

Collaboration & Design Thinking

Unit #: APSDO-00099541
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Grade(s): 5
Subject(s): Informational Digital Literacy
Course(s): GR. 5 - INFORMATIONAL DIGITAL LITERACY

Unit Focus

In this unit, students will utilize the design thinking process to create, code, and program. Students will apply their learning in a variety of contexts that may include designing and creating an individual video or making buttons, writing code to solve various challenges, and programming small robotics. Primary instructional materials include button making materials and online resources (e.g., American Button Making software, Screencastify video software Code.org and Ozoblockly.com software).

Stage 1: Desired Results

Established Goals

Standards

- ISTE Standards (2016)
 - *ISTE Standards for Students*
 - Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. (4)
 - Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems (4.a)
 - Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks. (4.b)
 - Students develop, test and refine prototypes as part of a cyclical design process. (4.c)
 - Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems. (4.d)
 - 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. (5)
 - Students formulate problem definitions suited for technology assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions. (5.a)
 - Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions. (5.d)
 - Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning

Transfer

What kinds of long-term, independent accomplishments are desired? Students will be able to independently use their learning to...

- T1 (T103) Collaborate with others toward common goal(s) where everyone has a voice in both design and ownership of the work.
- T2 (T106) Develop and refine a solution to a student-generated question or challenging problem using a design process.
- T3 (T104) Engage in positive and respectful interactions in physical and/or virtual forums to broaden perspectives and deepen knowledge.

Meaning

Understanding(s)

Essential Question(s)

<p>by collaborating with others and working effectively in teams locally and globally. (7)</p> <ul style="list-style-type: none"> ▪ Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints. (7.b) <ul style="list-style-type: none"> • AASL Standards Framework for Learning <ul style="list-style-type: none"> ◦ Shared Foundations and Key Commitments: All Grades <ul style="list-style-type: none"> ▪ COLLABORATE <ul style="list-style-type: none"> ▪ Think: Deciding to solve problems informed by group interaction. (IDL.COL.03) ▪ Create: Using a variety of communication tools and resources. (IDL.COL.04) ▪ Create: Establishing connections with other learners to build on their own prior knowledge and create new knowledge. (IDL.COL.05) ▪ EXPLORE <ul style="list-style-type: none"> ▪ Create: Problem solving through cycles of design, implementation, and reflection. (IDL.EXP.04) ▪ Create: Persisting through self-directed pursuits by tinkering and making. (IDL.EXP.05) ▪ Share: Co-constructing innovative means of investigation. (IDL.EXP.07) ▪ Share: Collaboratively identifying innovative solutions to a challenge or problem. (IDL.EXP.08) 	<p><i>What specifically do you want students to understand? What inferences should they make? Students will understand that...</i></p> <p>U1 (U700) Working to find creative solutions to a complex problem is an iterative process that requires perseverance and flexible thinking.</p> <p>U2 (U701) As one's knowledge base increases, the quality of thinking, meaning-making, and communication can improve.</p> <p>U3 (U401) Effective collaborators work to achieve a best possible outcome through constructive and interdependent conversations and actions.</p> <p>U4 (U400) Effective collaborators recognize and leverage others' individual knowledge and skills to achieve a goal.</p>	<p><i>What thought-provoking questions will foster inquiry, meaning making, and transfer? Students will keep considering...</i></p> <p>Q1 (Q700) What problem are we trying to solve? (K-1) What information do I need in order to help me find a viable solution? How does better understanding the problem help us imagine viable solutions? (2-12)</p> <p>Q2 (Q402) What is our goal? How are we working together to reach it?</p> <p>Q3 (Q600) How does access to the digital world allow people to interact and share ideas?</p> <p>Q4 (Q701) How do we design and test a solution? How can we use feedback to make a better design?</p> <p>Q5 (Q401) What's my responsibility in the collaboration and how can everyone's ideas and feedback help us achieve our goals?</p>
	Acquisition	
	Knowledge	Skill(s)
	<p><i>What facts and basic concepts should students know and be able to recall? Students will know...</i></p> <p>K1 How to utilize the iterative nature of the design process</p> <p>K2 How to access and use various design and programming software</p> <p>K3 How to apply basic coding/programming concepts</p> <p>K4 That collaboration is essential to group efficiency and productivity</p> <p>K5 That creativity and self expression are integral to producing original work</p>	<p><i>What discrete skills and processes should students be able to use? Students will be skilled at...</i></p> <p>S1 Using the design process to plan and implement</p> <p>S2 Reflecting upon their process and improving their product</p> <p>S3 Self regulating, interacting, and contributing positively to collaborative ventures</p> <p>S4 Using specific software to design, create, and program</p> <p>S5 Using logic, algorithms, and various coding languages and practices to solve programming challenges</p>