Invention Engine

Grant application starter guide

Information to get you started with your Invention Engine grant application

Invention Engine
The fun of inventing is the journey

microbric
motivate • create • educate

Contents

About this guide

Here at Microbric, the team behind Invention Engine, we understand that the budget process can be painful. Getting purchases approved can be a challenge, especially if you need to apply for the funds. Pulling together all the information you need for a grant proposal or budget request can be a time-consuming and annoying process.

We hope that this guide will help make it a little faster and easier.

Here you will find suggestions and sample written copy about Invention Engine addressing the most common topics educators tell us they have to cover in their grant applications. Please feel free to use this content as you see fit in your application.

Don't forget that our team are here to help! If your application requires information not covered in this guide, or you need a quote for your intended purchase, reach out to us at www.inventionengine.net. We will do our best to provide you with any additional information that you need.

The key to a successful grant

The #1 tip to writing a successful grant is: **deliver exactly what they ask for in the application.**

Follow the exact directions provided when completing and submitting the application. Be sure you include all the information you are asked for and pay attention to formatting requirements, including word count. It's not uncommon for grantors to reject (and potentially not even read) applications that do not follow their format or guidelines.

Remember also that there's a human reading your application on the other side. Make sure your answers are clear, specific and to the point. Avoid unfamiliar acronyms and unnecessary jargon wherever possible.

Overview of Invention Engine

Use this information to:

- Familiarise the grantor with Invention Engine in your introduction, overview or summary sections.
- Demonstrate that you have done your research in selecting Invention Engine as a solution.
- Highlight the aspects of Invention Engine, such as the particular bits, you are planning on using in your classroom.

What is Invention Engine?

Invention Engine is a robust, hands-on system for learning computer science, engineering, and design thinking.

The system contains a programmable 'Invention Engine Hub' and a range of connectable electronic bits (including LED's, motors, and sensors). All of the bits can be coded, and mounted to cardboard allowing coded creations to come to life.

Invention Engine is supported by a complete set of free educational resources including teacher and student guides.

There are three units, tied to computer science, engineering and design thinking learning objectives.

Students learn progressively key educational objectives and concepts, begin with the basics, learning by doing as they build up skills and create exciting inventions.

You can find more information about individual Invention Engine 'bits' at
https://inventionengine.net/the-hub-and-the-bits/

What is the Invention Engine coding language?

The Invention Engine block-based programming application, referred to as **Invention Blocks** (https://inventionengine.app/) is an easy-to-use programming language designed specifically for Invention Engine.

Invention Engine Blocks is free, intuitive, and robust.

Invention Engine Blocks is a vertical block-based visual programming language based on Scratch[1]. It combines the ease of drag-and-drop programming with powerful functionality and versatility. The result is a programming language that is easy to learn and offers a robust platform for computer science education.

Helpful features, like the built-in bug box, make the transition to using more complex programming structures approachable even with no prior coding experience. As students gain confidence in coding, they can do even more by controlling inputs, manipulating data, and creating and utilising variables.

Invention Engine Blocks is a web-based software and your device will require a USB port and a Chrome based browser to work correctly.

Coding with Invention Engine Blocks lets students see their programs working. The programmable bits allow learners to test their code 'in the real world' and provide instant, tangible feedback. This feedback loop helps students develop critical skills, such as problem-solving and debugging, in an engaging and fun way.

You can access Invention Blocks at www.inventionengine.app

Why choose Invention Engine?

1. **Invention Engine is designed to work with cardboard.** This inexpensive material is all you need for students to bring interactive creations to life. Add basic craft materials (such as paint or other art supplies) to the mix and students can design, test, debug, improve, decorate and personalize their inventions.

2. **Simplicity in design.** Invention Engine can be purchased as set kits, each tied to complete educational units, so you will have everything you need to get started. No need to worry about sourcing additional cables, memory cards or electronic components.

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[1] *Invention Engine Blocks is developed by Microbric Pty Ltd using open source software created and maintained by the Scratch Foundation. The Scratch Foundation does not sponsor, endorse, or authorize this content. See scratch.mit.edu for more information.*

3. **Engaging, relevant and fun!** Invention Engine makes the learning journey a personal one. Each student develops their own invention and approach to solving a problem, making the learning relevant, motivating, challenging, and interesting.

4. **Coding with a side effect.** The hands-on process of creating a working invention using the Invention Engine Cycle, supports students to develop the tools and skills needed to transform an idea through the design, code, build, test and iterate process into an invention.

5. **Low floor high ceiling.** The wide-range of Invention Engine bits offers a limitless range of projects across subject areas and skill levels.

6. **Reusable, flexible, and inexpensive.** Simply remove the Invention Engine bits, and rivets from inventions, recycle your cardboard and reuse the system. Create your own projects and choose your own adventure! You don't need to follow the resources. You can use Invention Engine to develop projects to suit your specific classroom needs.

7. **Buy only what you need.** If you need a top up of Invention Engine bits or rivets, or to add an additional Invention Engine bit to your kit – you can. You don't need to buy the whole kit again.

Using Invention Engine in your classroom

When asked this question as part of your grant application, use this information to explain your plans for using Invention Engine in your classroom. Remember to highlight how Invention Engine helps address your target educational outcomes.

