Industry Sector: Manufacturing and Product Development; Business and Finance; Marketing, Sales, and Services; Engineering and Architecture; Information and Communication Technologies

Career Pathway Emphasis: Product Innovation and Design; Graphic Production Technologies; Business Management; Entrepreneurship; Marketing; Engineering Design; Information Support and Services; Software and Systems Development

Community Partners: Walker Stamping, Amazon, Art Institute

Unit Overview: Students will be learning the basics of building an online business: that a business is a system, composed of sub-systems that are interdependent upon one another, that interact together, and that follow rules and processes for success. This unit will take approximately 8-10 weeks and will incorporate technology, engineering, research, writing, measurement, data analysis, hands-on explorations and investigations, inquiries, and cooperative learning experiences.

Background on Unit: This multi-faceted unit emphasizes the use of 21st century learning skills to gain perspective on the essential facts, concepts, principles, and skills related to the development of a new business. There will be a special focus on using and strengthening technical and design process skills to build the business. In addition, the idea of linked learning and business collaboration will be a large focus as part of the project goals. My main reason for developing this unit is to address the community and global need for public schools to prepare students to be ready to create new small businesses by pursuing entrepreneurism at the local level. In addition, as an avid advocate for at-risk students, I wanted to create a unit that will cater to the unique needs and interests of the direct local community. This unit differs from traditional teaching units, because it is designed to focus on creativity, collaboration, communication, critical thinking, leadership, entrepreneurism, and community connections. It is a multidisciplinary unit with a primary guiding focus on design thinking.

Objective: Students will collaboratively run a start-up online business selling products designed and manufactured using the iSTEAM Lab laser cutter and 3D printer.

Driving Question: How can we work as a team to manage a successful online business?

Common Core State Standards (CCSS):

Reading:
- **RL3.2** Recount stories, including fables, folktales, and myths from diverse cultures; determine the central message, lesson, or moral and explain how it is conveyed through key details in the text.
- **RL3.3** Describe characters in a story (e.g., their traits, motivations, or feelings) and explain how their actions contribute to the sequence of events.
- **RL3.4** Determine the meaning of words and phrases as they are used in a text, distinguishing literal from nonliteral language.
- **RI3.9** Compare and contrast the most important points and key details presented in two texts on the same topic.
- **RI3.2** Determine the main idea of a text; recount the key details and explain how they support the main idea.
- **RI3.5** Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

Writing:
- **W3.3** Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.
  - **W3.3.a** Establish a situation and introduce a narrator and/or characters; organize an event sequence that unfolds naturally.
  - **W3.3.b** Use dialogue and descriptions of actions, thoughts, and feelings to develop experiences and events or show the response of characters to situations.
  - **W3.3.c** Use temporal words and phrases to signal event order.
  - **W3.3.d** Provide a sense of closure.
- **W3.5** With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.
### Innovation and Entrepreneurship

**STEAM Career Unit Planning Template**

**Teacher(S):** Emerson  
**Grade Level(s):** 3, 4

| W3.6 | With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others. |
| W3.1 | Write opinion pieces on topics or texts, supporting a point of view with reasons. |
| W3.8 | Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. |

### Speaking and Listening

**SL3.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.

- **SL3.1.a** Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
- **SL3.1.b** Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
- **SL3.1.c** Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.
- **SL3.1.d** Explain their own ideas and understanding in light of the discussion.

**SL3.4** Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

- **SL3.4.a** Plan and deliver an informative/explanatory presentation on a topic that: organizes ideas around major points of information, follows a logical sequence, includes supporting details, uses clear and specific vocabulary, and provides a strong conclusion.

**SL3.3** Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.

- **SL3.2** Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

### Language

- **L3.1.g** Form and use comparative and superlative adjectives and adverbs, and choose between them depending on what is to be modified.
- **L3.1.h** Use coordinating and subordinating conjunctions.
- **L3.2.c** Use commas and quotation marks in dialogue.
- **L3.2.f** Use spelling patterns and generalizations (e.g., word families, position-based spellings, syllable patterns, ending rules, meaningful word parts) in writing words.
- **L3.4.b** Determine the meaning of the new word formed when a known affix is added to a known word (e.g., agreeable/disagreeable, comfortable/uncomfortable, care/careless, heat/preheat).
- **L3.4.c** Use a known root word as a clue to the meaning of an unknown word with the same root (e.g., company, companion).

