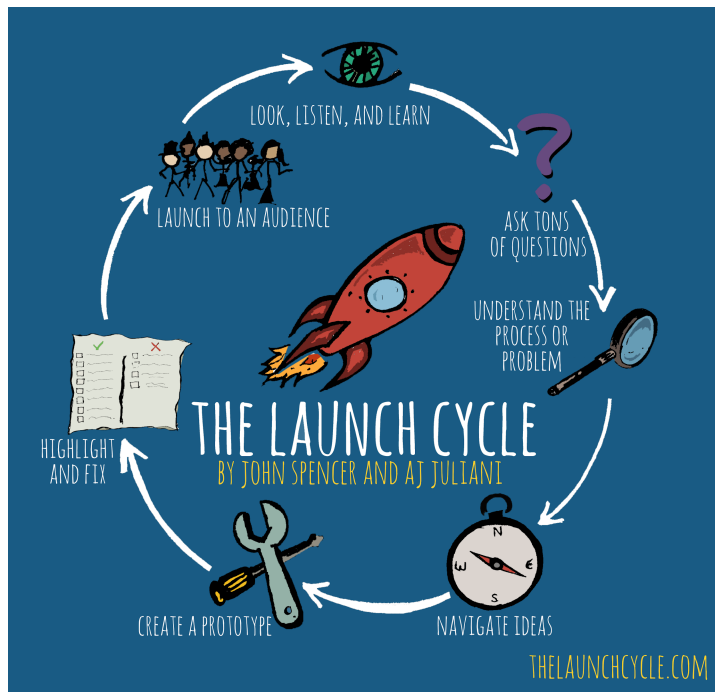




Invention/Innovation Economics:

Slonac, Jim

Teacher Planning Template:

The Maker Champion Expectations focuses on planning a single challenge-based making experience, supported by two skill building activities that support the challenge experience

This document is a planning guide to help you create the challenge experience. In Part A, you will focus on designing the challenge-based experience. In Part B, you will design two experiences that support the development of the student skills

required to successfully address the challenge.

- ***PART A:*** *Plan a single* challenge-based experience that employs the design process to focus on inventive problem-solving
- ***PART B:*** *Plan two* maker skill-building activities associated with making that support the challenge-based experience

PART A

Identifying curriculum entry points:

Consider the following behaviors - they are essential to the making process and define making. These are also essential elements of the New Berlin Maker's Manifesto
Invent, Design, Create, Produce, Represent, Visualize, Tinker, Play, Explore, Empathize, Interpret, Ideate and iterate.

In your course curriculum, where could your students engage in these behaviors?

In your course curriculum, where could your students create and invent products and solutions?

I am relating this to social studies, economics and Junior Achievement

[Student Maker Slideshow for Lessons](#)

[Maker Skills Launch for this Project](#)

Describe your idea for an open-ended, design thinking experience:

Imagine that you are opening a new company and you are the owner. One of the challenges is maintaining your business in the future because it is difficult for companies to succeed long term. Think of a product or service that has a positive effect in the world and that will sustain long term growth. This idea can be something completely new or an innovation to a product or service that exists. A few things to focus on:

- Why people would want this product/service? This is your target audience. Get to know your consumer story.
- How will this product serve or impact your customers in a positive way?
- Read this article first with students on prototyping. [“When, Why and How to Create a Prototype”](#)

Where does this experience fit best within the scope and sequence of the curriculum you teach; specifically, which units/topics?

It would tie into our social studies unit in economics but I would be doing this with a electrical engineer from GE.

Identify Subject / Grade Level:

Social Studies: Economics: 5th grade

What Learning Target(s) will be addressed through this Design Thinking/ Maker Experience?

- I can work with other students to come up with a mutual idea for our business.
- I can show empathy towards others and their ideas while designing a product.
- I can take risks and explore my creativity within design thinking.
- I can prototype an idea based on our group's thinking.
- I can follow the step by step process of Making and problem solving ideas.
- I can relate to the world around me and design and real world problem that can have a positive effect on others.
- I can use a variety of tools and digital resources to help assist in my creation and learning process.
- I can take the feedback or advice and data collected to alter and make changes to my plan.

What course standards(s) will be addressed through this Design Thinking/ Maker Experience?

