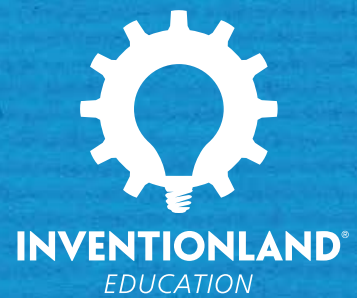


Curriculum Implementation Guide



Introducing a new curriculum with involving **industry-based learning** with a focus on **career readiness** may appear daunting, but it does not need to be. As of February 2019, the Inventionland Education Curriculum is partnered with 75 schools and after-school organizations throughout Pennsylvania, West Virginia, Ohio, and New York. In addition, the curriculum has partnered with industry leaders such as Intermediate Unit 1, EnvisionEdPlus, Allegheny Educational Systems Inc., Buckeye Educational Systems, and Owen Consulting. Based on practical knowledge gained from working with a high volume of educational institutions and programs across state lines, the following information has been compiled regarding successful course implementation.

Scheduling

The curriculum requires 72 to 90 hours of instruction, which can be incorporated into a school schedule in several different ways. Below are some of the options regarding how to implement the curriculum into students' schedules. The highlighted option is one that may work best, but the course has also been integrated successfully in the additional formats presented:

- 5 days/week for one Trimester
- **1-4 days/week for one Semester**
- 1-3 days/week for a Full Year
- After school program
- Summer Camp

*If a school or administrator has any additional ideas on how to implement the curriculum into student schedules, our staff will be able to work with to personalize a schedule based on a school's availability and course needs.

School Level

Below is a list of the school levels in which the curriculum has been successfully implemented:

- Elementary
- Intermediate
- Middle School
- High School
- College

Implementing The Curriculum

Schools will often implement the class either as its own course/elective or as a special day(s) in a specific class's weekly scheduling rotation. The following section covers suggestions on how to frame the Inventionland Education Curriculum to fit particular classes. Although alternative variations on these ideas could be customized, these are suggestions based on numerous successful implementations in various schools and districts.



Framing the Curriculum

Inventionland Education Elective Course

The most straightforward option would be to create a class solely for the curriculum. It can be implemented as a stand-alone elective course. This class could substitute as a credit for or be integrated into a pre-existing marketing, maker, entrepreneurial, shop, or business class.

Science

The Inventionland Education course material centers around manufacturing, material choice, and scientific technology used to create an invention. In addition, the 9-Step Method created for the course is based on the scientific principles of problem-solving so the course can be used to support these principles. The course may also fulfill some lab requirements as it revolves around hands-on project-based work rather than direct instruction. Teachers can implement this course to assist students in solving current, authentic, real-world challenges such as environmental or societal issues. The curriculum can be utilized as a unit of a science course or as a year/semester-long project students can work on during their down-time.

Math

The Inventionland Education curriculum can support the math classroom through a focus on math principles of engineering. Several facets of the curriculum include math fundamentals such as measuring, problem-solving, calculation, and geometry. This course utilizes math from a business perspective when analyzing data points and statistics. Students calculate various costs involved in making the product, selling, comparing, competition pricing, and evaluating overall market value.

Graphic Design & Tech

The curriculum focuses thoroughly on the principles of building/making, which heavily involve graphic design and technology. Students learn about virtually designing parts, 3D printing, laser cutting, designing packaging, etc. This process is especially rewarding because students get to design and workshop their own original invention, as opposed to being required to create a certain tool or object they may not use.

History

The course has also been implemented into history classes as a once-per-week special day rotation. In this version of the curriculum, teachers tie in the history of inventors, and innovative discoveries to assist in inspiring the student's projects and give them some historical context.

Multimedia Production/Evaluating Online Resources/Computer Science

The ABC's of Storytelling section of the Inventionland Education curriculum involves creating an infomercial for the product. As part of the project, students are tasked to script, shoot, and edit an infomercial which becomes a tool in their product pitch. In addition, the marketing component of the project involves online research in which students can learn about reliable online resources and the value of a well-researched product pitch.



Framing the Curriculum

English/Rhetoric/Public Speaking

The Storytelling component of the Inventionland Education Curriculum supports the instruction of reading, writing, speaking, and listening. This section requires students to create a video presentation telling the story of their invention and how it will help improve the lives of consumers. The project ends with a Product Pitch which involves students speaking to a group of 'investors' to pitch their product. Therefore, the pitch section of the project involves a well-spoken, well-researched, and personable presentation that convinces the audience to invest in their invention.

Special Education/Alternative Education

The Inventionland Education Curriculum has been utilized in a variety of settings including special education and alternative education classrooms. The course encourages students to communicate appropriately and effectively to collaborate with others. Students in special education and alternative education settings excel in this course because of the opportunities to build social skills and participate in quality discussions. Students are asked to identify a problem to solve that is meaningful to them which not only provides a creative outlet to showcase their work but also provides a purpose behind their problem solving, building resiliency, and persistence to fail forward.

