



BRIGANTINE PUBLIC SCHOOLS
TECHNOLOGY CURRICULUM
GRADE EIGHT

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

SUBJECT: Technology - STEM
GRADE LEVEL: Eighth Grade
UNIT: Bridge Building and Design

PACING GUIDE/STANDARDS

One Marking Period

- 8.2.8.D.1** – Design and create a product that addresses a real world problem using a design process under specific constraints
- 8.2.8.D.2** – Identify the design constraints and trade offs involved in designing a prototype by completing a design problem and reporting results in multimedia presentation, design portfolio or engineering notebook
- 8.2.8.D.3** – Build a prototype that meets a STEM based design challenge using science, engineering, and math principles that validate a solution.
- 8.2.8.D.4** – Research and publish the steps for using and maintaining a product or system and incorporate diagrams or images throughout to enhance user comprehension.
- 8.2.8.D.5** – Explain the impact of resource selection and the production process in the development of a common or technological product or system.
- 8.2.8.D.6** – Identify and explain how the resources and processes used in the production of a current technological product can be modified to have a more positive impact on the environment

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.
- CRP11** - Use technology to enhance productivity.

Instructional Activities	Materials	Modifications	Assessment/Benchmarks
<p>Class discussion on the proper techniques for performing internet research.</p> <p>Discuss modeling and how important it is that modeling be done with precision so students can figure out if plan will work and get a chance to rework the pieces.</p> <p>Students will focus on theoretical knowledge, apply it to a virtual model, use their plans and virtual model to build a physical model of their bridge, test the weight limits of their bridge, present findings in a focused, coherent manner with evidence, sound reasoning, and well chosen details.</p> <p>Have students prepare a class presentation on what goes into creating an effective bridge and present.</p> <p>When presentations are complete, each student begins a WPBD. This is student directed.</p> <p>Discuss mathematical formulas used and discuss why students picked the tools they did to make decisions.</p> <p>After virtual bridge is built, save to portfolio. Create a project website on Google Sites and include: how student came up with design, how design changed as bridge was built, geometric shapes used, strength of bridge, changes they would make next time, screenshots, how to information, insights and analysis, facts, definitions, and examples.</p> <p>Students now build their bridge using the balsa wood and design they came up with.</p> <p>Bridges will be tested to see how much weight they hold before breaking.</p> <p>Students will then add photos and analysis to the project website that they built using the WPBD design.</p>	<p>Internet Research</p> <p>West Point Bridge Designer</p> <p>Links on class web page</p> <p>Balsa Wood and Utility Knives</p> <p>Calculator</p>	<p>Allow students to work with a partner</p> <p>Chunk information into small parts</p> <p>Choice Board</p> <p>Provide extra time to complete assignments</p> <p>Handouts</p>	<p>Oral Questioning</p> <p>Sliding Scale for all parts of project</p> <p>Final Website</p> <p>Bridge Construction</p> <p>Rubrics</p>

SUBJECT: Technology - STEM
GRADE LEVEL: Eighth Grade
UNIT: Principles of Engineering - Robotics

PACING GUIDE/STANDARDS
One Marking Period

8.2.8.A.4 – Redesign an existing product that impacts the environment to lessen its impact(s) on the environment.

8.2.8.A.5 - Describe how resources such as material, energy, information, time, tools, people, and capital contribute to technological product or system.

Interdisciplinary Connections:

CCSS.ELA-LITERACY.W.8.2

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.

CRP6 – Demonstrate creativity and innovation.

CRP7 – Employ valid and reliable research strategies.

CRP8 – Utilize critical thinking to make sense of problems and persevere in solving them.

CRP11 - Use technology to enhance productivity.

Instructional Activities	Materials	Modifications	Assessment/Benchmarks
<p>Class discussion on the proper techniques for performing internet research.</p> <p>Students trace the history, development, and influence of automation and robotics.</p> <p>They learn about mechanical systems, energy transfer, machine automation and computer control systems.</p> <p>Students will use a robust robotics platform to design, build and program a solution to solve an existing problem that would help the environment.</p> <p>Students will begin to recognize the value of an engineering notebook to document and capture their ideas.</p> <p>They are introduced to and use the design process to solve problems and understand the influence that creative and innovative design has on their lives.</p> <p>Students use standard 3D Modeling software to create a virtual image of their designs and produce a portfolio to showcase their creative solution.</p> <p>Students investigate the impact of energy on our lives and the environment.</p> <p>They design and model alternative energy sources.</p> <p>Students evaluate ways to reduce energy consumption through energy efficiency and sustainability.</p> <p>Design a presentation showing their findings.</p>	<p>Internet Research</p> <p>Computer Modeling Software</p> <p>Robotic Kits</p> <p>Computers</p> <p>Calculator</p> <p>Portfolio</p> <p>Notebook</p>	<p>Allow students to work with a partner</p> <p>Chunk information into small parts</p> <p>Choice Board</p> <p>Provide extra time to complete assignments</p> <p>Handouts</p>	<p>Oral Questioning</p> <p>Sliding Scale for all parts of project</p> <p>Final Website</p> <p>Rubrics</p>

