

Facilitation Guide: Waste to Wealth

Challenge

Students will explore how decisions about materials, sales platforms, and production time can impact the profitability of their product and business. Select one of the included designs or add one of your own to the Business Model Builder to create a profitable product and lucrative business model.

This challenge is intended to be the second of three challenges within the Business Development series. Educators may choose to move through these challenges sequentially or pick and choose as needed.

Rationale

Simple choices are impactful for new businesses. Every decision by an emerging entrepreneur or business owner can determine whether or not their business succeeds. For creatives using tools like Glowforge to design, customize, and create products, choices about the design's size and shape or the material used can affect profitability.

This challenge helps students develop multiple business management skills by designing an efficient product and a viable business model. Whether they create a brand new design or adapt one from the Glowforge catalog, learners will reduce material waste, leading to a more profitable product.

Glowforge empowers your students to become business owners of all backgrounds, skills, and ages. To be successful, students will want to think about the impact that sales platforms, shipping prices, and customization have on their bottom line. All of these choices are made much easier with the easy-to-use [Business Model Builder](#). They'll use the Glowforge and the business model to develop a creative product and make some money!

Standards

Common Career Technical Core Standards

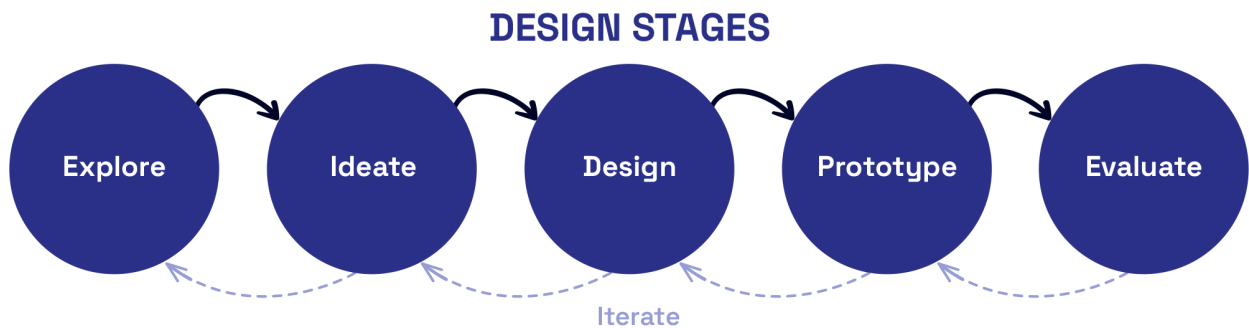
- BM-MGT 2. Access, evaluate and disseminate information for business decision making.

- MK 7.Determine and adjust prices to maximize return while maintaining customer perception of value.

ISTE Standards for Students

- 1.4.a. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- 1.4.b. Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
- 1.5.c. Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

Facilitation Steps



Explore

In this stage, students focus on researching and investigating types of production waste, techniques that help increase efficiency, and pricing a product using the [Business Model Builder](#), which they will complete during a later stage. To ensure that students have the knowledge and skills needed to complete this stage, use the following steps.

1. Use question prompts from the Explore stage to help inspire students' research and challenge them to think about how they will create a profitable business model.
2. Provide an introduction to the Business Model Builder.
 - Review the Business Model Builder together and take time to respond to any questions. Use this [handy guide](#) to help introduce parts of a spreadsheet including cells, columns, rows, tabs, and formulas.
 - Highlight the example of the Art Nouveau Lotus Earrings.
 - Provide a copy of the Business Model Builder to each student or group of students.
 - Go over the format of the spreadsheet including:

- Tab names and how they are used
 - The introductory message on the Step 1: Product tab
 - Green fields are editable and impact the formulas
 - Blue fields are optional if adding more than one product
3. Provide students with resources and a brief introduction to production waste.
 - Encourage students to explore Glowforge techniques that help reduce material waste such as [ideal placement](#) and [reusing partially used materials](#).

At the end of this stage, students will reflect on the research they did.

Before moving on, students should consider if there are any other helpful resources or techniques. Once finished, students continue to the Ideate stage, where they will brainstorm the product they'll use to develop their skills.

