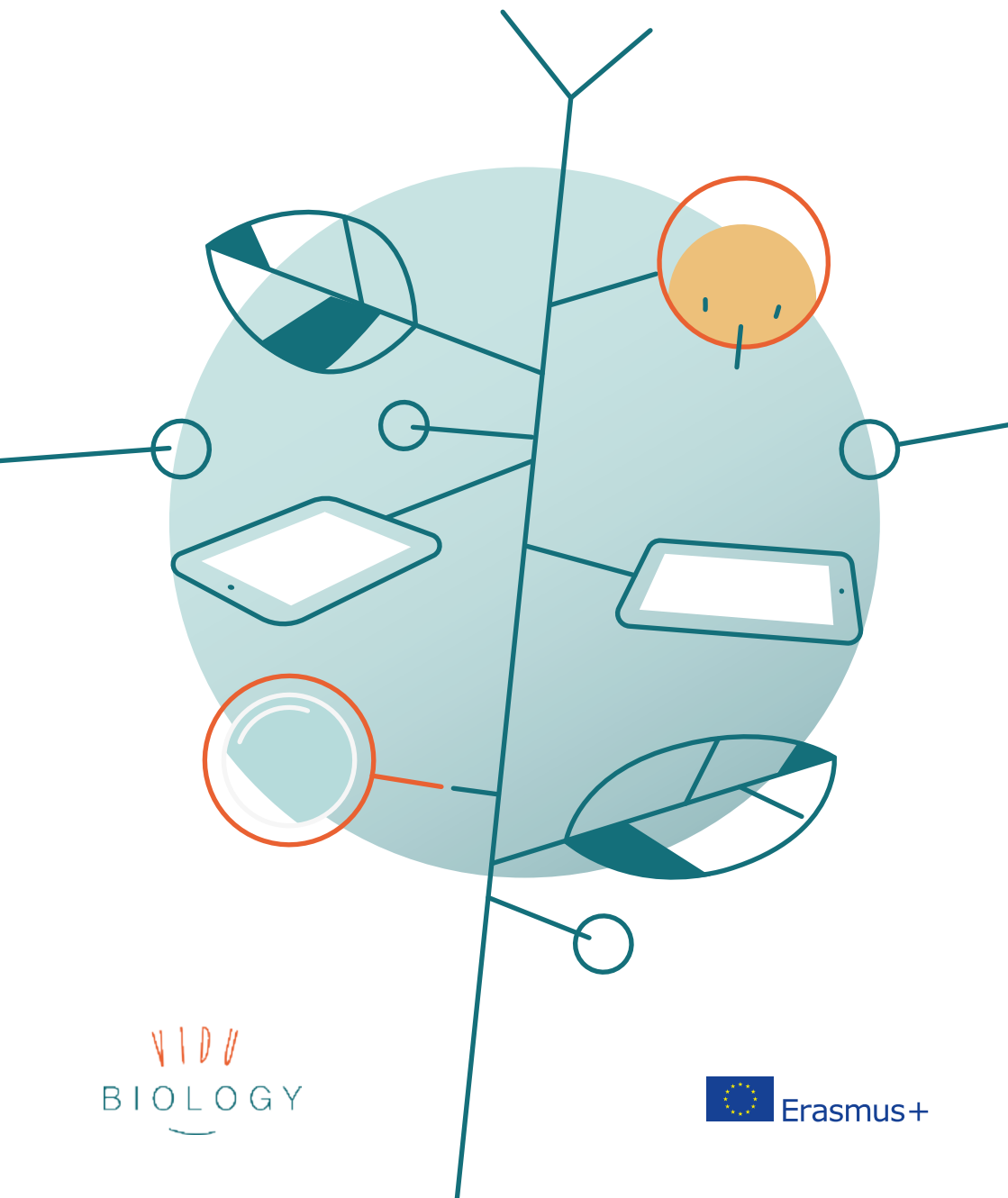


# VIDUBIOLOGY

creative video for biology



VIDU  
BIOLOGY

## ELEMENTS:



TEACHER'S AND STUDENT'S OPINIONS



EXAMPLES

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# CONTENT

• Welcome to vidubiology	5
• Introduction	6
Why vidubiology?	6
Goals of the vidubiology project	6
• Pedagogical Background	8
Student's learning	9
Photos and videos in inquiry-based learning process	11
• The vidubiology approach	14
Description of the project path	15
Step-by-step into the project	16
Privacy and copyright	18
Assessment	18
Module 1 - Entry task "Plants and Animals in the Seasons"	19
Module 2 - Intermediate task "Organisms in Action"	20
Module 3 - Advanced task "Creative Video"	22
• Technical support	24
Which technology to use?	25
Using your camera creatively	26
Uploading photos	28
Time-lapse videos	28
Slow-motion videos	28
Stop-motion videos	28
Post-production - editing photo stories and videos	29
• Teacher Training	32
• Experiences from the project	34
Feedback from Bulgaria	34
Feedback from Germany	35
Feedback from Iceland	36
• Conclusion	37
• Thanks	37
• References	38
• Team and Contact	39



## Welcome to vidubiology

„The essence of creativity is figuring out how to use what you already know in order to go beyond what you already think.“

*Jerome Bruner*

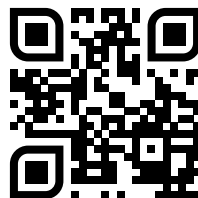
The European Erasmus+ project vidubiology offers innovative opportunities for students to explore and discover natural phenomena using digital media. In this handbook we seek to present an engaging, effective and enjoyable approach for teaching biology to children and young people. It has been designed to give teachers comprehensive support for the practical implementation of vidubiology.

We will explain why the project is needed and what goals it aims to meet. We will describe the pedagogical background of the project and discuss the benefits of using students' photo and video productions for enhancing and deepening their study of biology. We will also explore what we believe to be important factors for supporting children's learning and how it can make your teaching more effective, and how you can be involved in this project.

The tasks in the project are divided into three modules, each of which is presented in detail. We also offer technical support including information about different kinds of technology and ways of using them. At the end of the handbook we conclude with several examples from teachers and children who have participated in the project.

We invite you to visit our website [vidubiology.eu](http://vidubiology.eu) where the project is presented and where you can find all the supporting materials and worksheets for students and teachers. Photos and videos produced by participating students can be found on our Flickr site and YouTube playlist and we invite you to publish your own students' work there.