SUBJECT: Technology
GRADE LEVEL: Eighth Grade
UNIT: Computer Troubleshooting

PACING GUIDE/STANDARDS

Full Marking Period

- 8.2.8.E.1** – Identify ways computers are used that have had an impact across the range of human activity and within different careers when they are used
- 8.2.8.E.2** – Demonstrate an understanding of the relationship between hardware and software
- 8.2.8.E.3** – Develop an algorithm to solve an assigned problem using a specified set of command and use peer review to critique the solution
- 8.2.8.E.4** – Use appropriate terms in conversation
- 8.2.8.C.6** – Collaborate to examine a malfunctioning system and identify the step-by-step process used to troubleshoot, evaluate and test options to repair the product, presenting the better solution

Interdisciplinary Connections:

CCSS.ELA-LITERACY.RST.6-8.4

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*

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

- CRP2** – Apply appropriate academic and technical skills.
- CRP4** – Communicate clearly and effectively and with reason.
- CRP8** – Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP11** - Use technology to enhance productivity.

Instructional Activities	Materials	Modifications	Assessment/Benchmarks
<p>Discuss use of computer in today’s world. Students list ways they use computers today.</p> <p>Discuss computer hardware and vocab sheet.</p> <p>Direct lesson on parts of computer.</p> <p>Students will take apart a computer</p> <p>Follow lesson on rebuilding computer.</p> <p>Discuss the steps in the rebuilding of computer.</p> <p>Students will then fix a computer that is set up wrong.</p> <p>Discuss BIOS and how that runs computer.</p> <p>Discuss and install software onto computer.</p> <p>Troubleshoot software issues on computer.</p> <p>Installing more RAM and Hard Drives into computers and discussing compatibility.</p> <p>Discuss Laptops and similarities and differences to computers they are working on.</p> <p>Students will create their own how to presentation on building computers (video, step by step document, power point)</p>	<p>Internet Research</p> <p>Computer Hardware Vocab</p> <p>Old Computers</p> <p>Laptops</p> <p>Portfolio</p>	<p>Break task down into manageable steps</p> <p>Provide graphic organizer to assist with process</p> <p>Work with partner</p> <p>Written Tutorial</p> <p>Choice Board</p>	<p>Performance Based Assessments</p> <p>Computer End Test</p> <p>Computer Vocab Labeling</p> <p>Class Discussion</p>

SUBJECT: Technology
GRADE LEVEL: Eighth Grade
UNIT: Computer Graphics

PACING GUIDE/STANDARDS

Full Marking Period

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

8.1.8.A.2 – Create a document using one or more digital applications to be critiqued by professionals for usability.

8.1.8.B.1 – Synthesize and publish information about a local or global issue or event.

Interdisciplinary Connections:

CCSS.ELA-LITERACY.W.8.2.A

Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.

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 persevere in solving them.

CRP11 - Use technology to enhance productivity.

Instructional Activities	Materials	Modifications	Assessment/Benchmarks
<p>Introduce students to Photoshop and the tools in Photoshop. Basic coloring project using the fill tool, magic wand tool, gradient tool, and texture tool</p> <p>Understanding Fonts and Layers– students recreate famous logos using their name but finding and using the correct fonts. Fruit Bowl – students will use photos of fruit and an empty bowl to make their own fruit bowl to understand layers. Movie Poster – students will recreate a famous movie poster with new photos that they find. Students create their own cartoon character and design a cereal box based on their character. Use layers, fonts, background images, and cereal boxes to make a cereal box. After choosing an issue, students will use what they have learned to create a poster to show this issue.</p> <p>Understanding Color – students will recreate a black and white image and recolor it to make it look colorized. Discuss importance of doing this with old photos.</p> <p>Upload to online portfolio.</p>	<p>Internet Research</p> <p>Photoshop CS2</p> <p>Pixlr</p> <p>Online Photoshop</p> <p>Portfolio</p>	<p>Break task down into manageable steps</p> <p>Provide graphic organizer to assist with process</p> <p>Work with partner</p> <p>Written Tutorial</p> <p>Choice Board</p>	<p>Printed Documents</p> <p>Class Discussion</p>