![CreositySpace — Connecting Kids to STEM Through Entrepreneurship]

Book of Ideas

Educator Guide - Excerpt

Introduction to Invention

Kids around the country are inventing!

For more information on the Book of Ideas go to
https://www.creosityspace.com/young-entrepreneur-tools.html

To see our full K-5 science and engineering curriculum please visit our website:
www.creosityspace.com/k5science.html

Welcome to the *Book of Ideas*

Getting kids to connect to and see value in their ideas is a key ingredient in teaching STEM and to fostering student confidence. This is why CreositySpace created the *Book of Ideas*.
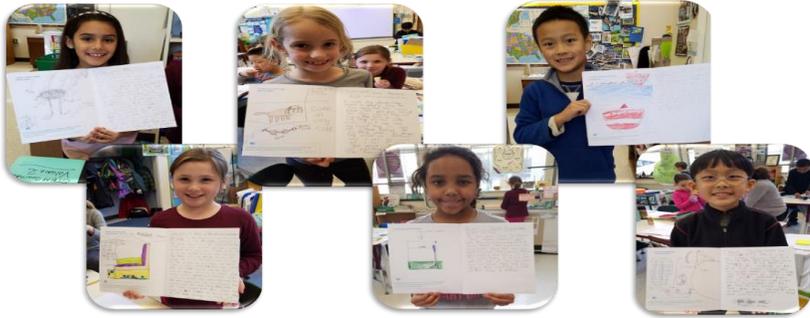
Similar to a real inventor's notebook, the *Book of Ideas* was designed to encourage kids to write down or draw, explore, and discuss their own ideas and inventions. Pages include a title block, quotes from entrepreneurs and innovators, short design prompts and a list of inventions and businesses started by kids.

The *Book of Ideas* is NOT about the right answer, perfect spelling, or fitting into a pre-determined box. **The *Book of Ideas* IS about:**

- Giving students the opportunity to explore and express their ideas in a way that works for them,

- Providing a forum in which students may work independently, as well as collaboratively, and practice giving and receiving respectful feedback, and

- Offering an exciting way for students to show you the ideas, big wonderings, and solutions on their minds and giving you additional insight on how to engage every learner.
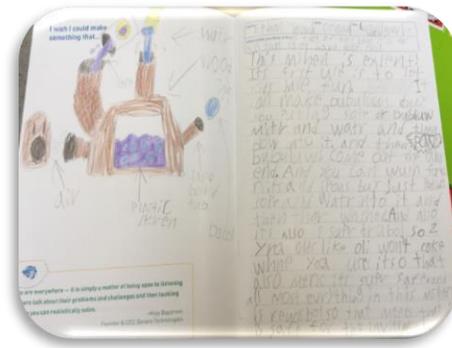
The Educator Guide

The CreositySpace *Educator Guide* is your resource to engage your classroom in student-directed inquiry-based discovery. We provide the tools and content designed to leverage your students' natural creativity and curiosity and you decide what exact sequencing works best for your classroom. In the full *Educator Guide* you'll find two introduction sections: a K–2 Introduction and a 3–5 Introduction. The K–2 Introduction has simplified text and vocabulary strategies that are more suited to younger students and/or early readers, while 3–5 Introduction is more appropriate for older students and/or more advanced readers.

My STEM Stories™ student notebook

The introductory text, vocabulary, and entrepreneur story have been combined to form a *My STEM Stories*™ student notebook. There are four versions of the *My STEM Stories*™ notebook targeting four different reading levels: A, B, C, and D.

Reading Level A   Reading Level C

- Levels A and B pull from the K–2 introduction

- Level C pulls from the 3–5 introduction

- Level D is for high-capacity readers with a more advanced version of the introductory text and entrepreneur story.

The reading level A notebook also comes with a *Teacher Version* of the notebook for the option to give a richer group reading experience.

There is no wrong way to use the *Book of Ideas* in your classroom.

Above all, it should be considered a conversation-starter and a great way to encourage creativity, communication, collaboration, and curiosity.

Getting Started

If you're already full of ideas and ready to dive right into using the *Book of Ideas* in your classroom, please feel free to skip forward to the *Introductory Activities* section of the educator guide *(not included in this excerpt).*

If, on the other hand, you're not quite sure of what to do first, we have some suggestions below based on your answers to the following questions:

- What is the first thing you'd like to accomplish by using the *Book of Ideas* in your classroom?
- What best describes the learning and collaboration style among your students?

