|  |  |
| --- | --- |
| **Title** | **Module 4 NATURE and BIODIVERSITY** |
| **Aims** | 1. Be aware that Nature is the origin of all resources essential for human life in its environments: water, soil, air 2. Frame changing situations(quality of ground, water, air, climate, etc.) in scientific terms, measure and interpret the results individually and in groups and to contribute to a sustainable management of this resource. 3. Be aware that the loss of Biodiversity contributes to food and energy insecurity, increases vulnerability to natural disasters, such as floods or tropical storms, decreases the level of health in society, reduces the availability and quality of water resources and impoverishes cultural traditions. 4. Be conscious that Biodiversity interacts with the physical environment to create the ecosystems that support living organisms – like us. We can't survive without the natural world, and too often we take it for granted. 5. To give to the Resource Manager Junior the competence to work in these topics |
| **Key competen-ces** | **With this module our students will develop the following eight key competences defined at EU level, which represent a combination of knowledge, skills and attitudes that are considered necessary for personal fulfilment and development; active citizenship; social inclusion; and employment**   1. **Communicating in a mother tongue**: to express and interpret concepts, thoughts, feelings, facts and opinions in an appropriate and creative way 2. **Communicating in a foreign language**: as above, but includes mediation skills (i.e. summarising, paraphrasing, interpreting or translating) and intercultural understanding. 3. **Mathematical, scientific and technological competence**: sound mastery of numeracy, an understanding of the natural world and to apply knowledge and technology to perceived human needs. 4. **Digital competence**: confident and critical usage of information and communications technology for work, leisure and communication. 5. **Learning to learn**: building on prior learning and life experiences in order to use and apply knowledge and skills in a variety of contexts. 6. **Social and civic competences**: to participate effectively and constructively in one’s social and working life and engage in active and democratic participation, especially in increasingly diverse societies. 7. **Sense of initiative and entrepreneurship**: to turn ideas into action through creativity, innovation and risk taking as well as to plan and manage projects. 8. **Cultural awareness and expression**: to appreciate the creative importance of ideas, experiences and emotions in a range of media such as music, literature and visual and performing arts. |
| **Approx. time** | 6 sessions 2 months |
| **Methods** | Different methods are used. |
| **Age** | Range: 12-19. |
| **Assessment** | SESSION 6.  Answering the questions about the issues the students have learnt during sessions 1-5. The same questions at the beginning and at the end |
| **Necessary material** | PC, Projector, smartphone / tablet with access to Internet, camera, board, pens, coloured pencils, etc. |
| **Remarks** | Background information for teachers (Annex 2) |
| **WEB LINKS** | <http://ec.europa.eu/environment/basics/natural-capital/biodiversity/index_it.htm&amp;ved=0ahUKEwjuzviR16HQAhUJ2hoKHdifAdsQFghwMBE&amp;usg=AFQjCNGP>  [QPP5A8pFEVzWalGV1V1Bk-3PBQ&amp;sig2=WsKjAzKhoeu8IHZAqF\_yjQ](http://ec.europa.eu/environment/basics/natural-capital/biodiversity/index_it.htm&amp;ved=0ahUKEwjuzviR16HQAhUJ2hoKHdifAdsQFghwMBE&amp;usg=AFQjCNGP)  <http://www.dta.cnr.it/index.php/en/gestione-sostenibile-ed-efficiente-delle-risorse-e-degli-ecosistemi>  <http://www.isprambiente.gov.it/en>  <https://en.wikipedia.org/wiki/Biodiversity> <http://www.pronatura-ti.ch/specie/natura-in-citta.php> <http://www.wsl.ch/fe/oekosystem/insubrisch/projekte/BiodiverCity/index_EN> |

ANNEX 1

INITIAL and FINAL EVALUATION

|  |  |  |
| --- | --- | --- |
| Answer the questions  1.1 What do you know about Nature?  1.2 Why nature is a source?  1. 3 Who does take care of Nature in your country?  1.4 What does“climate changes” mean?  1.5 Do you believe that Nature ends at the borders of the city?  1.6 Why do you achieve more sustainable agriculture and forestry? |  | 12-14 |
| 2. 1 What do you know about biodiversity?  2.2 Why to safeguard species and habitats?  2.3 How to make fishing more sustainable and seas healthier?  2.4 What do you know about Ecosystems?  2.5 How to combat invasive alien species? | 15-19 |
| 3.1 How is the situation of biodiversity in your country? 3.2 What are the main threats to biodiversity? 3.3 What are the relationships between biodiversity and climate changes? 3.4 How can the loss of biodiversity be stopped?3.5 What can be done to protect biodiversity? |  | 15-19 |

ANNEX 2 Nature, an environment or a resource?

Subjects: Philosophy / Natural Science / Social Science / Ethical Values/ Art/ English/ Literature/ Economy / Geography

**Definition**

The concept of Nature has evolved over the centuries (the time) and it is perceived differently by people (culture) who live in geographically different environments (space)  
For many people Nature is identified with one divinity (religion). Some call it “mother” some other “stepmother”. There are those who opposed the concept of ”against nature” or “unnatural” and those the concept of “artificial“ as if the work of a man that transforms a tree in a table is not "natural."

