critical thinking rather than only drawing upon generalized or abstract information
 - includes structured reflection activities involving thinking, discussing and writing about their service project
- Service-learning can:
 - take place in a number of settings, including schools and community-based organizations
 - involve a single group of students, a single class, or a grade level or an entire school
 - Extending learning beyond the classroom and into the community
- Service-learning projects can include:
 - direct action - responding to a community need through interaction with and impact on the service beneficiary or site.
 - indirect action- building or improving infrastructure or capacity to respond to a community need
 - advocacy - gathering and reporting information to increase awareness of a problem and/or advocating for a change in conditions affecting a community need



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So What

“A national study of Learn and Serve America programs suggests that effective service-learning programs improve grades, increase attendance in school, and develop students' personal and social responsibility.” - (http://www.learnandserve.gov/about/service_learning/index.asp)

Service-Learning offers young people the opportunity to solve real-world problems through the practical application of what they are learning in the academic environment. It fosters the development of 21st Century skills such as creativity, critical thinking, communication and collaboration.

Students who participate in Service-Learning become active, contributing community members and the bonds between the school and the community are strengthened. Partner organizations not only benefit from the service provided by the participants, they contribute to the students' growth by exposing them to diverse viewpoints, positive role models and real-world career possibilities. By fostering partnerships between the school and the community, Service-Learning helps the community partners become supporters of and advocates for the students.

To learn more about service-learning visit:

www.servicelearning.vcu.edu

www.servicelearning.org/what-service-learning.

www.ysa.org/about

www.nylc.org

Now What

Many schools have volunteerism and community service opportunities as a formal part for the educational experience. Investigate the possibility of expanding one of these service opportunities to include a “green” Service-Learning. Possible projects include:

- runoff management involving native plant gardens, rain barrels, pervious landscaping and pavement
- energy conservation awareness including a school energy audit, community education on conservation and alternative energy topics and the inclusion of alternative energy sources as part of the school's energy usage plan.
- starting or improving a school or community recycling program
- Other ideas can be found at:
 - <http://www.servicelearning.org/>
 - <http://www.epa.gov/osw/education/pdfs/svclearn.pdf>
 - <http://www.gotoservicelearning.org/search-plans>
 - <http://www.plt.org/greenschools>



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The Numbers Impact of Recycling

Grade Levels: 6 – 12

Objective: To explore issues related to recycling and renewable resources on both global and local levels. Students will track the success of the recycling Service-learning project and develop presentations for fellow students and the public.

Standards:

National Science Education Standards

Unifying Concepts & Processes; Standard A - Science as Inquiry; Standard E - Science & Technology; Standard F - Science in Personal and Social Perspectives

National Council of Teachers of Mathematics Standards

Numbers & Operations: 6-8; Measurement: 6-8; Problem Solving: 6-8; Communication: 6-8

National Educational Technology Standards

Standard 1 - Creativity and Innovation; Standard 3 - Research and Information Fluency; Standard 4 - Critical Thinking, Problem Solving, and Decision Making

Virginia Standards of Learning

Science: 6.9, LS. 11, LS.12

Mathematics: 6.1, 6.2, 6.9

Maryland State Curriculum (Grade 6-8)

Science: 1A, 1B, 1D, 6A

Mathematics: 1.B, 4.A, 4.B

Technology Education: Engineering Design and Development



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Background: Students will tour the school cafeteria and grounds and identify any concerns. They will list the negative aspects of leaving these areas in their current condition, make a list of people who could

Materials:

Numbers Impact of Recycling Webquest, <http://zunal.com/webquest.php?w=154627>

Computers

Numbers of Recycling worksheet

Garbage Dreams Game Rules

Procedure:

Day 1

1. Introduction to the Webquest: Students will be guided through the steps needed to complete this webquest, including how to access the webquest (<http://zunal.com/webquest.php?w=154627>) and work to be accomplished each day. Behavioral expectations are also discussed. Students are paired with a partner previously determined by teacher.
2. After the introduction to the webquest, students receive The Numbers of Recycling worksheet and the Garbage Dreams Game Rules.
3. Teacher will circulate through the classroom, monitoring students and assessing the work. With 30 minutes of class time remaining, discuss the movie and how it made the students feel, as well as the answers on their worksheets. Teacher collects all papers.