While there are almost as many answers to these questions as there are classrooms, we've selected some of the most common responses and put together a suggested strategy for introducing the *Book of Ideas* that fits well with for those scenarios.

Each strategy includes:

- A few **preparation** activities to pick from—to get your students excited and ready for the *Book of Ideas.*
- An **introduction** lesson outline for when you first distribute and have students start working in their *Book of Ideas*.

Once students have started working in their *Book of Ideas*, you can take your lesson direction from their ideas and interests keeping in mind some of the overarching goals of working with the Book of Ideas include:

- Giving students a comfortable space to describe, explore, and discuss their ideas.
- Giving students a framework to practice the giving and receiving of constructive feedback.
- Giving students an opportunity to build on their ideas—both individually and collaboratively—while fostering respect for different perspectives, interests, and skills.
- Giving students a forum to demonstrate their knowledge and express their capabilities—especially for those who struggle with traditional evaluation methods.

Key to Success: Students must have the opportunity to use their interests to drive the product.
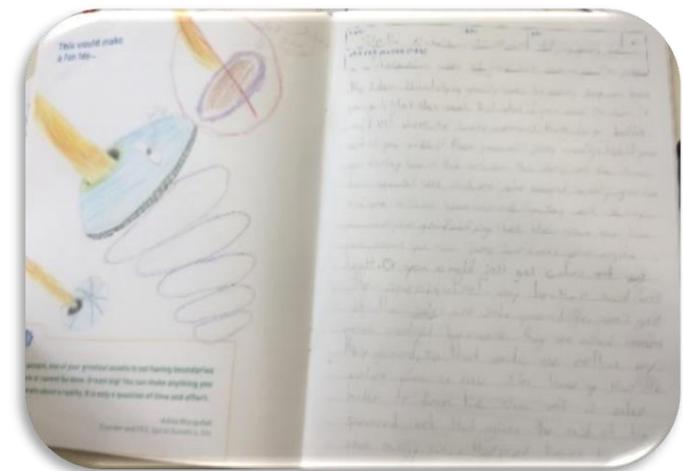
What is the first thing you'd like to accomplish by using the *Book of Ideas* in your classroom?

1. Integrate engineering concepts using innovation

Preparation and introduction should focus on the engineering design process and the connection between engineering and the needs of the community.

<u>Preparation</u>

- Ask students what they know about the engineering design process. Essential questions or blank engineering design process templates (in Appendix) can be used as discussion prompts.

- Read and discuss Barrett and JD's story about E Ink. Focus on identifying parts of the engineering design process throughout the story.

<u>Introduction</u>

- Hand out the *Books of Ideas* and read through the innovation prompts together as a class.

- Have students select one prompt they like and spend 5–10 minutes working on their idea alone.

- After 5–10 minutes have them partner up with someone and share their ideas. Have the partner provide some feedback. (Suggestion: Pick a couple of feedback phrases from the *Useful Phrases for Having Constructive Discussions* section in the [Appendix](#) and have them use one of those phrases to provide the feedback.)

- Repeat this process a few times and then gather the group together to discuss how the last 30–40 minutes have mapped to the engineering design process.

2. Encourage collaboration and communication in the classroom

Preparation and introduction should emphasize the collaborative nature of invention and entrepreneurship.

<u>Preparation</u>

- Show and discuss a video that emphasizes collaboration as critical to invention.

- Pick and discuss an entrepreneur quote that emphasizes collaboration.

- Participate in a warm-up challenge that focuses on collaboration to give students practice before they begin working with the *Book of Ideas*.

<u>Introduction</u>

- Hand out the *Books of Ideas* and read through the innovation prompts together as a class.

- Have students select one prompt they like and spend 5 minutes working on their idea alone.

- After 5 minutes have them partner up with someone **who picked the same prompt** and share their ideas. Have the partner provide some feedback. (Suggestion: Pick a couple of feedback phrases from the *Useful Phrases for Having Constructive Discussions* section in the [Appendix](#) and have them use one of those phrases to provide the feedback.)

- Have students go back to working on their ideas but repeat the feedback exercise a few more times.

- After a few rounds gather everyone together and have them discuss their thoughts on getting feedback and working together.

- The next time students work in their Book of Ideas, have them work in teams of two or three to collaborate on an invention.

3. Engage students in writing, presenting, and other ELA learning objectives

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Preparation and introduction should help students connect with their ideas and find value and confidence in those ideas.