We study nature as a “resource” that man uses to meet his needs. From the primary: to eat, to drink, to breathe, to dispose of waste, the protection from the cold / hot, from enemies and so on, to the more complex needs: to communicate, traveling, recovering from illness, to reproduce and to preserve the species, etc. And even to immaterial needs such as beauty, music, friendship, love.

In this Module we will examine even the aesthetic and economic aspects that very often have been considered to be contrary to each other: the discussions about the beautiful and the useful, Realism against the Aestheticism. As often it happens these academic disputes are exceeded when you take note of the fact that the synergy is possible even to build useful and beautiful objects.  
In the ‘900 from the foregoing considerations the “industrial design, the tourism, the ecology, the climate change conferences, etc.” arose.

### Philosophy

**Henri Bergson** is the philosopher who in the first half of the twentieth century took care of the developmental and vital pulse strategies (élan vitale) of living organisms, and their tendency to the development and differentiation.  
The “Philosophical thought”, even if subliminally, and with delayed effect, has always had, and continues to have, a profound influence on public opinion and therefore on the political choices of an historical period.  
In the years of industrialization, the development policies were strongly "anthropocentric" and considered the natural resources, as virtually infinite, to complete disposal of man. The same **Thomas Henry Huxley**, British biologist and philosopher particularly influential, strong supporter of Darwinian evolutionism, as to be nicknamed "Darwin's bulldog," had publicly exposed on nature's ability to regenerate and produce resources in a manner virtually infinite.  
This historical period, and the political choices that have characterized it, have improved the quality of life in Western countries, but at the cost of destruction and degradation of the environment of which we are now paying the consequences.  
The environmental and animal rights movements that have followed, are inspired by philosophical theories so-called "focused on nature", ie putting the center of his interest in the life of animals and plants, considering that the planet, or at least its wild part, initially was their house".  
The new approach developed in the context of the process on sustainable development, tends to regard the human population as an integral part of the ecosystem, which has the ability and the opportunity to influence him deeply, but whose life depends on the presence of healthy ecosystems and on the same life that exists on the planet.

**Ethics and religion**

ENCYCLICAL LETTER “***LAUDATO SI’”***  by **FRANCIS** THE POPE ON “CARE FOR OUR COMMON HOME” (Nature) 

1. *“LAUDATO SI’, mi’ Signore” – “Praise be to you, my Lord”.* In the words of this beautiful canticle, Saint Francis of Assisi reminds us that our common home is like a sister with whom we share our life and a beautiful mother who opens her arms to embrace us. “Praise be to you, my Lord, through our Sister, Mother Earth, who sustains and governs us, and who produces various fruit with coloured flowers and herbs”.[[1]](https://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html#_ftn1)

2. This sister now cries out to us because of the harm we have inflicted on her by our irresponsible use and abuse of the goods with which God has endowed her. We have come to see ourselves as her lords and masters, entitled to plunder her at will. The violence present in our hearts, wounded by sin, is also reflected in the symptoms of sickness evident in the soil, in the water, in the air and in all forms of life. This is why the earth herself, burdened and laid waste, is among the most abandoned and maltreated of our poor; she “groans in travail” (*Rom* 8:22). We have forgotten that we ourselves are dust of the earth (cf. *Gen* 2:7); our very bodies are made up of her elements, we breathe her air and we receive life and refreshment from her waters.

*Nothing in this world is indifferent to us*

*………………………………………………………………………………………*

67.

We are not God. The earth was here before us and it has been given to us. This allows us to respond to the charge that Judaeo-Christian thinking, on the basis of the Genesis account which grants man “dominion” over the earth (cf. Gen 1:28), has encouraged the unbridled exploitation of nature by painting him as domineering and destructive by nature. This is not a correct interpretation of the Bible as understood by the Church. Although it is true that we Christians have at times incorrectly interpreted the Scriptures, nowadays we must forcefully reject the notion that our being created in God’s image and given dominion over the earth justifies absolute domination over other creatures. The biblical texts are to be read in their context, with an appropriate hermeneutic, recognizing that they tell us to “till and keep” the garden of the world (cf. Gen 2:15). “Tilling” refers to cultivating, ploughing or working, while “keeping” means caring, protecting, overseeing and preserving. This implies a relationship of mutual responsibility between human beings and nature. Each community can take from the bounty of the earth whatever it needs for subsistence, but it also has the duty to protect the earth and to ensure its fruitfulness for coming generations. “The earth is the Lord’s” (Ps 24:1); to him belongs “the earth with all that is within it” (Dt 10:14). Thus God rejects every claim to absolute ownership: “The land shall not be sold in perpetuity, for the land is mine; for you are strangers and sojourners with me” (Lev 25:23).

**Music, Ethics**

This piece is acknowledgedly among Angelo Branduardi's greatest accomplishments.

Branduardi studied the melodies and instruments of the Italian early Middle Ages to recreate the music that accompanied this exceptional piece of Italian poetry and mystic literature: the Cantico delle Creature composed by St. Francis of Assisi, a lyric of such great beauty and spiritual simplicity that in the centuries has spoken to hearts of any faith.

The poem was originally accompanied by music, but this was lost and forgotten. Angelo Branduardi, with slight adaptations of the original words, has really created a masterpiece.