Some additional ideas where Invention Engine could support your classroom:

- o Literature: creating the characters and or an automated scene of the book.
- o Digital fabrication: each student will be using Invention Engine to develop their own technology.
- o Project Based learning; focus on environmental studies or a different field and build a model that would solve a problem.
- o Geography: ask students to choose and develop an animated representation of a country of their choosing

How will you implement Invention Engine?

Some applications ask you to explain your plan for using Invention Engine. The following points may help you form your answer.

Points to consider

The basics of your plan (where, who, when).

- Educational setting (general classes, technology or specialist classes, electives, clubs, etc.).
- Ages and grad level(s) of your students.
- Educators who will teach using Invention Engine (yourself, colleagues, etc.).
- Term or lesson schedule plan.

What subjects/topics will you teach with Invention Engine?

- Coding, computer science and computational thinking.
- Integrated subjects (STEM, STEAM, etc.).
- Project-based and inquiry-based learning.
- Other subjects (mathematics, English language arts, engineering, physical sciences, etc.).

Project/learning evaluation

- How will you evaluate the success of your project? (Implementation timeline, number of students exposed, etc.).
- How will you evaluate student learning? (Pre-and-post learning tests, student project showcases, aptitude evaluations, grades, self-evaluations, etc.).

Keywords to look for in standards

Many grants ask for specific learning outcomes or standards to be addressed by the proposed solution. Look for these example keywords in your standards to find which standards your project aligns to:

- "defining and delimiting engineering problems"
- "define a design problem that can be solved through the development of an object, tool, process, or system"
- "developing understanding and skills in computational thinking"
- "create and use a range of digital solutions"
- "use physical computing devices"
- "explore a range of digital systems with peripheral devices for different purposes"
- "collect, explore and transmit different types of data"
- "develop algorithms involving branching (decisions) and user input"
- "recognise and explore patterns in data"
- "implement digital solutions as visual programs"
- "follow, describe and represent a sequence of steps and decisions"
- "design, modify and follow simple algorithms involving sequences of steps, branching and iterations (repetition)"
- "solve problems involving measurement and conversion of measurements"
- "represent and interpret data"
- "consider and provide solutions for real-world problems"
- "demonstrate reading comprehension by accurately following instructions"
- "digital fabrication"

What else is needed?

Some applications ask you to list the additional products and services you will need in order to implement your solution with Invention Engine. The following points may help you form your answer.

Points to consider

Additional supplies

- Programming devices (such as laptops)
- Any additional/spare Invention Engine bits
- Storage containers
- Cardboard and other arts and craft supplies
- Print-outs (including student activity sheets and teaching guides)

The bigger picture

Use this information to:

- Offer context about how Invention Engine helps address specific educational outcomes you are seeking.
- Build a statement of the problem you are facing in your introduction, overview or summary sections.
- Explain the value of your proposal in broader terms.

Points to consider

The value of coding

- Coding helps kids develop academic skills, learn perseverance and organisation, and gain invaluable problem-solving skills.
- Programming provides hands-on opportunities to work through creative problem solving independently and collaboratively.
- Understanding computers and learning the basics of coding helps children develop an appreciation of how things work, particularly the technology in their everyday lives.
- Having strong foundations in coding and technology will be crucial for success in tomorrow's workforce.
- Coding helps make thinking processes, including logical thinking and computational thinking, tangible. Likewise, coding can help students develop metacognition capabilities.
- Coding helps students see the real-world value of (and learn how to have fun with) mathematics.

Additional product details

Use this information to:

- Provide specific details required in your grant application.

Pricing

Developed specifically for the classroom, Invention Engine Unit bundles are the quickest and easiest ways for learners of all skill levels to create engaging, interactive projects and have rich coding and engineering experiences.

Invention Engine bundle packs match the unit numbers in the lesson plans, so you always have the right Invention Engine bits! We recommend one set of Invention Engine bits per student. Each bundle, has ten sets.

Invention Engine Unit 1 Bundle - https://inventionengine.net/product/bundle-1/

Invention Engine Unit 2 Bundle - https://inventionengine.net/product/bundle-2/

Invention Engine Unit 3 Bundle - https://inventionengine.net/product/bundle-3/

All Products - https://inventionengine.net/shop/

Should your grant application require an official quote, please do not hesitate to contact our team at https://inventionengine.net/support/contact-us/ who would be happy to arrange one for you.

Product warranty

Invention Engine is covered by a 12-month replacement warranty. We will replace, refund or supply replacement parts at our discretion based on availability and the nature of the fault for a period of 12-months.

Technical overview

Invention Engine is a web-based software and your device will require a USB port and a Chrome based browser to work correctly.

Invention Engine will work on Windows PC, Mac and Linux that have a Chrome based browser.

At this time, Invention Engine will not work on Firefox on a Windows PC or Safari on a Mac device.

You can find technical information about each of the Invention Engine bits at https://inventionengine.net/the-hub-and-the-bits/

Additional information

Our team are here to help! If your application requires information not covered in this guide, please reach out to us at https://inventionengine.net/support/contact-us/

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