

Port Operations and Logistics – Sustainability and STEM Careers

LESSON PLAN

Subject: Science Technology Engineering and Math (STEM)

Unit: 3

Lesson Title: Port Logistics

Sessions Number: 3

Number of Sessions:
approximately 16 - 90 minute
blocks

Objective(s): After given instruction, the student will:

1. Research

- a. Apply digital tools to gather, evaluate, and use information.
- b. Gain mapping skills using Google Earth software or other mapping software.
- c. Explore training and careers in port logistics.
- d. Explore operations and management in port logistics.

2. Design

- a. Plan and manage activities to develop a solution or complete a Port logistics project.
- b. Develop and analyze a storyboard.
- c. Demonstrate creative thinking, problem solving, and develop innovative products and processes.
 - a. Work as a member of a design team.
 - b. Apply existing knowledge to generate new ideas, products, or processes.

3. Model Creation

- a. Design/Model a transportation, distribution, or warehousing process in a port facility.
- b. Create visualizations using basic design skills, graphing, image processing, 2D and 3D modeling, animation and simulation.

4. Presentation

- c. Demonstrate understanding of technological concepts, and systems in maritime port operations for commerce.
- d. Manipulate and manage data, including the use of spreadsheets and application of mathematical principles.

- e. Use computer data input and output devices that handle audio, video, static graphic, and alphanumeric-based information.
- f. Create and deliver multimedia presentations.
- g. Use appropriate marine terminal, modeling, and simulation terms in context.

5. Develop 21st Century Skills – Student/Learner 3.0: "The Teacher"

<http://www.youtube.com/watch?v=hENtGSrOj5Y>

(Show students this video and discuss their reaction prior to beginning instruction)

- a. Use flexibility and adaptability throughout the project process.
- b. Develop self-directed skills to produce quality products.
- c. Work in diverse teams to complete projects on time.
- d. Develop leadership, responsibility, social skills, collaboration skills, and cultural awareness.

Materials/Technology Integration:

Text:

- Word processing software
- Presentation software (e.g. 3ds Max, Sketch Up, Premiere Elements, Movie maker, Photo Story, Powerpoint)
- Computer with Internet access and a web browser that is Java –enabled
- Electronic Portfolio
- [Storyboard template](#)
- Video camera

- Multimedia Projector
- VPA-Maps:
<http://media1.vit.org/teamdocs/porttours/TourMaps.pdf>
- Mapping software e.g. Google Earth
- Graph paper
- Pencil and paper
- Visio or other flowcharting program
- Excel or other spreadsheet program



Anticipatory Set: Virginia port operations are vital not only to Virginia's economic growth but also to the US economy. However, a problem of the Port of Virginia is the landside area where the containers are temporarily stored – often referred to as the container yard. A container yard is a port facility at which containers are accepted for loading onboard ships, and off - loaded containers are delivered for eventual delivery to their market destination. Therefore, the limiting factor for future container handling capacity will always be available container yard space.

Craney Island is important to the future of the Norfolk Ports. The Craney Island Marine Terminal will provide over 500 acres of additional container handling space. It will provide necessary capacity that will allow The Port to grow in the future.

The Virginia Port Authority (VPA) and the U.S. Army Corps of Engineers (USACE) are partnering to construct the Craney Island Eastward Expansion project. Construction of the eastward expansion is scheduled to begin in 2010 and the first phase of the marine terminal is planned to be operational by 2020. The undertaking will generate \$6 billion in National Economic Development (NED) benefits over the 50-year life of the project.

Ask students: What are some goods they use that come from the ports of Virginia? Allow students the opportunity to discuss their understanding of impacts on port traffic in their community and their results.

Estimated Time: 15 Minutes

Correlation with Virginia Standards of Learning:

English: 10.4

Mathematics: A.1, A.2, A.4, G.2, G.3, G.10, G.12 and All-T.2

Science: PH.1, PH.2

History and Social Science: WHII.1, WHII.6, WHII.8

The overall goal of these activities is to empower students to use 21st century tools in a learning process that requires critical and creative thinking, collaboration, and problem solving. The immediate goal is to engage students in hands-on, less abstract learning.

The ultimate goal is preparing students for work and life in a changing economy that demands participants who are creative and innovative thinkers in addition to being skilled digital-age workers. *The following activities are designed to be used in order or randomly as the teacher sees fit based on student needs. The activities were developed with differentiation in mind for both product and process.*

Evaluation: Assigned Activities

1. Students successfully answer 75% of the post test questions.
2. Review storyboard for correctness.
3. Students complete an animated model or 2d drawing of an operational movement of cargo within the Port.
4. Students present and explain their portion of the project to their team and the other members of the class.
5. Present completed model/drawing to the class for peer critique.
6. Review Notes: It is suggested that each student have a project notebook to organize their work throughout the projects. If possible, this notebook can be an online project notebook. Online notebooks may be created with many different free online tools. Two possibilities are: Google Docs (<http://docs.google.com>) and Wiki spaces (<http://www.wikispaces.com/>). Teams working together may organize their work in a shared online project notebook.

