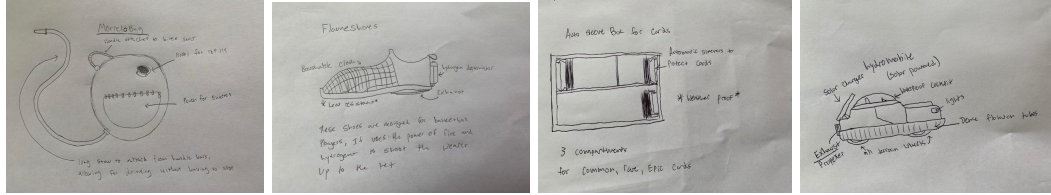


Lesson Plan: Designing a Prototype

Grade level: K-12



Duration: 3-4 class periods

Media Type: paper, colored pencils, markers, graphite pencils

Subject Integration or Collaboration: Business / Entrepreneurship and/or Science

Objective: To create a prototype for an invention or design idea

Assessment:

Rubric:

4-Standards are exceeded

3-Standards are met

2-Standards may be met at a very low quality or with some exceptions

1-Standards are not met

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Vocabulary:

Visual Arts Elements/Principles:

color	shape	line	texture	balance	unity	proportion	form
value	space	contrast	emphasis	movement	pattern	rhythm	

Materials and Procedure:

Day 1: Share the following *Making It Up North* video with students:

<https://makingit.wdse.org/watch/ride-romp-bags> (7:00)

Discussion Questions:

Zach likes to bike. Zach designs functional bags to carry his essential gear. How did Zach come to name his ROMP bags? What does ROMP stand for? What does Zach enjoy about creating his gear bags? How does Zach keep his business organized? How did he come up with the designs for his bags?

Students are given blank sheets of paper to start sketching their design ideas. Students are encouraged to come up with any design idea that they may wish to invent.

Further discussion:

“Have you ever wished you could invent an item, an object that would help you with something you enjoy doing?” “Have you ever thought you could design something that

would work better than what is out on the market currently?” “What would you name this idea?” “Where did this idea come from?”

Day 2-3:

Students create 3-4 design ideas. Students choose one of the four ideas to create a final drawing. Students share their ideas with their peers / small groups.

Extensions:

Students present their design ideas to the whole class. Students design a tri-fold project to show their design ideas from start to finish. Students carry out their design ideas at home by creating an actual prototype to bring back to school to share with their peers.

Students think about other design ideas: designing buildings (architects), designing roads (city planner), etc. Students create maps and designs for areas in their own neighborhoods or cities.

Websites/ Links:

[Book: Designing for Kids](#)

[Book: Maker Projects for Kids](#)

[Book: Designing with Pixar](#)

[Book: Designing Streets for Kids](#)

[Kids Think Design \(link\)](#)

[Video: Students learn to create prototypes \(video: 2:36\)](#)

[Design Thinking for Students \(video: 5:15\)](#)

[Design Thinking: A Problem Solving Framework \(video: 5:22\)](#)

[Ted Talk: What? How? Why? When? \(video: 18:35\)](#)

Further Understanding:

Enduring Understanding: Artists and designers experiment with forms, structures, materials, concepts, media, and art-making approaches.

Essential Question(s): How do artists work? How do artists and designers determine whether a particular direction in their work is effective? How do artists and designers learn from trial and error?

[National Standards for Visual Arts](#) (link)

Sample Standards:

VA:Cr1.1.4a Brainstorm multiple approaches to a creative art or design problem.

VA:Cr2.1.5a Experiment and develop skills in multiple art-making techniques and approaches through practice.

VA:Cr3.1.4a Revise artwork in progress on the basis of insights gained through peer discussion.

VA:Re9.1.6a Develop and apply relevant criteria to evaluate a work of art.

[Minnesota Family and Consumer Science Framework](#)

Sample benchmarks:

Minnesota Frameworks: 1. Students demonstrate knowledge and skills necessary for success in further education, career and life.

MMSFACS1.1.5 Family, career, community, and global connections

MMSFACS1.1.3 Aptitudes, abilities, interests, motivations

The Practice of Engineering

- explore materials constructively during free exploration
- design and make an object to solve a problem

Science: Interactions Among STEM and Society

- explain how engineered products and design services impact the natural world
- plan how to solve a problem using the engineering design process.
- test and evaluate engineering design solutions and communicate results
- describe how one invention leads to new inventions