Preparation

- Introduce students to innovation and the *Book of Ideas* via the Oli video. Discuss the value of all ideas—especially ones that seems different or "weird."

- Watch the Ideo video (better for older students). Discuss all the different communication skills needed to develop an idea or invention (reading, writing, drawing, speaking and listening, etc.)

- Use the *Book of Ideas* as a reward incentive, have students build up their stamina to work independently on writing or drawing (depending on age) up to 5 minutes undistracted.

Introduction

- Hand out the *Books of Ideas* and read through the innovation prompts together as a class.

- Have students select one prompt they like and spend 5 minutes working on their idea alone.

- After 5 minutes have them partner up with someone and share their ideas. Have the partner provide some feedback. (Suggestion: Pick a couple of feedback phrases from the *Useful Phrases for Having Constructive Discussions* section in the Appendix and have them use one of those phrases to provide the feedback.)

- Have the students continue working on their inventions with an end goal of presenting their inventions to the class. As students work towards their presentations, they should practice explaining their inventions to a partner (a new person) or in small groups. This is also a good opportunity to for students to continue practicing the giving and receiving of productive feedback.

What best describes the collaboration style of your students?

1. Collaborative and creative but sometimes have trouble focusing

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Preparation and introduction should keep their level of excitement high while giving them some practice focusing.

Preparation

- Introduce students to innovation and the *Book of Ideas* via the Oli video. Discuss the value of all ideas—especially ones that seems different or "weird."

- Use the *Book of Ideas* as a reward incentive, have students build up their stamina to work independently on writing or drawing (depending on age) up to 5 minutes undistracted.

Introduction

- Hand out the *Books of Ideas* and read through the innovation prompts together as a class.

- Have students select one prompt they like and spend 5 minutes working on their idea alone.

- After 5 minutes have them partner up with someone and share their ideas. Have the partner provide some feedback. (Suggestion: Pick a couple of feedback phrases from the *Useful Phrases for Having Constructive Discussions* section in the Appendix and have them use one of those phrases to provide the feedback.)

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2. Creative but quiet and not comfortable with group work

Preparation and introduction should generate excitement for invention with an emphasis on the benefits of collaboration.

Preparation
- Show and discuss a video that emphasizes collaboration as critical to invention.
- Pick and discuss an entrepreneur quote that emphasizes collaboration.
- Participate in a warm-up challenge that focuses on collaboration to give students practice before they begin working with the *Book of Ideas*.

Introduction
- Hand out the Books of Ideas and read through the innovation prompts together as a class.
- Have students select one prompt they like and spend 5 minutes working on their idea alone.
- After 5 minutes have them partner up with someone **who picked the same prompt** and share their ideas. Have the partner provide some feedback. (Suggestion: Pick a couple of feedback phrases from the *Useful Phrases for Having Constructive Discussions* section in the [Appendix](#) and have them use one of those phrases to provide the feedback.)
- Have students go back to working on their ideas but repeat the feedback exercise a few more times.
- After a few rounds gather everyone together and have them discuss their thoughts on getting feedback and working together.

3. Shy and lacking in self-confidence

Preparation and introduction emphasize the possibilities and create an environment that is supportive of their ideas.

Preparation
- Introduce students to innovation and the Book of Ideas via the Oli videos.
- Pick and discuss the story of one or two of the young inventors features in the front of the book.

Introduction
- Hand out the Books of Ideas and read through the innovation prompts together as a class.
- Have students select one prompt they like and spend 5 minutes working on their idea alone. **Join them in this activity with your own copy of the Book of Ideas.**
- (check with Annette on this one) After 5 minutes gather the students back together and ask if anyone is comfortable sharing their idea. If not, share your idea and ask for feedback. (Suggestion: Pick a couple of feedback phrases from the *Useful Phrases for Having Constructive Discussions* section in the [Appendix](#) and have them use one of those phrases to provide the feedback.)
- Have students go back to working on their ideas but repeat the feedback exercise a few more times.

It all starts with an idea...

Jordan (10 years old)

"I was trying to make a landable airplane and I accidentally made this. It works like a bag clip, hold down the more open side and it opens the other side to hold down the bag."

Aya (10 years old)

"This is ROBO the help robot. He is basically something to help people and with his parachute. He can be dropped from the sky, and he brings some food and water for people in need."

Ma'ayan (8 years old)

"I made this cat treat dispenser because I don't like touching the cat treats."

For more examples check out the CreositySpace

Young Inventors Gallery at

www.creosityspace.com/young-inventors-gallery.html

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