BRIGANTINE PUBLIC SCHOOLS

TECHNOLOGY CURRICULUM

GRADE SEVEN

Date Revised: August 2015
Board Approved: August 27, 2015

SUBJECT: Technology - STEM
GRADE LEVEL: Seventh Grade
UNIT: Box Kite Project

PACING GUIDE/STANDARDS

One Marking Period

8.2.8.A.1 – Research a product that was designed for specific demand and identify how the product has changed to meet new demands.
8.2.8.A.2 – Examine a system, consider how each part relates to other parts and discuss a part to redesign to improve the system
8.2.8.A.3 – Investigate a malfunction in any part of a system and identify its impacts

Interdisciplinary Connections:

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

21st Century Themes and Skills (Life and Careers):

CRP2 – Apply appropriate academic and technical skills.
CRP6 – Demonstrate creativity and innovation.
CRP7 – Employ valid and reliable research strategies.
CRP8 – Utilize critical thinking to make sense of problems and preserve in solving them.
CRP11 - Use technology to enhance productivity.

Instructional Activities	Materials	Modifications	Assessment/Benchmarks
Box Kite Construction • Construct and attach perpendicular cross-pieces to 36-inch external dowels • Cut and wrap box on both ends with 11 by 36 inch piece of plastic • Attach 36-inch string to one external dowel and attach kite string at 14-inch mark • Calculate surface area of plastic on box kite Calculate volume of box kite Research the History of First Flight • Complete the web quest of the Wright Brothers at Kitty Hawk Explore Bernoulli's Principle Complete three classroom activities to understand how air pressure affects a plane's ability to fly First Flight at Kitty Hawk Video • Recreate the first flight at Kitty Hawk by making a film of flying their constructed kite Recreation of time period (similar environment, clothing, equipment, etc.) How To Make A Box Kite Video Create a video tutorial on how to construct a box kite	Internet Research Dowel and Kite Material Video Equipment and editing software Kitty Hawk Web quest http://www.archives.ncdcr.gov/educationalresources/wrightbrothers_lesson.html Bernoulli's Principle Explorations http://www.pbs.org/kcet/chasingthesun/resources/resources_lessons.html	Allow students to work with a partner Chunk information into small parts Choice Board Provide extra time to complete assignments Handouts	Oral Questioning Rubrics for Each Project Final Box Kite and Measurements

SUBJECT: Technology
GRADE LEVEL: Seventh Grade
UNIT: IMovie – Using and Making Movies in iMovie

PACING GUIDE/STANDARDS

Marking Period

8.1.8.A.1 – Demonstrate knowledge of a real world problem using digital tools.

Interdisciplinary Connections:

CCSS.ELA-LITERACY.W.7.4
Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

21st Century Themes and Skills (Life and Careers):

CRP2 – Apply appropriate academic and technical skills.
CRP4 – Communicate clearly and effectively and with reason.
CRP7 – Employ valid and reliable research strategies.
CRP8 – Utilize critical thinking to make sense of problems and preserve in solving them.
CRP11 - Use technology to enhance productivity.

Instructional Activities	Materials	Modifications	Assessment/Benchmarks
Introduce iMovie to the students. Discuss the different editing features in IMovie using a direct instruction lesson. Have the students type a document consisting of ten interview questions, partner groups of two, discuss filming interview techniques, film their interview questions. Edit the video using IMovie. Publish Interview to be shown and discussed with class. Discuss perspective and storyboarding. Use iMovie to create a one-minute movie about any object. A day in the life of "X", an inanimate object, which could be a water bottle, a rock, your planner, but not a person. This movie cannot contain any speaking, but must contain music to create the mood. The goal of this project is for the audience to empathize with the main character and for you to think visually.	Google Drive Internet IMovie Cameras	Allow students to work with a partner Chunk information into small parts Provide written notes for struggling students Provide graphic organizers Provide extra time to complete assignments	Rubric Class Assignment Sheet Finished Project

SUBJECT: Technology
GRADE LEVEL: Seventh Grade
UNIT: IMovie – Public Service Announcement Video

PACING GUIDE/STANDARDS

Marking Period

8.1.8.A.1 – Demonstrate knowledge of a real world problem using digital tools.
8.1.8.C.1 – Collaborate to develop and publish work that provides perspectives on a global problem for discussions with learners from other countries.
8.1.8.E.1 – Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.