### CA ELD Standards

**3P1-1 Exchanging information and ideas:**

- **Emerging**: Contribute to conversations and express ideas by asking and answering yes-no and wh-questions and responding using short phrases.
- **Expanding**: Contribute to class, group, and partner discussions, including sustained dialogue, by following turn-taking rules, asking relevant questions, affirming others, and adding relevant information.
- **Bridging**: Contribute to class, group, and partner discussions, including sustained dialogue, by following turn-taking rules, asking relevant questions, affirming others, adding relevant information, building on responses, and providing useful feedback.

**3P1-6 Reading/viewing closely:**

- **Emerging**: Describe ideas, phenomena (e.g., insect metamorphosis), and text elements (e.g., main idea, characters, setting) based on understanding of a select set of grade-level texts and viewing of multimedia with substantial support.
Expanding: Describe ideas, phenomena (e.g., how cows digest food), and text elements (e.g., main idea, characters, events) in greater detail based on understanding of a variety of grade-level texts and viewing of multimedia with moderate support.

Bridging: Describe ideas, phenomena (e.g., volcanic eruptions), and text elements (e.g., central message, character traits, major events) using key details based on understanding of a variety of grade-level texts and viewing of multimedia with light support.

3P1-8 Analyzing language choices:

Emerging: Distinguish how different words produce different effects on the audience (e.g., describing a character as happy versus sad).

Expanding: Distinguish how different words with similar meanings (e.g., describing a character as happy versus ecstatic) produce shades of meaning and different effects on the audience.

Bridging: Distinguish how multiple different words with similar meanings (e.g., pleased versus happy versus ecstatic, heard versus knew versus believed) produce shades of meaning and different effects on the audience.

3P1-10 Writing:

Emerging: a) Write short literary and informational texts (e.g., a description of a flashlight) collaboratively (e.g., joint construction of texts with an adult or with peers) and sometimes independently. b) Paraphrase texts and recount experiences using key words from notes or graphic organizers.

Expanding: a) Write longer literary and informational texts (e.g., an explanatory text on how flashlights work) collaboratively (e.g., joint construction of texts with an adult or with peers) and with increasing independence using appropriate text organization. b) Paraphrase texts and recount experiences using complete sentences and key words from notes or graphic organizers.

Bridging: a) Write longer and more detailed literary and informational texts (e.g., an explanatory text on how flashlights work) collaboratively (e.g., joint construction of texts with an adult or with peers) and independently using appropriate text organization and growing understanding of register. b) Paraphrase texts and recount experiences using increasingly detailed complete sentences and key words from notes or graphic organizers.

3P2-3 Using verbs and verb phrases:

Emerging: Use frequently used verbs, different verb types (e.g., doing, saying, being/having, thinking/feeling), and verb tenses appropriate for the text type and discipline to convey time (e.g., simple past for recounting an experience).

Expanding: Use a growing number of verb types (e.g., doing, saying, being/having, thinking/feeling) and verb tenses appropriate for the text type and discipline to convey time (e.g., simple past for retelling, simple present for a science description).

Bridging: Use a variety of verb types (e.g., doing, saying, being/having, thinking/feeling) and verb tenses appropriate for the text type and discipline to convey time (e.g., simple present for a science description, simple future to predict).

3P2-4 Using nouns and noun phrases:

Emerging: Expand noun phrases in simple ways (e.g., adding an adjective to a noun) in order to enrich the meaning of sentences and add details about ideas, people, things, etc.

Expanding: Expand noun phrases in a growing number of ways (e.g., adding comparative/superlative adjectives to nouns) in order to enrich the meaning of sentences and add details about ideas, people, things, etc.

Bridging: Expand noun phrases in a variety of ways (e.g., adding comparative/superlative adjectives to noun phrases, simple clause embedding) in order to enrich the meaning of sentences and add details about ideas, people, things, etc.

Next Generation Science Standards (NGSS):

3PS2-1 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

3PS2-4 Define a simple design problem that can be solved by applying scientific ideas about magnets.
### Technology (Based on CDE CCSS K-12 Technology Skills Scope and Sequence and ISTE National Educational Technology Standards):

#### Spreadsheet (Tables, Charts, and Graphs):
- Demonstrate an understanding of the spreadsheet as a tool to record, organize, and graph information.
- Identify and explain terms and concepts related to spreadsheets (i.e. cell, column, row, values, labels, chart, graph).
- Enter/edit data in spreadsheets and perform calculations using formulas.
- Use mathematical symbols (e.g., + add, - minus, *multiply, /divide, ^ exponents).
- Use other applications to make predictions, solve problems and draw conclusions.