Estimated Time: As Noted

Closure:

<p>Homework: None</p>	<p>Reflections:</p>
<p>Procedure: Guided Practice (Instructional Strategies)</p> <p>Project #1: Administer the Port Logistics Pre Test section to students. Explain that The results on this test will help identify their understanding and learning needs.</p> <p>Estimated Time: 3 Minutes</p> <p>Project #2: Present Port Operations and Logistics PowerPoint presentation section on Port Logistics to students. Also show video of NOAA administrator discussing the importance of maritime trade in the US and some of the latest maritime navigation systems to aid port navigation. http://www.youtube.com/watch?v=Ry7nr7AiStQ</p> <p>Estimated Time: 35 Minutes</p> <p>Project #3: Assign students the activity of defining the terms on Terminology worksheet and use them in context. This can be a team assignment where one member defines and the other team member using the word in context</p> <p>Estimated Time: 5 Minutes</p> <p>Project #4: Invite guest speaker to discuss port operations with students. Craney Island Expansion Academic Outreach Contact Form:</p> <p>Estimated Time: 25 Minutes</p> <p>Project #5: Explain to students the benefits of the deep water access in the Hampton Roads. Demonstrate how to fly to</p>	<p>Procedure: Independent Practice:</p> <p>Project #1: Answer to the best of your ability the Port Logistics Pre Test section questions. The results on this test will help identify your understanding and learning needs.</p> <p>Estimated Time: 15 Minutes</p> <p>Project #2: Listen and analyze Port Operations and Logistics PowerPoint presentation section on Port Logistics. Also watch NOAA administrator discuss the importance of maritime trade in the US. http://www.youtube.com/watch?v=Ry7nr7AiStQ Take notes to ensure understanding. Ask questions and be an active learner.</p> <p>Estimated Time: 35 Minutes</p> <p>Project #3: Define the terms on Terminology worksheet and use them in context as directed by your teacher.</p> <p>Estimated Time: 25 Minutes</p> <p>Project #4: Listen to a Port professional and ask questions about the day to day operations. Complete the guest speaker worksheet and discuss at the conclusion of the presentation. http://craneyisland.info/educationservices.html</p> <p>Estimated Time: 25 Minutes</p> <p>Project #5: Explain the benefits of the deep water access in the</p>

Craney Island using Google Earth at lat-lon *N 36.89098 and W -76.3355*. Have students note the surroundings and make a list important land and water features.

Estimated Time: 5 Minutes

Project #6: Show the [Norfolk International Terminals](#) “Ride the Tide” and Virtual Tour videos to develop background knowledge port operations and logistics.

Estimated Time: 5 Minutes

Project #7: Show and discuss this port transfer loading operation have students brainstorm ways that it could be more efficient. Direct students to model and animate this process or a more efficient one.

<http://www.youtube.com/watch?v=0eAgTsjLTU>

Estimated Time: 10 Minutes

Project #8: Demonstrate the purpose and process of using a [storyboard](#). Be sure student work is copyright friendly and permission is obtained to distribute their work following the Acceptable Use Policies (AUP) within your school district. Use the following lesson as a guide.

<http://www.adobe.com/education/instruction/adsc/pdf/storyboards.pdf>

Show video of: Disney – The Art of Storyboarding

<http://filmmakeriq.com/pre-production/storyboarding/disney-the-art-of-storyboarding.html>

Hampton Roads. Demonstrate how to fly to Craney Island using Google Earth at lat-lon *N 36.89098 and W -76.3355*. Note the surroundings and make a list of important land and water features which make this an ideal location for a port facility.

Estimated Time: 25 Minutes

Project #6: View the [Norfolk International Terminals](#) “Ride the Tide” and Virtual Tour videos to develop background knowledge which will help you with your modeling assignment.

Estimated Time: 20 Minutes

Answer questions on [Video worksheet](#).

Estimated Time: 20 Minutes

Project #7: View this port transfer loading operation and consider ways that it could be more efficient. Model and animate a more efficient process.

<http://www.youtube.com/watch?v=0eAgTsjLTU>

Estimated Time: 20 Minutes

Project #8: Develop a [storyboard](#) for a port operation e.g. Transload, or other terminal operation. See various [port pictures](#).

Watch video of: Disney – The Art of Storyboarding

<http://filmmakeriq.com/pre-production/storyboarding/disney-the-art-of-storyboarding.html> This will provide background and guidance on the storyboarding process.