Day 2

4. Students continue work on webquest after receiving their papers, and reminders based on activities and discussions from previous class. With 20 minutes of class time, remaining discuss the day's activities, as well as the answers on their worksheets.

Day 3

5. Students continue work on webquest after receiving their papers, and reminders based on activities and discussions from previous class. With 20 minutes of class time, remaining discuss the day's activities, as well as the answers on their worksheets.

Day 4

6. Students continue work on webquest after receiving their papers, plus the Game Playing Strategies worksheet, and reminders based on activities and discussions from previous class. With 20 minutes of class time, remaining discuss the day's activities, as well as the answers on their worksheets.

Day 5

7. Students continue work on webquest after receiving their papers, and reminders based on activities and discussions from previous class. With 20 minutes of class time, remaining discuss the day's activities, as well as the answers on their worksheets.

Day 6

8. Students will create a poster using information gathered from the webquest.

Extensions:

Green Jobs and Careers:

The Bureau of Labor Statistics (<http://www.bls.gov/green/>) defines green jobs as:

“Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources.” And “Jobs in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources.”

1. Have students investigate the types of jobs are suited to their personality, skills and interests by using these online resources. The personality test center helps identify career options based on personality indicators and the O*NET tool uses interests and skills to suggest potential careers. Students can choose to use both tools and compare the results or use each tool individually.
 - a. Personality Career Tool Activity: Complete your Meyers Briggs type indicator at the online site.
 - i. Go to www.personalitytest.net/cgi-bin/q.pl
 - ii. Answer the 68 quick “either/or” questions. Choose your best answer to each question.
 - iii. When you click “RESULTS” your personality type will be listed.
 - iv. With your four letter reference type, choose an occupation from the list that might help suit your type and is a job that you might be interested in exploring.
 - v. The listing can be found by clicking “Green Jobs List” at <http://www.ctenergyeducation.com/greenjobs.htm>
 - vi. Do a web search of the listed resource sites and other sites to find out more about the job you chose.
 - What training/background is required?
 - What is the entry-level pay or average pay for this occupation?
 - Do there seem to be any jobs available in this occupation? If so where are they?

- After completing your research are you more or less interested in this occupation that when you started? Explain why.
- b. O*NET Interest Profiler Activity: Complete the O*NET Interest Profiler
- i. Go to <http://www.mynextmove.org/explore/ip> and complete the interest profiler
 - ii. Answer the quick 60 questions with your best answers for each question.
 - iii. When you have finished your interests will be shown in a graph, click Next to see the jobs suited to your interests.
 - Where any of the jobs you chose green jobs? If not you can go to www.onetonline.org/find/green to search the green economy jobs sector.
 - iv. For the jobs listed, choose ones you are interested in.
 - What training/background is required?
 - What is the entry-level pay or average pay for this occupation?
 - Do there seem to be any jobs available in this occupation? If so where are they?
 - After completing your research are you more or less interested in this occupation that when you started? Explain why.
2. Have the students investigate green jobs related to their project topics. Suggested resources:
- <http://www.bls.gov/green/greencareers.htm>

Service-learning Projects:

Have students design a service-learning project implementing a green solution at your school or in your community.

1. Create a brochure or display explaining the project topics. Share this information at community or PTA meeting or Earth Day celebration.
2. Develop a fun lesson for K-2 students at the school. Have upper-grade student present this lesson to the young students in the school.

To learn more about service-learning, visit www.servicelearning.vcu.edu and <http://www.servicelearning.org/what-service-learning>.

Additional Resources

- <http://www.pbs.org/independentlens/garbage-dreams/game.html>
- http://www.educationworld.com/a_lesson/03/lp308-02.shtml : student teams will have a relay race to sort recyclables and non-recyclables. (celebration)
- http://www.educationworld.com/a_lesson/03/lp308-04.shtml : students will discover how long it takes different types of trash to decompose in a landfill.
- http://www.kitsapgov.com/sw/pdf/3089_ard.pdf : America Recycles Day (November 15) packet from Kitsap, Washington

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