

ACTIVITY SHEETS & TEMPLATES

REPLICATE IBL IN YOUR CLASSROOM - GUIDELINES & TEMPLATE

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In order to create your course resources using the training programme of Let's STEAM, the proposed inquiry approach has been translated into an open and directly usable template, divided into 3 parts i.e. how to collect data, how to show these data and how to analyse them to learn from the experimentation. The following template gives you hints and information on how to use it to produce your own lesson plans.





Through this phase, you will search into some documentation and lead experimentations with programmable boards.

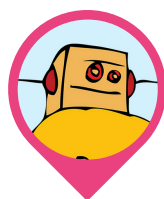
We are fully aware that starting from scratch on the proposed template might be a challenging process. It is not always obvious to exemplify a pedagogical concept or topic based on programming practices, especially for beginners regarding the use of microcontrollers and boards. This should not block you from going further in the development of meaningful coding activities, and this is why we have prepared examples gathered in this coursebook regarding what can be the deployment of our IBL template in the framework of the classroom. You can also feel free to use the following online resources as content for inspiration such as:



www.hackster.io/projects



www.microsoft.com/en-us/makecode/resources



www.instructables.com/projects/



makezine.com/projects/



hackaday.io/projects

These makers and developers' communities are sharing thousands of projects and ideas that can be adapted to a fruitful learning activity thanks to your pedagogical knowledge!

CONCRETELY, HOW IS THE IBL TEMPLATE STRUCTURED?

You can find in the next pages an open and directly usable template, divided into **4 parts**:



Step 1 - Present the project as a whole - 1 page

Describe the project you want to launch and reflect on the first main questions to be asked regarding inclusiveness before developing the content of your activity



Step 2 - Collect data thanks to the board and its embedded sensors - 2 pages

At this stage, you are required to find a programming solution to collect your data, identify which sensors to be used and how to program them on MakeCode for the platform to communicate with your board.



Step 3 - Display the data to get the needed information - 2 pages

At this stage, you are required to find a programming solution to display your data, enabling, now you have asked a sensor to obtain information, to make this information known to the user.



Step 4 - Analyse the data and learn from them - 2 pages

Now we are able to display data instantly, we need to analyze them to perform monitoring of our information (for instance, monitoring of temperature, of alerts, motion, frequency ...). This stage is made for enabling this analysis on the editor.



This division has been selected to ensure that your project is **readable** and **well defined**: from **data collection** to **display** to **exploitation**. You can **change or add as many parts as you wish**, as soon as you respect the inquiry approach steps in each of them. We consider that **3/4 parts** are a good ratio. Here is the definition of the expected contents for each of the steps of the inquiry-based learning approach:

Orientation	<i>Arouse astonishment and curiosity by proposing a triggering situation Define what is the problem to be solved</i>
Conceptualisation	<i>Structure the questioning, organise the ideas, clarify the vocabulary Formulate a hypothesis to answer the problem</i>
Investigation	<i>Proposes programming activities considering the experiments to be made Imagine how to verify the hypothesis and test them</i>
Debrief	<i>Identify the knowledge mobilized during this phase Think about your classroom and identify possible learning Add references issues that may come up</i>

In addition, you will find at the end of this coursebook a **list of 8 projects' ideas** that you can get inspired from, use, develop or modify:

- **Idea 1: How to make the invisible visible?** Reproduce the natural environment of frogs to ensure their survival (complete example)
- **Idea 2: Preserve biodiversity.** Monitor the number of plant species in your neighbourhood. Explore the streets and parks in your neighbourhood to find out more about the ecosystem and use technology to make this process easier! Use the STM32 card to record your findings!
- **Idea 3: Temperature control in the classroom.** It is too hot in the classroom. When students come in, they know to close the blinds, but during break time, the classroom gets really hot. How can we create a more autonomous system through programming?
- **Idea 4: Build a welcoming classroom.** Identify the particular light intensity needs in your classroom to perform a specific activity.
- **Idea 5: Your ideal (and sustainable) home.** Dream about where you would like to live, what your ideal home would be like and how this ideal home could be more sustainable.
- **Idea 6: Washing hands.** We need to ensure that children wash their hands when they come back from the playground. Although new routines have been put in place to ensure that all children wash their hands, we are not sure that they do it well enough. How can programming help us stick to the barrier actions?
- **Idea 7: Reasonable heating use.** Identify the optimum position for using heating appliances at given times to save electricity.
- **Idea 8: Music: Can you play what you hear?** Have you ever wished you could play a song on the piano just by listening to it?

These are proposed by the Let's STEAM consortium members. Feel free to contact each project responsible to co-create with us a solution.

Enjoy programming in the Let's STEAM way! Unleash your creativity and get started!