<https://youtu.be/aYdepwbwbeY>

|  |  |
| --- | --- |
| A Te solo Buon Signore  si confanno gloria e onore  a Te ogni laude et benedizione  a Te solo si confanno  che l'altissimo Tu sei  e null'omo degno è  Te mentovare. | To You only Good Lord  glory and honor befit  every praise and blessing  To You only befit  You are the Highest  and no man is worthy  to mention You. |
| Sii laudato Mio Signore  con le Tue creature  specialmente Frate Sole  e la sua luce. | Be praised my Lord  with your creatures  especially Brother Sun  and its light. |
| Tu ci illumini di lui  che è bellezza e splendore  di Te Altissimo Signore  porta il segno. | You enlighten us with him  that is beauty and splendor  of Thee Almighty Lord  he bears the mark. |
| Sii laudato Mio Signore  per sorelle Luna e Stelle  che Tu in cielo le hai formate  chiare e belle.  Si laudato per Frate Vento  Aria, nuvole e maltempo  che alle Tue creature  dan sostentamento. | Be praised my Lord  for Sisters Moon and Stars  that You in the sky created  Shining and beautiful.  Be praised for Brother Wind  Air, clouds and bad weather  that to your creatures  give livelihood. |
| Sii laudato Mio Signore  per sorella nostra Acqua  ella è casta, molto utile  e preziosa. | Be praised my Lord  for our sister Water  she is chaste, very useful  and precious. |
| Sii laudato per Frate Foco  che ci illumina la notte  ed è bello, giocondo  e robusto e forte. | Be praised for Brother Fire  that lights up our night  and is beautiful, joyous  and robust and strong. |
| Sii laudato Mio Signore  per la nostra Madre Terra  ella è che ci sostenta  e ci governa | Be praised my Lord  for our Mother Earth  it is she that supports us  and governs us |
| Sii laudato Mio Signore  vari frutti Lei produce  molti fiori coloriti  e verde l'erba. | Be praised my Lord  various fruits she bears  many colorful flowers  and green grass. |
| Sii laudato per coloro  che perdonano per il Tuo amore  sopportando infermità  e tribolazione | Be praised for those  who forgive for Your love  enduring illness  and tribulation |
| e beati sian coloro  che cammineranno in pace  che da te Buon Signore  avran corona. | and blessed be those  who will walk in peace  that from you Good Lord  will have a crown. |
| Sii laudato Mio Signore  per la Morte corporale  chè da lei nessun che vive  può scappare | Be praised my Lord  for Bodily Death  for from Her nobody living  can escape |
| e beati saran quelli  nella Tua volontà  che Sorella Morte  non gli farà male. | and blessed will be those  in Your will  that Sister Death  will not harm them. |

# Earth Song Michael Jackson’s Message

<https://www.youtube.com/watch?v=XAi3VTSdTxU>

**Social science**

Nature in the city

## <http://www.pronatura-ti.ch/specie/natura-in-citta.php>



On the Contrary to what one might perhaps imagine, nature does not stop at city borders. According to recent studies, the plant diversity of an urban center is even greater than that of the surrounding agricultural areas, while for the fauna we ​​are at comparable levels. This is because in the city, to the variety of habitats, a multitude of ecological factors can be added that are favorable to many species, forming what are called "replacement environments." These take the place of natural environments disappeared precisely because of advancing the construction. Among the most immediate examples there are parks, gardens and cemeteries, reminiscent of meadows and forests. Among the many others we mention the pavement, it has characteristics similar to those of the bed of a river, the walls that recall the natural rocks, or the gutters regularly flooded or old attics beloved by bats. Of course, not all species will go so far in the centre and not all come on their own. The city is the place where the hand of man is more visible and parks, orchards and gardens are full of non-native species. In some cases there are no native plants that wind up being so good, that develop extremely, becoming invasive.

In light of these elements, it is clear the importance that urban ecosystems take, both for biodiversity conservation and for their role as ecological laboratory. The rapid changes to which they are subject, in fact, bring the bodies to develop unexpected adaptation strategies, or lead to rapid specific phenomena or hybridization. Often, with simple and cost-effective interventions it is possible to encourage the establishment of nature in the city, for the benefit of its inhabitants.

Suggested Actions:

## Is the quality of life in urban areas improved by the urban wildlife?

##### Emptying a comby-trap for flying insectsBackground

The number of people living in urbanised areas is steadily increasing - in Switzerland too. Urban areas also have different forms of nature, ranging from indigenous vegetation, semi-natural habitats and parks to wasteland and other highly human-influenced habitats. Our understanding of social and cultural values, biodiversity and the quality of life in urban areas must be investigated if we hope to develop sustainable urban environments that will lessen their ecological footprint in future.

##### Objectives

The main goal of the project was to understand the relationship between urban diversity, built environment and the acceptance of the human population, in order to identify initial measures for integrating findings on how to enhance urban biodiversity and the acceptance of the residents into urban development processes.

##### Methods

The research plan consisted of 4 modules:

* Collecting historical and recent information in an international context in order to assess potential biodiversity in the built environment
* Assessing the ecological value of urban habitats by collecting data systematically in 3 Swiss cities
* Interviews in the study areas - representative of the whole of Switzerland - to investigate the attitudes of residents towards green urban habitats
* Synthesis and practical implementation

##### Significance

The findings are important in improving the decision-making basis of political and practical intervention to maintain and improve biodiversity, as well as their acceptance as part of the urban development process.

