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Connecting STEM with Design Thinking

Dawn M. White
Gwinnett County Public Schools, demwhite@gmail.com

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Connecting STEM with Design Thinking

Georgia Scholarship of STEM Teaching and Learning Conference
March 4, 2016
Welcome

Connecting STEM with Design Thinking

- In order to provide you with the information you desire, please write the following on the index card:
  - 3 things you want to learn during this session
  - Your name
  - Email address

Keep your card! I will collect them later!
Meet Presenter

- Dr. Dawn White, Technology Coach, Gwinnett County Public Schools
  - 20 years teaching gifted – primarily creativity & critical thinking
  - 10 years teaching science and technology

- Passion – provide students with the tools they need to succeed in the 21st and beyond!
- Researcher – stay abreast of current trends
Agenda

- Overview of design thinking
- Design thinking in educational settings
- Integrating design thinking in STEM lessons
- Examples of STEM and design thinking schools
  - The Vista Innovation and Design Academy
  - Bayside STEM Academy
Overview of Design Thinking

https://www.youtube.com/watch?v=a7sEoEvT8l8
Design Thinking

- A strategy for innovation to solve complex problems:
  - Different from creative problem solving, future problem solving, etc. because:

- **EMPATHIZE:** Work to fully understand the experience of the user for whom you are designing. Do this through observation, interaction, and immersing yourself in their experiences.

- **DEFINE:** Process and synthesize the findings from your empathy work in order to form a user point of view that you will address with your design.
Design Thinking

- **IDEATE:** Explore a wide variety of possible solutions through generating a large quantity of diverse possible solutions, allowing you to step beyond the obvious and explore a range of ideas.

- **PROTOTYPE:** Transform your ideas into a physical form so that you can experience and interact with them and, in the process, learn and develop more empathy.

- **TEST:** Try out high-resolution products and use observations and feedback to refine prototypes, learn more about the user, and refine your original point of view.

Design Thinking in Education

- https://www.youtube.com/watch?v=LhQWrHQwYTk

- Design Thinking for Educators Toolkit
  - http://www.designthinkingforeducators.com/

- Design Thinking Teaching Guide
  - https://dschool.stanford.edu/sandbox/groups/k12/wiki/14340/attachments/e55cd/teacher%20takeaway.pdf?sessionID=8a1e74f8bb3ba42c03074c699312098f74be7bb3
Educational Tool

- Edutopia (George Lucas Foundation) – Design Thinking

- Design Thinking Projects

- Integrates with Problem Based Learning
- Used to improve school performance
- Connects with STEM
Poll

- Elementary Teachers
- Middle School Teachers
- High School Teachers
- Administers
- STEM teachers
- Familiar with design thinking
The STEM Connection

- Integrating design thinking in STEM lessons
- What do you think a STEM lesson looks like integrating design thinking?
- 4Cs: Creativity, Communication, Collaboration, Critical thinking
- Project Based Learning
- Makerspace
Shipping for Survival: lesson focuses on how packaging engineers develop customized shipping and packaging containers to meet the needs of many different industries.

Students learn about different packages that have been engineered to transport hearts for surgery, blood for analysis, and foods to retain freshness.

Students then work in teams to build a container that will allow a flower to be shipped without damage and with water using everyday items. Flowers must remain and not wilted for 24 hours after being sealed in the box.
Comparing STEM with Design Thinking
Design Thinking Lesson Plan
Examples of Schools

- The Vista Innovation and Design Academy – middle school
  - [http://vida.vistausd.org/](http://vida.vistausd.org/)

- Bayside STEM Academy – middle school
  - [http://stem.schoolloop.com/](http://stem.schoolloop.com/)

- Denver School of Innovation and Sustainable Design – high school
Questions Answered?

- Review your index card information - the things you wanted to learn
- Circle the item(s) I did not cover
- Bring your card to me
- My goal is to email you any questions I did not answer during this presentation.
Thank you for coming!

Contact Information:
- Dr. Dawn White
- Rock Springs Elementary School
- Gwinnett County Public Schools
- drdawnedconsult@gmail.com