Direct student teams to organize, plan, and design a modeled scene of a port operations of their choosing.

Estimated Time: 5 Minutes

Project #9: Show the Northport commercial. Organize student teams to develop a similar commercial for Craney Island using your 3d modeling and animation tools.

<http://www.youtube.com/watch?v=mufmB-DThC8&feature=related>

Estimated Time: 5 Minutes

Project #10: Provide students with an overview of using a spreadsheet to organize data and make it useful in problem solving and decision making. Have students use this web site: Waterborne Commerce of the United States (WCUS)

Waterways and Harbors on **Sheet 33:**

http://www.iwr.usace.army.mil/ndc/wcsc/webpub/Part1_Ports_ton_sbycomm.HTM

- a. Determine the number of short tons of peanuts shipped to domestic locations from our ports in 2007.
- b. What was the largest export commodity in 2007?

From this web site Waterborne Commerce of the United States (WCUS)

Waterways and Harbors on **Sheet 38:**

http://www.iwr.usace.army.mil/ndc/wcsc/webpub/Part1_Ports_ton_sbyTT_Dr_Yr_comm.HTM

Estimated Time: 55 Minutes

Project #9: View the Northport commercial. You and your team will develop a similar commercial for Craney Island using your 3d modeling and animation tools.

<http://www.youtube.com/watch?v=mufmB-DThC8&feature=related>

Estimated Time: 460 Minutes

Project #10: From this web site: Waterborne Commerce of the United States (WCUS)

Waterways and Harbors on **Sheet 33:**

http://www.iwr.usace.army.mil/ndc/wcsc/webpub/Part1_Ports_ton_sbycomm.HTM

- a. Determine the number of short tons of peanuts shipped to domestic locations from our ports in 2007.
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From this web site Waterborne Commerce of the United States (WCUS)

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- c. Plot on an excel spreadsheet the total amount of commodities shipped and received in the Hampton Roads port from 2003 through 2007. From the

[sbyTT Dr Yr comm.HTM](#)

- c. Have students to plot on an excel spreadsheet the total amount of commodities shipped and received in the Hampton Roads port from 2003 through 2007. Ask students to determine the trend for both shipped and received commodities over this period.
- d. How many short tons of total coal were shipped from Hampton Roads in CY2007?

Estimated Time: 10 Minutes

Project #11: Have students go to the following web site and explore various port related careers.

<http://port.thinkport.org/workingattheport/default.asp>

After students have explored various careers, allow them to select or assign them a career/job to develop a PowerPoint (ppt) presentation on. Discuss the [PowerPoint rubric](#)

Estimated Time: 10 Minutes

Project #12: Have students go to the following web site and use the children's coloring book to teach their younger family members about port operations. This can be given as a homework assignment or students can teach younger students in your school division.

http://www.portoflosangeles.org/education/jr_crew.asp

Estimated Time: 5 Minutes

data entered, develop a chart in the spreadsheet graphing the following. What is the trend for both shipped and received commodities over this period?

- d. How many short tons of total coal were shipped from Hampton Roads in CY2007?

Estimated Time: 40 Minutes

Project #11: go to the following web site and explore various port related careers.

<http://port.thinkport.org/workingattheport/default.asp>

You may select or I will assign you a career/job to develop a PowerPoint presentation on. After you develop your ppt, you will present your finding to the class. [See PowerPoint rubric](#)

Estimated Time: 90 Minutes

Project #12: go to the following web site and use the children's coloring book to teach your younger family members about port operations. Your instructor may assign as a homework assignment or as an assignment to teach younger students in your school division. (Consider the youngsters grade level and attention span)

http://www.portoflosangeles.org/education/jr_crew.asp

Estimated Time: 20 Minutes

Project #13: go to the following web site and listen to the

Project #13: Have students go to the following web site and listen to the [presentation on Marine Transportation and Careers](#).

http://education-portal.com/directory/category/Transportation_and_Distribution/Marine_Transportation.html

Have students research and list courses that may be taken in a college major leading to a degree in Marine Transportation.

Estimated Time: 5 Minutes

Project #14: Have students create a simple flow chart identifying a port logistics operation such as trucks entering the port facility. See this site for details:

<http://www.hollyfield.kingston.sch.uk/gcseit/GCSE/algoflow.htm>

Estimated Time: 10 Minutes

Project #15: Assign students to use an online Harbormaster Daily Report of Shipping, to determine how many ships are currently ported at the Port of Mobile. Also which country has the most flagged ships currently ported there?