## Economy

## What’s the Value of Nature?

Marshes, mangroves, coral and oyster reefs can help to protect people and businesses from destruction caused by hurricanes and flooding.

We know it may sound odd that nature can safeguard us from natural disasters. But we know it works, because we’ve studied it. [Our research](http://onlinelibrary.wiley.com/doi/10.1002/ieam.1678/epdf) found that adding green infrastructure to more conventional infrastructure, such as dykes and levees, can help mitigate damage and loss.

Our study’s findings align with the recently adopted United Nations Sustainable Development Goals, specifically Goal 15: Protecting, restoring, and promoting sustainable use of terrestrial ecosystems, sustainably manage forests, combat the desertification and halt and restore land degradation and halt biodiversity loss.

There is a business value to valuing nature. By attempting to quantify nature’s economic value, we can help companies to understand how much nature is worth - thus encouraging them to preserve more of it.

Some may question why or whether people should even try to attach a dollar value to an extinction, for example. However, as threats to nature grow faster and more widespread than the traditional methods can work to solve them, the conservation movement must seek innovative ways to increase its impact, which has been one of the primary concerns of The Nature Conservancy.

If we do only the things that preserve small areas of land, we will never do enough to sustain the natural world that we want our children and grandchildren to know and cherish, and that the economy and business will need in the future. If we don’t estimate nature’s economic value, we essentially mark it “zero” by default when businesses and governments decide how to invest their capital and develop natural resources.

By assigning economic values - even imperfect ones - to the business benefits of nature, we enable companies to consider investing in important conservation projects that they might not otherwise even consider - and consider nature across all business decisions. By doing this, we not only create a culture of respect for the benefits of nature that can’t be measured, we also create a platform that allows corporations to strategically value nature in business decision making - which is good for businesses, and good for nature.

Dow’s 2025 Sustainability Goals make it the first company ever to commit valuing nature at an enterprise level by setting a financial target, committing to deliver $1 billion in net present value through projects that are good both for business and for ecosystems by 2025. To accomplish this, the company has teamed up with The Nature Conservancy to take this largely theoretical concept - that the value of nature to a company can be measured - and created a practical way to put it into practice.

Through pilot site testing, we have created analytical tools for managers to assess the financial benefit of conservation, to companies and to local communities, as well as values that can’t be measured in dollars, like species survival and human well-being. While Dow’s Nature goal won’t solve all the problems of conservation, it can make a significant contribution ... especially if other companies follow suit.

Restoring healthy ecosystems is at the heart of every major sustainability challenge and this approach provides a new, strong method to help continue to make progress toward our cause.

The collaboration between Dow and The Nature Conservancy demonstrates that valuing nature can be profitable for business. This insight can unleash investment capital and influence political decisions for conservation in ways that we’ve only imagined until now. Business will come to the table as the economic value becomes more and more evident over time.

*Blog co-authored by:*

*Glenn Prickett, Chief External Affairs officer for The Nature Conservancy (TNC)*

*Neil Hawkins, Chief Sustainability Officer and Corporate Vice President, The Dow Chemical Company*

**Geography. Global vision**

World Conference on Climate

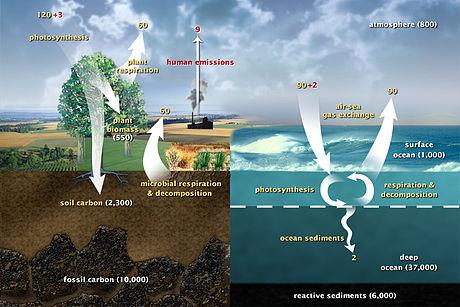
<http://www.giornalistinellerba.it/2016/11/23/clima-tutta-cop22-in-un-articolo/>

The World Meteorological Organization (WMO) alarm arrived a few days before the opening of COP22 in Marrakech, in late October: the planet has finally exceeded 400 parts per million (ppm) of CO2 into the atmosphere. And the signal that the new climate was not tomorrow, but today.  
The world, gathered in Paris for COP21 in December 2015, has signed a global agreement to tackle climate change that came into force in record time, November 4th 2016, before the Marrakesh Conference, thanks to more ratifications 55 more than 55% of global emissions representatives countries. Italy, however, is not yet among these, while, for example, India yes. And Europe, which in the meantime, incoherently, but is working on a renewable anti Directive.  
While the economist Nicholas Stern warns: "It 's worse than I thought," the president of COP22 Salaheddine Mezouar, Moroccan foreign minister, gives way to the earthworks of Africa with the pride of a country is one of the most virtuosos in the world in climate policies. As Delegations arrive journalists of all countries in the world (very few from Italy), NGOs, civil society, young people, the experts. This COP who called himself "action" we found ourselves with the Paris Agreement unexpectedly already in place, having to first deal with, and all agreed, procedural issues, the agenda, the next step, the old calendars that agreement, and to face difficult nodes as those of climate finance. The work is proceeding with an eye at the opening of American ballots. Just two days away, comes the jolt: the United States wins the presidential candidate Donald Trump denial of climate change. A cold shower for all those who trusted in continuity with the action of Barak Obama on climate.