College Level Business Course

The course has also been taught at the collegiate level in the form of a 'Business 101' class. This model acts as an introduction to business classes covering an entry-level understanding of how to build a business plan, research the market, manufacture a product, pitch a product, and apply marketing strategies.

Hybrid Course

In addition to being incorporated as part of individual classes, there have also been cases where the curriculum has been implemented as a shared project across two or more classes. This can be accomplished through a few methods. The first being one class (ex. Graphic Design) partnering with students from another class (ex. Tech) and working on the portions of the curriculum that pertain to the specific class in which they are enrolled. Or, if the same students are enrolled in two classes that pertain to the curriculum, they will work on the project as a portion of both courses-splitting the time they work on the project between them. In both versions, students work together through programs such as Google chats/docs, hold planning periods together, and check-in with teachers to update them regarding their progress. Most often, the course has been split between a Science and Math class or a Graphic Design and Tech class. Utilizing the project across a few classes allows students to see how multiple subjects can work in tandem with innovation and marketing.



Course Materials

A lab or custom Makerspace is not required for the implementation of this course. Although such an environment may allow students to learn additional skills, the most essential materials are hot glue guns, tape, and cardboard. In addition to these, schools will often assemble 'Magic Bins' which are just a collection of random supplies that students can take as needed. Students may bring materials from home to recycle into their projects. A list of the most commonly used materials embedded in the curriculum can be found on the Inventionland web portal.

If a school has access to a Makerspace, however, laser cutting and 3D printing can be implemented as a part of the course.

Student Collaboration

A portion of this course teaches students collaborative thinking and learning, so the recommendation is that students work in groups rather than individually. It is suggested that students are paired in groups of 2-3 for this project as this grouping allows the work and student skill sets to be evenly distributed among the students.

Career Readiness

One of the largest obstacles when it comes to career readiness is keeping career lists completely up-to-date. With new technology and innovation, the world is constantly evolving and new job opportunities are regularly being created. Inventionland Education consistently updates the list of careers on their web portal to confirm that every potential career opportunity is presented as an option for compatible students.

Throughout each project, students are tasked to log onto the curriculum web portal and report on the portions of the project in which they most excelled or enjoyed. Each section is designed to directly correlate with specific segments of the job market. Therefore, given this information, the portal is able to generate possible career opportunities for students from meticulously updated career lists. Each career displayed is also an active link, which sends students to a page where they can review the necessary schooling/apprenticeships, median income, job market locations, duties/skills, etc. required for that career choice.



Subsequent Years

A student who takes this course one year may also take it again the following year, regardless of grade level. While the curriculum varies in advancement based on school level (high school, middle school, elementary school, etc.), a high school student who takes the course will essentially be taking the same course again if they choose to take it a second time the following year.

Students are not, however, discouraged from taking the course multiple times. It has been observed that students who take the course a second or third time have even more overall success in the class. In the first year taking the course, students will learn about the principles of design, how to create parts for their invention, and the steps involved in creating and marketing an original product. In their second or third year with the course, a student will already come into the class as an expert in these essential concepts. This allows returning students additional time to focus on developing their product and marketing strategies on an advanced level. There have been cases where students will work on perfecting one invention over the course of multiple years or even develop more sophisticated products as they mature.



FAQ's

Q: How does Inventionland Education apply the principles of STEM/STEAM education?

A: Through the framework of the inventing process, students develop cognitive skills informed by a multidisciplinary approach to problem-solving. Students collaborate with a team to identify a problem, conduct research, conceptualize a solution, engineer a model, and artfully market a product.

Q: What is the value of the Inventionland Education curriculum to the student?

A: In a system where students are constantly being asked to memorize information for a test we are asking students to think critically and problem solve. The soft and STEM skills students learn while exploring our 9-Step invention method will stay with them as valuable assets, no matter what field of study they pursue. Students exiting our program leave with the confidence to navigate group dynamics and interact in an interview or board room setting.

Q: Does your administrative leadership evaluate the program?

A: Throughout the course, students upload assignments to their own online portal for review by their innovation curriculum trained teacher. We follow a unique outline for the evaluation of the final pitch presentations.

Q: What is the curriculum's approach to problem-solving?

A: Our curriculum teaches students to first identify problems independently and then work collaboratively to solve them. We believe it is most valuable to teach a student to think, rather than solve a given problem.

Q: Do students work in teams or individually?

A: Students will begin work individually and later transition into groups of 3 or 4 to work on one project of their selection.

Q: How does this curriculum help to promote literacy?

A: Inventionland Education coursework develops writing and speech skills through our communications methodology, The ABC's of Storytelling. During this section of the course, students will develop a story with which to market their products, write infomercial scripts, and prepare a presentation for their final pitch.