Ideate

In this stage, students will take what they learned in the Explore stage and brainstorm and experiment with different product ideas. Students should come up with as many ideas as possible without judgment. To ensure that students have the knowledge and skills they need to complete this stage, use the following steps.

1. Use question prompts from the Ideate stage to help inspire students' research and to guide how they will create a profitable business model.
2. Encourage students to generate as many ideas as possible, no matter how seemingly far-fetched or unconventional.
 - Motivate students to explore different perspectives and think about what would make their product appealing and cost-effective.
3. Direct students to the [Glowforge Catalog Designs](#) where they may find a design or inspiration.

At the end of this stage, students will have multiple ideas for products to use in developing a business model. They should narrow their focus to develop a product that will interest customers and that could be profitable.

Before moving on, students should consider which ideas could minimize the material waste and that could prove profitable. Once finished, students will continue to the Design stage, where they'll select one or two ideas for further development.

Design

In this stage, students will develop ideas from the Ideate stage to draft a detailed plan for a Glowforge design that optimizes material. Encourage students to consider how each of their design choices may impact profitability. By the end of this stage, they will have an assembled

product prototype. To ensure that students have the knowledge and skills they need to complete this stage, use the following steps.

1. Use question prompts from the Design stage to help them design.
2. Model how to use your Glowforge in a safe and efficient manner.
 - Review [Glowforge safety guidelines](#).
 - Use this [video](#) to show students a demonstration of how to use Glowforge.
 - Remind students of any applicable classroom or school policies.
 - Review the [Glowforge Community Forum](#) or page 25 in the [Glowforge Educator Guide](#) for tips and tricks for scaling designs.
3. Encourage students to use design software that helps reduce production waste.
 - Demonstrate using [Glowforge Live Preview](#) to visualize the remaining material available. If you get stuck, follow these [re-calibration steps](#).
 - Consider introducing students to other design software like [Deepnest](#) or [Fabricaide](#) that auto-arranges designs to reduce material and time waste.

At the end of this stage, students will have a detailed plan for their design, including sketches or digital mockups.

Before moving on, students should consider if they would like to revisit their design to change anything. Once they are finished, students continue to the Prototype stage, where they will use their product prototype to complete the Business Model Builder.

Prototype

In this stage, students will use their product prototype to complete the Business Model Builder. Students will input their prototype into the model and then adapt the sections of the Business Model Builder. To ensure that students have the knowledge and skills they need to complete this stage, use the following steps.

1. Reintroduce the spreadsheet vocabulary from the Explore stage as necessary.
2. Provide students with question prompts from the Prototype stage of the challenge to help them develop their Business Model Builder.
3. Demonstrate how to fill in the Business Model Builder, including how adjusting cells impacts profitability. Refer to the steps mentioned in the Prototype stage. Have students follow these steps for each tab. Tab names are in **bold**.
 - **Products, Materials, or Shipping** - Fill in the Options tabs for customized.
 - **Step 1: Products** - Add your name to B7 and select your product(s) in A.
 - **Step 2: Production** - Select your state in A6 and select Shipping in G11.
 - **Step 3: Sales** - Use the numbers that are in C8:G8 or customize as desired.
 - **Step 4: Pricing** - Adjust B6:B10. Notice the impact of adjusting options like Markup of materials and free shipping.
 - **FINISHED: Business Model** - Notice components of your model including Operating Costs and Bottom Line.

4. Remind students that pricing products is a challenging process even for the most experienced entrepreneurs and business owners. Emphasize the iterative nature of determining the right price that appeals to their target market while maintaining profitability.

At the end of this stage, students will have a finished Business Model Builder based on specific elements of their products, as well as pricing considerations like sales platform fees and production time.

Before moving on, students should review their finished model to ensure it maximizes profitability by reducing waste and optimizing materials. Students may need to refine and adjust their model multiple times or return to earlier stages of the design process before moving on. Once finished, students continue to the Evaluate stage, where they will receive feedback on their finished product prototype and business model.

Evaluate

In this stage, students will evaluate their Business Model Builder and receive feedback from others. Feedback can be provided in pairs, small groups, or as a whole class. Encourage students to reflect on their process. To ensure that students have the knowledge and skills they need to complete this stage, use the following steps.