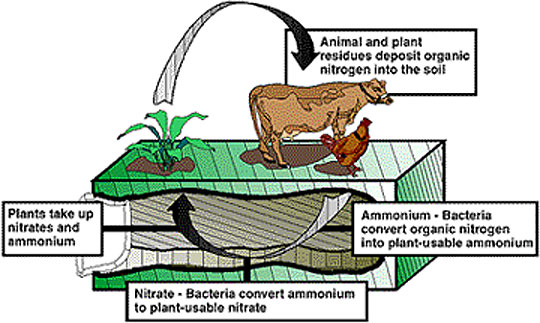
### Cycles of Nature

### WaterCycle

The Carbon Cycle



The Nitrogen Cycle



Activities

Students will explore how energy is transferred through the ecosystems.

1. Students will examine the dependence of organisms on one another and their environments.

2. Students will demonstrate in a food web chain that matter is transferred from one organism to another and it can be recycled between organisms and their environments.

3. Recognize that changes in environmental conditions can affect the survival of both individuals and entire species

**Videos:**

[**Download The\_Cycle\_Series\_\_The\_Nitrogen\_Cycle**](http://floydmiddle.typepad.com/files/the_cycle_series__the_nitrogen_cycle.asf)

**Activities:**

[Download Water Cycle Drawing Rubric](http://floydmiddle.typepad.com/files/water-cycle-drawing-rubric-1.doc)

[Download Water cycle cloze](http://floydmiddle.typepad.com/files/water-cycle-cloze.doc),

[Download Water Cycle Drawing](http://floydmiddle.typepad.com/files/water-cycle-drawing-rubric.doc)

[Download Water cycle diagram](http://floydmiddle.typepad.com/files/water-cycle-diagram.doc),

[Download Water Cycle Notes](http://floydmiddle.typepad.com/files/water-cycle-notes-1.doc)

[Download CornellNote. Water Cycle](http://floydmiddle.typepad.com/files/cornellnote.-water-cycle-1.doc)

[Download Watercycle best to use](http://floydmiddle.typepad.com/files/watercycle-best-to-use.ppt)

[Download Carbon Cycle Drawing Rubric](http://floydmiddle.typepad.com/files/carbon-cycle-drawing-rubric.doc)

[Download Nitrogen Cycle Drawing Rubric](http://floydmiddle.typepad.com/files/nitrogen-cycle-drawing-rubric.doc)

[Download CornellNote. Nitrogen Cycle](http://floydmiddle.typepad.com/files/cornellnote.-nitrogen-cycle.doc)

[Download CornellNote. Carbon Cycle Qs](http://floydmiddle.typepad.com/files/cornellnote.-carbon-cycle-qs-1.doc)

[Download Carbon cycle notes,](http://floydmiddle.typepad.com/files/carbon-cycle-notes.doc)

[Download The Carbon Cycle - notes](http://floydmiddle.typepad.com/files/the-carbon-cycle---notes-1.doc),

[Download Carbon and Nitrogen skill sheet](http://floydmiddle.typepad.com/files/carbon-and-nitrogen-skill-sheet-1.pdf)

*Activities:*

*Chemistry, Biology, Art, Language competencies*

1) Look at the pictures and discuss the 3 cycles: Water, Carbon, Nitrogen

2) Translate the 3 posters in your own language and modify the posters with the pc or tablet or cell

*Ethics, Art, English language, Economy*

1) Taking the texts as a starting point, a discussion is raised to deal with these topics:

A. The man is the master, lord, chief of nature or he is an inhabitant, an animal, a part of nature?

B. In the ideological confrontation between those who respect nature and would like to defend it and those who exploit its natural resources as long as they are cost-effective and then find other resources to be exploited to replace those depleted, who is going to win?  
C. The natural beauty are tradable? Is it right to pay to see and / or to photograph the scenery?  
  
For the discussion, the group is divided into 3 parts (A, B, C) and each one writes a VIDEO REPORT with the most relevant Conclusions. These reports can be shown in the schools in the Earth Day (Earth Day), the largest environmental event in the world, the only time when all citizens of the world unite to celebrate the Earth and to promote its conservation. Earth Day, strongly backed by the time US Senator Gaylord Nelson and promoted before by President John Fitzgerald Kennedy, each year involving up to one billion people in more than 192 countries worldwide.  
The United Nations celebrates Earth Day each year, one month and two days after the vernal equinox, April 22.

(or they can be part of an exhibition in each school, together with representative images.)

Subjects : science, maths

Search for the data related to your town.

-green surface and built surface relationship in your country:

- green area ratio per inhabitant  
-cultivated areas  
-Derelict land and uncultivated  
-Areas of woodland, scrub, grass, etc.  
-Cars per inhabitant  
-quality air  
-Life quality  
Students are divided into groups of 5 (one per country) write and represent a performance (in mother tongue or in English) of 5 minutes on nature in the city or in the country choosing among the following styles: tragic, comic, futuristic, sensory, of Grandma.