Please contact us if you wish to contribute and participate in this project.  
We will be happy to assist you!



## Why vidubiology?

The idea of vidubiology is that children themselves take photos and produce videos and use them in their investigation and learning about biology, in a playful and interesting way (many of the core ideas will also work with other school subjects). The process of taking pictures provides an opportunity for children to investigate and document phenomena or themes they are learning in biology. Furthermore, it increases their level of engagement in the subject far beyond what a textbook or even the internet can offer. A further important element of vidubiology is that the material produced by the children is made accessible to others.

The young students themselves are independent creators and producers of their own materials and as such are both learners and teachers. Presenting their productions in a creative way is educational both for themselves and for others. Their group discussions, while making their productions, help them to reflect on concepts, and to engage with, and use a new biological vocabulary.

A further central part of the vidubiology project is for children to develop skills in reflecting on media content. Being an active media participant enables students to become more critical media consumers.

## Goals of the vidubiology project

The 2015 PISA (Programme for International Student Assessment) global education survey focussed on science and concludes that students in many European countries showed low achievement and low motivation to study science (OECD, 2018). There is a need to find new ways to stimulate student's interest in, and understanding of, science.

Much of the work in vidubiology takes place outdoors. This encourages students to engage with, and enjoy nature, a reality that is missing in many young people's lives. It asks students to visit places in their neighbourhood they might otherwise not bother with, or gain new experiences of nature that they can learn from. It is important that children are offered opportunities to experience nature in their school curricula (Norðdahl, & Jóhannesson, 2016; Soga, & Gaston, 2016).

In Germany, young learners in our target age group (age 9 to 14 years) should do more scientific inquiry, that they are given more space to ask questions, and more support to investigate independently from the teacher, as well as in the use of digital technology (Secretariat of the Conference of Education Ministers, 2005 & 2016).

Similarly, the UK National Curriculum for Science states, 'Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted' (Department for Education, 2013 P.7). Research findings tell us that "hands on" approaches in nature, combined with engagement with technology, increases student's interest in learning science (Swarat, Ortony, & Revelle, 2012).

Teachers need more support and especially with ideas on how to implement digital media in their classrooms. The vidubiology project addresses these needs by providing relevant pedagogical materials of how active video making can be included in the biology classroom.

IN SUMMARY THE GOALS OF THE VIDUBIOLOGY PROJECT ARE TO:

- **INCREASE STUDENTS' EXPERIENCES OF NATURE**
- **PROMOTE STUDENTS' UNDERSTANDING OF BIOLOGICAL CONCEPTS AND PROCESSES**
- **SUPPORT STUDENTS' COMPETENCE IN INQUIRY BASED LEARNING**
- **FOSTER THEIR COMPETENCE IN USING DIFFERENT VISUAL MEDIA TO LOOK INTO BIOLOGICAL PHENOMENA AND REPORT THEIR FINDINGS**
- **INCREASE COMMUNICATION AND COLLABORATION BETWEEN LEARNERS IN EUROPEAN COUNTRIES**

## Pedagogical Background

“Education is not an affair of ‘telling’ and being told,  
but an active and constructive process”

*John Dewey*

Almost every student uses digital media every day outside of school. Our society has evolved into a digital society where information and communication technology devices (mobile phones, tablets etc.) are used and digitized content (including photos and videos) is produced and consumed. In particular, video is used by the younger generation for self-expression and communication, on YouTube, Instagram, Pinterest, Tumblr, etc. In addition to mobile phone usage, the internet and listening to music, watching videos online are generally high on the list of media recreational activities. In the JIM study 2018 (Youth, Information (Multi-) Media Survey in Germany among 12 to 19-year-olds) (Medienpädagogischer Forschungsverbund Südwest, 2018), it was shown that nine out of ten young people regularly watch online videos and also view photos / videos on their mobiles every day.



Although videos play a major role in young people's life they only play a minor role in school as a tool to support learning. The learning potential has hardly been explored or applied in schooling. Video technologies offer a variety of possibilities for use, in the methodological integration in the classroom, and as a technical design tool itself. Video as an audio-visual medium that appeals both aurally and visually - information recording and processing takes place through combined sensory perception, thus a higher learning success can be expected (Mayer, & Moreno, 2003) and learners can be specifically addressed in their learning preferences. Since students are the actual creators of the videos, digital and subject-related competencies can be specifically promoted. Using vidubiology, students develop digital skills for communication and collaboration, as well as designing digital content, as the European Digital Competence Framework for Citizens, proposes (European commission, 2019).



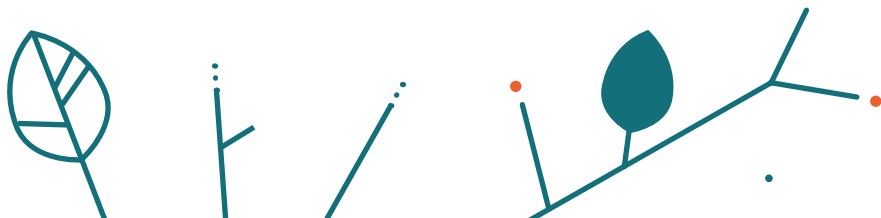
## Student's learning

In this project, learning is seen as an active construction of one's own understanding in which new information is linked to prior experience and knowledge. It will also emphasise children's experience of natural phenomena and the use of visual media. Most people know the phrase, referring to Dewey's theories, "learning by doing" or "learning from experience" (Einarsdóttir, 2010). Dewey emphasised the individual's activities involving experience, highlighting how the experience affected the individual (Dewey, 1938). He saw experience as both active and passive, "we do something to the thing, and then the thing does something to us in return" (Dewey, 1916/1966, p. 139). When a pupil takes a picture of, for example, a seed the photo creates a "reaction" in a way that the child can see if the photo did capture what the student was trying to capture, and also the student can see things in the photo that they did not see before. According to Dewey (1916/1966) this can involve an experience for the student if they reflect on the photo. Often people see experience and activity as the same and take it for granted that children will experience things if they are active, but this is not always the case. If there is no reflection on what they are doing, the activity is not giving children an experience according to Dewey (1916/1966).