Estimated Time: 5 Minutes

Project #16: Assign students to read an article in the [Virginia Maritimer Magazine](#) at

<http://www.portofvirginia.com/corporate/human-resources/benefits.aspx>

Or the Alabama Seaport online magazine at

http://www.asdd.com/newsroom_seaportmag.html

After reading the article students may do a PowerPoint

[presentation on Marine Transportation and Careers](#).

http://education-portal.com/directory/category/Transportation_and_Distribution/Marine_Transportation.html

After listening carefully to the presentation, research and list courses that may be taken in a college major leading to a degree in Marine Transportation.

Estimated Time: 45 Minutes

Project #14: create a simple flow chart identifying a port logistics operation such as trucks entering the port facility. Add as much detail as possible and consider unique variables. See this site for details:

<http://www.hollyfield.kingston.sch.uk/gcseit/GCSE/algoflow.htm>

Estimated Time: 40 Minutes

Project #15: Using an online Harbormaster Daily Report of Shipping, determine how many ships are currently ported at the Port of Mobile. Which country has the most flagged ships currently ported there?

Estimated Time: 15 Minutes

Project #16: Read an article in the [Virginia Maritimer Magazine](#) at

<http://www.portofvirginia.com/corporate/human-resources/benefits.aspx>

Or the Alabama Seaport online magazine at

http://www.asdd.com/newsroom_seaportmag.html

After reading the article you may do a PowerPoint presentation

presentation to the class on their selected article or write a 1 page review of the article.

Estimated Time: 5 Minutes

Project #17: Have students go to the [Port of Virginia](https://employment.portofvirginia.com/applicants/jsp/shared/application/CreateApplicant_css.jsp?createType=1) site https://employment.portofvirginia.com/applicants/jsp/shared/application/CreateApplicant_css.jsp?createType=1 to develop skills on how to fill out an online job general job application. Review the Frequently Asked Questions section with students. Also review Port of Virginia human resource benefits at <http://www.portofvirginia.com/corporate/human-resources/benefits.aspx> You may have students pair up and read about one of the 11 benefit areas and share with their partner.

Estimated Time: 10 Minutes

Project #18: Have students review the statistics on the [Port of Virginia spreadsheet](#) and answer the following [Port of Virginia questions](#).

Estimated Time: 5 Minutes

Project #19: Administer the Port Logistics [Post Test](#) section to students. Explain that The results on this test will help identify their understanding of the instruction presented.

Estimated Time: 3 Minutes

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Additional Resources:

to the class on your selected article or write a 1 page review of the article.

Estimated Time: 35 Minutes

Project #17: Go to the [Port of Virginia](https://employment.portofvirginia.com/applicants/jsp/shared/application/CreateApplicant_css.jsp?createType=1) site https://employment.portofvirginia.com/applicants/jsp/shared/application/CreateApplicant_css.jsp?createType=1 to develop skills on how to fill out an online job general job application. Review the Frequently Asked Questions section with your teacher. Also review Port of Virginia human resource benefits at <http://www.portofvirginia.com/corporate/human-resources/benefits.aspx> pair up and read about one of the 11 benefit areas and share with their partner.

Estimated Time: 30 Minutes

Project #18: Review the statistics on the [Port of Virginia spreadsheet](#) and answer the following [Port of Virginia questions](#).

Estimated Time: 25 Minutes

Project #19: Answer to the best of your ability the Port Logistics [Post Test](#) section questions. The results on this test will help identify how well you learned the objectives of the instruction.

Estimated Time: 15 Minutes

- The online journal of advanced technology for ports and terminals - <http://www.porttechnology.org/>
- International Trade Education Programs - [ITEP Inc. - Home](#)
- The Journal of Commerce - <http://www.joc.com/>
- Port A Transportation System - <http://port.thinkport.org/workingattheport/default.asp>
- Transportation education and training solutions - <http://onlinepubs.trb.org/Onlinepubs/trnews/trnews257.pdf>
- Opportunity Inc. Job Resources - http://www.opp-inc.org/job_search_resources#
- McHenry Community College Transportation, Warehousing and Logistics studies - <http://www.mchenry.edu/twl/index.asp>
- SEVAPORT News on M&S High school programs collaboration with Junior Achievement - <http://seva-port.org/news/news.html#news3>
- The Port of Virginia - <http://www.portofvirginia.com/>
- Teaching Port operations Outreach programs - <http://www.aapa-ports.org/files/PDFs/sec5.pdf>
- HPTI Hamburg Port Training Institute GmbH -

http://www.hpti.de/port_operations_courses.html

- Mid-Atlantic Maritime Academy – www.MamaTrains.com
- Top schools for transportation and distribution - http://education-portal.com/articles/Top_Schools_for_Transportation_and_Distribution.html
- TWIC site - <https://twicprogram.tsa.dhs.gov/TWICWebApp/Welcome.d>
[o](#)