Subjects: classical studies

### [On the Nature of Things: De Rerum Natura : Titus Lucretius Carus](https://www.google.it/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&cad=rja&uact=8&ved=0ahUKEwiSwdD74fnRAhVB0RQKHc2QAvgQFgg8MAQ&url=https%3A%2F%2Farchive.org%2Fdetails%2Fonnaturethingsd00carugoog&usg=AFQjCNGmNHgDBBf-ccN6YklQAk4w5vowJQ&sig2=xV2vgrRVTc0r7A7eesyLfg)

### Roman poet and philosopher

Lucretius presents the principles of [atomism](https://en.wikipedia.org/wiki/Atomism); the nature of the [mind](https://en.wikipedia.org/wiki/Mind) and [soul](https://en.wikipedia.org/wiki/Soul); explanations of [sensation](https://en.wikipedia.org/wiki/Sense) and [thought](https://en.wikipedia.org/wiki/Thought); the development of the [world](https://en.wikipedia.org/wiki/World) and its phenomena; and explains a variety of [celestial](https://en.wikipedia.org/wiki/Celestial_sphere) and [terrestrial](https://en.wikipedia.org/wiki/Earth) phenomena. The [universe](https://en.wikipedia.org/wiki/Universe) described in the poem operates according to these physical principles, guided by *fortuna*, "chance," and not the divine intervention of the [traditional Roman deities](https://en.wikipedia.org/wiki/Religion_in_ancient_Rome).

*For the documentary television series, see* [*The Nature of Things*](https://en.wikipedia.org/wiki/The_Nature_of_Things)*. In the past and today.*

The poem consists of six untitled books, in [dactylic hexameter](https://en.wikipedia.org/wiki/Dactylic_hexameter). The first three books provide a fundamental account of being and nothingness, matter and space, the atoms and their movement, the infinity of the universe both as regards time and space, the regularity of reproduction (no prodigies, everything in its proper habitat), the nature of mind (*animus*, directing thought) and spirit (*anima*, sentience) as material bodily entities, and their mortality, since, according to Lucretius, they and their functions (consciousness, pain) end with the bodies that contain them and with which they are interwoven. The last three books give an atomic and materialist explanation of phenomena preoccupying human reflection, such as vision and the senses, [sex and reproduction](https://en.wikipedia.org/wiki/Sexuality_in_ancient_Rome#Epicurean_sexuality), natural forces and agriculture, the heavens, and disease.

The students collect materials and write a 5 lines summary of the 6 books in English language choosing a title that will be written using a special funny hand lettering, find some images of nature related to their country and linked to the six books.Italian students will translate them in Latin. The students will translate into their own language and upload the files in the Twinspace with photos.

Exhibition can be made in the meeting in Italy and even as Augmented reality (AR)

Draw a comic strip, which can be done also using one of these apps:

Manga Studio (Windows, Mac)

Sketchbook Pro (Mac)

Adobe Photoshop CC (Windows, Mac)

Comic Creator (Windows)

Poser Pro (Windows, Mac)

Corel Painter (Windows, Mac a dramatization of the myth and record it on video.

2 Find out the most meaningful sentences written by Lucrezio in the web and illustrate it with a photo or with a drawing.

3 Summarize the six books (using even lettering)

The results will be uploaded and posted on our TWINSPACE site

Nature and art  
The relationship between man and nature has been summarized through art, through the symbolism of medieval sculpture, the Renaissance backdrops for human action, to perfection in the seventeenth-century imaginary landscape, to arrive in the nineteenth century the interpretation of the nature as a place that evokes moods. Today the land art (or earth art) abandons his brushes and paints nature with the same expression of the landscape. Natural elements such as logs, stones, sand or earth drawing in the desert, on the rocks or in the middle of a clearing (and sometimes even in the streets of big cities) the artist's outburst that refuses to join the museum to nature.  
 Again, man chooses the art of expressing the need to take refuge in the natural environment to which it belongs

The art teacher offers students a range of works of art in which nature is the subject ora the background. Students will elaborate one, even with unconventional technique and explain it with a caption of 15 words. The best, in the opinion of teachers, will shown in the exhibition.

.ANNEX 3 Biodiversity

What is biodiversity?

<http://ec.europa.eu/environment/basics/natural-capital/biodiversity/index_en.htm>



**"Biodiversity" is** a word we use to emphasise **the richness of the natural world**. It's the wide variety of animals, plants, their habitats and their genes. **Biodiversity interacts** with the **physical environment to create** the **ecosystems** that support living organisms – like us. We can't survive without the natural world, and too often we take it for granted.

Biodiversity is **vital** to countless **human activities**. Much **food production** is only possible because of natural benefits like fertile **soil** and **water**, and **bees** that pollinate plants and trees.

Plants **clean the air** by releasing oxygen and absorbing harmful pollutants.

Our wardrobes are full of **natural fabrics** such as cotton, wool, and silk. Natural systems provide us with **timber** and other materials to make buildings and furniture.

Many **medicines**, like **aspirin**, have **natural origins**. And natural systems such as rainforests and coral reefs contain undiscovered life-saving substances, whose value could be immense.

Half of the carbon dioxide we put into the atmosphere is absorbed by natural systems on land and at sea. These 'carbon sinks' play a huge role in slowing **climate change**.

Coral reefs and mangrove forests are a **buffer** against storms and tsunamis. Wetlands act like **sponges**, absorbing excess water and preventing floods.

Beautiful natural areas attract large numbers of **visitors**, providing local people with income.

Many people spend much of their spare time simply enjoying the beauty of the natural world. Some cultures even place a **spiritual value** on certain places and species.

But **biodiversity is under threat** all round the world. Plants and animals are dying out, mainly because of human action. And once biodiversity is lost, we can't get it back.