The Russian psychologist Vygotsky (1978) has influenced our view of how social interaction affects learning. He saw communication between people to be important in the learning process and some things people can only learn from other people, within the so-called social cultural theory. It states that children learn through discussion and interaction with other children and adults, and language is seen as very important in the learning process (Vygotsky, 1978). Scott, Asoko and Leach (2007) point out in this context that scientific knowledge is created within the community of natural scientists and children cannot discover the knowledge just by their experiences in the physical environment. They need the opportunities the environment offers and the quality of interaction with others to stimulate their learning. This is then enhanced by how the teachers use scientific concepts to help children in their explorations (Gustavsson, & Pramling, 2013).

In the vidubiology project we emphasise problem solving, and inquiry based learning, approaches (Harlen, 2011), where students are encouraged to ask questions, to work with problems, to solve and find ways to answer these questions, or to solve the problems and then document their work in different visual ways, and by presenting their findings to others.



## Photos and videos in an inquiry-based learning process

In a learning approach where digital media photos and videos are not only used as a didactic tool for teaching, visualising content, and motivation for a topic, but become the subject of instruction that is actively created and used by learners (Meier, & Kastaun, 2019). Video becomes the medium with which phenomena and contents can be captured, processed and presented, by the students. This form of constructivist integration of videos into self-regulated and action-oriented teaching builds on the ever-changing role of a teacher from facilitator to consultant. In addition, the technical know-how and especially knowledge of technological pedagogy is required for the use of digital media by the teacher (Mishra, & Koehler, 2006). This is precisely where the pedagogical and didactic concepts of vidubiology are applied within the project's teaching materials.

Scientific enquiry is an excellent application for the use of digital media which promotes open-ended experimentation. With the integration of digital technologies, we see the potential to support students in their individual learning so that they can tackle the hurdles in the learning processes and/or in the self-acquisition of scientific knowledge. Regarding scientific cognitive processes, techniques for the active use of photography and video can be integrated into the entire inquiry process or can be applied to specific stages in the process such as the planning of experiments.

The FIGURE 1 (P.12) shows the different phases of the scientific inquire process children go through when carrying out an investigation, like an experiment. In research-based learning environments, pupils follow the steps of a scientific knowledge process while experimenting. They formulate a question with a corresponding hypothesis. This hypothesis is to be tested in an experiment. For this purpose, a plan must be drawn up in which the variables are defined and controlled. Finally, the experiment is carried out and evaluated with a view to content background and the hypothesis. The processing of these process steps is connected with methodical skills and knowledge, which can be supported, deepened and furthered by the use of digital techniques. Therefore various digital techniques and devices can be used in experiments to explore phenomenon as well as to acquire and visualize knowledge.



## SCIENTIFIC INQUIRY AND DIGITAL TOOLS

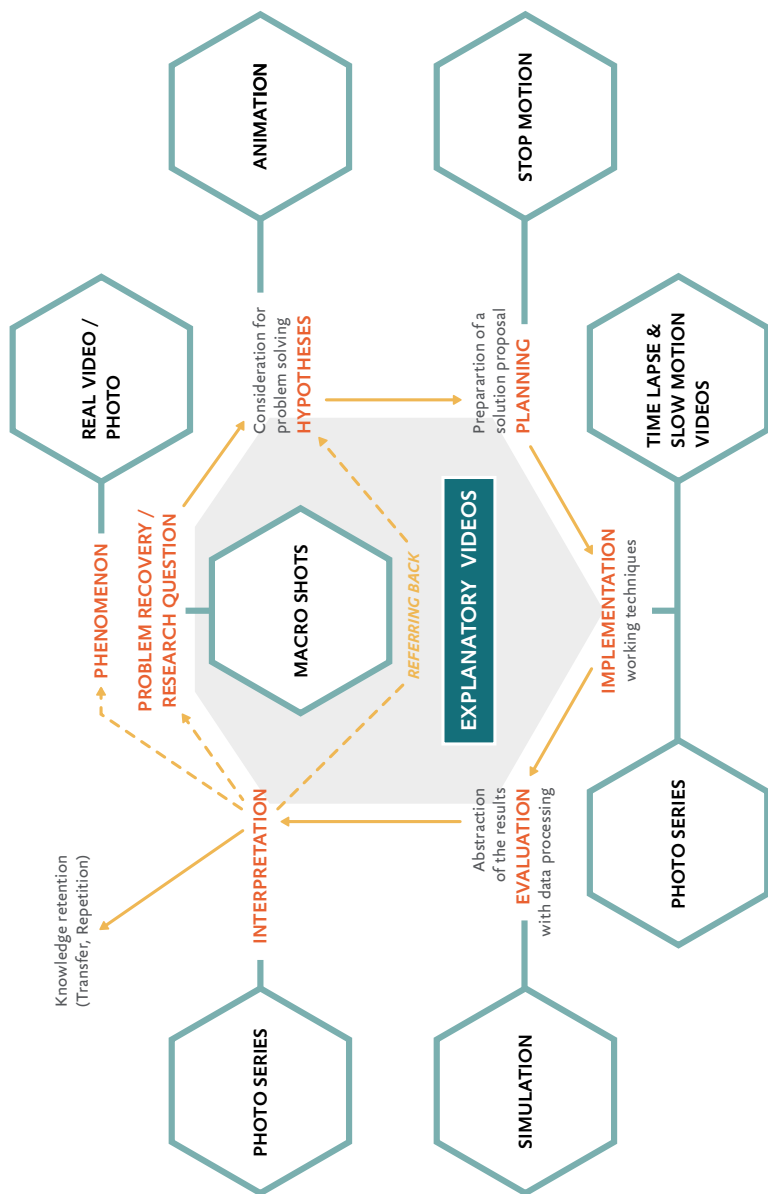


FIGURE 1

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- **PHOTOS, PHENOMENA, PAVING THE WAY TO AN EXPERIMENT.**

By means of photos, phenomena can be illustrated and even discovered by the students.

---

- **TAKING A CLOSER LOOK AT THE OBJECT**

that has attracted interest, using a magnifying glass, a microscope, or perhaps, a macro image can raise research questions that form the beginning of an investigation.

---

- **IN THE PLANNING PHASE OF AN EXPERIMENT,**

a stop-motion technique can be used by the students. This leads to an indepth analysis, of the factor to be investigated and/or possible sources of interference. With the experimental material or picture cards, students can present and explain the structure and sequence of the experiment in the stop-motion video.

