Bulldog Brainpower: Inventing The Next Big Idea

**Blurb For Student Choice on Google Form:** Scientists and inventors aren’t the only people who can invent the next big idea! In this course you will research influential inventors and inventions, identifying key features of their success. You will apply your research and your own creativity to the invention process, working to develop and communicate your own “next big idea”!

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| **Unit Timeline** | **MP** | **Days** (approx) |
| **Stage 1: In the past (and present) how have people come up with the right idea at the right time?**  Students research the design process of “makers” and inventors. Students research current trends inventions/making.  *Materials: Books (listed below), Interviews with community inventors/makers (listed below, hoping to grow the list)* |  | 2 |
| **Stage 2: How can you, as a maker/inventor, brainstorm the right idea at the right time?**  Students use brainstorming techniques to determine their “right idea at the right time”. They will brainstorm the needs and current products in the market. They will be scaffolded to invent something new, or create an improvement/variation to an already existing idea.  *Materials: Scaffolded questions/graphic organizers.* |  | 2 |
| **Stage 3: Once an idea exists, how do makers/inventors move forward with the process of creating their product?** Students will complete a cost analysis of their product prototype. They will determine business factors including cost analysis. They will be given support to complete the analysis including an interview with a financial analyst and local inventors.  *Materials: Scaffolded questions/graphic organizers. Interviews with local inventors.* |  | 3 |
| **Stage 4: How can you create a prototype or model of your invention/product?** Depending on the student idea, students will develop a detailed sample, prototype, or model of their idea. They will develop this with the intention of presenting it to their small group, as well as family and friends to receive feedback. Time during this stage may be devoted to developing persuasive presentation skills of the product, if they have finished their model.  *Materials: Scaffolded questions/graphic organizers. Materials for modeling or making their designs.* |  | 3 |
| **Stage 4: How would you market your product? What makes you different than competitors?**  Using feedback on their design/invention, students will analyze their competition and the market that their product would be competing in.  Materials: *Scaffolded questions/graphic organizers.* *Student chromebooks for researching.* |  | 2 |
| **Stage 5: How can you move forward with your invention/business design?**  In final presentations, students will share their product overview and marketing plan, reflecting upon their small business progress. They will evaluate their progress and analyze their successes in a plan for moving forward.  *Materials: Format for communicating details of invention/idea. Stage 4/5 may be a great place to have a STEM integration with BSD coding* [*https://app.bsd.education/*](https://app.bsd.education/) *as a way to have the students communicate their ideas.* |  | 2 |

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| **Big Idea:**  Scientists and inventors aren’t the only people who can invent the next big idea! This unit focuses on the importance of creative thinking in the invention and “maker” design process. Students will research influential inventors/makers and effective habits of “thinking outside the box” in the design process. Student inventors/makers will apply their creativity to the invention process, developing a new invention (or work to improve an already existing invention or product). Students will research, brainstorm, and design a model or prototype of their own invention, working individually or collaboratively in small groups. They will analyze their product, considering factors of successful small business design and marketing in working towards the effort of sharing their developments. |

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| **Enduring Understandings**   * We can all develop our creative thinking abilities through practice, engagement, and modeling the characteristics of highly creative people. * Inventors have many common personal characteristics. * Inventing is often someone working to meet a need of improving an already existing service or product in an original way. * Sometimes ideas don’t sell themselves. Inventors need to be informed on the strategies available for communicating their product and creating a need.   *Myths/Common Misunderstandings:*  *Myth: Creativity is innate or a lightning sensation.*  *Myth: Only geniuses, scientists, or inventors can invent something.*  *Myth: Inventing is designing from scratch.* | **Essential Questions**   * How have inventions changed the world? * What drives people to create something new and different? * What are the hottest trends on the market today and are there already products that address the same issues? * How can I explain my idea in a clear, concise way? What other tools and strategies can I use to market my idea? |
| **Knowledge**   * Well known inventions/inventors. * Challenges faced by inventors. * Inventing process. * Creative thinking process. * Different paths for products/services to becomes successful. * Anyone can be an inventor, but not everyone can be named on a patent license. | **Skills -**   * Students will be able to analyze a range of creative individuals in a variety of careers and academic disciplines throughout history. * Students will apply creativity to solve unique and multi-faceted problems, both in individual and group based works. * Students will integrate the creative planning process to help plan future developments. * Students will apply creativity techniques to generate ideas for new inventions or improvements in existing products by observing problems or gaps in information from daily life. * Develop an original invention or an improved product based upon a needs assessment. |

**Standards:**

**Science:**

**MS-ETS1-1.** Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

**MS-ETS1-4.** Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. The performance expectations above were developed using the following

**Technology:**

**TECH.8.1.8.A.2**: Create a document (e.g. newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications to be critiqued by professionals for usability.

**TECH.8.1.8.C.CS4**: Contribute to project teams to produce original works or solve problems.

**TECH.8.1.8.C.CS2**: Communicate information and ideas to multiple audiences using a variety of media and formats.

**TECH.8.1.8.A.1.** Research a product that was designed for a specific demand and identify how the product has changed to meet new demands.

**TECH.8.1.8..2.** Identify the desired and undesired consequences from the use of a product or system.

**Language Arts:**

**NJSLSA RI.6.7**. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

**NJSLSA.SL4.** Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

**21st Century Themes/Careers:**

**CRP2**. Apply appropriate academic and technical skills.

**CRP4**. Communicate clearly and effectively and with reason.

**CRP5**. Consider the environmental, social and economic impacts of decisions.

**CRP6**. Demonstrate creativity and innovation.

**CRP7**. Employ valid and reliable research strategies.

**CRP8**. Utilize critical thinking to make sense of problems and persevere in solving them.

**CRP9**. Model integrity, ethical leadership and effective management.

**CRP11**. Use technology to enhance productivity.

**CRP12**. Work productively in teams while using cultural global competence.

**Formative Assessment:**

Graphic organizers for brainstorming and reflection

Student artifacts

**Summative Assessment:**

Students will work to plan and present a digital product sharing details of their design process and invention details.

**Resources and Technology:**

**Books for Excerpts/Student Library:**

* The Creative Curve (bought -great excerpts)
* Mistakes that Worked (bought - arriving 7/30)
* The Kid Who Invented The Popsicle (bought - arriving 7/30)
* Inventions and Inventors (bought - arriving 7/30)
* Smarter Faster Better (bought - great excerpt)
* The Power of Habit (bought -great excerpt)
* Where Good Ideas Come From (need to buy)

**Possible People to Interview:**

*Plan would most likely be to screen record interview or edit in imovie and add to google drive to keep as a reference for all classes. So that over time we can develop a library of varying interviews. Potentially looking to reach out to the Haddonfield Alumni group and HMS staff for additional resources.*

* A.B.HMHS 03’ (inventor, small business owner)
* C.B.HMHS 10’ (financial analyst)
* C.S. HMHS Parent (inventor)
* Looking for more!!

**Digital Resources for Teacher:**

[Stanford - Who Is and Is Not An Inventor?](https://otl.stanford.edu/sites/g/files/sbiybj10286/f/who_is_inv.pdf)\*

[7 Essential Questions Inventors Should Ask Themselves](https://www.success.com/7-essential-questions-inventors-should-ask-themselves/)\*

[Invention Info - 38 Questions](https://www.invention-info.com/questions-inventors-should-answer) \*

[Invention - 10 Questions for Inventors](https://jeffreydobkin.com/invention/invention-10-questions-for-inventors/)\*

\*good resources for supporting teacher with questions for student discussion