Losing biodiversity doesn’t just mean losing rare plants and animals. It means that entire ecosystems produce less, and are **more vulnerable** to external shocks. Fish stocks can collapse, fertile soils can be lost, and bee populations can crash.

Economists have calculated the annual loss of the things we get from nature for free at €50 billion. If nothing is done, the loss of biodiversity on land could cost 7% of GDP by 2050.

Europe has **strong laws** to protect our nature, but **they need to be followed in practice**. And we need to make sure that activities like fishing, farming and forestry don't harm the natural environment.

<http://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm>

In 2011, the EU adopted an ambitious strategy setting out 6 targets to halt the loss of biodiversity and ecosystem services

Protect species and habitats - Target 1  
By 2020, the assessments of species and habitats protected by EU nature law show better conservation or a secure status for 100 % more habitats and 50 % more species.  
Maintain and restore ecosystems - Target 2  
By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15 % of degraded ecosystems.  
Achieve more sustainable agriculture and forestry - Target 3  
By 2020, the conservation of species and habitats depending on or affected by agriculture and forestry, and the provision of their ecosystem services show measurable improvements  
Make fishing more sustainable and seas healthier - Target 4  
By 2015, fishing is sustainable. By 2020, fish stocks are healthy and European seas healthier. Fishing has no significant adverse impacts on species and ecosystems.  
Combat invasive alien species - Target 5  
By 2020, invasive alien species are identified, priority species controlled or eradicated, and pathways managed to prevent new invasive species from disrupting European biodiversity.  
Help stop the loss of global biodiversity - Target 6  
By 2020, the EU has stepped up its contribution to avert global biodiversity loss

# Overexploitation

The unsustainable use of natural resources and overexploitation, which occurs when harvesting exceeds reproduction of wild plant and animal species, continues to be a major threat to biodiversity.

The ecological footprint analysis compares human demands on nature with the biosphere's ability to regenerate resources and maintain ecosystem services. It does this by assessing the biologically productive land and marine area required to produce the resources consumed and to absorb the corresponding waste, using available technology. Overall biological resources use and waste emission is well above the biological capacity available within Europe, showing that the continent cannot sustainably meet its consumption demands within its own borders. The EU-27 on its own has an ecological footprint of 4.7 global hectares per person, twice the size of its biocapacity. Europe’s high per capita consumption and waste production means that its impact also extends well beyond its borders.

Overfishing is still widespread across the pan-European region with 88 % of Community fish stocks fished down beyond maximum sustainable yields (meaning that less fishing pressure now would allow stocks to recover); thirty per cent of Community fish stocks are overfished outside safe biological limits that may not allow their recovery.

Non sustainable forest management, intensification measures, the drainage of peatlands and wet forest, fertilization and forest-tree genetic ‘improvement’ have had a particularly negative effect on the biodiversity values of forests. Whilst wood harvesting in the EU is largely sustainable, deadwood (which is a key indicator for forest biodiversity and the conservation value of a forest) remains well below optimal levels from a biodiversity perspective in most European countries.

Intensive agriculture, as currently practiced in Europe, is centred on crop monoculture with minimization of associated species. These systems offer high yields of single products, but depend on high rates of use of fertilizers and pesticides. The maintenance of high productivity over time is unlikely to be sustainable in the face of disturbance, disease, soil erosion and overuse of natural capital (for example water).

Pressures on European water resources have increased in recent decades and in many locations agriculture, energy supply, industry, public water supply and tourism pose a threat to water resources, with demand often exceeding availability. The increase in artificial storage volumes in turns reduces the share of water allocated to natural systems and increases their fragmentation because of damming. Over-abstraction and prolonged periods of low rainfall or drought have frequently reduced river flows, lowered lake and groundwater levels and dried up wetlands. In addition, salt water increasingly intrudes into ‘over-pumped’ aquifers throughout Europe.

## Ecosystem services <https://en.wikipedia.org/wiki/Biodiversity>

### The balance of evidence

"Ecosystem services are the suite of benefits that ecosystems provide to humanity."

These services come in three flavors:

1. Provisioning services which involve the production of renewable resources (e.g.: food, wood, fresh water)
2. Regulating services which are those that lessen environmental change (e.g.: climate regulation, pest/disease control)
3. Cultural services represent human value and enjoyment (e.g.: landscape aesthetics, cultural heritage, outdoor recreation and spiritual significance)

Summer field in Belgium (Hamois). The blue flowers are

*Centaurea cyanus* and the red one *Poppies.*

The most Common questions about biodiversity

What are the relationships between biodiversity and climate change?   
How can be stopped biodiversity loss?  
 What can we do to protect biodiversity?

What is biodiversity?  
Why biodiversity is important?  
 How many biodiversities there are in the world? How much do we lose?  
 How is the situation of biodiversity in Italy?in your country ?

What are the main threats to biodiversity?  
 What are the relationships between biodiversity and climate change?  
 How can be stopped biodiversity loss?  
What can you do to protect biodiversity?  
  