---

- **THE EXECUTION OF THE EXPERIMENT,**

according to the developed plan, can be accompanied and documented by time-lapse or slow-motion videos.

---

- **SIMULATIONS AND PHOTO SERIES**

obtained in the inquiry process, give the opportunity to visualise processes and to clearly illustrate a biological explanation leading to an interpretation of the results.



## The vidubiology approach

"We do not learn from experience...we learn from reflecting on experience."

*John Dewey*

Motivating students to learn science is a priority of the EU as it directly impacts on the future development of our societies and provides an innovative advantage. vidubiology addresses this need in the area of biology learning, by specifically showing how active video can be included in the biology classroom for students aged nine to fourteen. Using techniques of photography and video allows learners to discover and explore biological phenomena from a different perspective to more traditional learning formats.

### THE PROJECT SUPPORTS THREE LEARNING AREAS:

- **LEARNING BIOLOGY**
- **LEARNING ABOUT VISUAL MEDIA**
- **EUROPEAN LEARNING AND COOPERATION**

Biology learning is at the forefront of the approach. The content of the project is about biology and not media. It is important that specific content is acquired and reflected upon. It is also important that procedural knowledge is acquired while doing scientific investigations. Dividing content into specific topics, for example, seasonality of plants, is needed in order to develop content knowledge. Students work independently within the accepted norms of biology investigation (experimentation, observation, and recording - using accepted biological techniques such as working with a microscope). This project will then take them further by asking them to explore where visual media can support deeper learning, visualising, documenting and creating an individual approach to a biological topic.

Visual media learning is not about using a technical tool but exploring the visual language and understanding how visual messages are constructed and reflected. Applying different time based media, slow-motion or time-lapse recordings, will help students understand the nature of moving images. The project will also connect with the existing media world of the young people. For example, certain styles of image combinations are used in the media content they consume.

The European dimension comes through a comparison of plants and animals (our main focus) from different European regions, as well as discussions about different emphases in the various national and regional biology curricula. Students will exchange their ideas and videos, connecting and networking through platforms such as Flickr to create a Europe-wide discussion.

## Description of the project path

Vidubiology seeks to facilitate and deepen students' understanding of biology concepts. The project provides task sheets, video examples and video tutorials explaining how the project can be used inside and outside the classroom. For teachers with little or no experience in media production it is helpful to start with very simple exercises. These exercises could include taking simple photos or video clips connected with biology phenomena. Basic exercises can be completed within one lesson, or they could be homework task, particularly for older students who already have higher media experience.

The key idea is to use media production as an aid to support biology learning. The quality of the photos and videos is not important; students don't need to produce professional looking material, as it is the process that matters more than the product. Students can use any available technology including smart phones or tablets, camcorders or digital cameras with a video function. There is no need to buy technology for the project.

The vidubiology tasks are structured by the level of media production and not by biology content. These are grouped into 3 levels; entry, intermediate and advanced production. For example, all students can begin by taking photos. Animation and motion can be added later on with the intermediate or advanced task.



## Step-by-step into the project

Our task sheets are based on a sequence of steps which students can go through autonomously. All modules include five steps:

- **PREPARATION**
- **PLANNING**
- **SHOOTING**
- **SELECTION / POST-PRODUCTION**
- **PRESENTATION / REFLECTION**

The overall step-by-step outline is illustrated in FIGURE 2 (opposite), each task sheet contains more detailed information.



Step 2  
**PLANNING**



Step 4  
**SELECTION**



Step 5  
**REFLECTION**





FIGURE 2

## Privacy and copyright

It is vital to get written permission from both students and their parents to share their products online that include photos of the students, before the project starts (permission templates are provided). If this is a problem there are ways around it, for example by only showing the hands and objects and not including any sound.

Copyright needs to be observed. This includes all rights for photos, videos, sounds and music. No commercial material can be used. There are free licenses, the most recognised and developed being Creative Commons licenses for photos and music but it is still necessary to make sure that a right to publish the material is granted. It is always the best to use only material created by the students themselves (ideally a music track as well). Images from the vidubiology Flickr channel can be used copyright free.



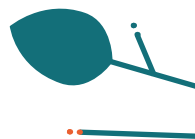
## Assessment

It is important to vidubiology that students always work collaboratively. The tasks are not designed for individual students to perform alone. There is great value and learning in the discussion about the biology content as well as the joint reflection on the images and videos created. The sharing of their production leads to even wider collaboration and potential discussion.

For teachers, who will be assessing the tasks, it is very important to consider the whole project and not just the final outcomes. Students should present a storyboard before they start their recording, and before the end of their project they should document the challenges they faced, and overcame, during the whole course of the project.

## Module 1 - Entry task "Plants and Animals in the Seasons"

This entry task is an easy way to begin the project. Taking photos requires very little technological understanding. However, it is still important to realise that the project is about more than just simply taking photos. Students should plan their photos and these should connect with their current biology lessons. They will need to discuss how (to use the camera) and where (to position the camera) they want to take their photos. They need to reflect on the images as a group and then select and present their images to the class.



### ENTRY TASK - TAKING PHOTOS

#### MODULE 1

#### Production:

Students create photos of their chosen biological phenomena taking into account media design (e.g. camera position, framing, close-up, image composition, focus).

#### Example:

"How plants change according to the season"

Students explore plants (or special parts of plants, or plant communities) visually as a support for a deeper investigation of biological phenomena. Students could also observe the change of appearance of animals in different seasons: colours of birds or thickness of fur with mammals (e.g. horses, foxes rabbits, etc.).

The entry task is ideal for recording biology phenomena that are not moving or not noticeably moving. Further ideas include: Comparing and arranging images of fruit, microscopic images such as macro shots of flowers or special parts of the flower.

YOU WILL FIND ADDITIONAL SUPPORT MATERIALS ONLINE:

- TASK SHEET FOR TEACHERS „PLANTS AND ANIMALS IN THE SEASONS“
- TASK SHEET FOR STUDENTS „PLANTS IN THE SEASONS“
- VIDEO TUTORIALS

## Module 2 - Intermediate task "Organisms in Action"

The second module is an introduction to filmmaking. Students will become aware that a film is a combination of still images (there are no "moving" images). They will learn how a video comes to life by making changes from one still image to the next. This module also explores how varying the speed of a video can show biological phenomena that are normally not visible to the eye (time-lapse for speeding up, slow movements and slow-motion for slowing down fast movement).