#### Multimedia and Presentation Tools:
- Create, edit and format text on a slide
- Create a series of slides and organize them to present research or convey an idea
- Copy and paste or import graphics; change their size and position on a slide
- Use painting and drawing tools/applications to create and edit work

#### Acceptable Use, Copyright and Plagiarism:
- Explain Fair Use Guidelines for the use of copyrighted materials (e.g., text, images, music, video in student projects) and giving credit to media creators.

#### Research and Gathering Information:
- Use age appropriate technologies to locate, collect, organize content from media collection for specific purposes, citing sources.
- Perform basic searches on databases (e.g., library, card catalog, encyclopedia) to locate information
- Use content specific technology tools (e.g., environmental probes, sensors, and measuring devices, simulations) to gather and analyze data.
- Use Web 2.0 tools (e.g., online discussions, blogs and wikis) to gather and share information
- Identify and analyze the purpose of a media message (to inform, persuade and entertain).

#### Communication and Collaboration:
- Work collaboratively online with other students under teacher supervision.
- Use a variety of age-appropriate technologies (e.g., drawing program, presentation software) to communicate and exchange ideas.
- Create projects that use text and various forms of graphics, audio, and video, (with proper citations) to communicate ideas.
- Contribute to project teams to produce original works or solve problems (ISTE).

#### Creativity and Innovation (ISTE):
- Demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
  - Apply existing knowledge to generate new ideas, products, or processes.
  - Create original works as a means of personal or group expression.
  - Use models and simulations to explore complex systems and issues.
  - Identify trends and forecast possibilities.

#### Critical Thinking, Problem Solving, and Decision Making (ISTE):
- Students use critical thinking skills to plan and conducts research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
  - Identify and define authentic problems and significant questions for investigation.
  - Plan and manage activities to develop a solution or complete a project.
  - Collect and analyze data to identify solutions and/or make informed decisions.
  - Use multiple processes and diverse perspectives to explore alternative solutions.

### Engineering (Next Generation Science Standards):
- **3-5ETS1-1** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- **3-5ETS1-2** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- **3-5ETS1-3** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.
Visual and Performing Arts Content Standards:

Visual Arts:
1.4 Compare and contrast two works of art made by the use of different art tools and media (e.g., watercolor, tempera, computer).
2.1 Explore ideas for art in a personal sketchbook.
4.2 Identify successful and less successful compositional and expressive qualities of their own works of art and describe what might be done to improve them.
4.3 Select an artist's work and, using appropriate vocabulary of art, explain its successful compositional and communicative qualities.

Music:
4.3 Describe how specific musical elements communicate particular ideas or moods in music.

Mathematics:

3NF2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.
3NF3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their state.
3NF3.d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

SMP1 Make sense of problems and persevere in solving them.
SMP2 Reason abstractly and quantitatively.
SMP4 Model with mathematics.
SMP5 Use appropriate tools strategically.
SMP6 Attend to precision.

The 4 C’s (Developed from the Industry Knowledge and Performance Anchor Standards)

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<thead>
<tr>
<th>Communication</th>
<th>Collaboration</th>
<th>Critical Thinking</th>
<th>Creativity</th>
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<td><strong>In the Profession:</strong></td>
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<td>● Demonstrate elements of written and electronic communication, such as accurate spelling, grammar, and format.</td>
<td>● Explain the importance of accountability and responsibility in fulfilling personal, community, and workplace roles.</td>
<td>● Evaluate personal character traits, such as trust, respect, and responsibility, and understand the impact they can have on career success.</td>
<td>● Create a portfolio, or similar collection of work, that offers evidence through assessment and evaluation of skills and knowledge competency.</td>
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<td>● Advocate and practice safe, legal, and responsible use of digital media information and communications technologies.</td>
<td>● Identify the characteristics of successful teams, including leadership, cooperation, collaboration, and effective decision-making skills.</td>
<td>● Identify and ask significant questions that clarify various points of view to solve problems.</td>
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**In my Lesson:**
 ● Students will create an e-business.
 ● Students will create and design products.
 ● Each team of students will complete a portfolio of accomplished
## Innovation and Entrepreneurship

### STEAM Career Unit Planning Template

**Teacher(S):** Emerson  
**Grade Level(s):** 3, 4

- Teams will present their portfolios to the management team in a socratic-type discussion.  
- Teams will talk with each other to make decisions and solve problems.  
- Teams will write their summaries of business lessons learned.  

