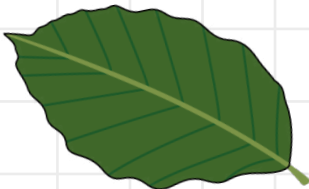


Digital Maker Stage 5 guidance for Scouts



Overview

In Stage 5, you will demonstrate that you can combine a variety of digital making skills to solve a real-world problem, and you will create a resource to show how the project can be rebuilt from scratch.



How to earn your badge:

- 1 Identify a real-life local or global problem and design, build, test, and improve a solution by combining your digital making skills and selecting appropriate software tools, digital devices, components, and materials.
- 2 Create and share a resource that would allow someone else to replicate your project with minimal previous knowledge. This resource should be digital, and it can be any format you like: a video (or a series!), an online (printable) document, an entry on a tutorials website such as Instructables, or a blog post, or you could meet with people who could benefit from your solution to share how you created it and explain how it can help them.

Terminology

Digital making skills

Design, programming, physical computing and manufacturing

Software tools

Computer programs which provide the means to calculate, produce or achieve something, e.g. a graphics tool to help you draw, or a CAD tool to help you lay out a manufacturing design

Digital devices

Devices such as a micro:bit, Raspberry Pi or Arduino

Components

Components that can be connected together to make circuits, e.g. LEDs, buttons and sensors

Materials

Materials used to assemble the physical form of a project, e.g. cardboard, wood and plastic



For more information on terms like these, refer to the Raspberry Pi Digital Making Curriculum and its glossary at rpf.io/curriculum.

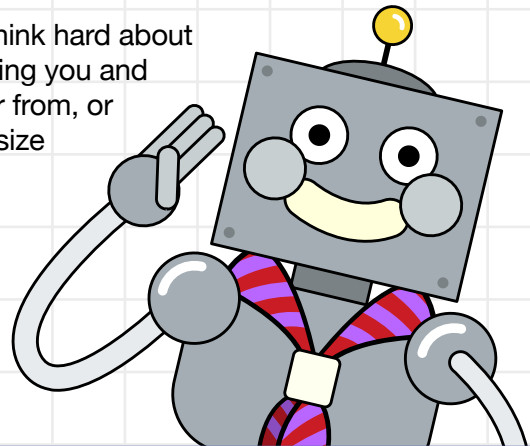


Identify a problem

For Stage 5, you have to identify a real-life local or global problem and develop a solution that combines all of your digital making skills — so it's going to be quite complex. You might find it best to work in a team!

First, think about a problem that you could try to solve. Really think hard about what matters to you — it could be something personal, something you and your school friends or the people in your local community suffer from, or something huge, such as a global environmental problem. The size and scale of the problem don't matter, as long as the problem's important to you.

Shortlist some problems, and think about how you could use technology to solve each of them. Finding something that balances your skills and interests is key.



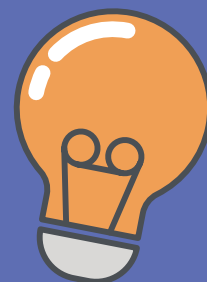
Your project idea

Once you've chosen a problem and drafted an idea for a technology solution, it's time to plan the project and how you're going to build it.

It's important for your idea to be realistic. For example, if your idea is related to the environment, building a system to calculate a person's carbon footprint from certain data is realistic, but building an app that tries to calculate it from a photograph using computer vision is far too advanced! Think about the technology you've used, what it can do, and how to access the solutions to potential problems. If you discover part-way through a project that it might be too difficult, ask your Leader for their view. You could also ask for advice from any techies you know. You can always modify your plan, or even change your idea completely.

Write down all of your project ideas, what problems they solve, and how they solve the problems. When you have an idea that you want to proceed with, start to plan its components and how it will work. Think about the following questions:

- What devices and components do you need to build this?
- How will it be programmed?
- What do you need to manufacture to create the finished build?
- What help will you need?