1. Provide students with question prompts from the Evaluate stage of the challenge to help them reflect on their business model.
2. Encourage students to share and discuss ideas to generate feedback and suggestions from their peers to refine and enhance their business model.
 - Students can use the question prompts from the Evaluate stage to guide their discussions.
 - Use a peer feedback model, such as a gallery walk, affinity mapping, or a concentric circle discussion, to support students as they work in pairs, small groups, or as a whole class.
3. Provide students with question prompts to help them reflect on the feedback that they received. These might include:
 - How can you further improve and refine your design or business model to increase profitability?
 - If making additional changes to your design or business model, which of the design process stages will you return to?
4. If applicable, provide students with time to complete a learning reflection, self-assessment, and/or peer critique.
 - Use the provided Assessment Suggestions for more ideas.

At the end of this stage, students will be able to reflect on the strengths and necessary areas for improvement of their product and business model. Students should determine whether revisions

are needed and return to the appropriate stage in the design process. Consider assessing student work using one of the Assessment Suggestions or extending the challenge using provided Extension Activities.

Supplemental Supports

- For students looking for inspiration from other Glowforge entrepreneurs, share the [Glowforge Stories](#) video series that features interviews from several small business owners.
- For insights about pricing Glowforge products, direct students to the [Glowforge Community](#), which has several threads including [Pricing Wholesale Items](#) and [How to Price Glowforge Projects](#).
- For a deeper discussion of pricing, share [Pricing, Planning, and Producing at Scale](#), which includes insights about profit margins, the impact of customizations, and setting sales goals.

Assessment Suggestions

Overall Learning Reflection

Learning reflections allow students to reflect on their learning experiences, identify key concepts, and explain how they have grown throughout the design and business model process. Ask students to write or record a video about what they learned and how their learning will impact developing products and pricing in the future. Students can incorporate feedback elements from the Evaluate stage to describe their strengths and areas for improvement.

Self-Assessment

Self-assessments allow students to reflect on their learning through portfolios, presentations, or learning journals that involve evaluating their own progress and identifying areas for improvement. Consider providing criteria to students prior to beginning the challenge that can be used by the student to reflect on their progress throughout the challenge. The criteria may include:

- Use of efficient design: How well did I use techniques to maximize my materials and reduce waste?
- Use of the Business Model Builder: How well did I use the Business Model Builder to create a profitable product?
- Use of the design process: How well did I develop, test, and refine prototypes as part of a cyclical design process?

Educator or Peer Assessment

Educator or peer assessments allow educators or students to review the quality and effectiveness of the finished Business Model Builder. The assessment can be based on specific criteria, such as minimizing waste or maximizing profitability in the business model, or use a more open approach like a gallery walk or artist showcase. Some criteria to consider may include:

- Minimizing waste: Did the design minimize waste or display resourcefulness?
- Profitability: Did the business model earn a profit? Was the product changed to increase profitability?
- Adaptability: Was peer feedback used to improve the business model and adapt the product design?

Extension Activities

Design challenges often inspire students to think about what's next. For some, this could mean connecting with entrepreneurs or applying their skills in new ways. Here are a few ideas for how you can help students extend this challenge:

- Throughout the challenge, students learned about various methods to reduce or reuse materials. Have students create a new product design made entirely of repurposed materials. Encourage students to create a marketable, profitable product that uses solely scrap or left-over materials. Explore the [Reinventing the Ordinary: an Upcycling Challenge](#) for additional ideas.
- Help students create an e-commerce storefront. Support them by teaching them to analyze business analytics, evaluate market trends, and assess growth potential. Bring in e-commerce experts to support student learning. Explore the [Sold! Build e-Commerce Success](#) for additional ideas.
- Encourage students to create a full product line. This will require them to think more deeply about their brand identity, business model, and storefront structure as well as the needs of their target market. Students may also return to their designs to maximize their prints for multiple products.

The next challenge in the Business Development series is [Pop-Up Shop Showcase](#).

Ready to take the Business Development series to the next level? Try the Capstone Challenge [Pitch It!](#), where students devise a business pitch for a unique design or product and present it to a panel of potential investors.