**In my Lesson:**  
- **Students will critically reflect on their contribution to the class project according to a rubric of their portfolios.**  
- **Students will analyze products according to criteria.**

### Career Technical Education Pathway Standards:

#### Engineering Design Pathway:
- Produce proportional two- and three-dimensional sketches and designs.  
- Present conceptual ideas, analysis, and design concepts using freehand, graphic communication techniques.  
- Know how the various measurement systems are used in engineering drawings.  
- Understand the degree of accuracy necessary for engineering design.  
- Develop multiview drawings using the orthographic projection process.  
- Use the concepts of geometric construction in the development of design drawings.  
- Develop a binder or digital portfolio representative of completed work for presentation.

#### Business Management Pathway:
- Recognize personal traits and leadership styles of entrepreneurs and business leaders.  
- Construct and defend a business plan (components may include an executive summary, organizational structure, market analysis, Strengths Weaknesses Opportunities Threats (SWOT) analysis, marketing plan, operating procedures, financial data, and feasibility and supporting documentation).  
- Determine Specific, Measurable, Achievable, Realistic and Time-bound (SMART) goals for a specific project.  
- Identify factors of production needed to create wealth.  
- Recognize the determinants of supply and demand and their impact on pricing.  
- Create and use budgets to guide financial decision making.  
- Integrate appropriate use of the Internet in business.  
- Describe effective marketing techniques.  
- Differentiate the components of a promotional plan (e.g., advertising, public relations, and sales promotion) and describe how the plan is used to achieve a stated outcome.  
- Practice selling techniques used to aid customers and clients in making buying decisions.

#### Information Support and Services Pathway:
- Describe how technology is integrated into business processes.  
- Model business processes using tools such as organization charts, flowcharts, and timelines.  
- Define and use appropriate naming conventions and file management strategies.  
- Identify and apply multiple ways to transfer information and resources (e.g., text, data, audio, video, still images) between software programs and systems.  
- Validate and cite Internet resources.  
- Use multiple online search techniques and resources to acquire information.  
- Take preventative measures to reduce security risks (e.g., strong passwords, avoid social engineering ploys, limit account permissions).
Innovation and Entrepreneurship

STEAM Career Unit Planning Template

Teacher(S): Emerson

Grade Level(s): 3, 4

- Use available resources to identify and resolve problems using knowledge bases, forums, and manuals.
- Use a logical and structured approach to isolate and identify the source of problems and to resolve problems.
- Use technical writing and communication skills to work effectively with diverse groups of people, including users with less technical knowledge.

Software and Systems Development Pathway

- Develop a presentation or other multimedia project: video, game, or interactive Web sites, from storyboard to production.
- Integrate media into a full project using appropriate tools.
- Create and/or capture professional-quality media, images, documents, audio, and video clips.
- Describe the full process of online content delivery, registering domain names, setting up hosting, and setting up email addresses.
- Attract Web-site visitors through search engine optimization using various strategies like keywords and meta-tags.
- Enable e-commerce capabilities to sell products, create a shopping cart, and handle credit card transactions.
- Create an online project, Web-based business, and e-portfolio.

Graphic Production Technologies Pathway

- Create a basic layout applying images, text, and typography.
- Create and choose font styles.
- Create a visually effective layout that communicates an intention using graphic software that integrates graphics, text, photographic imagery, and color.
- Convert and edit formats including encapsulated postscript (eps), drawing (dwg), and portable document file (pdf).
- Apply digital video technology processes and procedures used in producing a multimedia project.
- Apply research methodologies and business and entrepreneurial principles to identify potential business opportunities to apply graphic and multimedia design.

Product Innovation and Design Pathway

- Apply and identify the various phases of the product design development process to an existing product, product line, system design, or service.
- Apply ideation techniques to explore and produce multiple concepts.
- Synthesize information and experiment with nontraditional possibilities for innovative design solutions.
- Create a preliminary design of a product concept utilizing drawing, computer software (graphic or CAD), and/or conceptual model fabrication techniques.
- Identify materials, mechanisms, technologies, and other requirements (e.g., safety, manufacturing, sustainability) the concept may require.
- Analyze and assess the strengths and weaknesses in the design, function, ergonomics, features, and benefits and identify possible resolutions for improvement.
- Produce technical drawings and other specifications required for the prototyping or manufacturing of the products.
- Recognize the safety issues related to the reliability, functionality, and use of the product.
- Build a looks-like, works-like prototype of the model using the appropriate fabrication, manufacturing, or reproduction techniques or technologies.
- Assess the outcome of the prototype product and analyze any issues that need redesigning or refining related to function, construction, or other factors.
- Resolve and/or redesign issues with a prototype.
- Create a performance criteria and a quality standard to measure and evaluate a prototype.
- Test the functionality and other features of the prototype against the performance criteria and quality standard and evaluate the results.
- Create a marketing plan for the product that includes target consumer, price, product name, brand, and product positioning in the retail market.

