AVON PUBLIC SCHOOLS

Collaborative Design Thinking

Unit #: APSDO-00100311 **Team:** Julia Cowans-Wilhelm (Author)		**Grade(s):** 6 **Subject(s):** Informational Digital Literacy **Course(s):** GR. 6 - INFORMATIONAL DIGITAL LITERACY

Unit Focus

In this unit students will students will utilize the design thinking process to create, build, code, and program. Students will apply their learning in a variety of contexts that may include designing and building a marshmallow tower, creating origami, designing and making buttons, designing and creating an individual video, writing code to solve various challenges, and programming small robotics. Primary instructional materials include building, origami, and button making materials and online resources (e.g., American Button Making software, Screencastify video software, Code.org and Khan Academy web-based accounts.

Stage 1: Desired Results

Established Goals	Transfer

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
	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)

broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally. *(7)*
- Students use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints. *(7.b)*
- AASL Standards Framework for Learning
  - *Shared Foundations and Key Commitments: All Grades*
    - COLLABORATE
      - Think: Demonstrating their desire to broaden and deepen understandings. *(IDL.COL.01)*
      - 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
      - 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)*

What specifically do you want students to understand? What inferences should they make? Students will understand that...

U1 (U700) Working to find creative solutions to a complex problem is an iterative process that requires perseverance and flexible thinking.

U2 (U701) As one's knowledge base increases, the quality of thinking, meaning-making, and communication can improve.

U3 (U401) Effective collaborators work to achieve a best possible outcome through constructive and interdependent conversations and actions.

U4 (U400) Effective collaborators recognize and leverage others' individual knowledge and skills to achieve a goal.

U5 (U600) What users download to their devices and share online impact the safety of themselves and those connected to them.

What thought-provoking questions will foster inquiry, meaning making, and transfer? Students will keep considering...

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)

Q2 (Q402) What is our goal? How are we working together to reach it?

Q3 (Q701) How do we design and test a solution? How can we use feedback to make a better design?

Q4 (Q500) How do I say what is on my mind and do it in a respectful way?

Q5 (Q600) How does access to the digital world allow people to interact and share ideas?

Q6 (Q501) How do I safely share information and appropriately engage with others online?

Acquisition	
Knowledge	**Skill(s)**
What facts and basic concepts should students know and be able to recall? Students will know...	*What discrete skills and processes should students be able to use? Students will be skilled at...*
K1 How to utilize the iterative nature of the design process	S1 Using the design process to plan and implement
K2 How to access and use various design and programming software	S2 Reflecting upon their process and improving their product
K3 How to apply basic coding/programming concepts	S3 Self regulating, interacting, and contributing positively to collaborative ventures
K4 That collaboration is essential to group efficiency and productivity	S4 Using specific software to design, create, and program
K5 That creativity and self expression are integral to producing original work	S5 Using logic, algorithms, and various coding languages and practices to solve programming challenges