Unit 4: Engineering Entrepreneurship

Content Area: **Technology**
Course(s): **Engineering Design 1**
Time Period: **November**
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Transfer Skills

Successful entrepreneurs are persistent, creative, responsible, inquisitive, goal-oriented, independent, self-confident, risk-taking, action-oriented, and enthusiastic.

Enduring Understandings

1. Successful entrepreneurs are persistent, creative, responsible, inquisitive, goal-oriented, independent, self-confident, risk-taking, action-oriented, and enthusiastic.

2. There are many rewards associated with going into business for yourself, as well as many risks.

3. Entrepreneurs play a vital role in our economy.

4. The ability to recognize new opportunities and think creatively is essential for success in today's global market.

5. Engineering entrepreneurship involves the balance of effective design with the realization of the business world and the need for profit, growth and sustainability.

6. The presentation and communication of a new product can often be as important, if not more important, than the actual product design and function.

7. Entrepreneurship requires effective interpersonal and communication skills.

Essential Questions

1. What characteristics are important in order to be a successful entrepreneur?

2. Does entrepreneurship mean you always have to work alone?

3. What are the risks and rewards associated with entrepreneurship?

4. How are new products developed and marketed?

5. Why is a feasibility study an important part of a business plan?

6. How do the business principles of profit, growth and sustainability influece the design of products?

Content

Vocabulary:

Iteration, Mockup, Analysis, Design process, Proof of concept, Innovation, Specifications, Possible solution, Prototype, Evaluation, Invention, Demand, Free enterprise, Feasibility analysis, Business plan, Target customer, Sustainability

Skills

1. Describe what entrepreneurs contribute to the economy.

2. Analyze entrepreneurship from a historical perspective.

3. Name the five components of the entrepreneurial start-up process.

4. Identify the rewards of going into business for yourself.

5. Recognize the risks of entrepreneurship.

6. Describe background, characteristics, and skills of successful entrepreneurs.

7. Develop a potential product that could be used to start an idependent business.

8. Conduct a feasibility analysis of a potential new product.

9. Present a business plan to a group of peers for review and feedback.

Resources

Engineering drawing tools (various)

Engineering drawing paper

Calipers

Physical objects to be measured

Teacher presentation device

Document camera

Desktop computers

Research database access

2D & 3D CAD systems

3D printer

Laser cutter

Color laser printers

Large format printer

Prototyping equipment (hand-held and power tools)

Prototyping materials

Prototyping furniture

Presentation device

Standards

PFL.9.1.12.A.6	Summarize the financial risks and benefits of entrepreneurship as a career choice.
PFL.9.1.12.B.1	Prioritize financial decisions by systematically considering alternatives and possible consequences.
TECH.8.1.12.A.CS2	Select and use applications effectively and productively.
TECH.8.1.12.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
TECH.8.1.12.B.CS2	Create original works as a means of personal or group expression.
TECH.8.1.12.C.1	Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.
TECH.8.1.12.C.CS2	Communicate information and ideas to multiple audiences using a variety of media and formats.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.2.12.A.1	Propose an innovation to meet future demands supported by an analysis of the potential full costs, benefits, trade-offs and risks, related to the use of the innovation.
TECH.8.2.12.A.3	Research and present information on an existing technological product that has been repurposed for a different function.
TECH.8.2.12.C.5	Create scaled engineering drawings of products both manually and digitally with materials and measurements labeled.
TECH.8.2.12.D.1	Design and create a prototype to solve a real world problem using a design process, identify constraints addressed during the creation of the prototype, identify trade-offs made, and present the solution for peer review.
TECH.8.2.12.D.3	Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.