

This resource provides material for educators to explore biomimicry (innovation inspired by nature) with students 12-16 years old. After using the introductory modules (lessons), the remaining set of modules can be delivered in many different sequences and lengths, enabling teachers to build their own individualized programs depending on interest and time. Module topics frequently interrelate, helping to create depth and cohesiveness to the educational experience.

Modules follow a standard template to make them easy to follow (see template below). Modules are downloadable and printable. Within the modules there are links to Student worksheets, Teacher's pages, media slides, and other materials. All of this has been consciously designed to help make the adoption and effective implementation of a new, fascinating, and important subject as easy as possible for teachers.

Frequently used documents

- 9 principles of biomimicry
- Evaluation wheel
- Glossary

Module template with explanations: see on next pages



TITLE OF MODULE

Subtitle *Leading question/Challenge/How does nature...?*



Erasmus+



AGE RANGE

[11-16]

SUMMARY

*One sentence description about what the topic is and why the topic matters.
1-2 sentences describing what the students do.*



DURATION

Preparation:

... min.

*Approximate time for
preparing the modules*

Activity:

... min. / ... lessons

*Duration of the module in
minutes and number of
school lessons*

BIOMIMICRY PRINCIPLES

Relevant for the module from the list below:



- 1 - Nature runs on sunlight
- 2 - Nature uses only the energy it needs
- 3 - Nature fits form to function
- 4 - Nature recycles everything
- 5 - Nature rewards cooperation
- 6 - Nature banks on diversity
- 7 - Nature demands local expertise
- 8 - Nature seeks balance
- 9 - Nature taps the power of limits



SUBJECT(S)

*You can find relevant STEAM
Subjects from the list below:*

- Science – Biology,
Chemistry, Physics
- Design, Engineering
and Technology
- Arts
- Mathematics

LEARNING OBJECTIVES

- *Direct goals and attitudes should be reached by the end of the module.*

LEARNING OUTCOMES

- *What will the students achieve by the end of the module?*

BIOLEARN COMPETENCES

Relevant competences from the list below:

- Students are able to abstract principles of sustainability from the way the natural world functions.
- Students are able to identify functional design in Nature, develop greater awareness and appreciation for design excellence in Nature, and appreciate how nature works as a system which is elegant and deeply interconnected.
- Students are able to identify important needs and opportunities that can be addressed through design innovation for products, processes and systems.



KEYWORDS

*Most important words of the
content of the module*

- Students are able to use analogical creativity to innovate, using biological models to inspire solutions to design challenges.
- Students are able to assess the consequences of applying biomimicry solutions (values).
- Students are able to work in groups.
- Students are more motivated in learning STEAM and experience that knowledge of STEAM can be widely used.
- Students become more familiar with professions and research topics that relate to Nature-inspired sustainability and technological innovation, which can inform their choices in post-secondary education and careers.

SUMMARY OF THE ACTIVITIES

This table helps to overview the activities of the module.

Number	Activity Name	Short description	Method	Duration	Location
1	Activity	max. 10 words	• see the list below	Duration of one activity in minutes	<ul style="list-style-type: none"> • indoor • outdoor • both can be
2					
3					

For "method" we choose from the list below:

- analysis
- brainstorming
- card sort
- demonstration
- design activity
- discussion
- experiment
- exploration
- game
- group discussion

- group work
- hands-on activity
- observation (including sensing)
- quest
- quiz
- research
- role play
- student presentation (video, ppt, poster etc.)
- surveying
- synthesis
- teacher presentation



OUTLINE OF THE MODULE

BACKGROUND FOR TEACHERS

Some deeper background on the module, how to implement the module.



ACTIVITY DETAILS

1 | ACTIVITY



LOCATION
Outdoor



LOCATION
Indoor



LOCATION
Indoor / Outdoor



TOOLS AND MATERIALS

Physical tools and materials needed for the activities; sources for research during the activity.

- tools
- PC and related tools



PREPARATIONS

In- or outdoors.

What shall be done before we can start?

How to arrange the classroom?



RESOURCES

e.g. websites/from annexes

Icons about types of the activity (sometimes more within one activity):

» **DISCOVER** 

This icon indicates that you will get or need to search for information. It stands in front of pieces of text that you should read or at a source that you can look up. It helps to better understand the topic.

» **QUESTION** 

This icon comes with a question. Take a moment and think about the question. The question helps you to gain a better understanding of the topic.

» **CREATE** 

When you see this icon, you are going to do something! An assignment or an action for yourself or with your group.

DESCRIPTION

EXTENSIONS

Versions/other ideas, how to perform the activities.

LITERATURE, ADDITIONAL INFORMATION

Any additional literature in the topic.



T1.1. TITLE *Numbered according to the activities.*
Subtitle

*Important materials for the teacher to show or read to students during an activity; solution for exercises.
Additional information.*

Made on separate page.





D1.1. TITLE *Numbered according to the activities.*
Subtitle

Easy to print/copy and give to the students.

Made on separate page.