Social Studies Standards:

D.8.8 Explain how and why people who start new businesses take risks to provide goods and services, considering profits as an incentive

E.8.5 Describe and explain the means by which groups ~~and institutions~~ meet the needs of individuals and societies

D.8.1 Describe and explain how money makes it easier to trade, borrow, save, invest, and compare the value of goods and services

Next Generation Science Standards [Rubric](#)

3-5-ETS1-1 Engineering Design

Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2 Engineering Design

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.

3-5-ETS1-3 Engineering Design

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.

What WI State Information and Technology Standard(s) will be addressed through this Design Thinking/ Maker Experience? ([view by grade bands](#))

Must include: Innovative Designer and Computational thinker standards

Standard: KC2 - Students produce creative artifacts and make meaningful learning experiences from curated knowledge for themselves and others.

KC2.a.2.i:

Explore, select, and utilize sources of curated information to produce creative artifacts to make meaningful learning experiences.

KC2.b.4.i:

Connect learning to age-appropriate real-world issues and problems and begin to develop questions for problem solving.

Standard: ID.1 - Students use a variety of digital tools and resources to identify and solve authentic problems using design thinking.

ID1.a.2.i:

Identify and describe problems or challenges that affect the community. Analyze all conditions that make it a problem.

ID1.b.2.i:

Demonstrate perseverance when working with authentic, open-ended problems.

Standard: CC1 - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals.

CC1.a.2.i:

Evaluate and utilize the features and functions of a variety of digital tools for producing new creations or communications with educator support.

CC1.c.2.i:

Create digital artifacts to communicate ideas clearly.

Designing the Challenged-Based Experience

Step 1: Identify the Provocation/ Challenge. This is a question that will introduce students to the challenge.

- What is the challenge? Why is it important?
- What is the curriculum connection?
- How does it engage students through an empathetic approach?
- [Provocation/ Challenge Development Guide for Teachers](#)

Example 1: A local manufacturing company is seeking a new way to spread awareness of needed skills and job openings for positions they have available.

Example 2: A student that needs help understanding chemical bonds is looking for a new way to learn and remember the different chemical bonds.

Imagine that you are opening a new company and you are the owner. One of the challenges is maintaining your business in the future because it is difficult for companies to succeed long term. Think of a product or service that has a positive effect in the world and that will sustain long term growth. This idea can be something completely new or an innovation to a product or service that exists. A few things to focus on.

- Why people would want this product/service? This is your target audience. Get to know your consumer story.
- How will this product serve or impact your customers in a positive way?
- Read this article first with students on prototyping. [“When, Why and How to Create a Prototype”](#)

Provocation:

You are a new business owner and you need to develop a new product or service that will allow your company to succeed. Design, build and test a product or service that has a positive effect in the world and that will sustain long term growth. This idea can be something completely new or an innovation to a product or service that exists.

How will your students use physical or digital tools to document their learning during this part of the maker process?

Examples: Engineering Notebook, PowerSchool Wikisite, various Google Apps

They will use their composite notebooks, Padlet and iPads.

- Composite notebook - take notes from teacher lessons, student ideas and drawings or sketches. [Student Brainstorming Document](#) - Model only
- iPads - Will be used to document their progress throughout the Making Process with images and video.
 - Mainly using their camera roll or another app to do this.
- Padlet - to go through the prototype phases and collaboratively share ideas.
 - The [Padlet attached](#) is a model for students to make their own copy

Step 2: How will you engage students in identifying a problem worth solving?

- [Research and Problem Definition Guide for Teacher and/or Student](#)

Students will be working to think of a product or service that has a positive effect in the world and that will sustain long term growth. This idea can be something completely new or an innovation to a product or service that exists. This idea can be something completely new or an innovation to a product or service that exists.

Activities to assist with this include:

- Lessons related to [Economics "Biz Town"](#)
- Reading the book [What to do with an Idea?](#)
- Playing the game Disruptus - putting together two images and coming up with an idea
- Doing a skill builder with Sphero that focuses on an invention that succeeded
- Doing the skill builder of Reverse Engineering
- Doing activity - Brainstorm ideas to solve a problem but instead of solving the problem at first we will try and do the opposite. By thinking of the opposite you can then get better ideas on how to solve issues that would come up.
- Reading the prototype article ["When, Why and How to Create a Prototype"](#)
- Students conducting a survey to use to gather information on where to start with their idea. They might even conduct interviews to gather information to see what interests their consumers want and need.
- Students pitching or trying to negotiate a deal for their business, similar to the show Shark Tank.