Digital Maker Stage 5 guidance for Scouts



To ensure that you have all the components you need, copy out this table and replace the examples (for a carbon footprint calculator) with the information for your own project:

Component	Your project
Digital devices	Raspberry Pi and micro:bit
Software tools	Python and MakeCode
Electronic components	LED strip, big push button, speakers
Other materials	Woodwork, acrylic

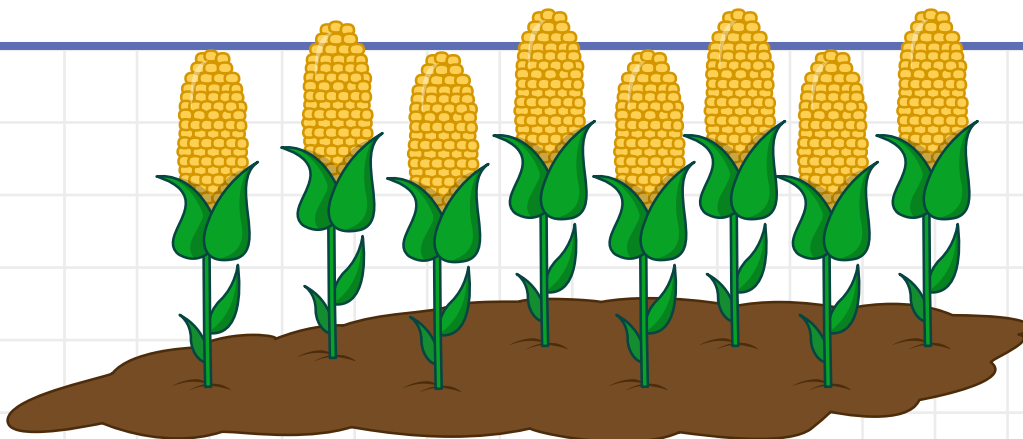
Print the components sheet and fill it in for your project.

Build a digital making project



Make a plan for how you're going to complete the project. It's best to start with a prototype that shows a proof of concept that demonstrates what you're trying to achieve (don't worry about presentation or completeness!). Show a Leader or another adult your prototype, get feedback early, and once you've validated your idea and demonstrated that you have everything you need to complete the project, it's time to crack on with the build.

Make a plan for how you'll make your project, and prototype everything first. If your team members are going to work on different parts, make sure you keep good communication and stay on track.





Design, test, and iterate

The requirements state that you must design, build, test, and improve your project. You might be used to doing projects in phases, where you would design first, then move on to implementation, then test it and address any issues you find when testing. You don't have to do it like this; it's healthier to use an iterative process, where you prototype some ideas before you design what it will look like, then work on bits of the code and parts of the build, while constantly testing and iterating.

While you don't need to do your design as a separate phase, it's important to keep any designs you make, to show evidence. Keep a log of your design work for all parts of the project, as you will need to include it with what you present to your Leader to be awarded your badge. You should keep and present a record of your testing work too.

Be sure to make notes about how you built your project as you go along, because to meet the second requirement, you'll need to be able to write instructions to recreate it. It may also be useful to document the build process with photographs and screenshots.

Create and share your resource

Once your project is complete, you need to create a resource that would allow someone else to replicate your project with minimal previous knowledge. You can write the instructions down or make a video.

The tutorial must be step by step and include as much detail as is necessary to recreate the project from scratch. Include photos, tips, advice, and warnings.

If you're writing a build tutorial, you could publish it on a website or blog, or upload it to a tutorial site like **Instructables**.

If you make a video, you could upload it to a website like **YouTube** or **Vimeo**.

You can, of course, mix the two — written tutorials with embedded photos and videos could be ideal!

You can read other project builds on Instructables and watch similar videos on YouTube for inspiration.

Get the badge

Once you've fulfilled both requirements, fill in the assessment form and present it to your Leader to evaluate.

Congratulations!

Congratulations! You've now achieved Digital Maker Stage 5. Can you help others earn their Digital Maker badges too?