Crystal Hill, Peggy Castro, Ryan Rainbolt, Sarah Emerson
### Innovation and Entrepreneurship

**STEAM Career Unit Planning Template**

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**Grade Level(s): 3,4**

- Understand physical packaging construction and materials used; e.g., chipboard, cardboard, PVC, plastic blisters, etc. as it relates to protecting the product, costs, and logistic requirements.
- Create a presentation of the design solution (e.g., product, product line, system design, or service) that effectively communicates its features and benefits.
- Integrate into the presentation a marketing plan that may include an advertisement, promotion, and packaging/retail strategy using one or more visual communication tools (e.g., graphics, multimedia).

#### Marketing Pathway

- Use digital and graphic design in creation of advertising.
- Examine legal issues affecting business such as trade, environmental, personnel, truth in advertising, and workplace regulations.
- Demonstrate the role of technology in marketing information systems.
- Set a marketing budget.
- Develop a marketing campaign and write a marketing plan.
- Demonstrate an understanding of the importance of ensuring quality of products and services.
- Recognize the logistics of product delivery and importing and exporting products and services.
- Determine the uses of information systems in the order fulfillment process.
- Evaluate the types of inventory controls.
- Recognize legal and ethical considerations in promotion.
- Understand important promotional strategies for communicating information about products, services, images and ideas in an e-commerce environment.
- Summarize the effectiveness of different types of advertising media.
- Explain the role of business ethics and legal considerations in pricing as well as the importance of a reputation for honesty in communication and for quality products.
- Employ pricing strategies to determine prices.

#### Entrepreneurship/Self-Employment Pathway

- Demonstrate the relationship between supply and demand and pricing and production.
- Define and identify the following entrepreneurial characteristics: adaptability, competitiveness, confidence, discipline, perseverance, vision and risk-taking.
- Deconstruct the reasons for success of key entrepreneurs.
- Develop creative thinking in order to stimulate curiosity and promote divergence.
- Defend why failure is an opportunity to learn and to understand that creativity and innovation are a long-term and cyclical process of successes and mistakes.
- Explore creative-minded individuals and their products and services.
- Defend why competitiveness depends on innovation.
- Create and design potential innovative twenty-first-century products and services.
- Identify and explain the components of a business plan.
- Compare and contrast sample business plans, identifying strengths and weaknesses.
- Synthesize all elements into an original business plan.
- Identify mission and purpose.
- Develop core values.
- Develop a vision statement.
- Identify startup costs.
- Project annual and monthly business income and expenses.
- Construct a financial plan.
- Identify the selling techniques used to aid customers and clients in making buying decisions.
- Create an effective marketing plan including current social media, viral marketing, and other technologies.
- Recognize various types of taxes that affect a small business.

#### Legal Implications:

- OSHA, copyrighting and patents, taxes and nonprofit status
| **Formative and Summative Assessments:** | portfolio, blog, Socratic seminar, pretests, graphic organizers, concept maps, narrative, performance tasks, posttest, project rubric, interest inventories, skills rubric |
| **Materials Needed for Lesson:** | coats, ties, professional binders and sheet protectors, |
| **Introductory Activities:** | video, KWHLAQ |
| **Teaching Methods:** | inquiry-based instruction, demonstration/modeling, shadowing experiences, concept attainment: frayer model, synectics, socratic questioning, cooperative learning (expert groups), researching |
| **Learning Activities:** | |
| **Grouping Strategies:** | |
| **Resources:** | David Noonan as guest speaker via face-to-face technology |
| **Products:** | |
| **Extension Activities:** | |
| **Differentiation:** | |
| **Closure and/or Culminating Learning Excursion:** | Meetings with CEO’s and tours of their facilities, CEO for a day job shadowing at Walker Stamping in Ontario, CA |
| **Macroconcepts:** | |
| **Notes:** | Field Trip, 8 Lessons, Interview for Video: 1) Focus on Design and Manufacturing Team working in iSTEAM Lab; 2) Focus on Web Design Team in Computer Lab; 3) Focus on Marketing Team in Computer Lab; 4) Focus on Legal and Accounting Team with iPads; 5) Focus on Management Team in iSTEAM Lab with iPads; 6-7) Focus on Socrative Business meeting in which each team presents 8) Focus on orders being sent, customer feedback, effect in school and community |