How will your students use physical or digital tools to document their learning during this part of the maker process?

Examples: Engineering Notebook, PowerSchool Wikisite, various Google Apps

They will use their composite notebooks or they could use a Google document to collaborate with other students. They could also brainstorm ideas using other Apps like, Share Everything or even Padlet.

Step 3: How will you have students work individually and collaboratively to develop a solution/ product solution?

[Individual/ Team Brainstorming Guide for Teacher and/or Student](#)

Team Organization: Scaled Agile Framework (SAFe) is a powerful industry tool used to produce rapid, impactful results. For more info, please use this [resource](#).

Students will be able to work in small groups of their choosing. They must think of a product that is an invention or an innovation that can be adjusted or changed.

How will your students use physical or digital tools to document their learning during the solution storming process:

Examples: Engineering Notebook, PowerSchool Wikisite, various Google Apps

They will use their composite notebooks or they could use a Google document to collaborate with other students. They could also brainstorm ideas using other Apps like, Share Everything or even Padlet.

Step 4: What steps will you take to support students as they develop a Prototype?

[Developing a Final Solution and Prototype Guide for Teacher and/or Student](#)

The Process: [- See the Prototype student checklist](#)

Phase 1: Understanding the problem

- Determine what the task at hand is or the problem. Review criteria, constraints and directions.

Phase 2: Brainstorming

- You might want to start with quiet think time first. Thinking of product and services you know and needs in our world.
- Spend time in discovery: investigate your consumer and target audience
 - Why people would want this product/service? This is your target audience. Get to know your consumer story.
 - How will this product serve or impact your customers in a positive way?
- Everyone share out ideas. Remember you are moving from problem to solution creation.

Phase 3: Creating a Plan to Test Prototypes

- Create blueprints, first draft or rough notes in order to test their prototype.

Phase 4: Make a Prototype

- Create a prototype of your team's idea.
 - Double check all criteria, constraints and directions.

Phase 5: Test a Prototype

- Begin testing your prototype and document all the phases of the creation.
 - Take iPad photos or video to document the process and testing.
 - Remember, this should be ongoing and anytime there is a change it should be documented.
- Seek feedback on your initial prototype based on teacher guidance.
- Revise your prototype and make changes based on feedback and data gathered.
- Continue to test prototype after making changes
 - This will occur as many times as need to make better and adjust your prototype.

Phase 6: Evaluate the Solution

- Reflect on Phase 5. Did you follow all the criteria?

Phase 7: Launch your Solution

- Explain and demonstrate how your solution works.

- How will you share this out with others? (Presentation)
- How will you reach your target audience? (Advertisement)

Phase 8: Reflect on your Solution

- Take time individually to reflect on your solution and the process
 - What went well?
 - What could have went better?
 - Explain how you contributed to the group.
- Optional: Think of multiple solutions to task. This should be ongoing throughout the process.

How will your students use physical or digital tools to document their learning during the solution storming process:

Examples: Engineering Notebook, PowerSchool Wikisite, various Google Apps

They will use their composite notebooks or they could use a Google document to collaborate with other students. They could also brainstorm ideas using other Apps like, Share Everything or even Padlet.

Step 5: What steps will you take to support students as they Launch their solution?

In working with another educator, (JA instructor from GE) we will develop the following steps with students.

1. Create and demonstrate a model that students can follow
2. Show them other examples of the same process
3. Follow the phases of prototyping
4. Meeting with students, conferring and giving feedback
5. Making sure the students follow a timeline and there are checkpoints and due dates

How will your students use physical or digital tools to document their learning during the solution storming process:

They will use their composite notebooks or they could use a Google document to collaborate with other students. They could also brainstorm ideas using other Apps like, Share Everything or even Padlet.

Designing the Skill Based Experience:

What skills would students need before they are able to approach the problem and develop computational thinking?

PART B: *Plan at least Two* skill building activities associated with making that support the challenge-based experience

Click [here](#) for Skill Builder Menu opportunities.

Maker Skill Building Activity 1:

Sphero Activity - Use the little ball robots to work on coding and team collaboration. This was also used to show students a creation that was really successful and hit multiple target audiences.

Maker Skill Building Activity 2:

[Reverse Engineering](#):- Taking apart products and learning from this. See the presentation for more detail.

[Maker Skill Builder](#)