### INTERMEDIATE TASK - SERIES OF PHOTOS

#### Production:

Students use photo story / time-lapse / slow-motion.  
Still images are edited into photo stories or software is used to change the speed of video footage for time-lapse or slow-motion.

#### Examples:

"Plants in motion" or "Animals in motion":  
filming animals (e.g. feeding behavior and locomotion of snails)  
or movement of plants (e.g. opening and closing of flowers;  
reaction to touch in mimosa).

### MODULE 2

#### FURTHER EXAMPLES INCLUDE:

- **1) USING PHOTO STORIES TO VISUALISE ECOLOGICAL CYCLES:**  
food or water cycles or processes invisible to the human eye  
(e.g. metabolism of yeast cells)
- **2) USING TIME-LAPSE:**  
to observe and record plant growth
- **3) USING SLOW-MOTION:**  
to observe fast animal movements such as birds flying,  
dogs running or drinking (tongue movement)

YOU WILL FIND ADDITIONAL SUPPORT MATERIALS ONLINE:

- TASK SHEET FOR TEACHERS „ORGANISMS IN ACTION“
- TASK SHEET FOR STUDENTS „ORGANISMS IN ACTION“
- TECHNICAL CARDS FOR STUDENTS
- VIDEO TUTORIALS



*„I liked the photos and videos the most because it was fun and something else to photograph and film from a different perspective.“*



Example of a student from Iceland

Three examples of student work from Iceland, showing task sheets and technical cards.

**Task Sheet 1: Kynning & vinnunni**

**Task Sheet 2: Kynning & vinnunni**

**Task Sheet 3: Kynning & vinnunni**

**Technical Card 1: Kynning & vinnunni**

**Technical Card 2: Kynning & vinnunni**

**Technical Card 3: Kynning & vinnunni**

The task sheets and technical cards are filled out with handwritten notes and diagrams. The technical cards include a table with columns for 'Kynning & vinnunni' and 'Kynning & vinnunni'.

## Module 3 - Advanced task “Creative Video”

This third module is about full video production. Students will combine materials they have already created in module 1 and 2 OR alternatively design a completely new video production:

### OPTION 1:

Continue the work from the previous modules: Students use photos / photo series/video clips (also slow-motion or time-lapse clips) that they have created so far, and develop these further. For example, the use of narration, a video clip to introduce the topic or additional titles/graphics/subtitles will create a stronger message and a useful teaching resource.

### OPTION 2:

Students produce a new video. For example, answering scientific questions connected with birds, micro-organisms, pollinators and plants, or developing a video in a local zoo or aquarium.

Other examples include longer term observations of plant growth or specific adaptations of the environment such as how plants survive the winter. Processes which are not accessible (such as the water cycle in an ecosystem) can be systematically recorded and investigated independently by students. These processes could be also done with a stop-motion production.



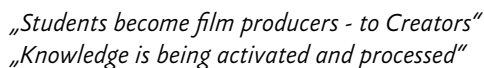
## MODULE 3

Students produce a video about a selected biological theme/phenomena.  
They bring together different products  
(e.g. photos of flowers time-lapse of flower movement)  
in an explanatory video.

Students can either continue their previous work or work on new ideas.  
E.g. "What kind of relationships do pollinators and plants have?  
How do certain animals find their food using different senses?  
What influence does the light, temperature or composition  
of the air have on plant growth?"

YOU WILL FIND ADDITIONAL SUPPORT MATERIALS ONLINE:

- TASK SHEET FOR TEACHERS „CREATIVE VIDEO!“
- TASK SHEET FOR STUDENTS „CREATIVE VIDEO!“
- TECHNICAL SUPPORT
- VIDEO TUTORIALS



## Production techniques

The technical support section provides an overview of photo and video production in biology teaching. Students should be encouraged to be as creative as they like but at the same time to bear in mind that their productions are also to help other students gain new biological insight.

VIDUBIOLOGY USES SIX DIFFERENT PRODUCTION TECHNIQUES:



- TAKING PHOTOS
- CREATING PHOTO STORIES
- TIME-LAPSE VIDEO
- SLOW MOTION VIDEO
- STOP-MOTION VIDEO
- VIDEO PRODUCTION





## Which technology to use?

The project is not about creating high quality or professional level photos and videos. The quality of the equipment is not important. You can use what is available including smart phones, tablets, digital cameras, notebooks and desktop computers.

### WHAT CAMERAS CAN BE USED ?

Cameras from mobile phones and tablets are the most commonly available and have good quality but have limited lenses. Old style compact cameras are still very good: they normally come with a zoom lens which helps explore different framings more easily. Digital cameras with changeable lenses (DSLRs) offer more flexibility if students want to make this into a bigger project and develop their media skills.

### WHAT CAN BE USED FOR POST-PRODUCTION ?

Choose your technology before you start your project. Mobile technologies (smart phones, tablets) are easier and faster to use since both camera and post-production, as it uses the same device. With these, students can record photos and videos and can edit them immediately. There is range of apps for editing such as PowerDirector for Android and iMovie for Apple. Presenting the photos/videos in the class is more complicated and needs planning. This can be done via the internet, a set up box in the classroom or through messaging/emailing the results to a central address.

The more traditional approach involves working with a camera (photo camera or video camera) then transferring the material to a computer for editing/post-production. Software solutions for this include iMovie (MacOS) or Windows 10 apps such as Adobe Premiere Clip, Animotica or Movie Maker (available in the Windows 10 store).



## Using your camera creatively

Students should be encouraged to give time and consideration to their photos and videos (not just running outside and coming back five minutes later with results and the idea that all is done). Here are a few ideas of how to do this:

### I. WORK ON CAMERA FRAMING AND IMAGE COMPOSITION

- **PICTURE COMPOSITION:**

Explore different foregrounds and/or backgrounds.

- **PICTURE FRAMING:**

Explore “tighter” and “looser” framing – showing a bit more or rather a bit less (and what difference it makes).

- **USE OF LENS (IF THERE IS A CHOICE):**

Explore how different lenses influence the photo (such as telephoto lenses which go closer from a distance or wide angle lenses which show rather more from a short distance).