   
BIODIVERSITY

Biodiversity is a very important concept in ecology. Generally it is understood as the wealth of species, it is actually far more.  
Stability and adaptability of the environment and the species depends on biodiversity therefore it assumes a crucial value for the protection of the environment and its evolution and continuity over time.  
 This is the official definition according to the Art.2 of the Rio de Janeiro International Convention (1992): "the variability among living organisms of all types, including, inter alia, terrestrial, marine and those of other aquatic ecosystems and the ecological complexes of which they are part. This includes diversity within species, between species and ecosystem diversity. "  
They recognize different levels of diversity:  
  
Genetic diversity: each individual is unique and carries in its genetic important differences that are manifested in appearance or in particular circumstances (resistance to disease, frost,...).  
species diversity: the diversity that we instinctively imagine, that of species (birds, fish, mammals, insects, but also, often forgotten, fungi, bacteria, and many more inconspicuous organisms).  
Diversity of environments: swamps, rivers, dry grasslands, alpine meadows, cliffs, ponds, woods, ...  
Diversity of relations: the elements of the previous three differences would not matter if there were no relationships between them (power, a source of natural selection, protection, mutualism, symbiosis, parasitism, ...).  
  
  
Why biodiversity must be protected?  
Without biodiversity, natural processes do not work  
We have no right to destroy the biodiversity  
The richness of nature is part of our cultural heritage  
Biodiversity is also important for humans:  
It contributes to food security  
It contributes to the protection of air, water, soil and ecosystems  
It provides materials, food and medicines  
It promotes cultural diversity  
It is a resource for tourism, development and well-being  
Biodiversity is threatened by:  
Buildings, concreting  
Land fragmentation  
Mechanization, production  
intensive farming and abandonment  
Standardization  
Pollution, greenhouse  
What can you do for biodiversity?

Using the interests of nature and not the capital  
Increasing the areas and the number of protected natural areas and enhance existing ones  
Reducing the isolation of habitats and improve the mobility of living organisms  
Maintaining a diverse environment  
Involving farmers  
Providing land use planning more environmentally  
Intensifying environmental education in schools  
Raising awareness and feeling part of nature  
A document summarizing exhaustively the arguments in favor of biodiversity can be downloaded (French or German) on the documentation. There is also the pdf on the objectives for biodiversity in 2020.

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| **ACTIVITIES** | **SUBJECT** | **AGE** |
| 1. **Session** | | |
| * 1. Watch the videos and discuss the information.   2. Ecosystem services and Biodiversity - Science for Environment Policy https://www.youtube.com/watch?v=D6luBEJfi3s   3. Find other movies about natural resources and overexploitation | IT, language | 12-14 |
| * 1. Watch the videos and discuss the information. What is Biodiversity   1.1.1 <https://www.youtube.com/watch?v=aqtdaIkxnQo>   * 1. Find other movies about biodiversity. | 15-19 |
| 1. **Session** | | |
| * 1. Search the information about biodiversity on web pages (or use other web pages).  Valuation of Ecosystem Services: Classes of Values  * + 1. <https://www.youtube.com/watch?v=q8AZHtF2f50> | IT, sciencet | 12-19 |
|  |
| * 1. Create a video showing the biodiversity in your household/region/country. |
| 1. **Session** | | |
| * 1. Look through the web pages. Read 1-2 articles from each page. Be ready to discuss about the issues you have read. (Students can choose articles from the local web pages). | Languages,biology | 14-19 |
| * 1. Students answer the questions “What news have happened recently? What is their opinion about that? |  |  |
| * 1. Students work in groups and complete the sentence **“Biodiversity is difficult to sustain in the short time but if we consider ......”.** |  |
|  | | |
|  |  |  |
|  |  |  |
|  |
| 1. **Session** | | |
| * 1. Write a short article (50-80 words) „ How to explain biodiversity to your parents?” | Languages | 12-14 |
| * 1. Organize a promotional campaign for biodiversity | 15-19 |
| What is Biodiversity? | | |
| Subjects / Areas: Social Science, English, class tutor, etc. |  |  |
| Starting point:using material texts |  |
| The students are divided in international groups of 4 or 5 and each group elaborates a short comic sketch about biodiversity and show it.  POSTERS or INFOGRAPHICS:   * about Biodiversity as a generator of resources, * with sentences defining what Biodiversity is, * referring to different types of Biodiversity .   The students make a Dictionary of the organic products, DOP. (Protected Designation of Origin, DOC (Denomination of Controlled Origin) PGI (Protected Geographical recognized) with short explanation of the products in 6 languages. |  |  |

Activities

Students create An interactive calendar of festivals, an app for the cultivation of vegetable gardens on the balconies and in the flower beds with warnings about the risks and prevention, the seeding, fertilizing, waterings, etc.  
A good news magazine which addresses the problems of the gardens, schools, air quality, water, waste reception days, etc.

The app of the responsible citizen.

What are the folk festivals and bio villages ? Why are they important for the project.

In such popular festivals there are many stalls in which the peasants sell their traditional foods and, to promote them, offer to the passers a dish taste with bread and wine.

Frequently such popular market coincide with the protector saint.

We think that unconsciously they are the celebration of the local identity and at the same time the promotion of products “not convenient" for trade but that safeguard ancient flavours and so they safeguard biodiversiy

Example are the black chickpeas from Cassano , a little town not far from Bari,the almonds from Toritto, the cherries from Turi, the “caroselli” a special cucumber, the coloured carrots from Polignano, the orecchiette with durum wheat flour “Senatore Cappelli”, the Primitive wine, the Strong Ricotta, etc. . To name just some countless products destined to disappear if they were not protected.  
The “ Bio Festivals” protect the biodiversity of the earth.