Interdisciplinary Connections:

CCSS.ELA-LITERACY.W.7.2
Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

21st Century Themes and Skills (Life and Careers):

CRP2 – Apply appropriate academic and technical skills.
CRP4 – Communicate clearly and effectively and with reason.
CRP7 – Employ valid and reliable research strategies.
CRP8 – Utilize critical thinking to make sense of problems and preserve in solving them.
CRP11 - Use technology to enhance productivity.

Instructional Activities	Materials	Modifications	Assessment/Benchmarks
Brainstorm a class list of local and world problems (climate change, overpopulation, beach erosion, etc.) Students will choose a topic for their PSA. Students will research their topic using online and print resources. Students will film their PSA using a variety of camera options. Students will edit their PSA using IMovie. Students will be able to use Royalty free video clips to use in their movies to support their view. Students will publish their movies to their portfolio and or online blog to be discussed.	Google Drive Internet IMovie Cameras	Allow students to work with a partner Chunk information into small parts Provide written notes for struggling students Provide graphic organizers Provide extra time to complete assignments	Rubric Class Assignment Sheet Finished Project

SUBJECT: Technology - STEM
GRADE LEVEL: Seventh Grade
UNIT: Water Rocket Project

PACING GUIDE/STANDARDS
One Marking Period

8.2.8.C.1 – Explain how different teams/groups can contribute to the overall design of a product
8.2.8.C.2 – Explain the need for optimization in the design process
8.2.8.C.3 – Evaluate the function, value and aesthetics of a technological product or system, from the perspective of the user and the producer**.**
8.2.8.C.4 – Identify the steps in the design process that would be used to solve a designated problem.
8.2.8.C.5 – Create a technical sketch of a product with materials and measurements listed.
8.2.8.C.7 – Collaborate with peers and experts in the field to research and develop a product using the design process, data analysis and trends, and maintain a design log with annotated sketches to record the development cycle**.**
8.2.8.C.8 – Develop a proposal for a chosen solution that includes models to communicate the solution to peers

Interdisciplinary Connections:

CCSS.ELA-LITERACY.RST.6-8.7
Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

21st Century Themes and Skills (Life and Careers):

CRP2 – Apply appropriate academic and technical skills.
CRP6 – Demonstrate creativity and innovation.
CRP7 – Employ valid and reliable research strategies.
CRP8 – Utilize critical thinking to make sense of problems and preserve in solving them.

Instructional Activities	Materials	Modifications	Assessment/Benchmarks
Class discussion on the proper techniques for performing internet research. Students will work in small groups to perform the required research about Newton. Students will work together to comprehend information obtained through the internet research. Students will synthesize opinions on the impacts of Newton's contributions in today's society. Class discussion connecting knowledge of Newton's Law's obtained in lesson 1 to rockets and water bottle rockets. Students will work in small groups to perform research on the history of rockets and create a timeline of this history. Students will then use small group discussion to answer questions of how to use Newton' Laws while designing their water bottle rockets. Students will work in groups to create isometric drawings of water bottle rockets both by hand and using the computer resources available. Students will work in groups to create orthographic drawings of water bottle rockets. Students will work in small groups to run the computer simulations adjusting the different variables/parameters to determine the effects each has on the bottle rocket. Students will then analyze the results in small group discussion to determine the optimal situations to make the rocket perform the best. Students will work in small groups to design an original water bottle rocket based upon the knowledge obtained from earlier lessons. Students will then construct the bottle rocket they designed. Students will show their comprehension of the concepts through an oral presentation. Students will synthesize a conclusion based on the performed research and the results of the evaluation of the data collected from the launches.	Internet Research NASA's Beginning Rockets http://microgravity.grc.nasa.gov/education/rocket/bgmr.html Web 2.0 drawing tool Simulation Websites www.grc.nasa.gov/www/k-12/bottlerocket http://phet.colorado.edu/en/simulation/projectile-motion Laboratory Equipment required to launch the rocket	Allow students to work with a partner Chunk information into small parts Choice Board Provide extra time to complete assignments Handouts	Oral Questioning Sliding Scale for all parts of project Final Presentation Rubrics