- **MACRO SHOTS/CLOSE UP (CLOSE UP LENSES):**

Using macro functions or close up lenses (screwed-on lenses) to go a lot closer.



Example of a student from Germany



## II. WORK ON THE CAMERA POSITION

- **HIGH CAMERA POSITION:**

Higher positions to look down on the object  
(standing on chair/table, looking down from window/hill/...)

- **LOW CAMERA POSITION:**

Put the camera as low as possible  
(looking up on higher objects such as trees, ...)

- **DIFFERENT CAMERA POSITIONS:**

Take photos of the same object from different locations  
(from behind or a different side) and observe how the image change.

## III. WORK ON LIGHTING

- **USE EXISTING LIGHT:**

Compare shooting in shadow and broad sunlight;  
explore using strong backlight (sun, reflection of sun);  
explore how shadows influence your photo

- **USE ARTIFICIAL LIGHT (SUCH AS CAMERA FLASH, ROOMLIGHT, DESK LAMPS, BULBS, TORCHES, ...):**

Explore how existing and artificial lights work together

## IV. WORK ON CAMERA MOVEMENT (WITH VIDEO RECORDINGS)

- **ZOOMING IN AND OUT WITH YOUR CAMERA TO CHANGE THE COMPOSITION AND FRAMING OF YOUR RECORDING:**

To highlight certain elements

- **PANNING THE CAMERA:**

Move the camera from one side to another, showing a larger picture

- **TILTING THE CAMERA:**

Going up and down (stressing the height of an object)

- **CHANGING THE POSITION OF THE CAMERA:**

Walk with your camera, slide the camera on a smooth surface

## PHOTOS

Photos can be easily shared on Flickr and other social platforms. Flickr (and also Instagram) offer the opportunity for people to see photos without logging in. Students can create their own accounts for uploading. We would be happy to include your work on our project Flickr channel: <https://www.flickr.com/photos/vidubiology/>

## TIME-LAPSE VIDEOS

Time-lapse recording refers to taking individual still images in defined time periods (for example one image every 10 seconds). When the images are played back things come to life (like popular time-lapse recordings of clouds). Time-lapse can be useful for showing slow animal movements. It can be completed with apps such as Framelapse. Better photo cameras often have a time-lapse feature included.

## SLOW-MOTION VIDEOS

Slow-motion is used for the opposite effect i.e. for fast movements such as animals. Almost every editing software or app has a feature to slow videos down. Newer cameras and top smartphones also offer immediate slow motion recording where more frames per second and more details can be recorded.

## STOP-MOTION VIDEOS

Stop-motion is useful for demonstrating an experiment and also simulating movement. Students take many photos (not automatically as with time-lapse) to summarise a longer process in a few seconds. Stop-motion can be easily created with apps such as Stop Motion Studio (for both Android and iOS) but also by taking many photos and importing them into a video editing software (where the duration of each photo needs to be a fraction of a second).

## Post-production - editing photo stories and videos

Video editing is the creative process of selecting and arranging photos, video clips, graphics, music, sounds and titles and bringing it together to make a video.

THIS PROCESS INCLUDES:

- **IMPORTING** YOUR MATERIAL
- **EDITING** YOUR MATERIAL
- **EXPORTING** YOUR FINAL PRODUCTION TO CREATE A NEW VIDEO FILE

### IMPORTING

Copy all source files into one folder (photos, video clips, graphics, sounds/audio). If you used a camera you should connect the camera to the computer (normally with a USB lead) or put the camera memory card into the card reader of your computer (if the computer has no reader, you will need a separate card reader). If you recorded with mobile devices you will have everything ready without any additional work. You might only need to find out where your device has stored your recordings.

### EDITING

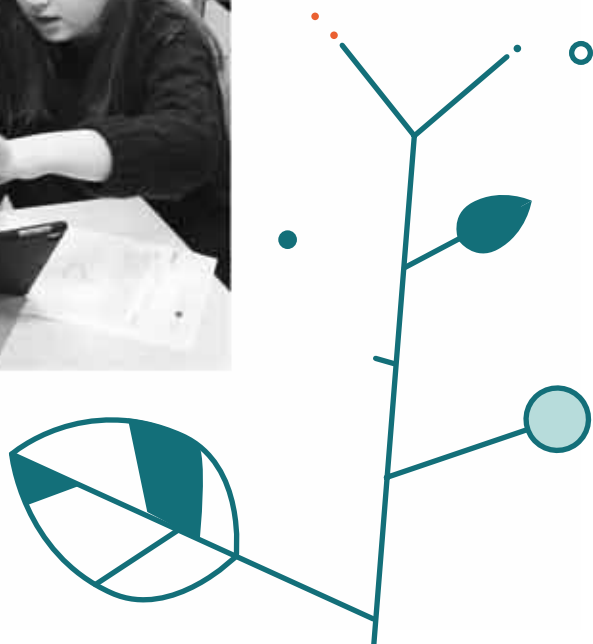
Go back to your plan (your storyboard) and lay out the videos and photos on the timeline. Continually watch the development of your video; trim photos/video clips to make them shorter or change the order of the clips. Add music and sounds and re-adjust your images. Add titles for the beginning and credits for the end. Consider adding subtitles. Be aware of the copyright of visuals and music. It is becoming increasingly hard to find music which can be used and published online. If you have access to musicians or have a music group in your school that can compose music clips this is by far the best option. Under no circumstance can commercial material be used. If you do you will risk legal consequences.

### EXPORTING

Once all work is done and you have viewed and are happy with your video, you must export it. This is a process called “rendering” in which a new video file is made. All software packages offer pre-sets where you can choose the quality and format of your video. Often there is a “recommend” option. The higher the compression, the lower the file size but also the lower the visual quality. Choose an option which fits with what you want. Common file formats are based on “MP4”. You can show the file to your class, upload it to your school website or social media channels or you can share it directly. We would be happy to include your videos on our website.







## Teacher training


Teacher training workshops were the best opportunity for promoting vidubiology ideas to teachers and to encourage them to include these ideas in their individual teaching practice. During the vidubiology project teacher training workshops took place in Germany, Iceland, Bulgaria and England.

THE OBJECTIVES OF THE WORKSHOPS WERE TO:

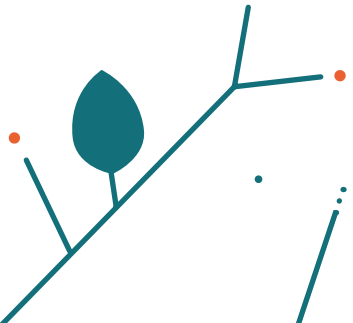
- **DISSEMINATE PROJECT CONCEPTS, GOALS AND MATERIALS.**
- **SUPPORT AND EMPOWER TEACHERS IN THE USE OF DIGITAL PHOTO AND VIDEO.**
- **PROMOTE A POSITIVE ATTITUDE TOWARDS THE USE OF DIGITAL MEDIA.**

Each teacher training workshop was based on content from the project such as the key ideas, the module descriptions, task sheets for teachers and students as well as video tutorials. After introducing the project we presented the chosen workshop topic and the technical skills needed. The teachers were able to practice these skills and, depending on the length of the workshop, develop ideas for implementing these in their various teaching situations. All three modules were included: taking photos, different photo / video formats and complete video productions.

The biology content of the workshops was adapted to the season of the year and what the location offered. Common to all workshops was a high level of practical application where the teachers worked with the technology themselves. While the first workshops in Sofia and Chester focused on modules 1 and 2, the teachers from Iceland and Germany also tested parts of module 3. Through their own work with photo and video technology the teachers were able to gain experience in a classroom situation which helped them to reflect on how they could later implement the project work with their own students.



*"I really enjoyed the workshop. It was very engaging. The workshop gave me another teaching tool that can make disengaged students finally engaged."*





**"VIDUBIOLOGY IN ACTION -  
TREES IN SOFIA"**

Bulgaria, Sofia | 14 teachers

06/18



**"ADAPTING TO THE ENVIRONMENT"**

England, Chester | 12 teachers

10/18



**"DIGITALLY VISUALIZED FOOD  
RELATIONSHIPS"**

Germany, Kassel | 18 teachers

10/18



**"THE ARRIVAL OF SPRING IN  
THE NEIGHBOURHOOD"**

Iceland, Reykjavik | 17 teachers

04/19



**"PLANTS AND SNAILS IN  
THE SPOTLIGHT"**

Germany, Kassel | 45 teachers

09/19

## Experiences from the project

Here are examples from BULGARIA, GERMANY and ICELAND who have piloted the vidubiology project.

### FEEDBACK FROM BULGARIA

The teachers adopted the ideas quickly and easily. They investigated and decided on the most appropriate video tools. The older students coped easily with the worksheet and the creation of mind maps. The students were interested in working with the camera, the process of taking photos, videos and the use of new apps. They also explored objects from various perspectives, they tried stop-motion techniques and every team worked in groups. One of the teachers said:

*Even at the beginning of the project it created interest with all participants. First of all it made me but also other teacher curious to look at nature with a zoom lens. But it also created interest in the students as well. For them it has been easy to work with the apps. I was the one to catch up with them.*

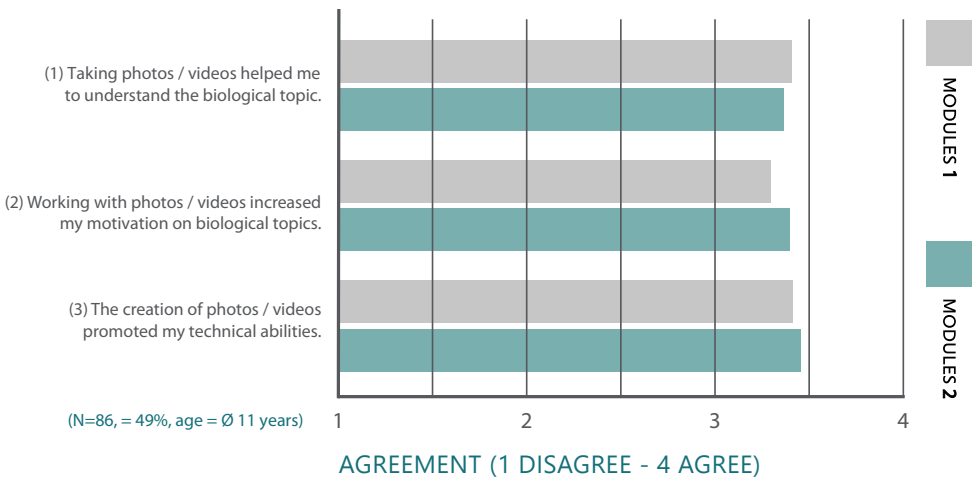
The Bulgarian teachers prioritised the development of social skills and improving relationships between students and their ability to work together. The project contributed to a good mood, satisfaction and positive energy in the class. The sharing of the results also strengthened the communication with the parents as the students shared their experiences and the positive emotion of working in the project. In the class students' activity and motivation increased. Also their creativity, observation skills and analytical thinking were stimulated. Students gained a better understanding of biology and new way to look at nature. It also had the benefit of promoting discussions about ecological values. The emphasis on collaboration and learning from each other can be seen in a quotation from one of the teachers:

*As my current students will be fifth grade next year and I will start with the first grade, I intend to continue to use the vidubiology approach with the first and fifth graders together. It will be a peer-to-peer training - the „older ones“ will teach the „younger“ students. I believe this will be a good experience and a positive basis for co-development.*

## FEEDBACK FROM GERMANY

Teachers were very positive about how the students approached the tasks and how they handled the technology. They also found the contact with natural objects, the creative access to biology and the group work phases, as beneficial. From the very beginning the students worked independently and helped each other which made the cooperative approach in vidubiology visible. The teachers noted that the content which the groups worked on could be easily integrated into the curriculum and bring the students a lot of fun in the overall implementation. Teacher expressed the need to make the language of the support materials more accessible to less academic student groups. The vidubiology team responded to this.

Feedback received from the students who completed modules 1 and 2 was consistently positive. Creating photos, photo stories and videos to create motivation for, and understanding of, the biological subject was rated as highly positive by the learners. Learners also positively rated their technical skills.



The students created photos and videos in the schoolyard and in the surrounding area with great enthusiasm and enjoyment as can be seen in these quotes from teachers and students.

*"The students learn to look more closely at biological phenomena"*

*"Creating the video was fun"*

*"I liked the fact that we created small videos and photos outside"*

*"I really liked the project because we did something with nature"*

## FEEDBACK FROM ICELAND

The Icelandic teachers also commented on children's interest in the project. Children were interested in using visual media in their learning and enjoyed the work. As one child aged 10 said "... it was fun and also when we were editing and things".

Children, age 10 to 16, also enjoyed going outside with their class to take photos and videos, one 10 year old pupil said "... I found it very joyful to be outside and take pictures so this suited me very well". Observation in two classes noted the obvious pleasure 14 year olds had in working with their phones and taking photos. They enjoyed investigating the signs of spring in their school yard with their phones, or finding signs, after being instructed to find hidden things, like buds on the trees. Focussing on visuals helped the children be aware of seeing new things that they haven't noticed before.



Students, age 10 - 11, found the preparation of the project the most difficult part. But they enjoyed presenting their productions to each other and managed to bring across their ideas clearly. Their teacher mentioned the importance of discussing with children the biology content they were working on, to insure their biology learning, as well as the learning about using visual media.

A teacher of 13 - 16 year old students commented that the vidubiology project had helped the student to learn ecology by being in direct contact with plants and animals when taking the photos. Or as the teacher put it "They get the opportunity to see more of what they are learning about in the classroom. ... They can investigate by themselves and this helps them understand better than if they were just reading a textbook".



*"In my opinion using the technology was the strongest part of the project. The children were mostly secure about that and those that had some problem with it got more confident after using the technology."*

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## Conclusion

In the vidubiology project we developed a teaching approach that increases children's and young people's interest and knowledge in biology. We used children's own media productions to support their own investigations of biological concepts and phenomena.

The teachers from Bulgaria, Germany and Iceland who tried out the vidubiology material reported that the children liked the approach and their interest in biology increased and they enjoyed working on the task. In Iceland, the productive approach helped the students focus their attention on special phenomena as had been hoped for. Both teachers and children saw the vidubiology project as a good way to support understanding in biology, and to make teaching more effective with better retention.

The Bulgarian teachers commented that the project stimulated students' social skills and improved relationships between students and teachers. The project also shows that the media tasks can inspire further creativity.



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## Thanks

We would like to thank all the schools and teachers who helped us develop the material by trying it out and reporting on their experience. It was very helpful for developing all the project tasks. We also thank all the children that have published their products on our Flickr and YouTube playlists. Thank you for sharing your investigations with us and for inspiring others and giving them the opportunities to learn from you.

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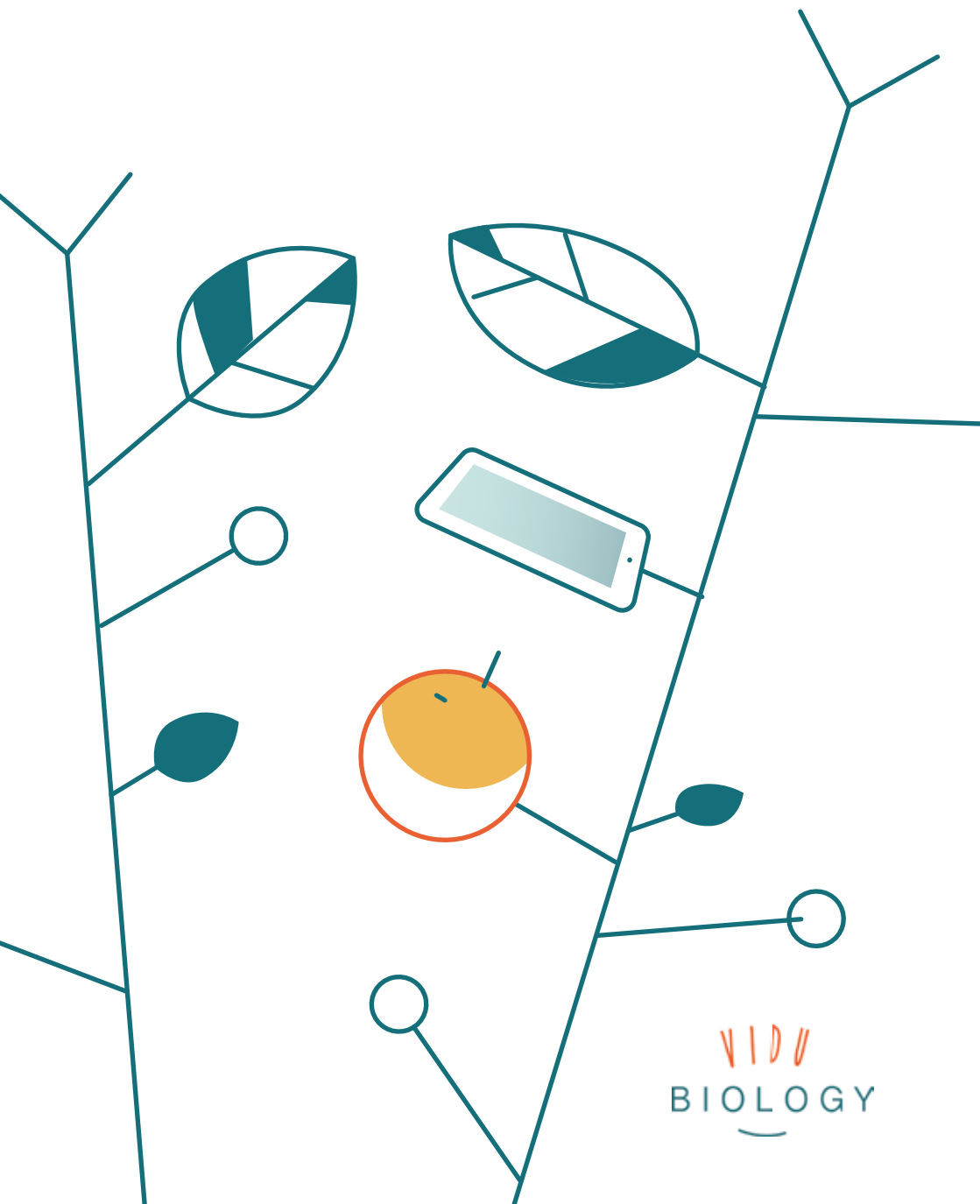
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Национална Менаджмент Школа



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VIDU  
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