Unit Planner: Unit 4: Innovative Designer Technology 5

Last updated August 1, 2019

Unit 4: Innovative Designer

Stage 1: Desired Results	
General Information The unit calendar is flexible and can be taught when it best fits. Students use a variety of technologies within a design process to solve problems by creating new, useful or imaginative solutions.	**Essential Question(s)** ● How can I develop a plan and use digital tools to solve problems and make informed decisions? ● How can I represent, analyze, test, and validate my data? ● What was my result and how can I synthesize my data for future learning?
Enduring Understandings and Knowledge ● Students will utilize the design process. ● Students will use digital tools to design algorithms and solve problems. ● Students will collaborate to conclude if the design worked.	**Skills** **Engineering:** ● Participates in the cyclical design process which includes generating ideas and developing, testing, and refining prototypes/models. **Coding:** ● Use a guided program to create simple code ● Use block programming language to create ● Explain and interpret binary code ● Create sequencing and patterns ● Debug your code ● Create a loop ● Use conditional statements ● Create and use functions and variables **3D Design**: ● Solve a problem, create a solution and design a product for a 3D printer ● Understand the 3D design process ● Explain the 3D design process in relation to solving a problem ● Understand and explain the real world connection to 3D printing
Connections to Catholic Identity / Other Subjects Cross-curricular project-based learning experiences should be coordinated with content area teachers based on their pacing guide. **Religion -** Use a 3D printing software to create an ornament for your class Jesse tree. **Social Studies -** Research colonial trades and design a	**Vocabulary** ● innovation ● data ● validate ● 3D design ● 3D printer ● filament

tool for 3D printing for one of the trades	- coding - block coding - design process - problem - solution - prototype - research - requirements - redesign - develop - algorithm - binary - bit - bug - variable - function - command - loop - conditional - debug - drag and drop - if statement - input - output - parameter - pixel - program - layers - CAD

Standards & Frameworks Addressed

ISTE: Educational Technology (2016)
ISTE: All Grades

3. Knowledge Constructor
Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. Students:

d. build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

4. Innovative Designer
Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:

a. know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

b. select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

c. develop, test and refine prototypes as part of a cyclical design process.

d. exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

5. Computational Thinker
Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:

a. formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

b. collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to

facilitate problem-solving and decision-making.

c. break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

d. understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

2016 ISTE Standards
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