123D Design Ipad App Review

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Center Moriches School District

Grade: 9-12

Subject: Technology Education

Standards: ITEA Standards

- Standard 1: Students will develop an understanding of the characteristics and scope of technology.
- Standard 2: Students will develop an understanding of the core concepts of technology.
- Standard 3: Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.
- Standard 6: Students will develop an understanding of the role of society in the development and use of technology.
- Standard 8: Students will develop an understanding of the attributes of design.
- Standard 9: Students will develop an understanding of engineering design.
- Standard 10: Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.
- Standard 11: Students will develop abilities to apply the design process.
- Standard 12: Students will develop abilities to use and maintain technological products and systems.
- Standard 19: Students will develop an understanding of and be able to select and use manufacturing technologies.

MST Standard 5

- 5.1 Engineering design is an iterative process involving modeling and optimization used to develop technological solutions to problems within given constraints.
- 5.3 Computers, as tools for design, modeling, information processing, communication, and system control, have greatly increased human productivity and knowledge.

Common Core

CCSS.ELA-Literacy.RST.9-10.3
Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

CCSS.ELA-Literacy.RST.9-10.4
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 9-10 texts and topics*.

CCSS.ELA-Literacy.RST.9-10.5
Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., *force, friction, reaction force, energy*).

CCSS.ELA-Literacy.RST.9-10.10
By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.

CCSS.ELA-Literacy.RST.11-12.3
Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

CCSS.ELA-Literacy.RST.11-12.4
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 11-12 texts and topics*.

CCSS.ELA-Literacy.RST.11-12.10
By the end of grade 12, read and comprehend science/technical texts in the grades 11-CCR text complexity band independently and proficiently.

Location: 123D Design is available through iTunes - This app is free

Description: Our students will be graduating into a world that is becoming more and more dependent on electronics. Our society is finding ways to use computers programs to improve the cost, efficiency, and quality of our products and services. It is of the upmost importance that our students become technologically literate, so they can compete in a world of virtual models, computer aided designing and CNC technologies such as 3D printing.

123D Design is part of a collection of 123D Apps made by Autodesk including 123D Creature, 123D Sculpt, 123D Make, and 123D Catch.

This software is a very simplified version of Autodesk Inventor, an engineering design software used by professionals every day to make things from guitars to cars. This software helps new users to understand the basic concepts and theories behind how a 3D modeling software works. With limited, yet powerful, tools the student will not be

overwhelmed by all the tool options, but will still be able to play and design many things. There are basic geometric shapes called "primitives" as well as a library of pre made parts that will allow users to make an assembly. The tools provided will teach the students how to navigate around their object and make selections. The editing tools will allow them to snap, align, combine objects, subtract objects, fillet, chamfer, extrude, shell, color, and scale objects. This software works in solids, and the designs made on the iPad can be further edited on the PC version of 123D Design which has many more editing tools. The students designs on the iPad can also be exported as an STL file, emailed and then printed on a 3D printer.

Incorporation:

The fun, touch screen based program feels very inviting to kids, and is a great way to inspire them to get engaged in the world of virtual design. This motivation can then naturally lead to the use of 123D Design for the PC which will introduce many more tools, further preparing them to use the industry grade software, Inventor. Autodesk is the company that has created all of these programs with this purpose in mind, and I think it is a great tool for teachers to get the job done.

I have only had access to one iPad, and I have seen the students create some really cool designs. Other students have begun downloading this software on their own iPads, almost as if it is a cool new game. The software has a great built in tutorial, with noninvasive tool descriptions every time you select a new tool.

I used the iPad 2, which struggled at times to process the powerful software causing it to have a delay in my actions at times. Students with newer versions of the iPad did not experience this.

I believe that schools with iPads could easily use 123D Design as a starting point for teaching solid modeling software. They could even have the students start different design assignments at home, and then import their designs onto the more powerful PC version for final editing. Over time, I think this software will find its way to the middle school and even elementary school, as our society becomes more technologically savvy.

Below are some student built assemblies using pre made parts from the parts library: