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CLICK FOR SCHOOLS
CLIMATE CHANGE KIT FOR SCHOOLS

Diagnostic of the practices and pedagogical references for Secondary Schools Students

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Secondary Education & Climate Change
Intellectual Output O1 - Report

Contents

Objective of this research

The objectives of this research are:
- to better identify the needs of educators of secondary schools in terms of online support for a global apprehension of Climate change and its impact the day to day life in the Mediterranean.
- to provide an overview of the existing online tools aiming at a better comprehension of the Climate change issue and

The results of this research should provide representative examples of existing tools and a global analysis of the way Climate change is integrated into the National Educational programs of secondary schools in the countries of the project.
The research only focused on existing online tools adapted to children 11-15 years old (secondary school).

The Methodology followed

The methodology followed from January 2018 to April 2018 included the following steps:

- Remote research: each partner made a research on its own country following the guidelines provided by the Mediterranean Centre of Environment (MCE). Research could be based on interviews, questionnaires, research online, etc.

- National cooperation was recommended to collect at least 5 examples of online tools per country.

- In addition to guidelines for research, the MCE provided to the partners:
    - A scheme for the national reports
    - A template for the description of the existing tools

- Skype meetings were organized by the MCE with each country in order to clarify some elements and facilitate identifying the main outputs of the research.

This report is the synthesis of this collaborative work.

Formal education: Secondary school curriculum and Climate change

Main pedagogical objectives on Climate change

Most of the educational systems recall the importance of environmental education and sustainable development, as a perequisite for the development of social and civic competences.

However, when analysing how curricula of Secondary schools in the partners countries address the issue of Climate change, it appears that this approach is not completely put into practice. In Italy for example, a Circular of 2010 is reiterating the importance of the issues of environmental sensitivity and education for sustainable development, paying a particular attention to energy conservation, protection and enhancement of artistic, cultural and environmental heritage. But in the same country, there is no compulsory educational program, addressing environmental problems, but just recommendations to teachers from the Ministry of the Environment.

Climate change does not always constitute a separate or integrated unity in the curriculum of Secondary school, but is apprehended as one of the natural phenomenon. The main pedagogical objectives on this topic is to make students better understand the natural phenomenon of Climate change as a whole, with a focus on the phenomenon of the Greenhouse Effect (e.g. in Greece, the the role of CO2 and the Carbon cycle).

Some other features, directly related to Climate change, are not systematically identified as such. In Greece, for example, *"Apart from the global warming and the more obvious melting of ice or the sea level rise and the extreme weather conditions there are a few more negative effects that are mentioned in some part and in some of the relative student's books."* (National report – Greece).

From the National reports of the Cli.c.k. for Schools partners, it appears that the main topics of Climate change tackled by the curricula of Secondary schools are:

- Ecosystem and Climate in general (especially during 1st year)
- Climate change phonomenon - causes and effects (during the last years of Secondary school)
- Energy resources and Climate change
- Carbon cycle and Climate change
- And in some curriculum, ecological problems and CC (natural resources, water, seas)

Main disciplines concerned

Climate change is mainly teached though Geography (during 1st and 2d grades of Secondary school), and Natural sciences, i.e. Physics, Biology, as well as Chemistry (especially 3rd, 4th grades).

The various aspects of Climate change are studied at different grades, through different disciplines, without given the students enough opportunities to understand the connections between the various topics and to get a global comprehension of the phenomenon. It is true that the issue is so wide, and it includes so many aspects that a hollistic approach of the phenomenon is very ambitious.

In France, however, a reform in 2016 tends to associate several disciplines to tackle environmental issues of our planete. Teachers are asked to work in pluridisciplinary team and to work on 2 or 3 years programs. One of the objectives is to use the expected learning outcomes of the previous year to better analyse the environmental phenomenon and their impacts during the next grades. More specifically, a 3 years 'cycle', running grades 2-3 and 4 by the transdisciplinary team should help students using the knowledge they get from the previous years to better observe the present and potential consequences of Climate change.

Specificities exist in some countries: Climate change is also addressed through other disciplines such as Home economics in Greece (through lessons on "Natural resources and energy situation" and "Ecological Crisis") or Technology in Italy (through lessons on "Environmental impact of productive systems").

The issue of climate change may be also examined outside the formal curriculum, through environmental clubs created in some schools or through optional extra-curricular projects. In Greece, the Centres for Environmental Education, under the responsibility of the Ministry in charge of Education, and in France, the CPIE (Centres permanents d'initiatives pour l'environnement) propose extra-curricular project of Environmental Education which consist of a unity of various learning activities that take place both in and outside school. In this context, students groups have the opportunity to be supported through educational activities.

Pedagogical approach

A critical analysis of the pedagogical approach demonstrates that, during their cursus, students get an accumulation of information on Climate change that may not be sufficient to understand the various features of the problem and the cause and effect relationships. "*The consequences of climate change and other implications are in most cases very limited and not sufficiently explained.*" (National report - Greece)

Moreover, Climate change is not sufficiently learned in relation with the local realities and impacts. "*Information on climate change is not related to students' daily life. Because of this, students think that climate change does not affect them personally.*" (National report

- Croatia). A direct consequence of this approach is that students are not motivated to change behavior or to think of their personal responsibility as citizen.

A too fragmented approach of the topic does not help for a good comprehension of interconnections between phenomena (i.e. climate change and sustainable cities; climate change and resources as energy, water, food; climate change and biodiversity; etc.).

"*The fact that serious environmental problems with different features (about causes, processes and impacts) are grouped thematically may lead to students' conceptual misunderstandings.*" (Greek report). For instance, as research data show, students of high school tend to confuse atmospheric problems such as global warming or/and Greenhouse Effect, ozone hole and acid rain.

In conclusion

Recognizing the complex nature of the issue due to its various, often interrelated, dimensions (environmental, economic, social, political) and the critical role of education in addressing it, one can stress the need for further strengthening of Curriculum by incorporating Climate change topics in diverse subjects, by interrelating them and optimizing the teaching hours.
There is a real need for curriculum to move from a content-based towards an objective-based model which should be based on the question "What features (as regards as knowledge, competences, behavior) should characterize a climate literate citizen?".

If we want children to build competences for mitigation and adaptation and reduce vulnerability to climate-related impacts, the pedagogical approach must become simultaneously holistic (global approach of the phenomenon and of its causes and impacts) and local (understanding the specific causes & impacts of Climate change on our local reality).

This orientation supposes to improve interdisciplinarity at school (only mentioned in France) and to better connect climate change with other topics such as natural resources, pollution, energy, sustainable cities, etc.

Main disciplines concerned & main issues of Climate change studied in the project Countries

Students age	11-12	12-13	13-14	14-15
COUNTRIES **Topics**				
CROATIA				
Geography	- Types of climates & impacts of climate - Natural resources, Energy and Environment - Non compulsory: Environment (water)	- water and climate in Africa - Natural phenomenons & Climate in America - Polar regions and Climate - Non compulsary: Deforestation & Climate	- Sea, Water and earth - Climate & Flora	- Climate & Ecological problems in Croatia
Biology/Natural sciences		- Natural habitat and Biodiversity - non compulsary: wetlands in danger in Croatia		
Physics			- Internal energy, thermal expansion	
Chemistry				- Carbon cycle - Fossil fuels

FRANCE				
Geography	Global change in Geography: Living in different spaces (city, coastline, etc.) & Sustainable development	Global change in Geography: - Natural resources management - Risks prevention	Global change in Geography: - Transnational human mobilities - Oceans and Seas & Climate Territorial dynamics and Climate change - France and EU: COP and EU policy	
Biology/Natural sciences	The Earth, living beings in their environment (3 years cycle starting Primary School)	The Earth, Environment and Human impact (3 years cycle)		
Physics/Chemistry		- Dissolution of gaz in water and Health - acid-base property: chemicals transformation and environment - Electicity (energy saving)		
GREECE				
Geography		Very limited reference: Natural resources (the burning of fossil fuels as a cause of the Greenhouse Effect)	-A small informative inlet on 'Climate in Europe and in Greece' - EU plan on climate change - Greenhouse gases emissions & Greenhouse effect - Transportation and use of cars	

Biology/Natural sciences			- Air Pollution and the Greenhouse Effect - Carbon Cycle the anthropogenic emissions of CO2	- Air Pollution and the Greenhouse Effect - Carbon Cycle the anthropogenic emissions of CO2
Physics			Greenhouse Effect and the global energy fluxes originating from the sun	
Chemistry			- the role of CO_2 in the regulation of climate - Air pollution and Greenhouse Effect	- The Chemistry of Carbon & Greenhouse effect - Carbon cycle
Home economics			- "Natural resources and energy situation" - "Ecological Crisis"	
ITALY				
In Italy there are no compulsory educational programs, addressing environmental problems. Just recommendations to teachers from the Ministry of the Environment.				
History	Topics studied need to focus also to the close relationship between historical events and the surrounding environment. Suggested topics: the different sources of energy, the defense against adverse natural elements and the progressive transformation of the environment, the many steps of technical development, conservation of goods and food.			

Geography	Recycling and waste management; preventive action and fight against pollution; development of renewable energy; biodiversity protection; adaptation to climate change	Features of Italian, European and world landscapes and how to preserve them.	Environment, urbanization, globalization and its consequences, the relationship between economy, environment and society, the imbalances between the different regions of the world, sustainable development (energy, water resources, climate change, food and biodiversity).
Biology/Natural sciences	Observation and analysis of environmental transformations caused by nature itself (by the sun, atmospheric agents, water, etc.) and by man (urbanization, cultivation, industrialization, etc.); awareness of the role of the human community on Earth; limited resources and limits to their access; the adoption of ecologically sustainable personal behaviors and choices; the respect for biodiversity in environmental systems.		Biodiversity
Arts	Cultural and natural heritage - how to protect it		Architecture and its impact on the environment; sustainable materials and technologies.
Technology	Environmental impact of productive systems		
Law/Economics			Sustainable development

Online tools for Secondary school education on Climate change

This report provides a list of various examples of available online tools on Climate change, either developed in one of the project countries, or on a European level. These 29 examples have been selected by the partners of the project and analyzed (see Annex).

The selected tools aim at strenghtining awareness and understanding of Climate change, its causes and its impacts. The main aspects of Climate change tackeled by these examples are the following:

- CC & renewable and non-renewable energy sources
- CC & impact on local and daily life/activities
- CC & Meteorology
- CC & Pauverty – Environmental migration
- Cc & environmental rules and regulation

Analyses of the existing online tools for formal and non-formal education

Each tool mentioned in the annex has been analysed separately, however some weaknesses were often mentioned in the national reports. They highlight the gaps that the project Cli.c.k for Schools aims at fulfilling:

- Objectives are not always clear (what do we want to learn to children?)
- Children from 11 to 15 are not a specific public target. Contents are not enough adapted to this specific public
- Not enough languages available; some tools are only in one language
- Only local information is provided
- Tools are not smart enough: many downloadable pdf documents or manuals, but very few interactive and attractive tools (eg. role plays / games / videos);
- Websites with information do exist but very less with funny tools for students
- Some websites provide static data or simulations of future scenarios without any supporting learning material.
- They are not adapted to be easily transferred to the class by teachers
- Transdisciplinary is missing
- They are not updated and may content outdated information (often between 2010 and 2015)

However, the tools selected by the partners of Cli.c.k for Schools can be **source of inspiration for teachers**, as an additional tool/information for the student, in addition to the lesson, or as new source of activities in an extra-curricular activity or project.

Annex – Selection of online tools

I. EU existing tools
1. Climate action (old version)
2. Climate action (new version)

II. Existing tools in Croatia
3. Project AWERES (AWareness and Education in Renewable Energy Sources)
4. It's cold outside, and I'm hot – teaching scenario
5. DIVERTERRA – multimedial information and education centre
6. 2050 Energy Model Video game
7. Obnovljivi izvori energije - Radni listovi / Renewable energy sources – Worksheets

III. Existing tools in France
8. "Climat sous Tension"
9. "Climat jeunes"
10. "Normales et variabilité"
11. Quizz réchauffement climatique
12. Mieux comprendre le climat: Système climatique, une formidable machine qui s'emballe
13. L'Océan, ma planète... et moi !
14. Modéliser les climats du futur : activité pédagogique avec le logiciel BYOE

IV. Existing tools in Greece
15. Climate change and poverty ("Against the stream")
16. Climate Change: Shall we play?
17. Environmental – Climate Migration: Educational Activities
18. Climate – Energy
19. Environmental Education material

V. Existing tools in Italy
20. Same World Edukit
21. Il progetto R.A.C.E.S.
22. La Scuola per il Clima
23. After Ice
24. Ambiente Piemonte
25. RETE CLIMA: Area download e materiali didattici
26. IMPARIAMO LE ENERGIE
27. CLIMALTERANTI
28. INQUIRE BOTANY
29. MY TEST

EU Existing Tools

1. *Climate Action (old version)*
2. *Climate Action (new version)*

Climate Action (old version)

Link (URL): http://ec.europa.eu/clima/sites/campaign/index_en.htm

Pedagogical objective

The above web-page of the European Commission comprises an interactive on-line tool about climate change.

Main topic(s)

- Mechanism/Phenomenon
- Causes
- Impacts
- Measures / Solutions
  - Mitigation
  - Adaptation

Short presentation

The on-line tool is very well structured. The navigation is very easy and helps the students to go through all sections of the tool through different pathways. The main section that contains the educational tool is entitled "For schools" but different kind of resources, such as on-line game, CO_2 calculator, power-point presentations, teaching notes, videos and other multimedia, galleries, publications, slideshows, webpages, hyperlinks, etc. are available in the whole tool.

a. Home (Screenshot 1)

b. What is climate change?

c. Take control!

d. EU actions

e. For schools

Features a quiz, power-point presentations, teaching notes, animated film, videos, CO_2 calculator etc. (Screenshot 2)

f. Resources

g. Features and past events

Complementary elements provided by the online tool

A variety of complementary elements is provided.

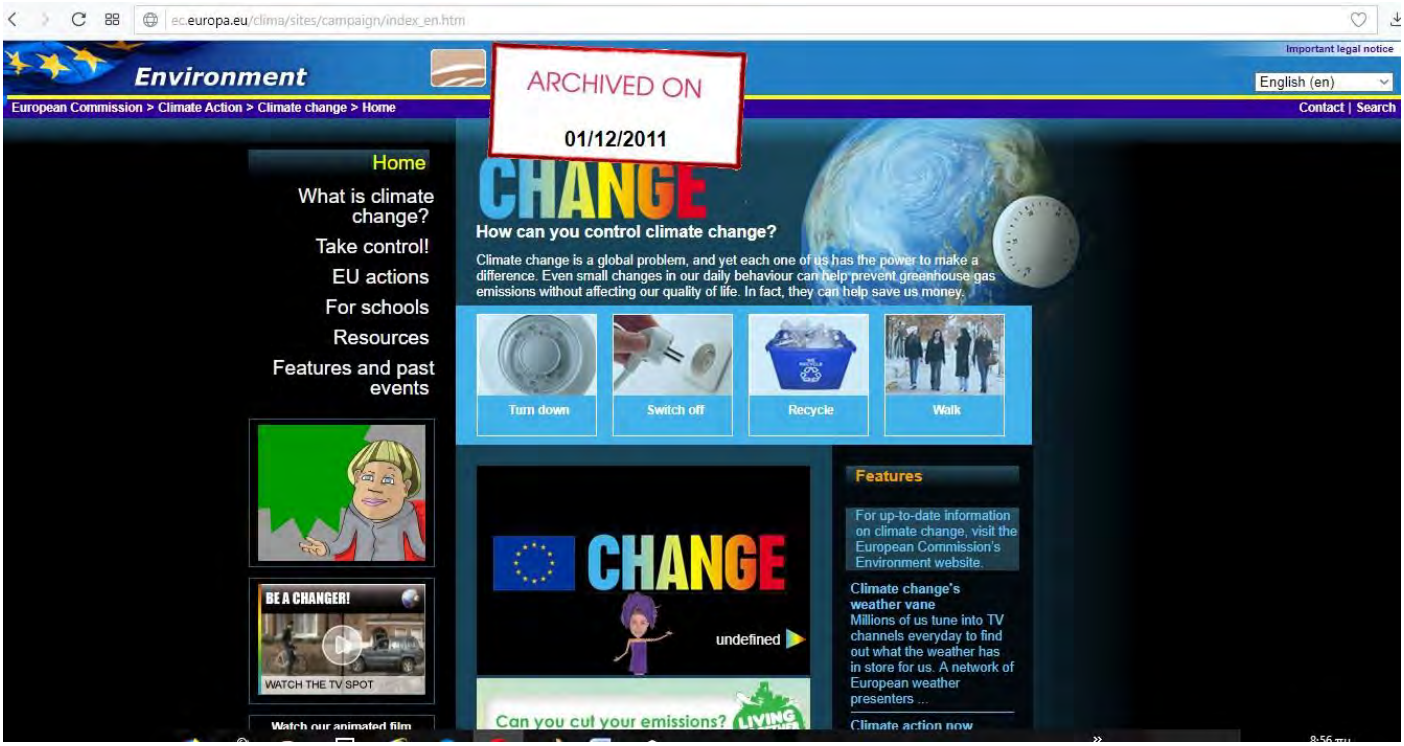
Language(s) available: 21 European languages (BG, CS, DA, DE, ET, EL, EN, ES, FR, IT, LV, LT, HU, NL, PL, PT, RO, SK, SL, FI, SV)

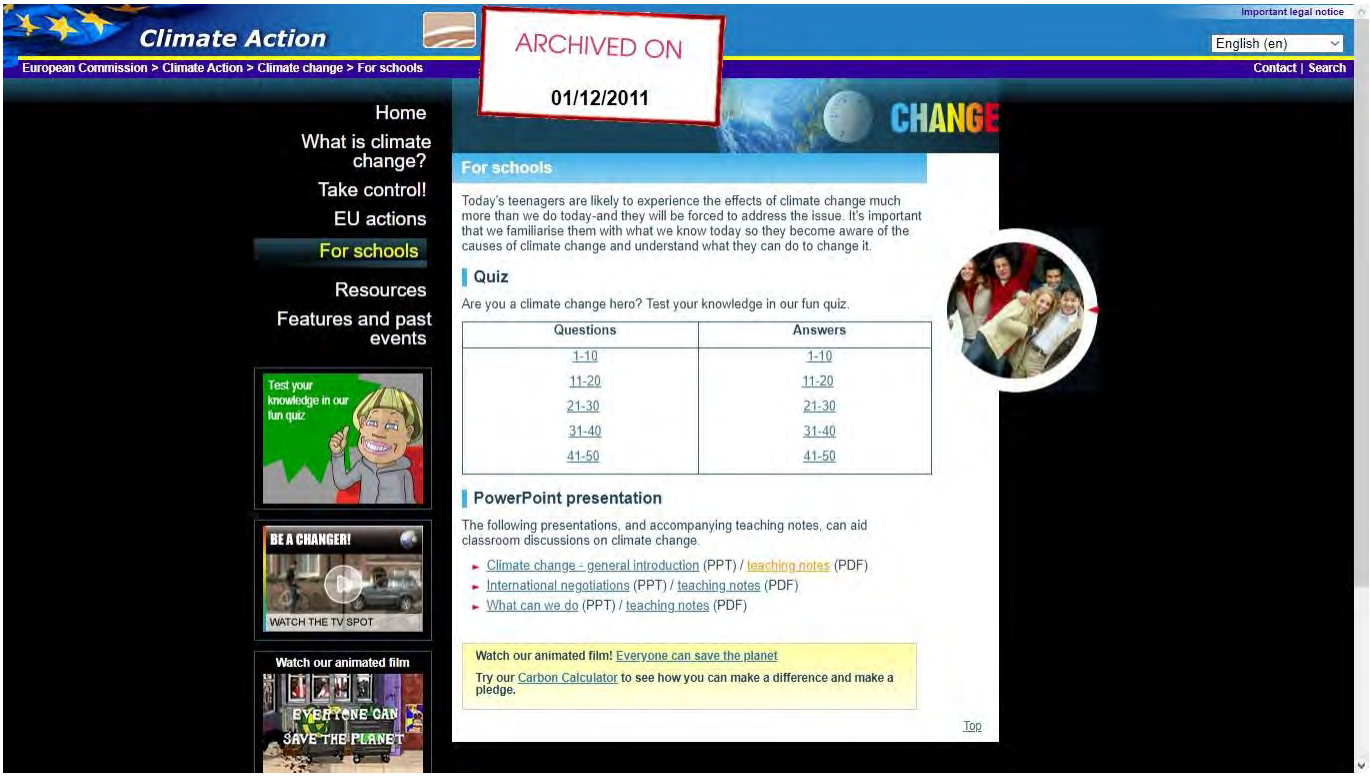
Responsible organisation/Producer: European Commission

Contact
email: enquiries@climatechange.eu.com

Strengths of this tool
A thorough interactive on-line tool. Available to 21 European languages.

Weaknesses of this tool
This is an old version that was archived on 2011. Data should be checked and updated.




Climate Action
ARCHIVED ON
01/12/2011
Important legal notice
English (en)
European Commission > Climate Action > Climate change > For schools
Contact | Search
Home
What is climate change?
Take control!
EU actions
For schools
Resources
Features and past events
Test your knowledge in our fun quiz
BE A CHANGER!
WATCH THE TV SPOT
Watch our animated film
CHANGE
For schools
Today's teenagers are likely to experience the effects of climate change much more than we do today-and they will be forced to address the issue. It's important that we familiarise them with what we know today so they become aware of the causes of climate change and understand what they can do to change it.
Quiz
Are you a climate change hero? Test your knowledge in our fun quiz.
Questions
Answers
1-10
11-20
21-30
31-40
41-50
PowerPoint presentation
The following presentations, and accompanying teaching notes, can aid classroom discussions on climate change.
Climate change - general introduction (PPT) / teaching notes (PDF)
International negotiations (PPT) / teaching notes (PDF)
What can we do (PPT) / teaching notes (PDF)
Watch our animated film! Everyone can save the planet
Try our Carbon Calculator to see how you can make a difference and make a pledge.
Top

Climate Action (new version)

Link (URL): https://ec.europa.eu/clima/index_en

Pedagogical objective

This new part of the European Commission platform, managed by the Directorate-General for Climate Action (DG CLIMA), provides a comprehensive and simple information to the EU policy and action on Climate, but also interesting videos, links, and on-line tool about climate change.

Main topic(s)

- Mechanism/Phenomenon
- The causes and the main impacts
- Measures / Solutions
    - Mitigation
    - Adaptation

Short presentation

The website includes a specific session addressed to "Citizens" https://ec.europa.eu/clima/citizens/eu_en. It gives emphasize to the international strategy towards Climate change, but also proposes:

- Regularly reviewed data for each EU Country (Special Eurobarometer on climate change: https://ec.europa.eu/clima/citizens/support_en#tab-0-1)
- A Quiz for kids and another for adults (see screenshot 1)
- A board game (https://ec.europa.eu/clima/citizens/youth_en) see screenshot 2
- "Climate tips": some ideas to reduce our consumption and footprint at home, with water, etc

Complementary elements provided by the online tool

A variety of complementary elements is provided.

Language(s) available: 21 European languages (BG, CS, DA, DE, ET, EL, EN, ES, FR, IT, LV, LT, HU, NL, PL, PT, RO, SK, SL, FI, SV)

Responsible organisation/Producer: European Commission, Directorate-General for Climate Action (DG CLIMA)

Contact

Directorate-General for Climate Action
European Commission
1049 Bruxelles/Brussel
Belgium
Tel. +32 2 299 11 11

Strengths of this tool

Provide simple and clear information
Available to 21 European languages

Weaknesses of this tool

No specific tools for the age of Click for Schools project
More focused on promoting the EU Policies and action on Climate change than on information and education of the large public

Existing tools in Croatia

1. *Project AWERES (AWareness and Education in Renewable Energy Sources)*
2. *It's cold outside, and I'm hot – teaching scenario*
3. *DIVERTERRA – multimedial information and education centre*
4. *2050 Energy Model Video game*
5. *Obnovljivi izvori energije - Radni listovi / Renewable energy sources - Worksheets*

Project AWERES (AWareness and Education in Renewable Energy Sources)

Link (URL) http://door.hr/portfolio/aweres/

Pedagogical objective

- to stimulate interest, thinking and activities related to renewable energy sources
- to understand how renewable energy sources contribute to the preservation of the environment and which positive effects it may have on other aspects of life

Main topic(s)

- Mechanism/Phenomenon: renewable energy sources
- Causes: use of fossil fuels – impact on climate changes
- Impacts: use of renewable energy sources on preservation of the natural balance
- Measures / Solutions:
    - Mitigation: replacing fossil fuels with renewable energy sources

Short presentation

The aim of AWERES project (AWareness and Education in Renewable Energy Sources) is to increase the use of renewable energy sources in the Republic of Croatia through the promotion and education on renewable energy sources. As part of the project, two vocational schools (in Labin and Varaždin) are equipped for teaching in the field of renewable energy sources.
As a summary of the knowledge, experience and results the project team created the publication "Renewable Energy Sources in My Community". The material consists of descriptions of different domains in which renewable energy sources have a significant positive effect compared to conventional energy use.

Complementary elements provided by the online tool

- "Renewable Energy Sources" Curriculum
- Workbook «Design, installation and maintenance of photovoltaic systems»
- Publication "Renewable Energy Sources in My Community"

Language(s) available: Croatian

Responsible organisation/Producer

DOOR – Društvo za oblikovanje održivog razvoja / Society for Sustainable Development Design

Contact

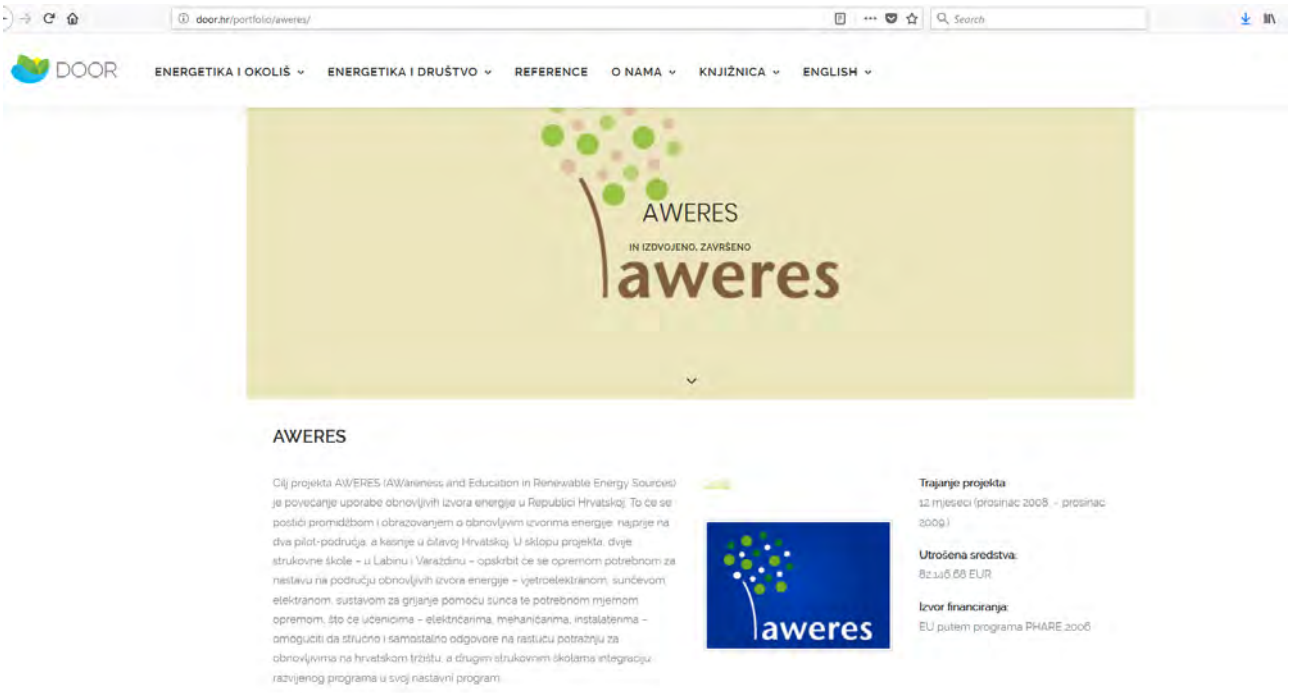
Phone/email tel/fax: +385 (0) 1 4655 441; e-mail: info@door.hr

Strengths of this tool:

- Emphasizing the important topic of renewable energy sources and connecting it to climate changes
- Including the topic in formal education system, although as an optional subject in vocational schools ("Renewable Energy Sources" Curriculum)
- Providing practical knowledge (the *Workbook* and the *Curriculum*)

Weaknesses of this tool

- It's not an online tool



It's cold outside, and I'm hot – teaching scenario

Link (URL): https://scenariji-poucavanja.e-skole.hr/scenarij-poucavanja/vani-zima-a-meni-je-vruce/

https://scenariji-poucavanja.e-skole.hr/

Pedagogical objective

- Understand the relationship between heat and internal energy
- Analyze the change of internal energy
- Explain the thermal balance

Main topic(s)

- Mechanism/Phenomenon: global warming
- Causes: Disruption of thermal balance
- Impacts: *it's not mentioned, but can be used to explain the phenomena related to CC*
- Other : The concepts necessary to understand global warming and climate change are well explained, so they can become a prerequisite for further learning about the phenomena

Short presentation

Teaching material includes instruction manuals for teachers. It is based on a series of well-explained experiments that will allow students to associate the phenomena of global warming with their everyday life, thus allowing them to understand it better. The material can be used as a basis for creating digital applications.

Language(s) available: Croatian

Responsible organisation/Producer

CARNet – Hrvatska akademska i istraživačka mreža /Croatian Academic & Research network

Contact

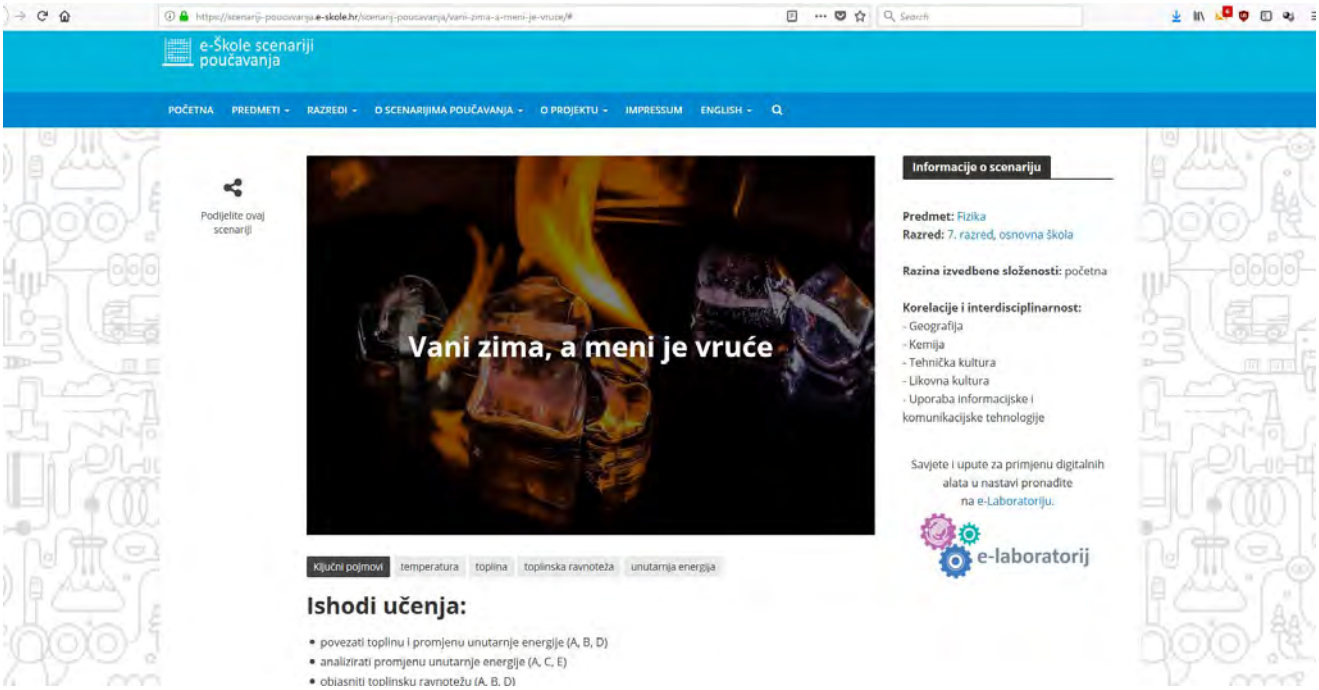
Phone/email: tel. +385 (0)1 6661 555 - helpdesk@CARNet.hr

Strengths of this tool:

- facilitates the understanding of global warming
- linking global warming (climate change) with the daily life of students
- promotes learning by doing
- refers to additional information for those who want more
- can be the basis for developing digital teaching materials

Weaknesses of this tool

- key concepts are not (directly) linked with the phenomenon of climate change
- no digital material
- there is no task for checking the acquired knowledge



DIVERTERRA – multimedial information and education centre

Link (URL)

http://www.haop.hr/hr/diverterra/pravila-privatnosti
https://www.facebook.com/diverterra/
https://play.google.com/store/apps/details?id=hr.novena.haopvr (mobile app)

Pedagogical objective

- to raise awareness of how each individual has an environmental footprint, which is smaller or larger depending on his/her lifestyle
- to realize how modern way of living impacts our specific ecosystems
- to understand the role and the power of each individual in dealing with the climate changes

Main topic(s)

- Mechanism/Phenomenon:
  Sustainable development
  Biodiversity
  Nature protection

- Causes: modern way of living affecting climate changes

- Impacts: impact of climate changes on biodiversity

- Measures / Solutions
  - Mitigation: changing habits (modern/everyday life) will help reducing climate change, preservation of nature and biodiversity

Short presentation

Modern and innovative IEC Diverterra will unite the themes of environmental protection, climate change, nature and biodiversity conservation in one place and will be presented using the best available technologies, in line with current global developments.
"The content of the Diverterra brand is an interesting story about Croatia, a small country of exceptional geo-diversity that will be promoted through the Diverterra IEC. The aim is to present the challenges of modern lifestyles, their impact on the exceptional values of our distinctive ecosystems, the causes and consequences of climate change, and to show the role and power of the individual, as well as the power of the community to deal with them." - project leader

Complementary elements provided by the online tool

- Information and Education Centre - stationary component (in progress)
- Mobile app N3VR Diverterra Virtualni muzej (Virtual museum) – mobile component

Language(s) available: Croatian

Responsible organisation/Producer

Hrvatska agencija za okoliš i prirodu / Croatian Agency for the Environment and Nature

Contact

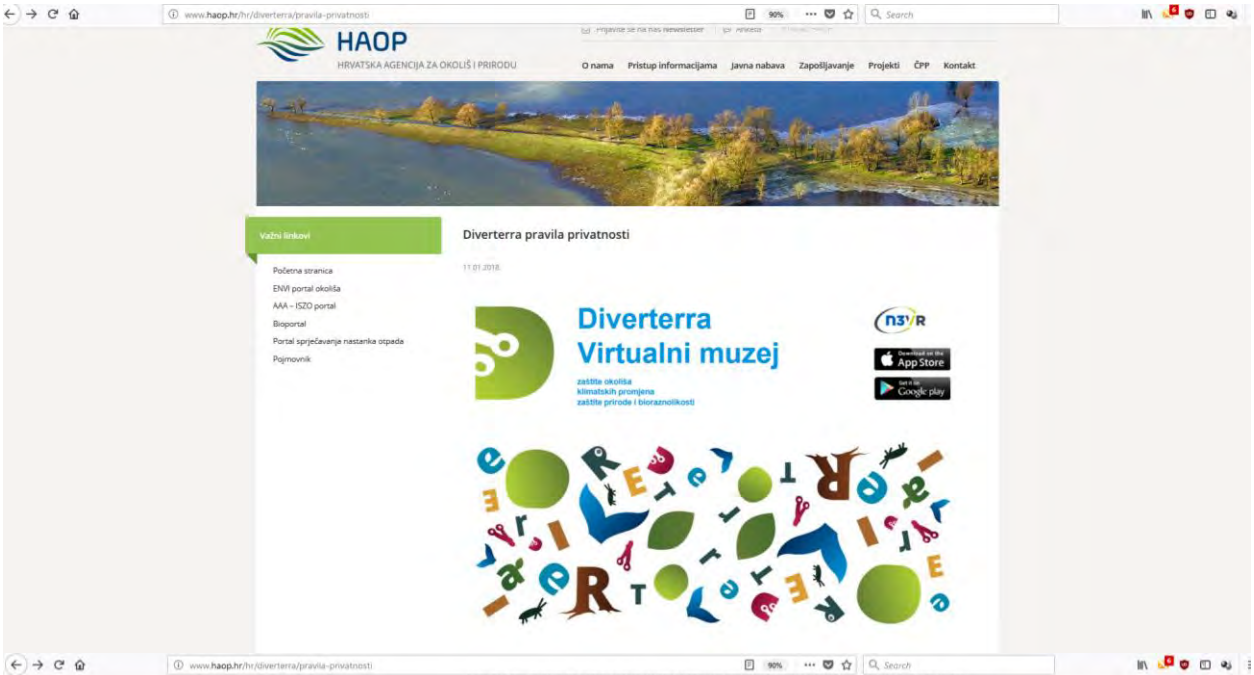
Name: Hrvatska agencija za okoliš i prirodu / Croatian Agency for the Environment and Nature
Phone/email: info@haop.hr

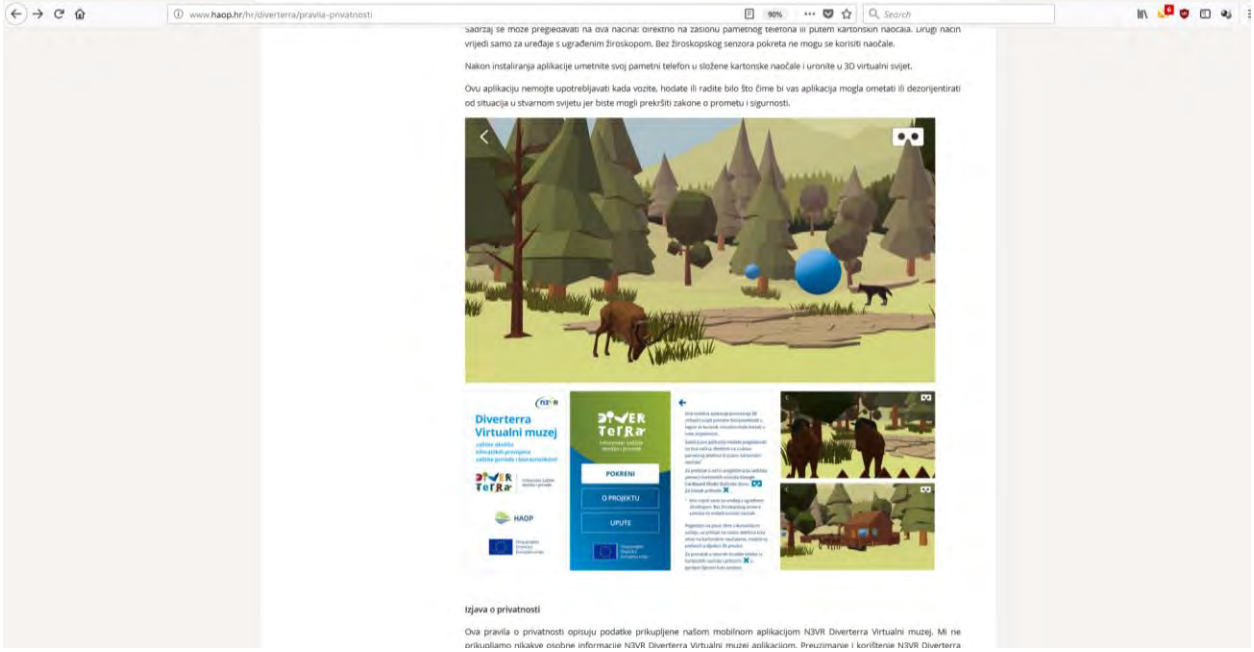
Strengths of this tool:

- topics of environmental protection, climate change, nature and biodiversity conservation united in one place
- using modern technologies in presenting the topics

Weaknesses of this tool

- lack of problem/interactive approach: the emphasis is on presenting information. But the work on IEC is still in progress, and some more interactive components are foreseen


www.haop.hr/hr/diverterra/pravila-privatnosti
HAOP
HRVATSKA AGENCIJA ZA OKOLIŠ I PRIRODU
O nama
Pristup informacijama
Javna nabava
Zapošljavanje
Projekti
ČPP
Kontakt
Važni linkovi
Početna stranica
ENVI portal okoliša
AAA – ISZO portal
Bioportal
Portal sprječavanja nastanka otpada
Pojmovnik
Diverterra pravila privatnosti
11.01.2018.
Diverterra
Virtualni muzej
zaštite okoliša
klimatskih promjena
zaštite prirode i bioraznolikosti
App Store
Google play


www.haop.hr/hr/diverterra/pravila-privatnosti
Sadržaj se može pregledavati na dva načina: direktno na zaslonu pametnog telefona ili putem kartonskih naočala. Drugi način vrijedi samo za uređaje s ugrađenim žiroskopom. Bez žiroskopskog senzora pokreta ne mogu se koristiti naočale.
Nakon instaliranja aplikacije umetnite svoj pametni telefon u složene kartonske naočale i uronite u 3D virtualni svijet.
Ovu aplikaciju nemojte upotrebljavati kada vozite, hodate ili radite bilo što čime bi vas aplikacija mogla ometati ili dezorijentirati od situacija u stvarnom svijetu jer biste mogli prekršiti zakone o prometu i sigurnosti.
Diverterra
Virtualni muzej
POKRENI
O PROJEKTU
UPUTE
HAOP
Izjava o privatnosti
Ova pravila o privatnosti opisuju podatke prikupljene našom mobilnom aplikacijom N3VR Diverterra Virtualni muzej. Mi ne

2050 Energy Model Video game

Link (URL): https://see2050energymodel.net/

Pedagogical objective

- Understand that the mode of producing and consuming energy affects the reduction of CO2 emissions in the atmosphere.
- Select behaviors that reduce greenhouse gases.

Main topic(s)

- Mechanism/Phenomenon: greenhouse gases (greenhouse effect)
- Causes: energy production and consumption
- Measures / Solutions
  - Mitigation: changing the mode of energy production and consumption
- Other: the individual's relationship to the possibilities of changing the mode of production and energy consumption

Short presentation

By the year 2050, we need to dramatically change the way we produce and consume energy. We need to do this in order to reduce the level of greenhouse gas emissions and avoid the dangerous consequences of climate change. Different choices and trade-offs, as well as the steps we need to take, are offered in order to reach the future we want.

The game's console consists of sliders which allow you to change how we use energy and how we produce energy. The bubble appears telling you the impact of the decision you are about to make. Last click checks the whole of your choices, and you have the ability to go back and improve the result.

Language(s) available: Croatian, Serbian, Macedonian, Albanian, English

Responsible organisation/Producer

SEE Change Net Foundation
http://www.seechangenetwork.org

Contact

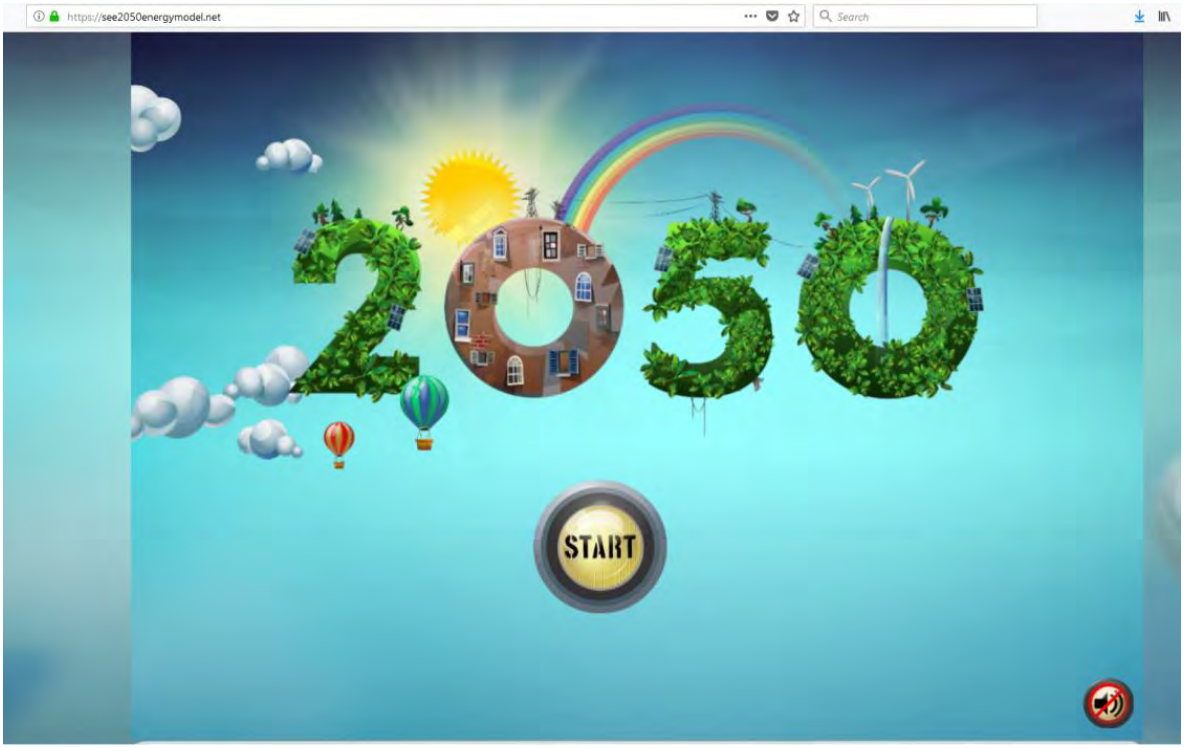
Email: info@seechangenet.org

Strengths of this tool:

- very simple
- accompanied by calming music
- Quick access to useful information
- The summary obtained at the end of the game makes it easier to remember the information presented

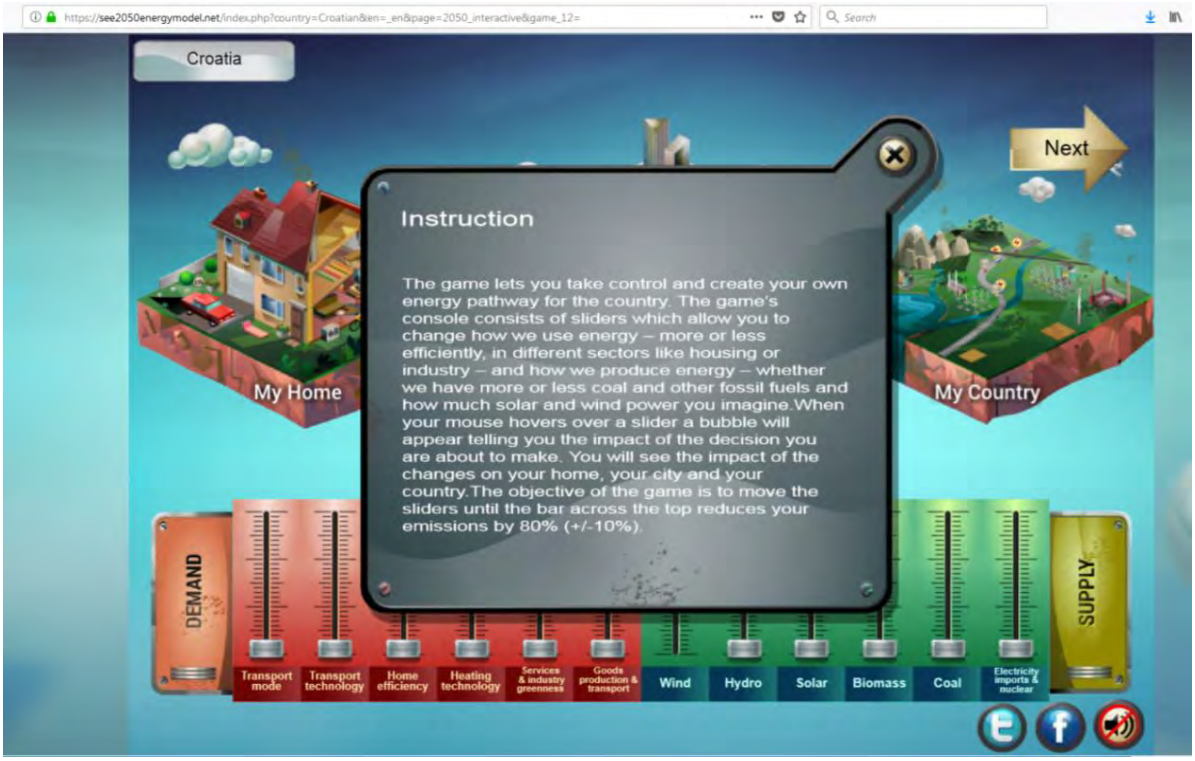
Weaknesses of this tool

- too simple means for collecting information
- ineffective: after the first two solutions, players realize how to move the slider to get an acceptable result, so it is not necessary to read the information in the bubble to make a decision
- the game does not require any intellectual effort; there are no surprises or challenges for children; we anticipate that it will not achieve the desired pedagogic effects
- teaching contents involved do not engage students' emotions, nor connect the phenomenon with their daily life




https://see2050energymodel.net
Search
SOUTH EAST EUROPE
Hrvatska / Croatia
Zagreb
Srbija / Serbia
Sarajevo
Bosna i Hercegovina
Bosnia and Herzegovina
Kosova / Kosovo
Podgorica
Crna Gora / Montenegro
Македонија / Macedonia
Shqipëri / Albania
ADRIATIC SEA
MEDITERRANEAN SEA
Welcome to the 2050 Energy Model Video Game. Please choose a country to begin the game and see if you can solve our energy dilemma!
Dobrodošli u video igru "Energetski model 2050". Molimo odaberite zemlju za početak igre i izaberite svoju energetsku budućnost!
Mirë se vini në Video Lojën Modeli i Energjisë 2050. Ju lutemi zgjidhni një vend për të filluar lojën, dhe të shohim nëse ju mund të zgjidhni dilemën tonë të energjisë!
Добредојдовте во видео играта "Енергетски модел 2050". Ве молиме изберете држава за да ја започнете играта и за да видите дали можете да ја решите нашата енергетска дилема!


https://see2050energymodel.net/index.php?country=Croatian&en=_en&page=2050_interactive&game_12=
Search
Croatia
Next
In order to avoid the most dangerous impacts of global climate change scientists have proposed that we need to reduce our greenhouse gas emissions by 80% by 2050, from a 1990 base.
CO2
100%
To achieve this, between now and 2050, we will need to dramatically change the way we consume and produce energy. The challenge is to see if you can reduce our emissions by 80%, which will require some skill and thought. It is not easy so solutions that are +/- 10% of that target could be submitted. Good luck!


https://see2050energymodel.net/index.php?country=Croatian&en=_en&page=2050_interactive&game_12=
Search
Croatia
Next
Instruction
The game lets you take control and create your own energy pathway for the country. The game's console consists of sliders which allow you to change how we use energy – more or less efficiently, in different sectors like housing or industry – and how we produce energy – whether we have more or less coal and other fossil fuels and how much solar and wind power you imagine.When your mouse hovers over a slider a bubble will appear telling you the impact of the decision you are about to make. You will see the impact of the changes on your home, your city and your country.The objective of the game is to move the sliders until the bar across the top reduces your emissions by 80% (+/-10%).
My Home
My Country
DEMAND
SUPPLY
Transport mode
Transport technology
Home efficiency
Heating technology
Services & industry greenness
Goods production & transport
Wind
Hydro
Solar
Biomass
Coal
Electricity imports & nuclear


https://see2050energymodel.net/index.php?country=Croatian&en=_en&page=2050_interactive&game_12=
Search
Croatia
43%
My Home
My City
My Country
My energy security indicator
We use public transport instead of cars for 49% of our travel. Non-motorized transport - walking and biking for short distance journeys - increases moderately by 2050.
DEMAND
SUPPLY
Transport mode
Transport technology
Home efficiency
Heating technology
Services & industry greenness
Goods production & transport
Wind
Hydro
Solar
Biomass
Coal
Slider information

Obnovljivi izvori energije - Radni listovi / Renewable energy sources - Worksheets

Link (URL)

http://www.door.hr/wp-content/uploads/2016/06/OIE-radni-listovi.pdf

Pedagogical objective

- understand the difference between renewable and nonrenewable energy sources
- perceive the advantages and disadvantages of both kinds of energy sources
- understand the impact of renewable and nonrenewable energy sources on the environment
- understand the benefits that conscientious use of energy brings in terms of environmental protection

Main topic(s)

- Mechanism/Phenomenon: renewable and nonrenewable energy sources
- Causes: nonrenewable energy sources causing environmental and climate changes
- Impacts: use of renewable energy sources for protecting environment
- Measures / Solutions
  - Mitigation: conscientious use of energy

Short presentation

Part of the project whose main objective is to raise awareness of sustainable development through the use of renewable energy sources and conscientious energy use. Worksheets are complementary with the picture book "Renewable energy sources", and the purpose is to educate school children about renewable energy sources, their use, energy efficiency and the benefits that conscientious use of energy brings about in terms of environmental protection. Worksheets are available for download and free use.

Complementary elements provided by the online tool

picture book "Renewable energy sources"

Language(s) available: Croatian

Responsible organisation/Producer

DOOR – Društvo za oblikovanje održivog razvoja / Society for Sustainable Development Design

Contact

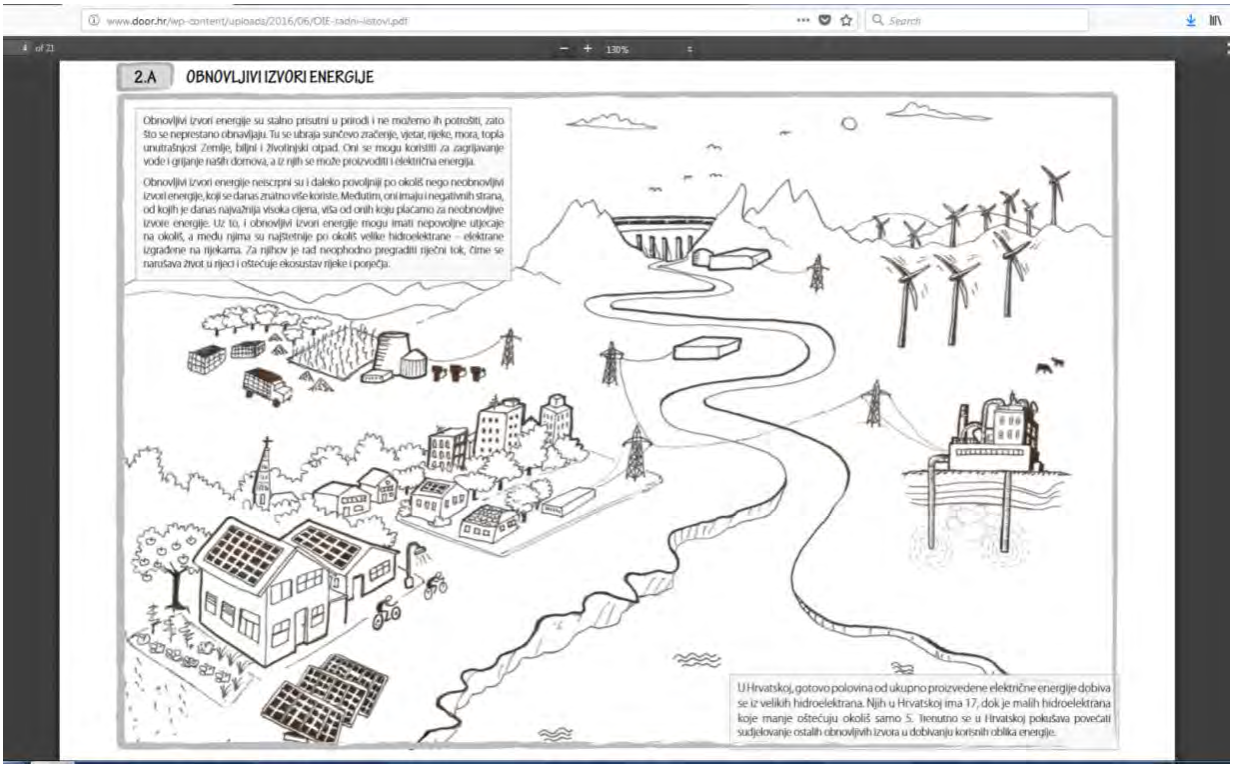
Phone/email: tel/fax: +385 (0) 1 4655 441; e-mail: info@door.hr

Strengths of this tool:

- renewable sources are well explained, and followed by small experiments that helps students to understand how they function
- available online

Weaknesses of this tool

- not well explained the link between different energy sources and changes in environment (including climate changes)
- not interactive

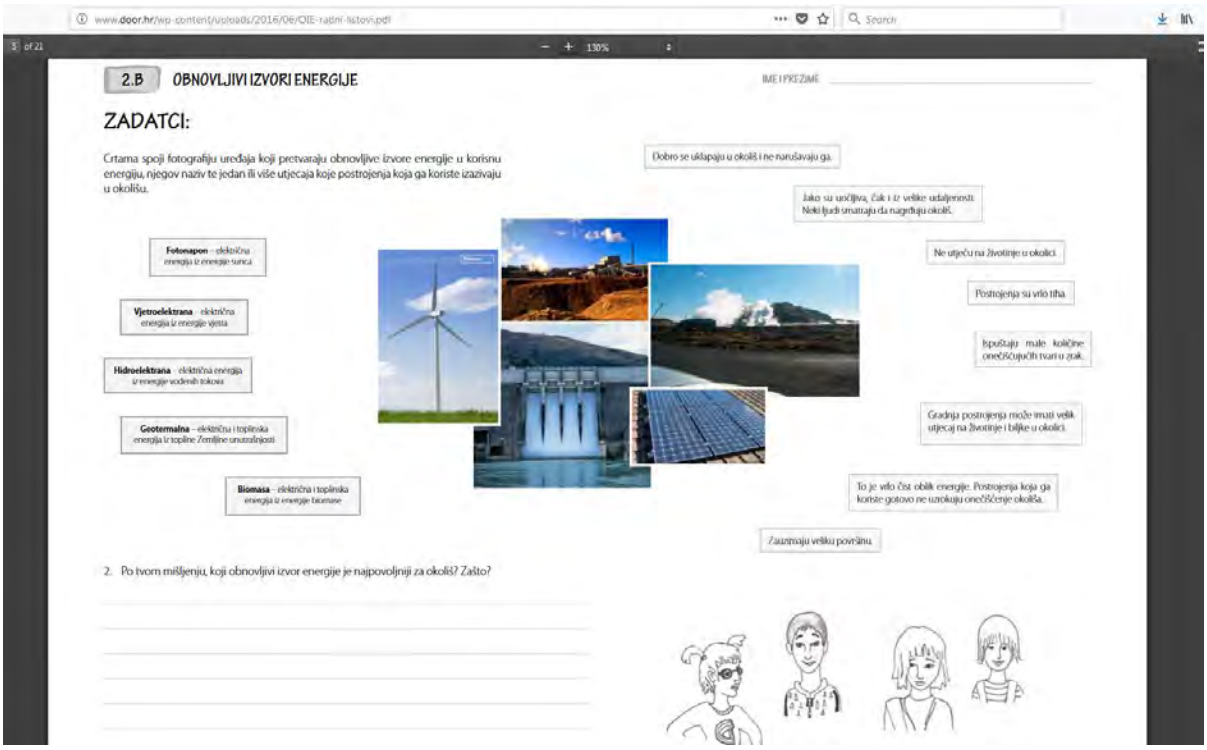


2.A OBNOVLJIVI IZVORI ENERGIJE

Obnovljivi izvori energije su stalno prisutni u prirodi i ne možemo ih potrošiti, zato što se neprestano obnavljaju. Tu se ubraja sunčevo zračenje, vjetar, rijeke, mora, toplа unutrašnjost Zemlje, biljni i životinjski otpad. Oni se mogu koristiti za zagrijavanje vode i grijanje naših domova, a iz njih se može proizvoditi i električna energija.

Obnovljivi izvori energije neiscrpni su i daleko povoljniji po okoliš nego neobnovljivi izvori energije, koji se danas znatno više koriste. Međutim, oni imaju i negativnih strana, od kojih je danas najvažnija visoka cijena, viša od onih koju plaćamo za neobnovljive izvore energije. Uz to, i obnovljivi izvori energije mogu imati nepovoljne utjecaje na okoliš, a među njima su najštetnije po okoliš velike hidroelektrane – elektrane izgrađene na rijekama. Za njihov je rad neophodno pregraditi riječni tok, čime se narušava život u rijeci i oštećuje ekosustav rijeke i poriječja.

U Hrvatskoj, gotovo polovina od ukupno proizvedene električne energije dobiva se iz velikih hidroelektrana. Njih u Hrvatskoj ima 17, dok je malih hidroelektrana koje manje oštećuju okoliš samo 5. Trenutno se u Hrvatskoj pokušava povećati sudjelovanje ostalih obnovljivih izvora u dobivanju korisnih oblika energije.



2.B OBNOVLJIVI IZVORI ENERGIJE

IME I PREZIME _____

ZADATCI:

Crtama spoji fotografiju uređaja koji pretvaraju obnovljive izvore energije u korisnu energiju, njegov naziv te jedan ili više utjecaja koje postrojenja koja ga koriste izazivaju u okolišu.

Fotonapon – električna energija iz energije sunca

Vjetroelektrana – električna energija iz energije vjetra

Hidroelektrana – električna energija iz energije vodenih tokova

Geotermalna – električna i toplinska energija iz topline Zemljine unutrašnjosti

Biomasa – električna i toplinska energija iz energije biomase

Dobro se uklapaju u okoliš i ne narušavaju ga.

Jako su uočljiva, čak i iz velike udaljenosti. Neki ljudi smatraju da nagrđuju okoliš.

Ne utječu na životinje u okolici.

Postrojenja su vrlo tiha.

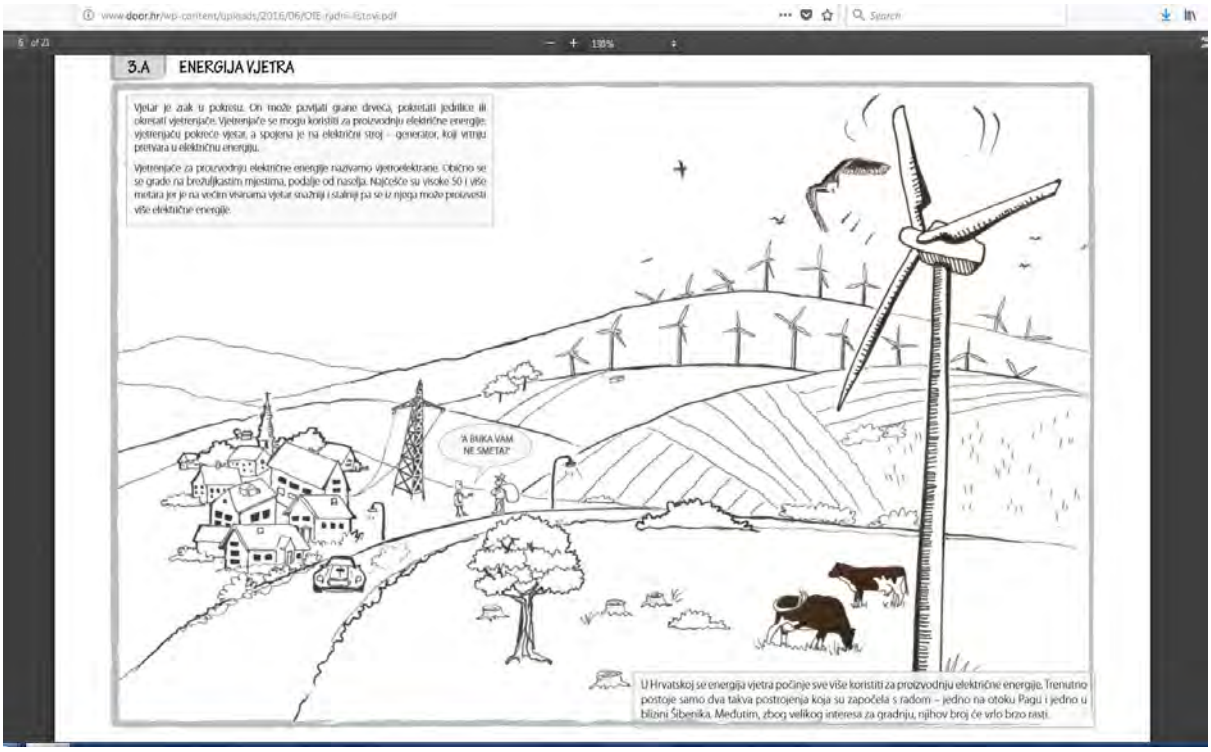
Ispuštaju male količine onečišćujućih tvari u zrak.

Gradnja postrojenja može imati velik utjecaj na životinje i biljke u okolici.

To je vrlo čist oblik energije. Postrojenja koja ga koriste gotovo ne uzrokuju onečišćenje okoliša.

Zauzimaju veliku površinu.

2. Po tvom mišljenju, koji obnovljivi izvor energije je najpovoljniji za okoliš? Zašto?



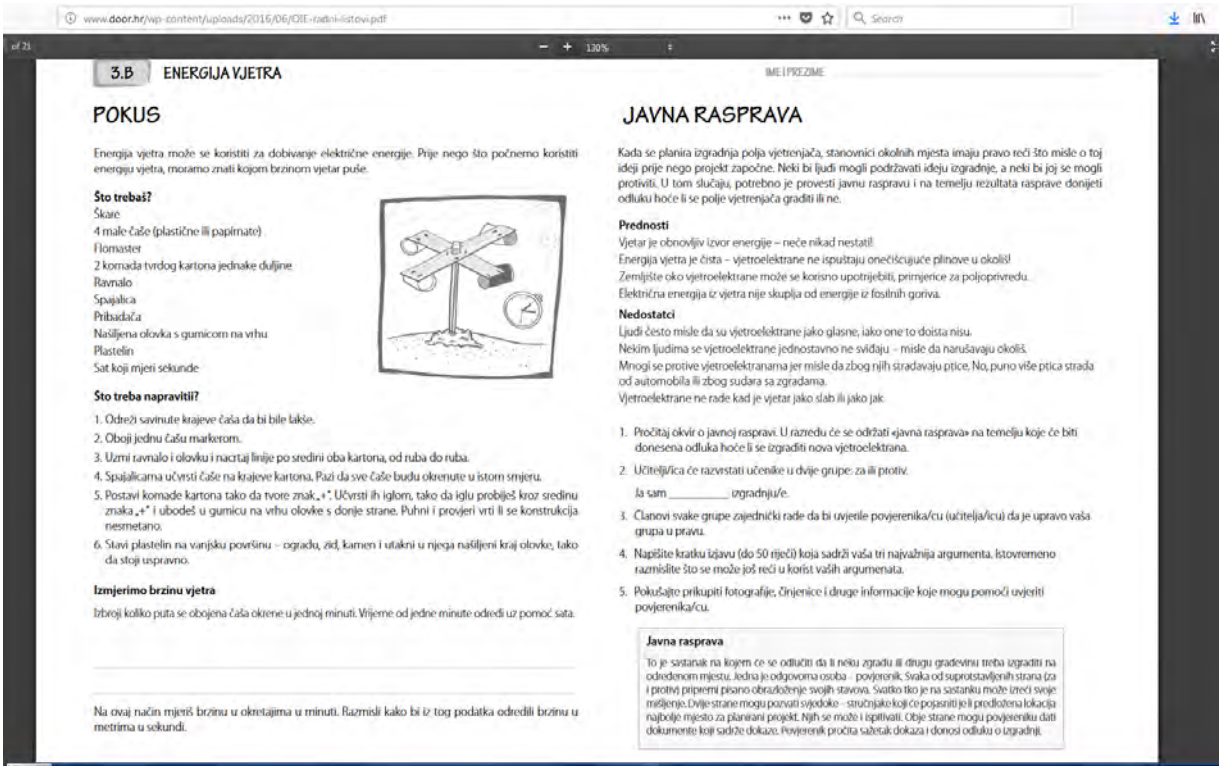
3.A ENERGIJA VJETRA

Vjetar je zrak u pokretu. On može povijati grane drveća, pokretati jedrilice ili okretati vjetrenjače. Vjetrenjače se mogu koristiti za proizvodnju električne energije: vjetrenjači pokreće vjetar, a spojena je na električni stroj – generator, koji vitlu pretvara u električnu energiju.

Vjetrenjače za proizvodnju električne energije nazivamo vjetroelektrane. Obično se se grade na brežuljkastim mjestima, podalje od naselja. Najčešće su visoke 50 i više metara jer je na većim visinama vjetar snažniji i stalniji pa se iz njega može proizvesti više električne energije.

"A BUKA VAM NE SMETA?"

U Hrvatskoj se energija vjetra počinje sve više koristiti za proizvodnju električne energije. Trenutno postoje samo dva takva postrojenja koja su započela s radom – jedno na otoku Pagu i jedno u blizini Šibenika. Međutim, zbog velikog interesa za gradnju, njihov broj će vrlo brzo rasti.



3.B ENERGIJA VJETRA

IME I PREZIME

POKUS

Energija vjetra može se koristiti za dobivanje električne energije. Prije nego što počnemo koristiti energiju vjetra, moramo znati kojom brzinom vjetar puše.

Što trebaš?

Škare
4 male čaše (plastične ili papirnate)
Flomaster
2 komada tvrdog kartona jednake duljine
Ravnalo
Spajalica
Pribadača
Našiljena olovka s gumicom na vrhu
Plastelin
Sat koji mjeri sekunde

Što treba napraviti?

1. Odreži savinute krajeve čaša da bi bile lakše.
2. Oboji jednu čašu markerom.
3. Uzmi ravnalo i olovku i nacrtaj linije po sredini oba kartona, od ruba do ruba.
4. Spajalicama učvrsti čaše na krajeve kartona. Pazi da sve čaše budu okrenute u istom smjeru.
5. Postavi komade kartona tako da tvore znak „+". Učvrsti ih iglom, tako da iglu probiješ kroz sredinu znaka „+" i ubodeš u gumicu na vrhu olovke s donje strane. Puhni i provjeri vrti li se konstrukcija nesmetano.
6. Stavi plastelin na vanjsku površinu – ogradu, zid, kamen i utakni u njega našiljeni kraj olovke, tako da stoji uspravno.

Izmjerimo brzinu vjetra

Izbroji koliko puta se obojena čaša okrene u jednoj minuti. Vrijeme od jedne minute odredi uz pomoć sata.

Na ovaj način mjeriš brzinu u okretajima u minuti. Razmisli kako bi iz tog podatka odredili brzinu u metrima u sekundi.

JAVNA RASPRAVA

Kada se planira izgradnja polja vjetrenjača, stanovnici okolnih mjesta imaju pravo reći što misle o toj ideji prije nego projekt započne. Neki bi ljudi mogli podržavati ideju izgradnje, a neki bi joj se mogli protiviti. U tom slučaju, potrebno je provesti javnu raspravu i na temelju rezultata rasprave donijeti odluku hoće li se polje vjetrenjača graditi ili ne.

Prednosti

Vjetar je obnovljiv izvor energije – neće nikad nestati!
Energija vjetra je čista – vjetroelektrane ne ispuštaju onečišćujuće plinove u okoliš!
Zemljište oko vjetroelektrane može se korisno upotrijebiti, primjerice za poljoprivredu.
Električna energija iz vjetra nije skuplja od energije iz fosilnih goriva.

Nedostatci

Ljudi često misle da su vjetroelektrane jako glasne, iako one to doista nisu.
Nekim ljudima se vjetroelektrane jednostavno ne sviđaju – misle da narušavaju okoliš.
Mnogi se protive vjetroelektranama jer misle da zbog njih stradavaju ptice. No, puno više ptica strada od automobila ili zbog sudara sa zgradama.
Vjetroelektrane ne rade kad je vjetar jako slab ili jako jak.

1. Pročitaj okvir o javnoj raspravi. U razredu će se održati «javna rasprava» na temelju koje će biti donesena odluka hoće li se izgraditi nova vjetroelektrana.
2. Učitelj/ica će razvrstati učenike u dvije grupe: za ili protiv.

   Ja sam _____ izgradnju/e.
3. Članovi svake grupe zajednički rade da bi uvjerile povjerenika/cu (učitelja/icu) da je upravo vaša grupa u pravu.
4. Napišite kratku izjavu (do 50 riječi) koja sadrži vaša tri najvažnija argumenta. Istovremeno razmislite što se može još reći u korist vaših argumenata.
5. Pokušajte prikupiti fotografije, činjenice i druge informacije koje mogu pomoći uvjeriti povjerenika/cu.

Javna rasprava

To je sastanak na kojem će se odlučiti da li neku zgradu ili drugu građevinu treba izgraditi na određenom mjestu. Jedna je odgovorna osoba – povjerenik. Svaka od suprotstavljenih strana (za i protiv) pripremi pisano obrazloženje svojih stavova. Svatko tko je na sastanku može iznijeti svoje mišljenje. Dvije strane mogu pozvati svjedoke – stručnjake koji će pojasniti je li predložena lokacija najbolje mjesto za planirani projekt. Njih se može i ispitivati. Obje strane mogu povjereniku dati dokumente koji sadrže dokaze. Povjerenik pročita sažetak dokaza i donosi odluku o izgradnji.

Existing tools in France

1. *"Climat sous Tension"*
2. *"Climat jeunes"*
3. *"Normales et variabilité"*
4. *Quizz réchauffement climatique*
5. *Mieux comprendre le climat: Système climatique, une formidable machine qui s'emballe*
6. *L'Océan, ma planète... et moi !*
7. *Modéliser les climats du futurs : activité pédagogique avec le logiciel BYOE*

”Climat sous Tension”

Lien (URL) : http://climatsoustension.com/

Objectif pédagogique: Les élèves se mettent dans la peau d’un personnage dans diverses régions de la planète. Des problématiques liées aux enjeux climatiques sont abordées. Les prises de décisions influent sur le destin des personnages et aident à améliorer le « niveau de risque climatique personnel ». Il s’agit de comprendre quelles actions peuvent avoir un impact positif ou négatif au niveau du climat et de la vie des personnes engagées dans ces changements. Des contenus multimédias (vidéos d’intervenants) viennent compléter les apprentissages sur différents thèmes (permaculture, consommation, déplacements…).

Principales thématiques

- Impacts : Les effets du réchauffement climatique sur nos vies et nos métiers.

- Mesures / Solutions
  Mitigation : Les actions à mener et les solutions qui vont dans le bon sens.

Courte présentation

C’est un jeu interactif sorti à l’occasion de la COP 21 qui met l’élève dans la peau d’une personne incitée à faire évoluer son mode de vie à cause des changements climatiques. Au cours de l’histoire, l’élève doit faire des choix qui influent sur le destin de son personnage. A la fin, le joueur obtient un compteur d’impact de risque climatique personnel et accède à des vidéos sur les thèmes abordés dans l’aventure.

Eléments complémentaires fournis par l’outils en ligne

- Vidéo explicatives par des experts dans les différents domaines
- Guides pour enseignants et étudiants

Langue(s) disponible(s) : Français, Anglais

Organisme responsable/Créateur

coproduction TV5 Quebec et TV5 monde
Conception: Samuel St-Pierre

Contact

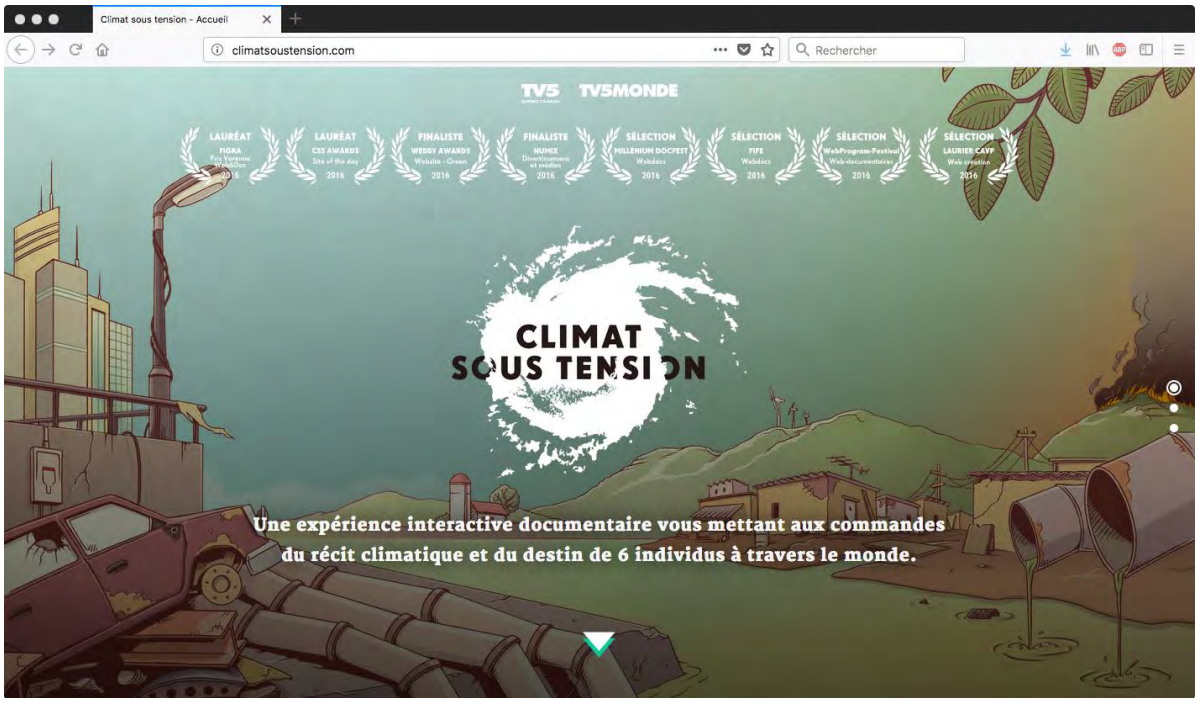
Création technique http://www.pliab.com/

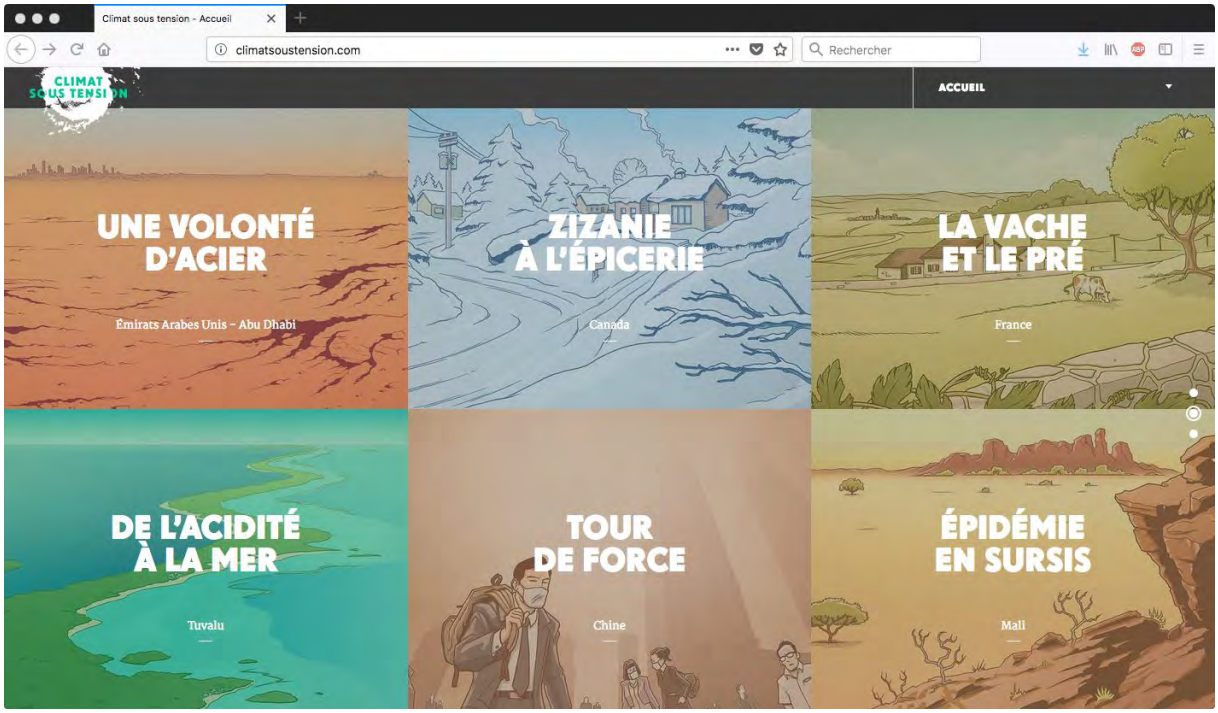
Forces de cet outils :

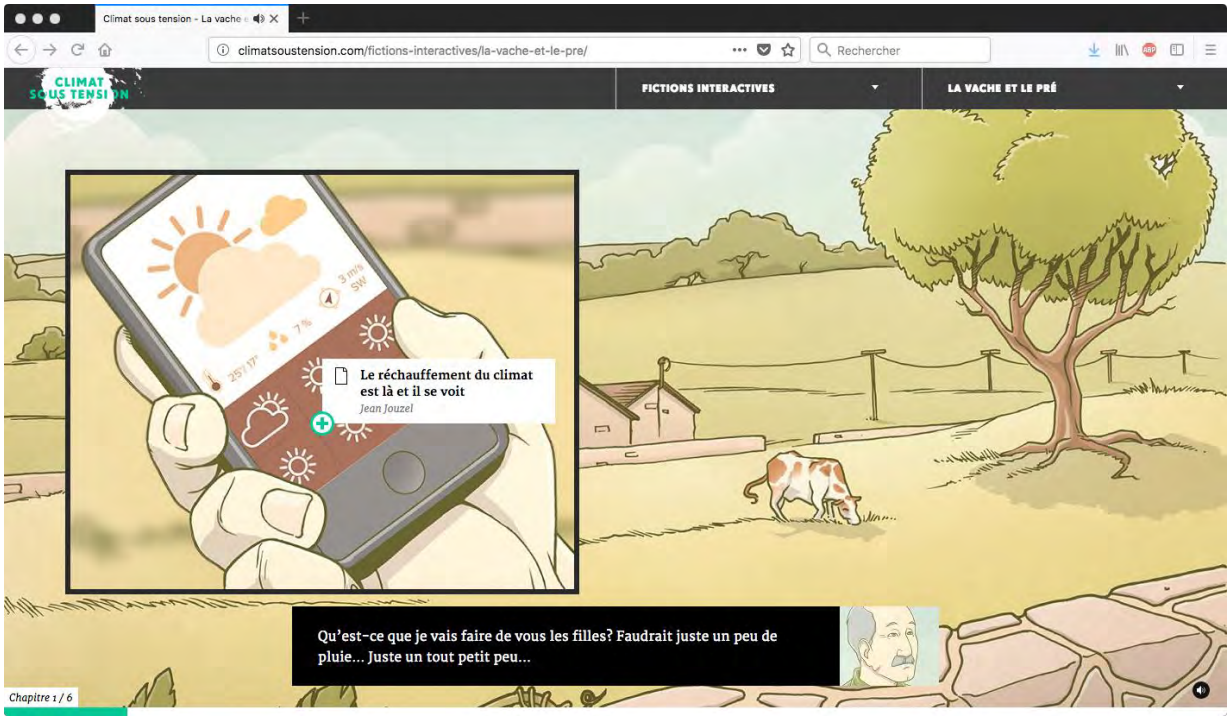
- Esthétique très attrayante
- Scénarios intéressants et variés
- Le lien direct entre les actions et les effets positifs ou négatifs

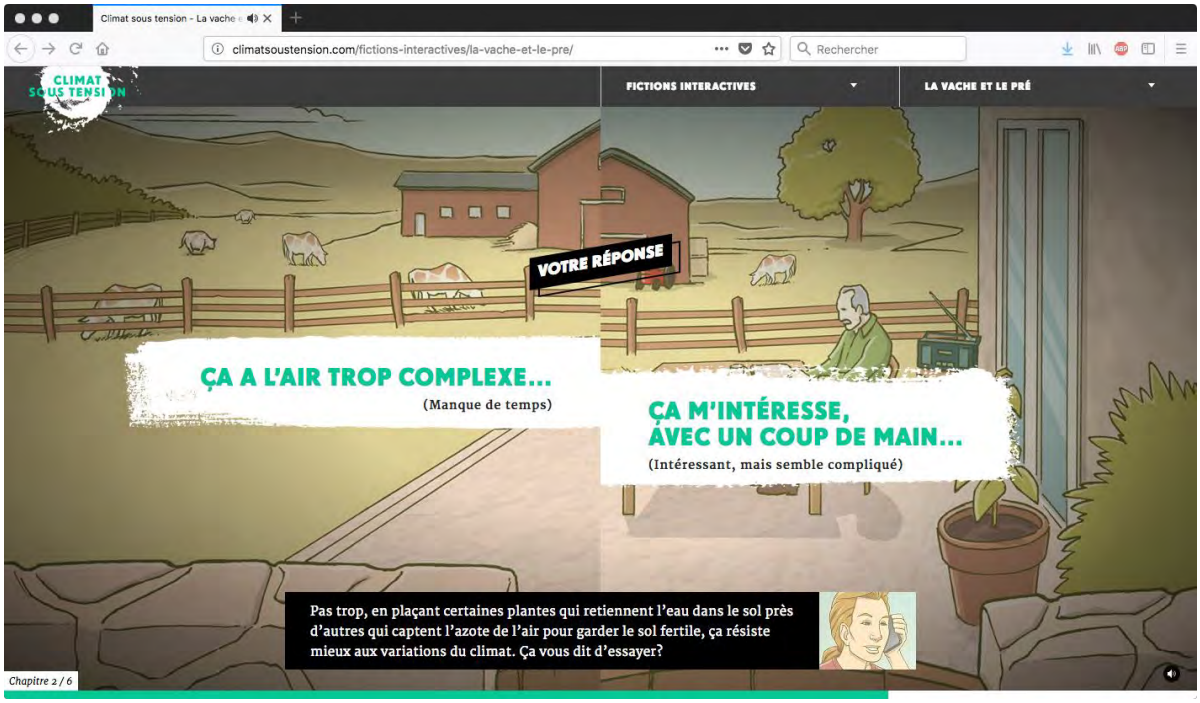
Faiblesse de cet outil :

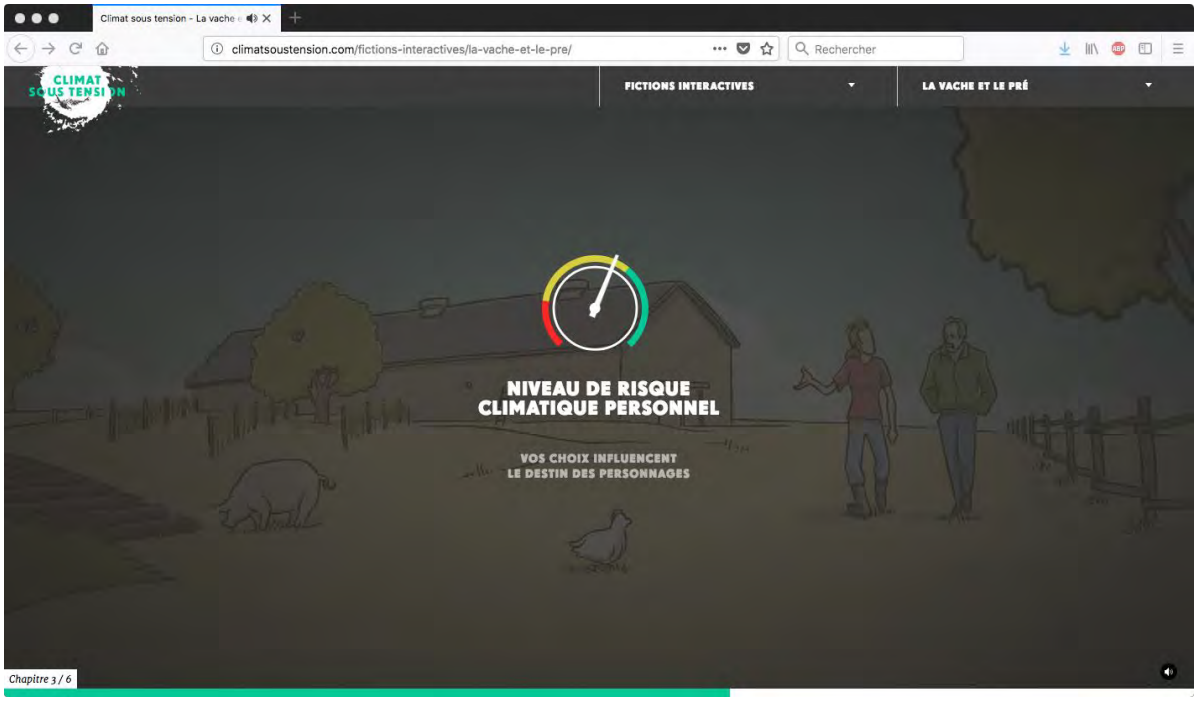
- Certaines notions sont un peu complexes selon l'âge des élèves.




Climat sous tension - Accueil
climatsoustension.com
Rechercher
CLIMAT SOUS TENSION
ACCUEIL
UNE VOLONTÉ D'ACIER
Émirats Arabes Unis - Abu Dhabi
ZIZANIE À L'ÉPICERIE
Canada
LA VACHE ET LE PRÉ
France
DE L'ACIDITÉ À LA MER
Tuvalu
TOUR DE FORCE
Chine
ÉPIDÉMIE EN SURSIS
Mali


Climat sous tension - La vache
climatsoustension.com/fictions-interactives/la-vache-et-le-pre/
Rechercher
CLIMAT SOUS TENSION
FICTIONS INTERACTIVES
LA VACHE ET LE PRÉ
Le réchauffement du climat est là et il se voit
Jean Jouzel
Qu'est-ce que je vais faire de vous les filles? Faudrait juste un peu de pluie... Juste un tout petit peu...
Chapitre 1 / 6


Climat sous tension - La vache
climatsoustension.com/fictions-interactives/la-vache-et-le-pre/
Rechercher
CLIMAT SOUS TENSION
FICTIONS INTERACTIVES
LA VACHE ET LE PRÉ
VOTRE RÉPONSE
ÇA A L'AIR TROP COMPLEXE...
(Manque de temps)
ÇA M'INTÉRESSE, AVEC UN COUP DE MAIN...
(Intéressant, mais semble compliqué)
Pas trop, en plaçant certaines plantes qui retiennent l'eau dans le sol près d'autres qui captent l'azote de l'air pour garder le sol fertile, ça résiste mieux aux variations du climat. Ça vous dit d'essayer?
Chapitre 2 / 6


Climat sous tension - La vache
climatsoustension.com/fictions-interactives/la-vache-et-le-pre/
Rechercher
CLIMAT SOUS TENSION
FICTIONS INTERACTIVES
LA VACHE ET LE PRÉ
NIVEAU DE RISQUE CLIMATIQUE PERSONNEL
VOS CHOIX INFLUENCENT LE DESTIN DES PERSONNAGES
Chapitre 3 / 6

“Climat jeunes”

Lien (URL) : https://climatjeunes.ca/

Objectif pédagogique: Amener l’élève à améliorer ses connaissances et comprendre l’impact de ses actions quotidiennes sur les changements climatiques puis le guider vers des actions plus vertueuses à travers des jeux et des tests.

Principales thématiques

- Mechanism/Phenomenon: Explication du phénomène
- Ses causes : Les gaz à effet de serre
- Impacts : Les effets observés
- Mesures / Solutions
  - Mitigation : Actions quotidiennes à adopter
  - Adaptation : Vers quelles énergies se tourner

Courte présentation

On propose à l’élève 3 jeux autour du thème des changements climatiques : un Quizz pour tester ses connaissances, un test pour évaluer les actions qu’il mène déjà qui vont dans le bon sens, et la création d’un superhéros virtuel qui pourrait aider à améliorer les choses. L’idée, c’est que l’élève s’approprie les thématiques et questionnements et on lui propose ensuite des solutions adaptées et des idées pour agir au quotidien.

Eléments complémentaires fournis par l’outils en ligne

On propose à l’enfant de s’impliquer dans des actions quotidiennes, mais aussi de partager sur les réseaux sociaux son expérience.

Langue(s) disponible(s) : Français, Anglais

Organisme responsible/Créateur

Gouvernement du Canada

Contact

Nom: ……

Tel/email……

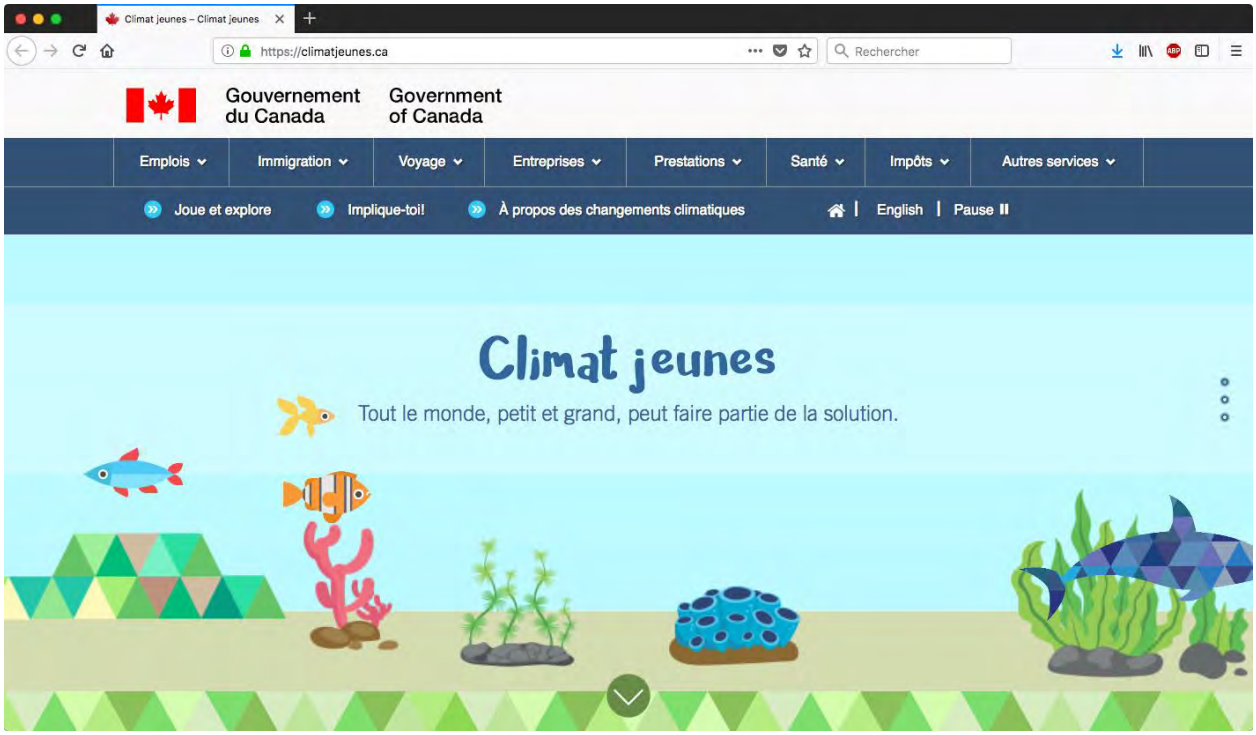
Forces de cet outils :

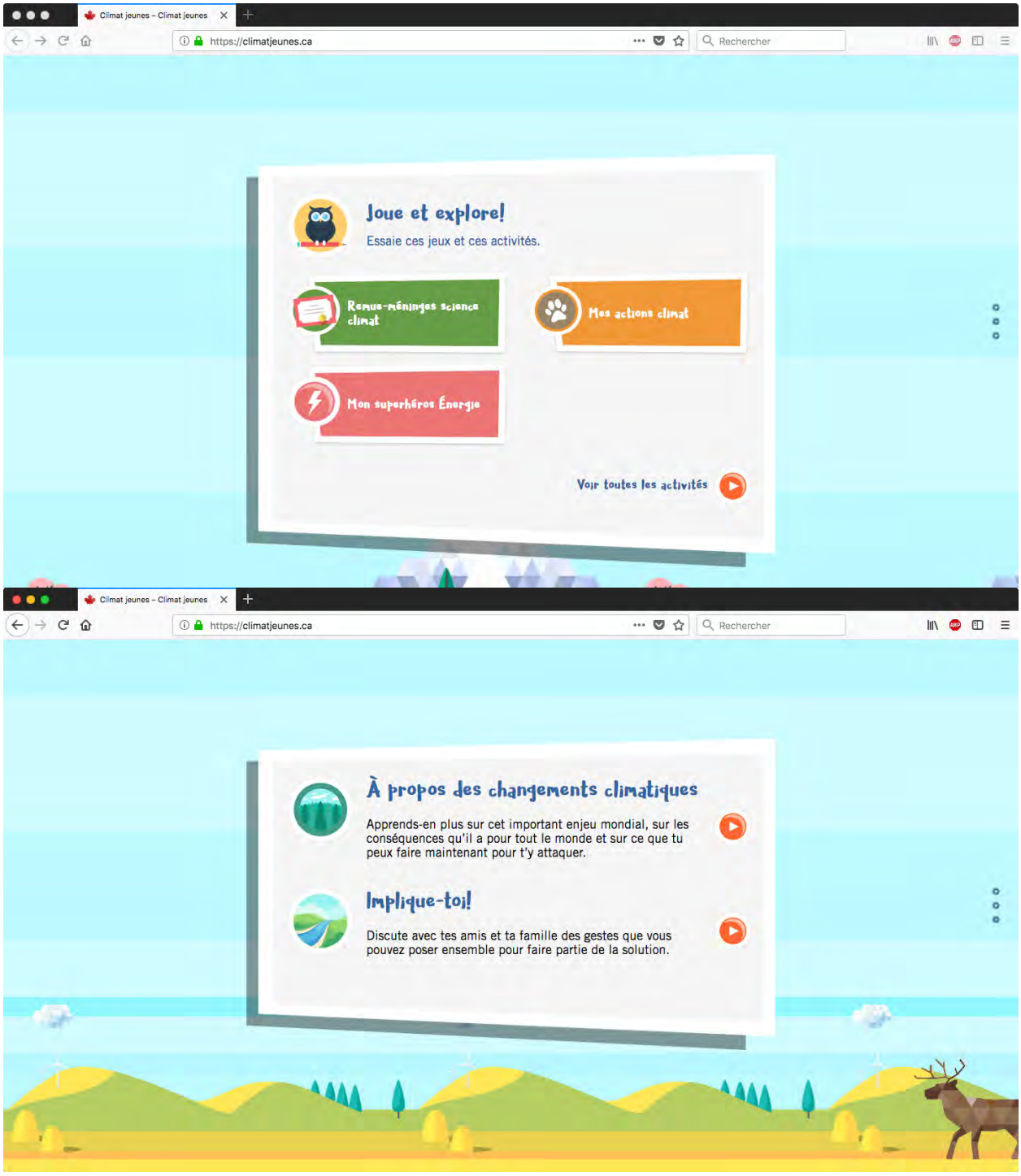
- Très ludique
- Interactif et esthétique

- Apporte des solutions en fonction des réponses données par l'élève

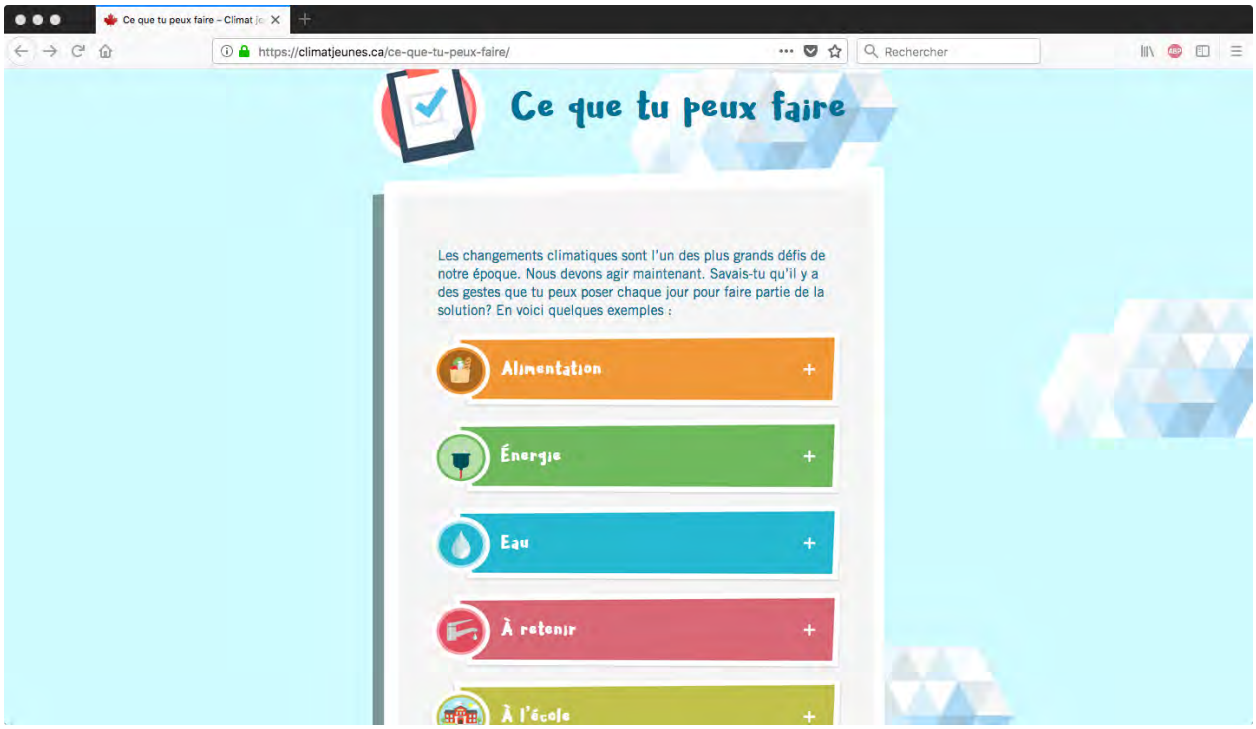
Faiblesse de cet outils :

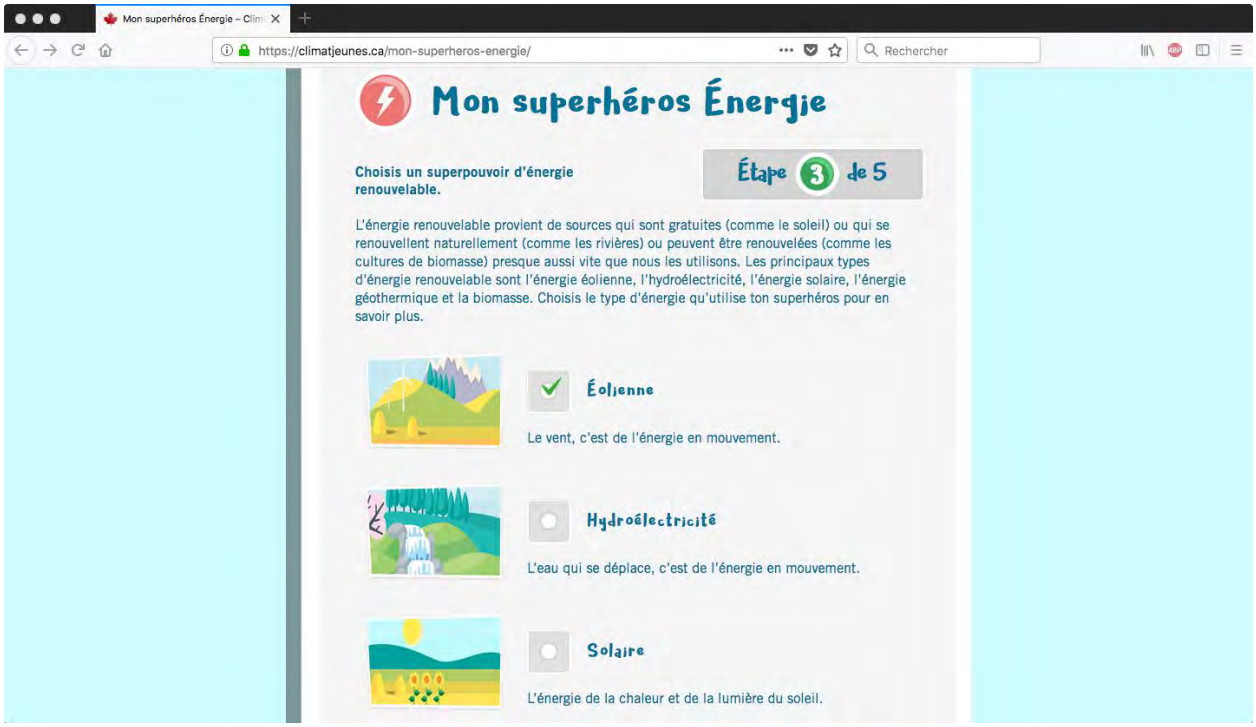
- Questions un peu généralistes qu'il faudrait approfondir
- Niveau de connaissance un peu faible dans le quizz
- Activité qui se mène seule devant son écran (pas besoin d'un prof)
- Pas de caractère local à la reflexion.




Climat jeunes – Climat jeunes
https://climatjeunes.ca
Rechercher
Joue et explore!
Essaie ces jeux et ces activités.
Remue-méninges science climat
Mes actions climat
Mon superhéros Énergie
Voir toutes les activités
Climat jeunes – Climat jeunes
https://climatjeunes.ca
Rechercher
À propos des changements climatiques
Apprends-en plus sur cet important enjeu mondial, sur les conséquences qu'il a pour tout le monde et sur ce que tu peux faire maintenant pour t'y attaquer.
Implique-toi!
Discute avec tes amis et ta famille des gestes que vous pouvez poser ensemble pour faire partie de la solution.


Remue-méninges science climat
https://climatjeunes.ca/remue-meninges-science-climat/
Rechercher
Remue-méninges science climat
D'où provient l'énergie renouvelable?
Question 5 de 12
Du vent
Du soleil
Des rivières
Toutes ces réponses
SOUMETTRE


Ce que tu peux faire – Climat
https://climatjeunes.ca/ce-que-tu-peux-faire/
Rechercher
Ce que tu peux faire
Les changements climatiques sont l'un des plus grands défis de notre époque. Nous devons agir maintenant. Savais-tu qu'il y a des gestes que tu peux poser chaque jour pour faire partie de la solution? En voici quelques exemples :
Alimentation
Énergie
Eau
À retenir
À l'école


Mon superhéros Énergie – Clim
https://climatjeunes.ca/mon-superheros-energie/
Rechercher
Mon superhéros Énergie
Choisis un superpouvoir d'énergie renouvelable.
Étape 3 de 5
L'énergie renouvelable provient de sources qui sont gratuites (comme le soleil) ou qui se renouvellent naturellement (comme les rivières) ou peuvent être renouvelées (comme les cultures de biomasse) presque aussi vite que nous les utilisons. Les principaux types d'énergie renouvelable sont l'énergie éolienne, l'hydroélectricité, l'énergie solaire, l'énergie géothermique et la biomasse. Choisis le type d'énergie qu'utilise ton superhéros pour en savoir plus.
Éolienne
Le vent, c'est de l'énergie en mouvement.
Hydroélectricité
L'eau qui se déplace, c'est de l'énergie en mouvement.
Solaire
L'énergie de la chaleur et de la lumière du soleil.


Justicier De la Bioénergie
Énergie éolienne

“Normales et variabilité”

Lien (URL) : http://education.meteofrance.fr/college/activites-experimentales/le-climat-en-mathematiques/normales-et-variabilite

Objectif pédagogique: Activité mise en œuvre en classe avec les élèves à partir de mesures locales de météorologie. Cela permet de constater ou non des écarts entre les la météo observée et les normales de saison. Éveille le sens critique de l’élève et lui fait constater l’impact au niveau local des changements climatiques. Développe l’utilisation d’indicateurs statistiques en Mathématiques ainsi que l’utilisation du tableur.

Principales thématiques

- Le phénomène : Les variations du climat
- Impacts : Ce que l’on observe localement

Courte présentation

“Au mois de janvier 2015, la météo de Montpellier a-t-elle été conforme aux normales saisonnières ?”
Il s'agit, à partir d'informations recueillies sur le site de Météo-France, de comparer la météo locale (températures, ensoleillement, pluviométrie) du dernier mois écoulé avec les normales saisonnières.
Après avoir rangé les données recueillies en classes, les élèves sont invités à calculer des fréquences afin d'élaborer une argumentation et de présenter leurs conclusions.

Eléments complémentaires fournis par l’outils en ligne

Document d’aide (fiche élève…)

Langue(s) disponible(s): Français

Organisme responsible/Créateur

Météo France
Site réalisé en partenariat avec le ministère de l'Éducation nationale

Contact

Nom: Météo France
Tel/email……

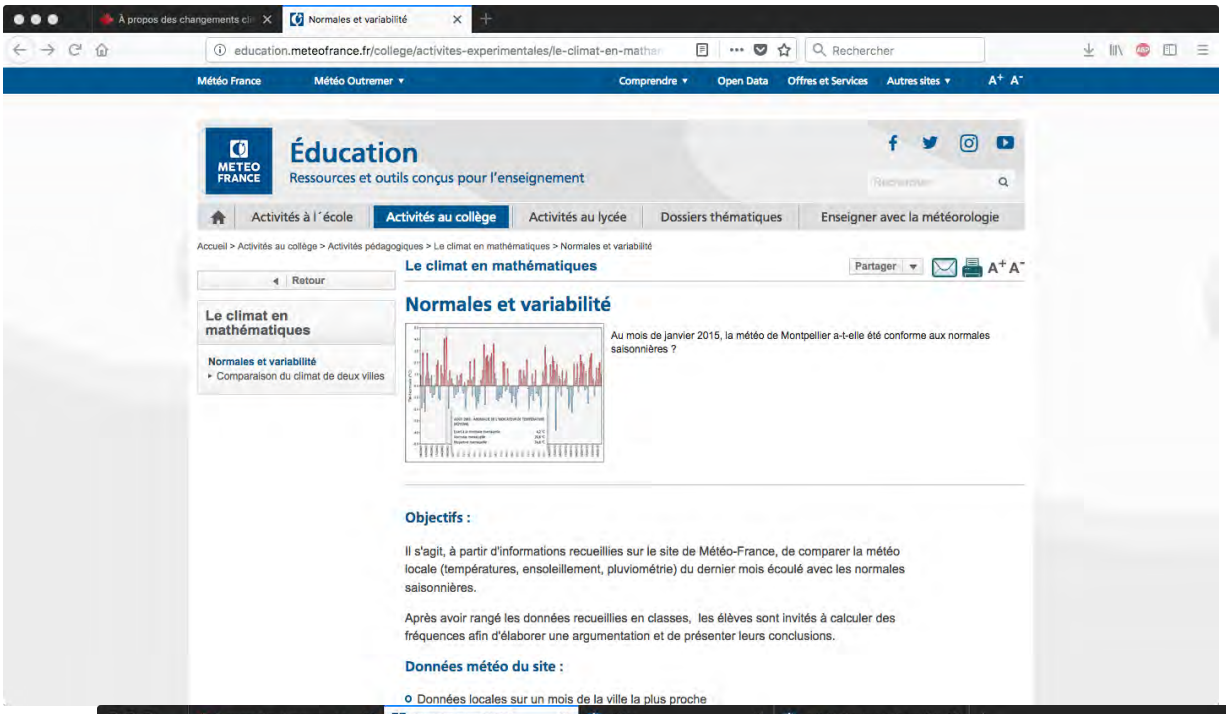
Forces de cet outils :

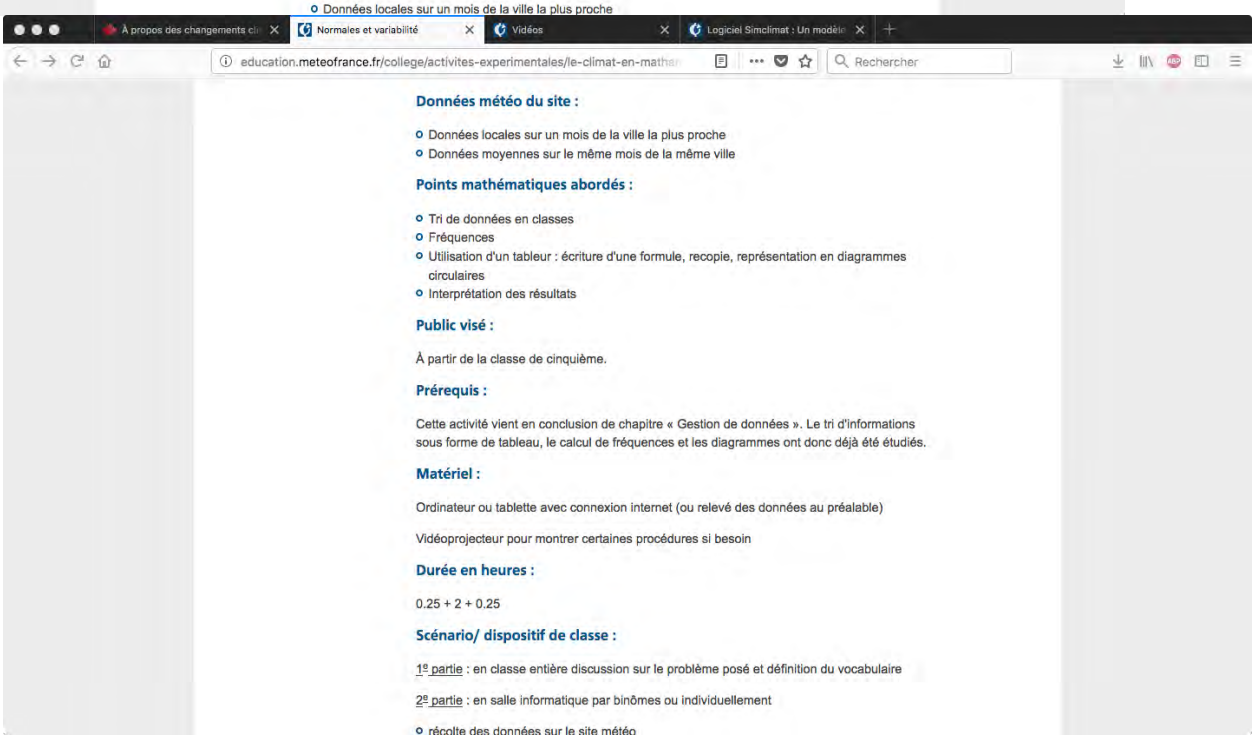
- Activité parfaitement adaptée au programme de cycle 4 de Maths
- Caractère local de l’étude

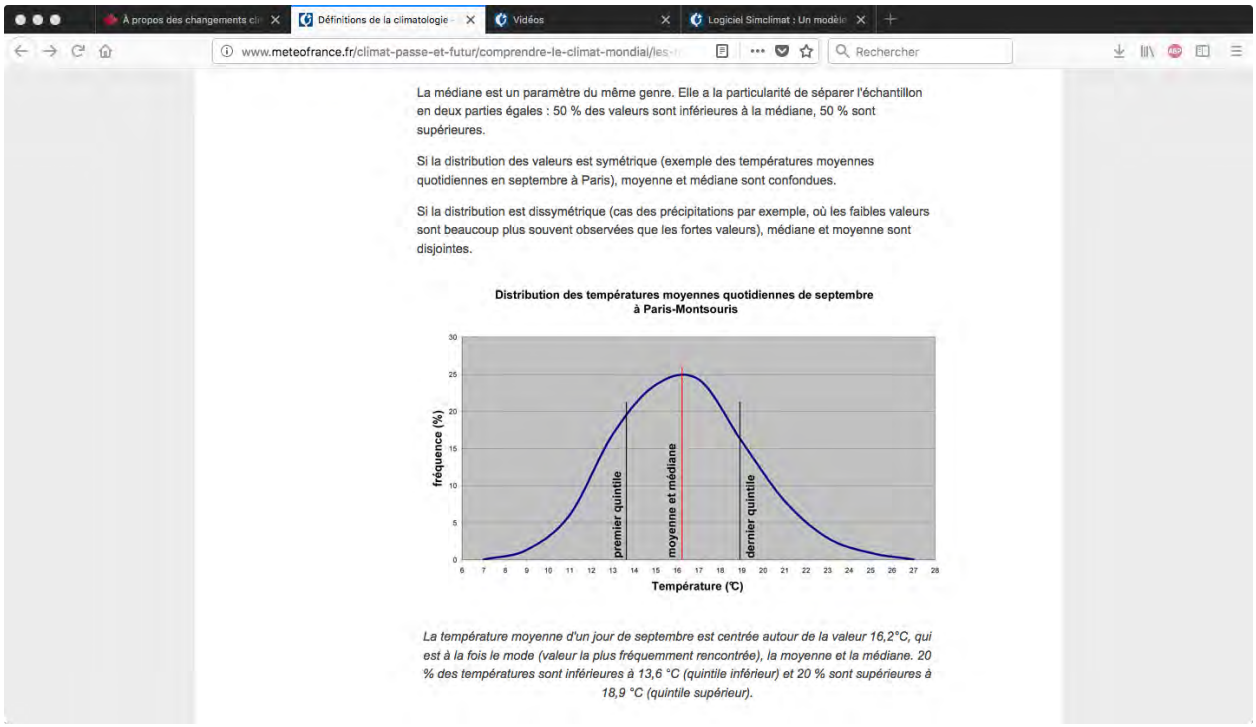
- Demande aux élèves de faire eux même leur propre analyse de ce qu'ils observent.

Faiblesse de cet outils :

- L'activité doit être mise en place par le professeur







La médiane est un paramètre du même genre. Elle a la particularité de séparer l'échantillon en deux parties égales : 50 % des valeurs sont inférieures à la médiane, 50 % sont supérieures.

Si la distribution des valeurs est symétrique (exemple des températures moyennes quotidiennes en septembre à Paris), moyenne et médiane sont confondues.

Si la distribution est dissymétrique (cas des précipitations par exemple, où les faibles valeurs sont beaucoup plus souvent observées que les fortes valeurs), médiane et moyenne sont disjointes.

Distribution des températures moyennes quotidiennes de septembre à Paris-Montsouris

La température moyenne d'un jour de septembre est centrée autour de la valeur 16,2°C, qui est à la fois le mode (valeur la plus fréquemment rencontrée), la moyenne et la médiane. 20 % des températures sont inférieures à 13,6 °C (quintile inférieur) et 20 % sont supérieures à 18,9 °C (quintile supérieur).

Quizz réchauffement climatique

Lien (URL): http://colleges.ac-rouen.fr/sainte-marie/ecoquiz/lemaitrelormier.htm

Objectif pédagogique: Ce quizz permet de tester ses connaissances sur le réchauffement climatique à travers un questionnement de type QCM en ligne.

Principales thématiques

- Ses causes : Rejet CO2, déforestation, combustion…
- Impacts : Effet de serre, fonte des glaciers, dilatation de l'eau...
- Mesures / Solutions
  - Adaptation : Transport, sources d'énergie, consommation d'énergie…\

Courte présentation

Cette activité en ligne se compose de 20 questions à choix multiples portant sur les différentes thématiques du réchauffement climatique. Selon les questions il peut y avoir une aide, un indice et à chaque fois la correction.

Langue(s) disponible(s) : Français

Organisme responsable/Créateur

Collège sainte Marie

Contact

Collège sainte Marie
14 Rue de l'Église, Déville-lès-Rouen

Forces de cet outil:

- Simplicité
- Diversité des types de questions
- Correction et score qui s'affichent

Faiblesse de cet outil :

- Nombre de questions limité
- Certaines parties liées au réchauffement climatique ne sont pas forcément traitées.
- Ne traite pas spécifiquement du bassin méditerranéen

Quizz réchauffement climatique

Questionnaire à choix multiples ou à réponses courtes.

Votre score est de: 66%.

Afficher toutes les questions

1 / 20 =>

L'atmosphère se réchauffe parce que les humains ...

A. ? font des trous dans la couche d'ozone

B. ? fabriquent de la radioactivité.

C. :-) augmentent l'effet de serre

D. ? font des pluies acides

Votre score est de: 66%.

Afficher toutes les questions

<= 17 / 20 =>

Citez au moins un gaz à effet de serre (responsable du réchauffement climatique): (tapez soit l'écriture scientifique soit le nom en français sans article!)

Correction | Aide | Afficher la réponse

Votre score est de: 66%.

Afficher toutes les questions

<= 12 / 20 =>

Quelles sont les technologies mises en œuvre dans un chauffe-eau solaire ?

a. ☐ Des cellules photovoltaïques
b. ☐ Des capteurs thermiques vitrés
c. ☐ Des capteurs sous-vides
d. ☐ Des capteurs photo-sensibles

Correction

Mieux comprendre le climat: Système climatique, une formidable machine qui s'emballe

Lien (URL):
https://www.equalx.eu/upload/projet/dossier.11938167061510154259.pdf

Objectif pédagogique: L'objectif est de construire la notion de réalité du réchauffement climatique observable dans des faits. Les supports ont été volontairement diversifiés afin de varier le type d'activité : prélever des informations dans un texte, sur des images, sur une carte, sur un graphique.

Principales thématiques

- Le phénomène : Concentration du CO2, effet de serre.

- Impacts : Conséquences observables du réchauffement : migrations des animaux, réchauffement, fonte des glaciers, élévation du niveau des mers, ouragans, répartition des chenilles.

- Mesures / Solutions
    - Mitigation : La transition énergétique en limitant les émissions de CO2

    - Adaptation : Déterminer les zones vulnérables, modifier les pratiques agricoles, The Big U de New York

Courte présentation

• Séance 1 :
1-Le changement climatique actuel : les faits
L'exploitation de la première double page de documents permet de construire la notion de changement climatique actuel sur des faits d'observation, afin de lutter contre l'idée commune que le réchauffement climatique est une théorie. L'exploitation de ces documents doit permettre d'aboutit à la notion de réchauffement climatique actuel, et à ses conséquences observables.
2- Le changement climatique actuel : comprendre ce qui se passe
Etudier l'impact de l'homme et les climats anciens

• Séance 2 – Prévoir et prévenir les risques
A l'aide des modèles, mais aussi grâce aux études des variations passées, on peut essayer de prévoir et prévenir les risques associés au changement climatique.

Langue(s) disponible(s) : Français

Organisme responsable/Créateur

Dossier réalisé par Marc Jubault-Bregler, Professeur au lycée Montaigne (Bordeaux)

Directeur de collection du manuel Spiralère
Cycle 4 aux éditions Nathan.

Contact

Fondation La main à la pâte
43, rue de Rennes
75006 Paris - France
Tel : +33 1 85 08 71 79

Forces de cet outil :

- Diversité des documents proposées sur cette thématique
- Scénario cohérent et applicable dans une progression de cycle 4 en répondant aux attendus de fin de cycle :
    - Explorer et expliquer certains éléments de météorologie et de climatologie
    - Identifier les principaux impacts de l'action humaine, bénéfices et risques à la surface de la planète Terre.

Faiblesses de cet outil :

- Pas d'interactivité dans les documents proposés
- Scénario basé en amont puis en aval d'un entretien avec une scientifique spécialisée dans le réchauffement climatique : absence de cette conférence sur cet outil

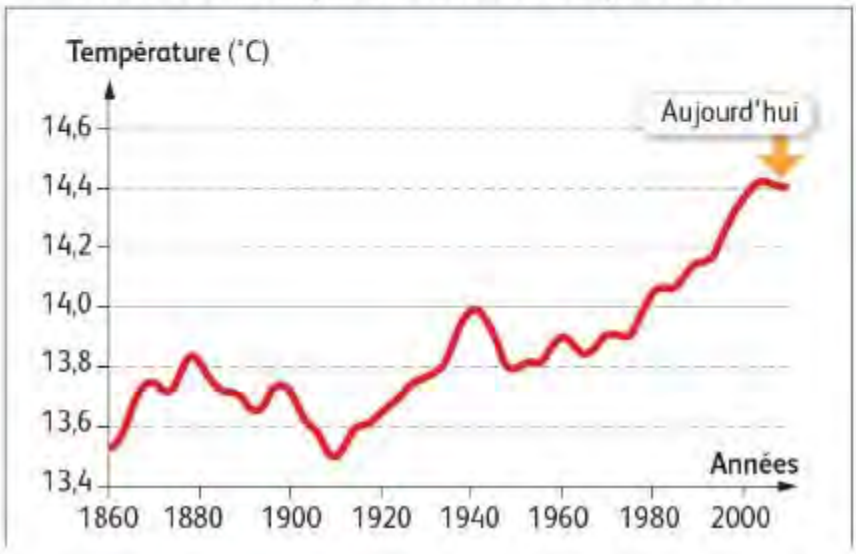
1 Des oiseaux qui déménagent

Sur les rochers du Cap Fréhel, ce printemps, ils étaient trois fois moins nombreux qu'il y a deux ans. Ailleurs, ils modifient leurs itinéraires de migration, ils décalent leurs périodes de reproduction, ils changent leur régime alimentaire. Les bouleversements du mode de vie des oiseaux constituent l'un des meilleurs indicateurs des évolutions climatiques en cours.

Le phytoplancton est parti le premier. Parce que les eaux de la mer du Nord s'étaient réchauffées d'un petit degré, ces micro-organismes marins ont subitement migré vers des fonds plus rigoureux. Le zooplancton l'a suivi. Et puis dans leurs sillages, on a vu s'en aller le lançon, ce "poisson-fourrage" fin et longiligne dont se nourrissent les gros poissons et les oiseaux marins... Parmi les vastes colonies de mouettes tridactyles, de guillemots et de pingouins, de sternes et de fous de Bassan qui peuplent les côtes britanniques, souffla un vent de panique... Un jour de 2004, quand les ornithologues écossais revinrent sur la falaise qu'ils étudiaient, il n'y avait plus d'oiseaux.

Laurent Carpentier, « Le réchauffement climatique raconté par les oiseaux »,
Le Monde Magazine, 27 juin 2008.

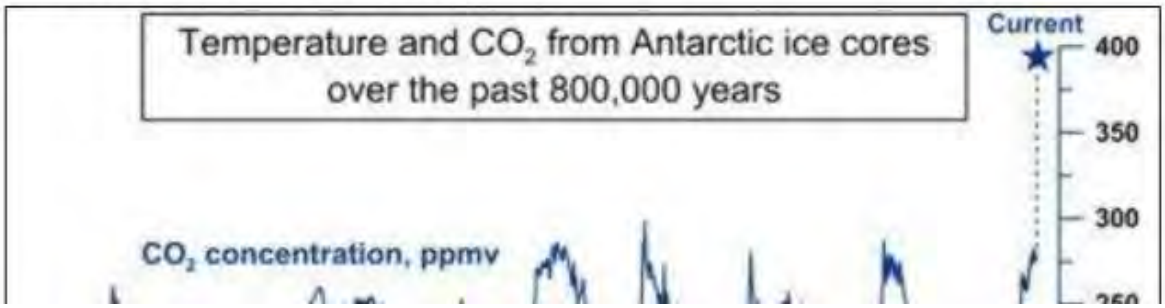
2 L'évolution de la température mondiale depuis 1860



4 Scientifiques prélevant une carotte de glace en antarctique
Expédition Great Ice sur le glacier Guanaco, Chili, août 2008.

5 Bulles d'air emprisonnées dans la glace (observation en lumière polarisée et analysée)
Les bulles d'air apparaissent en noir tandis que les cristaux de glace sont colorés.

6 Reconstitution de la concentration en CO2 de l'atmosphère terrestre grâce aux études sur les glaces polaires



3 Comment le passé peut-il nous aider pour l'avenir ?

1 La grotte Cosquer et le niveau de la Méditerranée

• En 1985, le plongeur professionnel Henri Cosquer découvre, près de Marseille (Bouches-du-Rhône), l'entrée d'une grotte à 36 m sous le niveau de la mer.

• Cette grotte, nommée « grotte Cosquer », abrite de nombreuses gravures et peintures préhistoriques.

• Des analyses scientifiques ont révélé qu'elle a été fréquentée par les Hommes préhistoriques entre environ -27 000 et -19000 ans. Les scientifiques affirment qu'à cette époque, l'entrée de la grotte était à l'air libre, donc accessible aux Hommes préhistoriques.

2 La grotte Chauvet et la biodiversité passée

• La grotte Chauvet, découverte en 1994, est située à Vallon-Pont-d'Arc (Ardèche). Les scientifiques estiment que la grotte a été occupée par des êtres humains entre -37 000 et -28 000 ans.

• On peut y observer plus de 400 peintures et gravures représentant un grand nombre d'animaux typiques des régions de steppes et de toundras : félins, mammouths, rhinocéros laineux, chevaux, bisons, bouquetins, ours, rennes, aurochs, mégacéros.

L'Océan, ma planète… et moi !

Lien (URL): https://www.fondation-lamap.org/fr/page/28652/ocean-sequence-i-locean-et-le-climat

Objectif pédagogique: Cette étude de la « machine océanique » conduit à une prise de conscience de la fragilité des océans, poumons de notre planète, et à la nécessité de leur sauvegarde

Principales thématiques

- Impacts : Les élèves réalisent les complexes conséquences du réchauffement planétaire sur les océans : accélération de la fonte de la banquise et des glaciers, montée du niveau des mers, acidification des eaux (et ses conséquences sur le vivant)…

Courte présentation

Cette séquence (10 séances) explore les océans avec les yeux d'un physicien océanographe. Les élèves commencent par étudier la répartition des grandes masses d'eau sur Terre et la place des océans dans le cycle de l'eau. Ils s'interrogent sur l'origine et l'entretien des grands courants océaniques et comprennent que la température et la salinité sont des paramètres clés. Cette séquence permet également d'étudier le rôle central que jouent les océans dans la régulation des climats, en raison notamment de leur inertie thermique. Les élèves réalisent les complexes conséquences du réchauffement planétaire sur les océans : accélération de la fonte de la banquise et des glaciers, montée du niveau des mers, acidification des eaux (et ses conséquences sur le vivant).
Cette étude de la « machine océanique » conduit à une prise de conscience de la fragilité des océans, poumons de notre planète, et à la nécessité de leur sauvegarde.

Eléments **complémentaires fournis par l'outil en ligne**

Pour chaque séance : Présentation -Question initiale-Expérimentation-Mise en commun-Recherche (étude documentaire)-Conclusion-Prolongements

Langue(s) disponible(s) : Français

Organisme responsable/Créateur

La Fondation *La main à la pâte* – Paris - France

Contact

Mathieu HIRTZIG
David Wilgenbus
Gabrielle Zimmermann
Tel : +33 1 85 08 71 79

Forces de cet outil:

- Diversité des activités pratiques proposées sur cette thématique
- Scénario cohérent
- Possibilités de traiter cet outil autour d'un projet interdisciplinaire (EPI/ SVT-Sciences Physiques).

Faiblesse de cet outil :

- Il nécessite une inscription avec une adresse mail
- Ne traite pas directement la Méditerranée mais l'ensemble des eaux océaniques
- Ne traite pas directement du réchauffement climatique mais d'une conséquence

Plusieurs parcours possibles

Ce module pédagogique offre de nombreuses entrées suivant la thématique voulue (plutôt physique, ou biologique, ou développement durable...) et le temps que la classe pourra consacrer au projet. Il n'a pas été pensé de façon à être mis en place in extenso, de la première à la dernière séance, mais de façon à permettre à l'enseignant de « piocher » les séances qui lui permettront de réaliser son propre parcours.

Chacune des 3 séquences thématiques constitue en soi une progression possible, à laquelle peut s'adjoindre une séance-bilan :

- **Séquence 1 : L'océan et le climat**
- **Séquence 2 : L'océan, milieu de vie**
- **Séquence 3 : L'océan et l'homme**

Nous proposons ci-dessous 3 exemples de parcours :

- **Parcours pluridsciplinaire à l'école primaire**
- **Parcours physique-chimie au collège**
- **Parcours SVT au collège**

Séquence 1 : L'océan et le climat

Séquence 2 : L'océan, milieu de vie

Titre	Résumé
I.1 - Les réservoirs d'eau	La Terre est la « planète bleue » car elle dispose de grandes quantités d'eau. Les élèves réalisent que la presque totalité (97%) de cette eau est salée et présente dans les mers et océans.
I.2 - Le cycle de l'eau	Une étude documentaire montre que l'eau passe sans cesse d'un réservoir à un autre : c'est le « cycle de l'eau ». Ce faisant, elle peut également changer d'état, liquide, solide ou gazeuse. La quantité d'eau présente sur Terre reste constante.
I.3 - Les courants thermiques	Les élèves s'interrogent sur l'origine et l'entretien des courants océaniques et réalisent, par une expérience, que l'eau chaude est moins dense que l'eau froide.
I.4 - Les courants de salinité	Les élèves expérimentent et réalisent que l'eau salée est plus dense que l'eau douce. Cette différence de salinité peut alimenter des courants marins, comme le Gulf Stream.
I.5 - L'inertie thermique des océans	A l'aide d'une expérience montrant l'inertie thermique de l'eau et d'une étude documentaire, les élèves mettent en évidence le rôle des océans dans la régulation des climats.
I.6 - Fonte des glaces et augmentation du niveau des mers	Les élèves réalisent une expérience montrant que la fonte de la banquise ne fait pas monter le niveau des océans, tandis que la fonte des glaciers continentaux entraine bien une montée des eaux. Une étude documentaire montre la fragilité de certaines régions du Globe.
I.7 - Dilatation des océans et augmentation du niveau des mers	Les élèves mettent en évidence la dilatation de l'eau, sous l'effet de la chaleur. Ils en concluent qu'il s'agit d'un facteur supplémentaire d'augmentation du niveau des mers sous l'effet du changement climatique.
I.8 - Couleur et température : l'importance de la banquise	Les élèves montrent par une expérience simple qu'une surface claire se réchauffe moins, sous l'action de la lumière du Soleil, qu'une surface sombre. Ils en déduisent que la banquise joue un rôle important dans la régulation du climat global.
I.9 - Emissions de CO_2 et acidification des océans	Les élèves montrent, par une expérience, que les émissions de CO_2 entrainent une acidification des océans.
I.10 - Conséquences sur le vivant de l'acidification des océans	En étudiant le blanchiment des coraux et en observant la dissolution d'un coquillage dans du vinaigre, les élèves comprennent que l'acidification des océans nuit aux espèces marines, en particulier aux coquillages et aux coraux.

Océan - Séance I.9 Emissions de CO2 et acidification des océans

Résumé	Les élèves montrent, par une expérience, que les émissions de CO_2 entrainent une acidification des océans.
Notions	· Le CO_2 émis peut se dissoudre dans l'eau · cette dissolution entraine une acidification de l'eau
Modalités d'investigation	Expérimentation
Matériel	Pour la classe : · un pH-mètre ou un kit de mesure de pH pour piscine Pour chaque groupe : · 1 ou 2 paille(s) · Un petit récipient · De l'eau · Du vinaigre, du jus de citron, du soda (type « coca-cola ») · (facultatif) de l'eau de chaux
Lexique	Acidité, pH, dioxyde de carbone, pollution
Durée :	1 h

A propos du matériel

Cette séance nécessite un matériel spécifique, certes, mais peu onéreux : un pH mètre numérique peut être commandé pour 7 euros, et un kit de mesure de pH pour piscine pour 12 euros.

Le papier pH est encore moins cher (1 euro)... mais nous le déconseillions car il n'est pas assez sensible pour cette expérience.

Modéliser les climats du futurs : activité pédagogique avec le logiciel BYOE

Lien (URL):
http://eduterre.ens-lyon.fr/ressources/par-niveau/ressources-pedagogiques-cycle-4
http://www.buildyourownearth.com/index.html

Objectif pédagogique: Faire comprendre l'importance de la COP 21 grâce à la modélisation des climats du futur. Le logiciel BYOE permet de comprendre les effets de l'augmentation du taux de gaz à effets de serre dans l'atmosphère sur le climat global.

Principales thématiques

- Le phénomène: La variation de la température due aux gaz à effet de serre
- Ses causes: Relation entre l'émission des gaz à effet de serre et l'élévation de la température

Courte présentation

Le logiciel BYOE a été mis au point par l'Université de Manchester pour simuler l'évolution du climat en fonction de différents paramètres naturels variables comme :

- Les paramètres orbitaux (inclinaison de l'axe de la terre, excentricité de l'orbite, constante solaire ...)
- La répartition des continents et des océans
- Les propriétés des enveloppes fluides (atmopshère, hydrosphère, cryosphère ...)

et bien d'autres encore

Il permet de créer votre propre monde et d'en explorer la météo (les nuages, le vent, les précipitations, la température de l'air et des eaux de, les courants océaniques ...).

Langue(s) disponible(s) : français (ressource, fiche pédagogique) ; anglais (site byoe)

Organisme responsible/Créateur :

Eduterre est une équipe d'ACCES (Actualisation Continue des Connaissances des Enseignants en Sciences) de l'Institut français de l'Éducation (IFÉ) dont les productions

de ressources sont tournées vers l'enseignement scientifique du secondaire et destinées aux professionnels de l'éducation et de la formation.

Contact

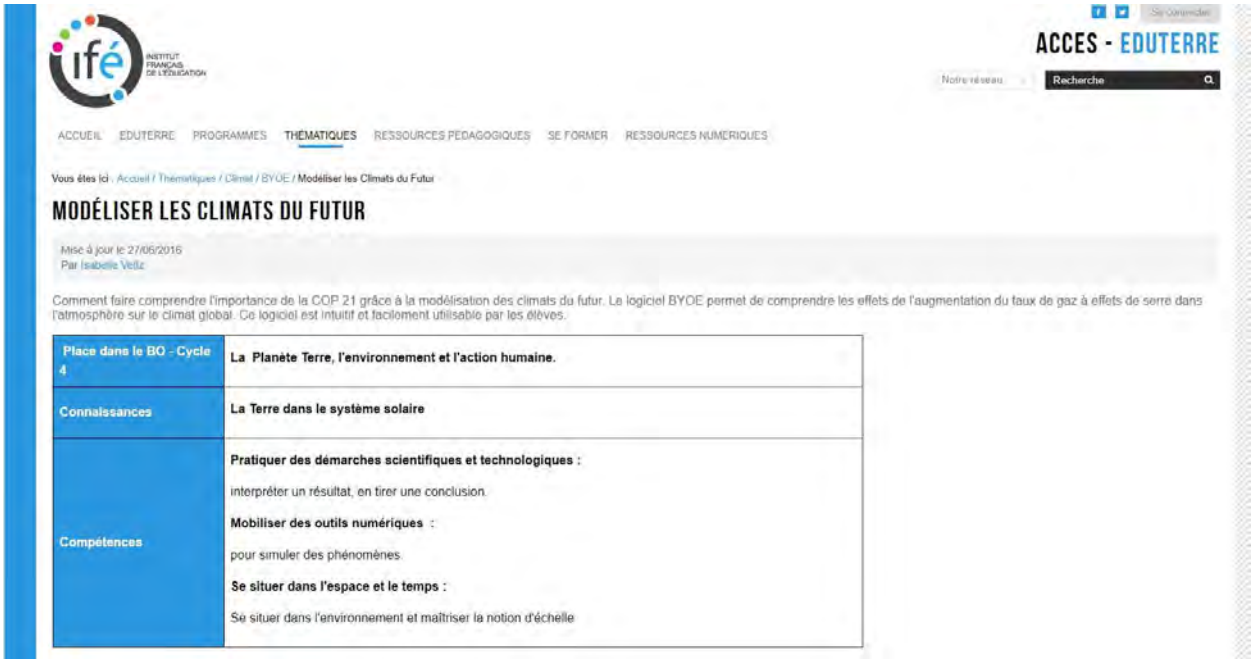
École normale supérieure de LyonInstitut français de l'Éducation - ACCES19 allée de Fontenay 69007 Lyon - France
http://eduterre.ens-lyon.fr/contact-info

Forces de cet outil :

- adapté au programme cycle 4: condition de la vie sur terre; changement climatique du futur
- interactif, innovant, le logiciel est intuitif et facilement utilisable par les élèves
- compétences : collecter les informations sous forme de tableau
- peut être le support d'un travail pluridisciplinaire entre SVT, Physique-Chimie et Géographie

Faiblesse de cet outil :

- changement globale pas régionale
- n'explique pas les causes de l'émission des gaz à effet de serre (origine humaine ?)
- lié à l'informatique, réseau au collège

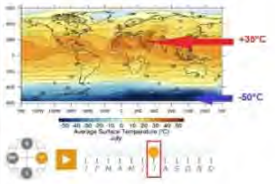


Paramétrer le logiciel en suivant les consignes suivantes :

- Dans la fenêtre "Earth 1" choisir "Recent" puis dans le menu déroulant choisir "Current day 2015"
- Dans la fenêtre "Change climate property" choisir "Atmosphere" puis Mean Temperature" et "Surface"

- Cliquer sur view properties"

- Observer l'évolution de la température à la surface du globe au cours des mois de l'année.
- Rechercher le mois où les écarts entre les températures les plus chaudes et les températures les plus froides est le plus important.
- Noter ces valeurs et calculer l'écart thermique.
- Observer la teneur en gaz à effet de serre présent dans l'atmosphère en 2015. Noter ces valeurs dans un tableau à double entrée.
- Observer les valeurs des teneurs de ces mêmes gaz 40 ans plus tôt et les noter dans le tableau.



85°C

	Concentration de l'atmosphère en gaz à effet de serre		
	CO_2 (ppm)	NO_2 (ppb)	Méthane (ppb)
2015	400	326	1750

- Cliquer sur "view climate model" puis "Add Earth 2" et choisir "Recent" puis " Control in 1975"
- Cliquer sur "View climat model" et en déplaçant le curseur de gauche à droite regarder si les températures ont beaucoup changé.
- Dans la fenêtre "Earth2" choisir "Preindustrial Control" (qui correspond aux données récoltées l'année 1850 avant que la société ne soit profondément industrialisée).
- Cliquer sur "View climat model" et déplacer le curseur.

- Compléter le tableau à l'aide des valeurs des taux atmosphériques en 1850.

	Concentration de l'atmosphère en gaz à effet de serre		
	CO_2 (ppm)	NO_2 (ppb)	Méthane (ppb)
2015	400	326	1750
1975	335	275	1500

- Observer, en Juillet, l'évolution des surfaces occupées par les régions où la température est supérieure à 35° et au pôle nord de celles qui sont inférieures à 0° rappeler quel est l'état de l'eau à des températures inférieures à 0°C.

	Concentration de l'atmosphère en gaz à effet de serre		
	CO_2 (ppm)	NO_2 (ppb)	Méthane (ppb)
2015	400	326	1750

Existing tools in Greece

1) *Climate change and poverty ("Against the stream")*
2) *Climate Change: Shall we play? Environmental – Climate Migration: Educational Activities*
3) *Climate – Energy*
4) *Environmental Education material*

Climate change and poverty ("Against the stream")

Link (URL): http://education.actionaid.gr/dunamikoi-ekpaideutikoi/ekpaideutiko-uliko/klimatikes-allages-ftoheia/

Pedagogical objective

"Against the stream" is an educational package offered to teachers and students by NGO Action Aid. Its main aim is to raise students' awareness about two of the biggest global problems: Climate change and Poverty. Some of its objectives are (indicatively), The students should

- understand the world and its problems as an interconnected total
- study the way of climate change is emerged all over the world
- realize the impacts of human activities on the environment
- interrelate climate change impacts with human rights
- develop social action skills

Main topic(s)

- Mechanism/Phenomenon
- Causes
- Impacts
- Measures Solutions
  - Mitigation
  - Adaptation

Short presentation

"Against the stream" is an educational package offered to teachers and students by NGO Actinoaid. It's available for teachers in a CD after their registration. The education material is aimed at students of Gymnasio (age 12-15).

"Against the stream" discusses two of the biggest global problems-challenges for the future world's citizens, inextricably tied: Climate change and Poverty.

CD contains the software Comic Lab and a 5 chapters' book (online: http://education.actionaid.gr/dunamikoi-ekpaideutikoi/ekpaideutiko-uliko/klimatikes-allages-ftoheia/). Each chapter includes 2-3 activities. There are worksheets and supporting material for every chapter. Some of its topics-questions are:

What is causing climate change? What is the role of developed and developing countries? What is CO_2 ? Does climate change contribute to encroachment of basic human rights such as food and water ?

The five chapters (and subtopics) are:

1. Global connections (I live in my world – What do I care? – The line that connects stories)
2. Climate and climate change (What the camera didn't see – The thermometer raises – News from the globe)
3. What is causing climate change? (Emissions – Low, middle and high footprints – lifestyle priorities- If the globe was a village of 100 people- Priorities pyramid)
4. Climate change and human rights (When low becomes right – the human right to water – How many meals from one litre?- A debate on biofuel - Arguments)
5. We go against the stream (I am a citizen of the world – What is the future I want to live in? -)

Its implementation lasts about 20 didactic hours.

Complementary elements provided by the online tool

1. A six minutes video about climate change
2. A global map
3. Educational material for primary school students

Language(s) available: Greek

Responsible organisation/Producer: ActionAid Education

Contact

Name: ActionAid
Phone: 0030-2109211029/Fax 0030-2109212376
e-mail: education.hellas@actionaid.org

Strengths of this tool:

- This educational material emphasizes issues that are usually missing (social problems) in such projects. It develops the critical approach and-in this way-students critical thinking.
- It is useful for every teacher and its structure could be adapted to his/her project
- It helps students to look in many aspects of climate change, so they can easily learn, develop skills and think of their personal contribution to the solution of the problem

Weaknesses of this tool

- This educational material is not interactive- it can be under conditions. Teachers can install the software Comic Lab provided on the cd of Action aid.
- It could be relatively easy for the organization to upload an application supporting the students activities (e.g. ch.5)

Web page of Action aid
on Climate change and poverty

The book (Cosmobook)
"Against the stream"

Climate Change: Shall we play?
99 questions on climate change and related issues

Link (URL): http://kpe-kastor.kas.sch.gr/climate_change/index.htm

Pedagogical objective

CLIMATE CHANGE: Shall we play? is an online educational tool which contains 99 questions about climate change and relevant topics (see Annex, Screenshots 1 & 2). Students, who participate in, are asked to choose the right answer among the multiple options given for each question.
Its pedagogical objective, as implied by the content, is to sensitize students about climate change, to increase their knowledge on various dimensions and affect positively their attitudes in addressing it. The objectives (cognitive, affective and psychomotor) are concerning the topics and sub-topics mentioned in the short presentation of the tool.

Main topic(s)

- Mechanism/Phenomenon
- Causes
- Impacts
- Measures / Solutions
  Mitigation and Adaptation

Short presentation

The online educational tool *CLIMATE CHANGE: Shall we play?* contains 99 questions which cover the following main topics: Weather-Climate (10 questions), Greenhouse effect (25 questions), Climate change (29 questions), Individual and collective actions to address it (35 questions) (see Annex, Screenshots 1 & 2).
In each question, they are given different choices (from two up to four). Participants should choose the right one by checking the corresponding checkbox. Further supporting information is commonly available in the reply tab. On the right side of the text there is an illustration related to the question. (see Annex, Screen shots 3 & 4).
More specifically the tool covers the following topics and sub-topics:
1. The difference between weather and climate.
2. The Greenhouse effect:

2a. Atmosphere composition, GHE gases, Mechanism of Greenhouse effect and its role in average air temperature.
2b. Common misunderstandings: GHE/depletion of ozone layer, GHE: beneficial phenomenon/serious environmental problem.
2c. Human activities and deforestation in regard to the increase of the concentration of greenhouse gases.

3. Climate change:

3a. Impacts in natural systems: Average air temperatures, ice sheet in polar regions, glaciers, sea level, extreme weather events, biodiversity.
3b. Impacts in humans: climate refugees, access to fresh drinking water, human health, agricultural sector.
3c. Scientific predictions and future scenarios, with particular reference to possible impacts on Mediterranean region (change in annual precipitation patterns, increase of drought periods. Quest. 62/see Annex: Screenshot 4).

4. Individual and collective actions to address Climate Change. Energy saving and pollution reduction.

4a. Mitigation strategies regarding mainly everyday energy use in household electrical appliances, house heating, cooling and lighting as well as recycling (aluminium, glass), eating choices, renewable energy sources.
4b. Adaptation strategies regarding generating energy systems, transportation infrastructure, awareness and education of public, the role of international scientific community (IPCC), politics (European climate change policy), school community (projects for climate change education and communication).

Complementary elements provided by the online tool

- Embedded information texts and other reference online material ( the icon for *Further information*).
- Glossary in which the terms and concepts related to climate change are listed alphabetically. Approximately 40 terms are explained.
- Climate Change...and some consequences. A second online tool about the impacts of climate change is provided by the same educational organization in its website: http://kpe-kastor.kas.sch.gr/additional_material/add_climate_1.htm. It may also be considered as individual or additional material to *CLIMATE CHANGE: Shall we play?* (see Annex. Screenshot 3).

Language(s) available: Greek

Responsible organisation/Producer

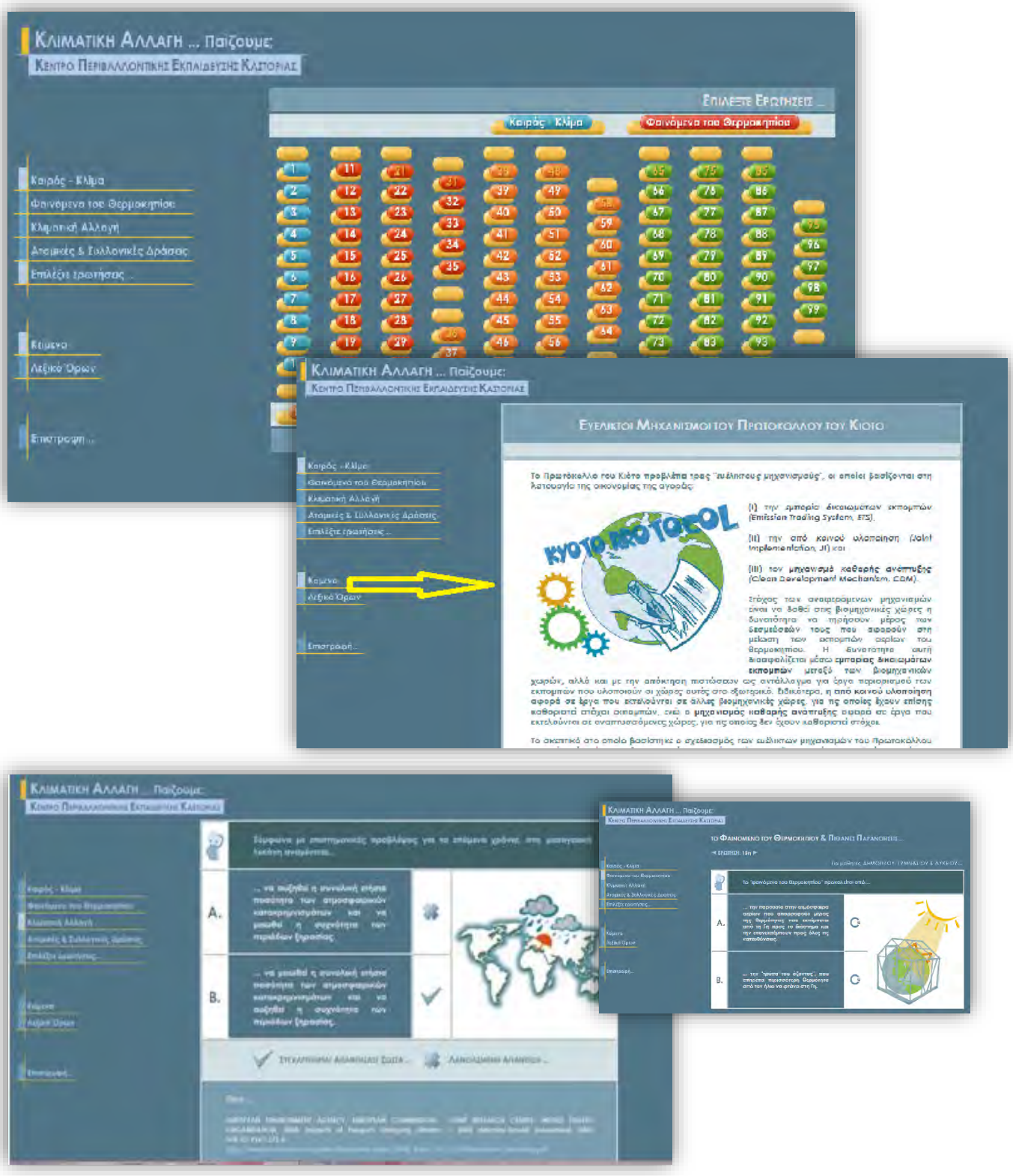
Name: Kastoria Center of Environmental Education
Phone/email: Ph.: +30 2467-023069 e-mail: kpekast1@otenet.gr

Strengths of this tool

- A multidimensional approach in terms of the content as it covers a variety of aspects regarding the issue of climate change. The content is appropriate in terms of accuracy and thoroughness.
- User-friendly with easy accessibility and navigation in the different parts of the tool through simple keystrokes.
- Students are given the opportunity to control, in their own way, the pace of using this tool and, hence, the pace of their learning.
- Attractive aesthetics.

Weaknesses of this tool

- The structure upon which the tool is based is totally characterized by a "right-wrong" approach. As a result, it may not support adequately the development of high order learning skills such as critical thinking, problem solving and decision-making. However, these competences are deemed important to address a very complex issue like climate change.
- Possible motivational weakness because the repeated form in presenting 99 questions of the tool may not be effective in capturing and holding students' interest.


Κλιματικη Αλλαγη ... Παιζουμε:
Κεντρο Περιβαλλοντικης Εκπαιδευσης Καστοριας
Επιλεξτε Ερωτησεις ...
Καιρός - Κλίμα
Φαινόμενα του Θερμοκηπίου
Κλιματική Αλλαγή
Ατομικές & Συλλογικές Δράσεις
Επιλέξτε ερωτήσεις ...
Κείμενο
Λεξικό Όρων
Επιστροφή ...
Ευελικτοι Μηχανισμοι του Πρωτοκολλου του Κιοτο
Το Πρωτόκολλο του Κιότο προβλέπει τρεις "ευέλικτους μηχανισμούς", οι οποίοι βασίζονται στη λειτουργία της οικονομίας της αγοράς:
(I) την εμπορία δικαιωμάτων εκπομπών (Emission Trading System, ETS),
(II) την από κοινού υλοποίηση (Joint Implementation, JI) και
(III) τον μηχανισμό καθαρής ανάπτυξης (Clean Development Mechanism, CDM).
Στόχος των αναφερόμενων μηχανισμών είναι να δοθεί στις βιομηχανικές χώρες η δυνατότητα να τηρήσουν μέρος των δεσμεύσεών τους που αφορούν στη μείωση των εκπομπών αερίων του θερμοκηπίου. Η δυνατότητα αυτή διασφαλίζεται μέσω εμπορίας δικαιωμάτων εκπομπών μεταξύ των βιομηχανικών χωρών, αλλά και με την απόκτηση πιστώσεων ως αντάλλαγμα για έργα περιορισμού των εκπομπών που υλοποιούν οι χώρες αυτές στο εξωτερικό. Ειδικότερα, η από κοινού υλοποίηση αφορά σε έργα που εκτελούνται σε άλλες βιομηχανικές χώρες, για τις οποίες έχουν επίσης καθοριστεί στόχοι εκπομπών, ενώ ο μηχανισμός καθαρής ανάπτυξης αφορά σε έργα που εκτελούνται σε αναπτυσσόμενες χώρες, για τις οποίες δεν έχουν καθοριστεί στόχοι.
Το σκεπτικό στο οποίο βασίστηκε ο σχεδιασμός των ευέλικτων μηχανισμών του Πρωτοκόλλου
KYOTO PROTOCOL
Κλιματικη Αλλαγη ... Παιζουμε:
Κεντρο Περιβαλλοντικης Εκπαιδευσης Καστοριας
Κλιματικη Αλλαγη ... Παιζουμε:
Κεντρο Περιβαλλοντικης Εκπαιδευσης Καστοριας
A.
B.
Κλιματικη Αλλαγη ... Παιζουμε:
Κεντρο Περιβαλλοντικης Εκπαιδευσης Καστοριας
το ΦΑΙΝΟΜΕΝΟ του ΘΕΡΜΟΚΗΠΙΟΥ & ΠΙΘΑΝΕΣ ΠΑΡΑΓΟΝΤΕΣ...
A.
B.
C.
C.

Environmental – Climate Migration: Educational Activities

Link (URL): https://drive.google.com/file/d/1afcXVEUaxLRXXTrpP708H7LbMy7K6tkj/view

Pedagogical objective

"Environmental – Climate Migration » is an 275 p. e-book that contains educational material regarding the issue of migration caused by environmental causes. Its main aim is to help teachers and students implement educational programs about environmental - climate migration in school (even beyond school).
Some of its objectives are (indicatively):

The students to...:

- comprehend the basic concepts related to environmental-climate migration
- perceive the causes of environmental-climate migration
- critically analyse the public discourse about migration and detect the values behind the words.
- stand with migrants and refugees by planning and implementing initiatives that support them

Main topic(s)

- Mechanism/Phenomenon
- Causes
- Impacts
- Measures / Solutions
    - Mitigation
    - Adaptation

Short presentation

This e-book was created by teachers they serve environmental education in Greece in the framework of the European project « S.A.M.E. WORLD – Sustainability - Awareness - Mobilization - Environment ». It is mainly focused on environmental refugees and migrants. Global community concerns about this issue since increasing number of people are forced to leave their residence due to climate change causes. The

educational activities are aimed at students of 10-15 y.o. They are developed on four thematic axes:

- Environmental - climate migration: a phenomenon coming from the past
- Environmental- climate migration in nowadays: a complex phenomenon
- Migrants and refugees through the view of society, mass media and formal policy
- We and environmental- climate migration

Complementary elements provided by the online tool

Worksheets for each activity

Language(s) available: Greek

Responsible organisation/Producer: ITYE «DIOFANTOS»

Contact

Name: ITYE (Institute of Computer Technology and Publications) «DIOFANTOS»
Strategy and Digital Educational Material Administration
Mitropoleos 26-28, 10563, Athens
http://www.cti.gr

Strengths of this tool:

- This educational material emphasizes on some impacts of climate change like migration. It's an issue that is usually missing in such projects. It develops the critical approach and-in this way-students critical thinking.
- It is useful for every teacher and its structure could be adapted to his/her project.
- It helps students develop skills like empathy and having a deepest look in such an important global issue.

Weaknesses of this tool

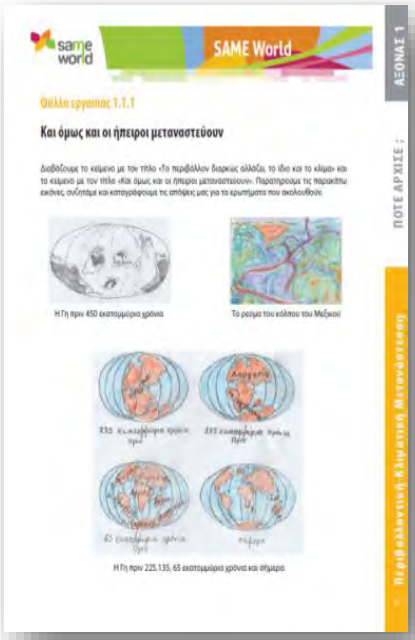
- It is not interactive.

ΠΕΡΙΒΑΛΛΟΝΤΙΚΗ - ΚΛΙΜΑΤΙΚΗ ΜΕΤΑΝΑΣΤΕΥΣΗ

ΕΚΠΑΙΔΕΥΤΙΚΕΣ ΔΡΑΣΤΗΡΙΟΤΗΤΕΣ

Ινστιτούτο Τεχνολογίας Υπολογιστών & Εκδόσεων «ΔΙΟΦΑΝΤΟΣ»

Αθήνα, 2017



same world

SAME World

ΑΞΟΝΑΣ 1

ΠΟΤΕ ΑΡΧΙΣΕ ;

Περιβαλλοντική Κλιματική Μετανάστευση

Θέμα εργασίας 1.1.1

Και όμως και οι ήπειροι μεταναστεύουν

Διαβάζουμε το κείμενο με τον τίτλο «Το περιβάλλον διαρκώς αλλάζει, το ίδιο και το κλίμα» και το κείμενο με τον τίτλο «Και όμως και οι ήπειροι μεταναστεύουν». Παρατηρούμε τις παρακάτω εικόνες, συζητάμε και καταγράφουμε τις απόψεις μας για τα ερωτήματα που ακολουθούν.

Η Γη πριν 450 εκατομμύρια χρόνια

Το ρεύμα του κόλπου του Μεξικού

Η Γη πριν 225,135, 65 εκατομμύρια χρόνια και σήμερα

same world

SAME World

ΑΞΟΝΑΣ 3

ΠΟΣΟ ΤΗ ΒΛΕΠΟΥΜΕ ;

Περιβαλλοντική Κλιματική Μετανάστευση

Περάστημα 3.4.1

Εικόνες με θετική/αρνητική υποδοχή προσφύγων

Εικόνα 1

Εικόνα 2

Climate – Energy
Environmental Education material

Link (URL): http://www.wwf.gr/enviromental-education/env-edu-climate

Pedagogical objective

The above web-page of WWF Greece is a source of a diverse educational material dedicated to the thorough study of climate change and its complex interconnections with various aspects of our everyday life as well as the country's priorities for economic development, the prevailing life-style, the choices we make etc.

Main topic(s)

- Mechanism/Phenomenon
- Causes
- Impacts
- Measures / Solutions
  - Mitigation
  - Adaptation

Short presentation

The titles of the various and diverse educational material follow, mentioning the kind of activity and the time needed (where possible). It should be mentioned that for some of these activities/material there is a variety of supporting material: power-point presentations, explanatory notes, work-sheets, instructions, references, photographs, videos and other multimedia, webpages, hyperlinks, etc.
Also some titles are adapted to different age levels. For each title one screenshot (relatively numbered) follows in the last section of the template.

1. The journey to the city of the future ...
   Educational Workshop (60')
2. ECO_2nomy: A game for our planet and our pocket!
   Board-game (40')
3. Bingo for Climate!
   Activity: "find someone who ..."
4. Floor game for climate change
   Floor-game
5. CD-**ROM "The Climate is in your hand"**

Complete Digital Educational Programme (the CD was distributed to the Directorates of Secondary Education and to the Environmental Education Centers)

6. Climate Change, Consumption and Sustainability
   A collection of 14 independent educational activities (the 12 of which are addressed to pupils of lower secondary education)

7. Schools for the Climate
   Educational Programme

8. Climate Chaos
   Complete Teacher Guide including several activities and supporting material.

At the end of the list there are two more titles: "A fairy tale about solar energy" & "Educational Program for Energy and Climate Change" which are addressed to pupils of Primary School.

Complementary elements provided by the online tool

A variety of complementary elements for each title or activity is provided.

Language(s) available: Greek

Responsible organisation/Producer: WWF Greece

Contact

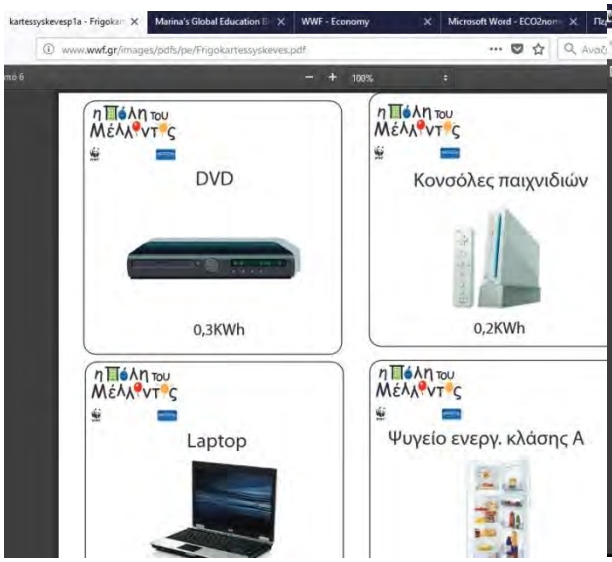
Name: Eleni Svoronou (Responsible for Environmental Education and Training)
Phone/email: +30 210 3314893 / e.svoronou@wwf.gr

Strengths of this tool

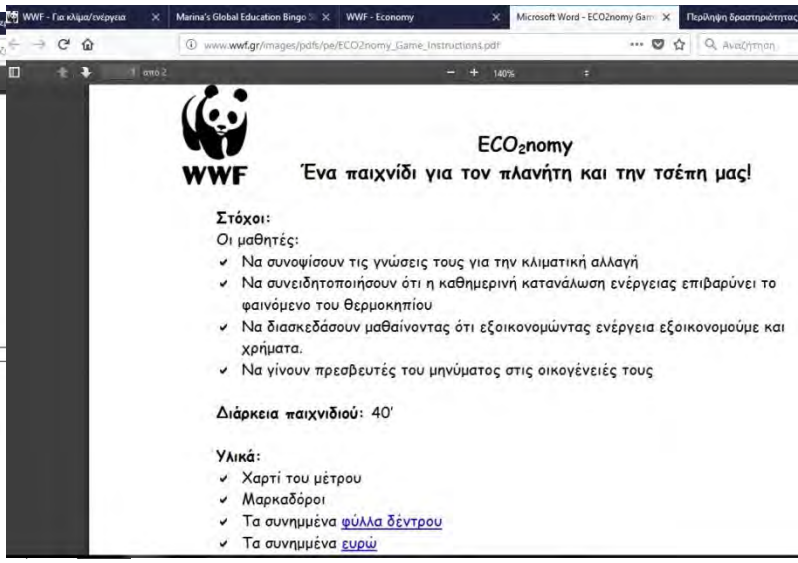
Very versatile and innovative material. It is adapted in specific age groups. It contains a lot of resources. It is scientifically and pedagogically sound.

Weaknesses of this tool

Only the Digital Educational Programme "The Climate is in your hand" is interactive, but it is not available on-line (it runs through a CD-ROM).


η Πόλη του Μέλλοντος
DVD
0,3KWh
η Πόλη του Μέλλοντος
Κονσόλες παιχνιδιών
0,2KWh
η Πόλη του Μέλλοντος
Laptop
η Πόλη του Μέλλοντος
Ψυγείο ενεργ. κλάσης Α

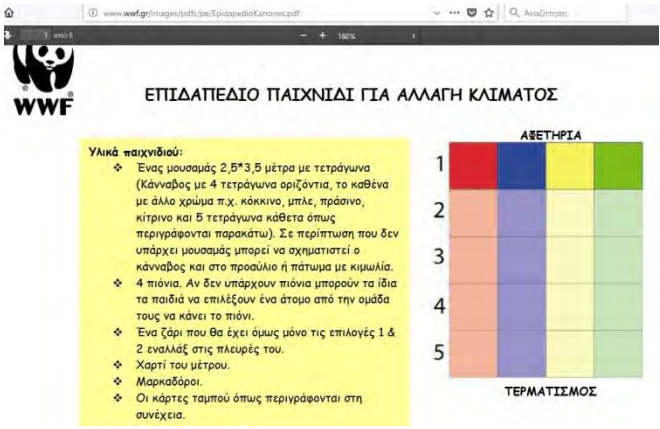
1


WWF
ECO2nomy
Ένα παιχνίδι για τον πλανήτη και την τσέπη μας!
Στόχοι:
Οι μαθητές:
Να συνοψίσουν τις γνώσεις τους για την κλιματική αλλαγή
Να συνειδητοποιήσουν ότι η καθημερινή κατανάλωση ενέργειας επιβαρύνει το φαινόμενο του θερμοκηπίου
Να διασκεδάσουν μαθαίνοντας ότι εξοικονομώντας ενέργεια εξοικονομούμε και χρήματα.
Να γίνουν πρεσβευτές του μηνύματος στις οικογένειές τους
Διάρκεια παιχνιδιού: 40'
Υλικά:
Χαρτί του μέτρου
Μαρκαδόροι
Τα συνημμένα φύλλα δέντρου
Τα συνημμένα ευρώ

2


WWF
Bingo για το κλίμα!
Βρείτε κάποιον από την ομάδα που θα σας δώσει την απάντηση...
(Προσοχή: Δεν μπορείτε να πάρετε δύο ή περισσότερες απαντήσεις από το ίδιο άτομο. Κάθε ερώτηση θα πρέπει να σας την απαντήσει διαφορετικός συμμαθητής σας)
Πόσο έχει αυξηθεί η μέση παγκόσμια θερμοκρασία της Γης;
α)0,8°C β)1,5°C γ)4°C
Την απάντηση μου την έδωσε ο/η:
Το φαινόμενο που έχει ανεβάσει τη θερμοκρασία της Γης
Την απάντηση μου την έδωσε ο/η
Το πιο ένοχο αέριο αυτού του φαινομένου
Την απάντηση μου την έδωσε ο/η
Ένα παράδειγμα από πού μπορεί να προέρχεται αυτό το αέριο (το πλεόνασμα)
Μια πρώτη ύλη που το παράγει
Κάτι που κάνω στην καθημερινότητά μου χρησιμοποιώντας αυτή την πρώτη ύλη

3


WWF
ΕΠΙΔΑΠΕΔΙΟ ΠΑΙΧΝΙΔΙ ΓΙΑ ΑΛΛΑΓΗ ΚΛΙΜΑΤΟΣ
Υλικά παιχνιδιού:
Ένας μουσαμάς 2,5*3,5 μέτρα με τετράγωνα (Κάνναβος με 4 τετράγωνα οριζόντια, το καθένα με άλλο χρώμα π.χ. κόκκινο, μπλε, πράσινο, κίτρινο και 5 τετράγωνα κάθετα όπως περιγράφονται παρακάτω). Σε περίπτωση που δεν υπάρχει μουσαμάς μπορεί να σχηματιστεί ο κάνναβος και στο προαύλιο ή πάτωμα με κιμωλία.
4 πιόνια. Αν δεν υπάρχουν πιόνια μπορούν τα ίδια τα παιδιά να επιλέξουν ένα άτομο από την ομάδα τους να κάνει το πιόνι.
Ένα ζάρι που θα έχει όμως μόνο τις επιλογές 1 & 2 εναλλάξ στις πλευρές του.
Χαρτί του μέτρου.
Μαρκαδόροι.
Οι κάρτες ταμπού όπως περιγράφονται στη συνέχεια.
ΑΦΕΤΗΡΙΑ
1
2
3
4
5
ΤΕΡΜΑΤΙΣΜΟΣ

4

www.wwf.gr/images/pdfs/pe/PEKPESynedrioWWF_Anakoinosi.pdf

110%

4ο Πανελλήνιο Συνέ
«Προς την Αειφόρο Ανάπτυξη Φυσι
Περιβαλλοντική Εκπαι
Ναύπλιο, 12-14 Δεκεμβρ

Τίτλος ανακοίνωσης:

Εκπαίδευση για την Αειφορία και το Περιβάλλον: Το Ψηφι
Ελλάς για την Κλιματική Αλλαγή «Το Κλίμα είναι στο Χέρ

Ελένη Σβορώνου
Υπεύθυνη Περιβαλλοντικής Εκπαίδευσης &
Κατάρτισης Ενηλίκων
WWF Ελλάς
Φιλελλήνων 26
105 58 Αθήνα
e.svoronou@wwf.gr

ΠΕΡΙΛΗΨΗ
Η κλιματική αλλαγή είναι η σημαντικότερη ίσως πρόκλησ
ευαισθητοποίηση των μαθητών είναι επείγουσας προτεραιό
υλικού που να πραγματεύεται ολοκληρωμένα το θέμα κατά
παιδιά είναι ένα απαιτητικό εγχείρημα. Το εκπαιδευτικό CI
είναι στο Χέρι σου», για μαθητές 10-16 ετών, που σχεδιάστ
στόχο να καλλιεργήσει αξίες, να δημιουργήσει κίνητρα για
την αντιμετώπιση της κλιματικής αλλαγής. Κύριοι άξονες
(α) ολοκληρωμένη αλλά και ευσύνοπτη παρουσίαση της ου
και πολιτικής πλευράς του θέματος, (β) σύνδεση της τοπικ
προβλήματος, (γ) καλλιέργεια της κριτικής σκέψης και των
(δ) αξιοποίηση της αφήγησης μιας ιστορίας ("story telling") ώστε η εκπαιδευτική διαδικασία να

5

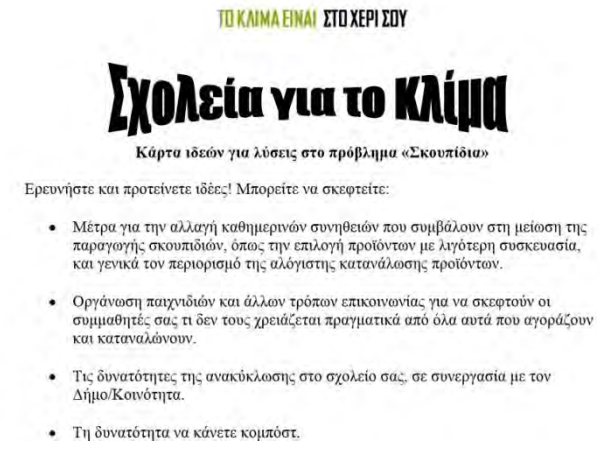
/enviromental-education/env-edu-climate

Κλιματικές Αλλαγές, Κατανάλωση και Αειφορία

Αυτοτελείς εκπαιδευτικές δραστηριότητες για όσους από εσάς δεν μπορούν να αφιερώσουν περισσότερο χρόνο για να κάνουν ένα πλήρες πρόγραμμα περιβαλλοντικής εκπαίδευσης. Οι δραστηριότητες αυτές έχουν μεταφραστεί από τις αντίστοιχες του WWF UK.

Πηγαίνοντας με τα πόδια στο σχολείο (για παιδιά 5-16 ετών)
Οικολογικό αποτύπωμα (για παιδιά 8-13 ετών)
Οράματα για το μέλλον (για παιδιά 8-13 ετών)
Η ιστορία ενός t-shirt (για παιδιά 8-13 ετών)
Ποιος αποφασίζει για σένα (για παιδιά 8-13 ετών)
Πάρε θέση (για παιδιά 8-13 ετών)
Κλιματική αλλαγή: προβλήματα & λύσεις (για παιδιά 7-9 ετών)
Κλιματική αλλαγή: προβλήματα & λύσεις (για παιδιά 9-16 ετών)
Κλιματική αλλαγή: χάρτης ιδεών (για παιδιά 7-16 ετών)
Κλιματική αλλαγή: φώτα, κάμερα, πάμε! (για παιδιά 7-11 ετών)
Κλιματική αλλαγή: φώτα, κάμερα, πάμε! (για παιδιά 12-16 ετών)
Παγκόσμια διάσταση (για παιδιά 7-14 ετών)
Προστατεύοντας το περιβάλλον (για παιδιά 11-14 ετών)
Τοπική ευημερία (για παιδιά 7-14 ετών)

6



ΤΟ ΚΛΙΜΑ ΕΙΝΑΙ ΣΤΟ ΧΕΡΙ ΣΟΥ

Σχολεία για το Κλίμα

Κάρτα ιδεών για λύσεις στο πρόβλημα «Σκουπίδια»

Ερευνήστε και προτείνετε ιδέες! Μπορείτε να σκεφτείτε:

- Μέτρα για την αλλαγή καθημερινών συνηθειών που συμβάλουν στη μείωση της παραγωγής σκουπιδιών, όπως την επιλογή προϊόντων με λιγότερη συσκευασία, και γενικά τον περιορισμό της αλόγιστης κατανάλωσης προϊόντων.
- Οργάνωση παιχνιδιών και άλλων τρόπων επικοινωνίας για να σκεφτούν οι συμμαθητές σας τι δεν τους χρειάζεται πραγματικά από όλα αυτά που αγοράζουν και καταναλώνουν.
- Τις δυνατότητες της ανακύκλωσης στο σχολείο σας, σε συνεργασία με τον Δήμο/Κοινότητα.
- Τη δυνατότητα να κάνετε κομπόστ.

7

WWF

ΤΟ ΚΛΙΜΑ ΕΙΝΑΙ ΣΤΟ ΧΕΡΙ ΣΟΥ

ΚΛΙΜΑΤΙΚΟ ΧΑΟΣ

συγκεντρωτικό υλικό για εκπαιδευτικούς

Μαθαίνοντας για την ΑΕΙΦΟΡΙΑ

8

Existing tools in Italy

3. *Same World Edukit*
4. *Il progetto R.A.C.E.S.*
5. *La Scuola per il Clima*
6. *After Ice*
7. *Ambiente Piemonte*
8. *RETE CLIMA: Area download e materiali didattici*
9. *IMPARIAMO LE ENERGIE*
10. *CLIMALTERANTI*
11. *INQUIRE BOTANY*
12. *MY TEST*

Same World Edukit

Link (URL)
http://www.sameworld.eu/en/
http://edu-kit.sameworld.eu/

Pedagogical objective
A Digital educational kit for teachers and educators with teaching units and class activities to raise students awareness on Climate change, Environmental Justice and Environmental Migration

Per saperne di più sulla!

Main topic(s)
- Mechanism/Phenomenon :
  Environmental justice
  Environmental migration
  Climate change

- Causes: Human behaviour

- Impacts: Climate modification and new migrations

- Measures / Solutions
  - Mitigation
    Defense of human and environmental rights
    Choices in everyday life
    Promoting sustainability

  - Adaptation
    Migration
    New economic models

Short presentation

Interactive website and e-learning platform co-funded by the EU. It includes:

- edu kit in three different fields
- a introduction tutorial
- online lessons

- theater play

Some numbers:
12 units
60 text sections of interdisciplinary content, with images, videos, text 35 experts who elaborated the material from 10 Countries
40 class activities to carry out
12 main key topics to examine
12 questions to think about

Complementary elements provided by the online tool

- online game
- school workshop
- best practices area
- youth observatory

Language(s) available: 12 languages (CA, DE, ET, EN, ES, IT, HU, PT, SK, SL, EL, BG)

Responsible organisation/Producer

CIES - Centro Di Informazione E Educazione Allo Sviluppo (IT), Coordinator

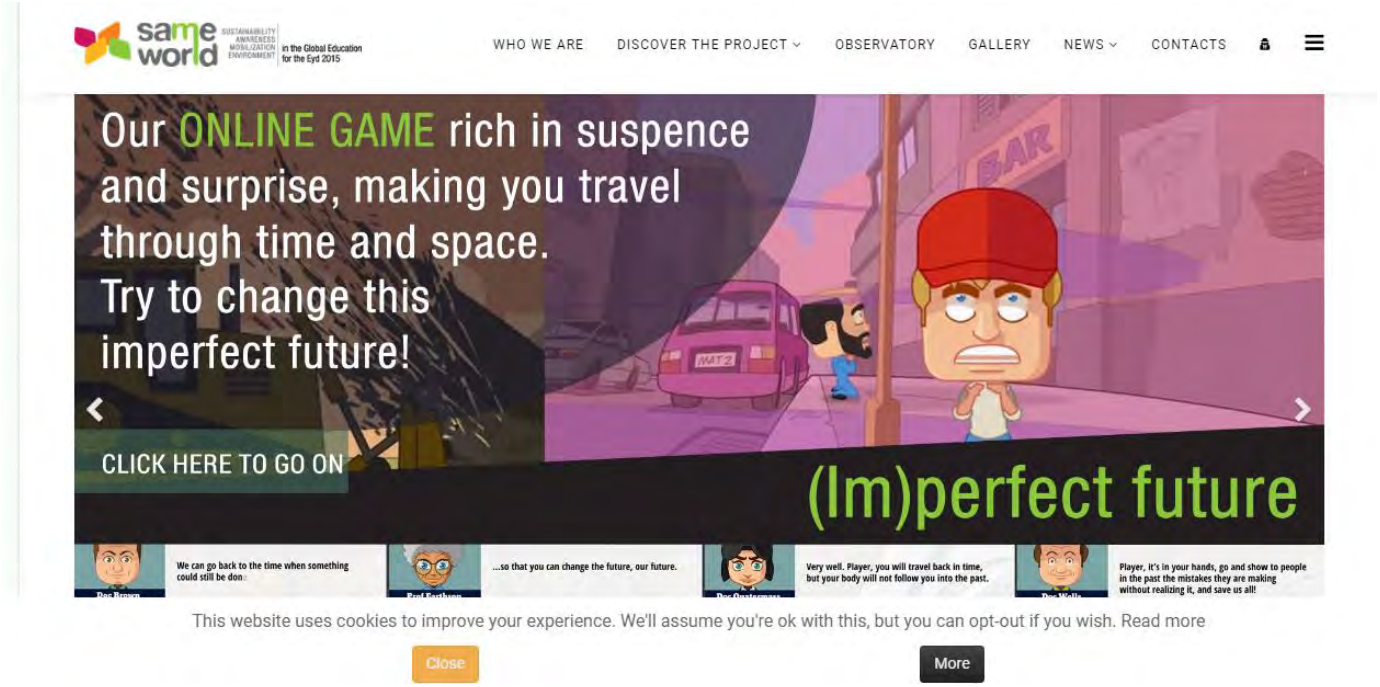
Contact

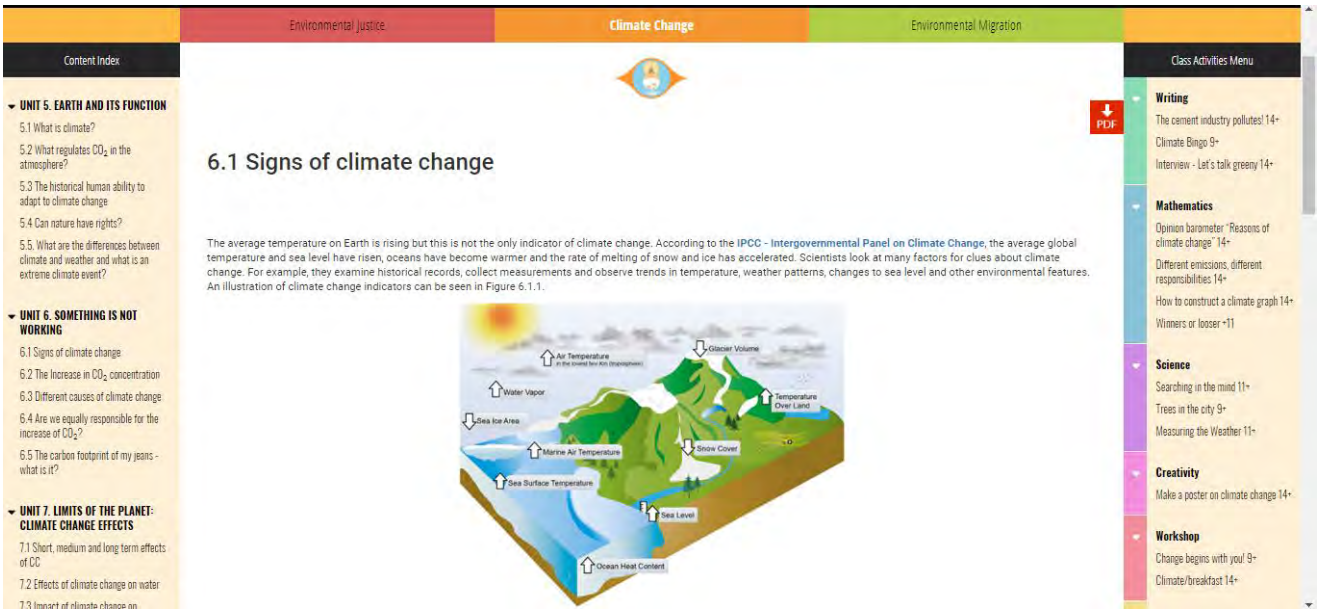
Phone/email: Tel 0039 0677264611 - Mail: cies@cies.it

Strengths of this tool:

- interactive
- several languages
- free

http://video.unimarconi.it/dsms/istitutional/9/sameworld.mp4




Environmental Justice
Climate Change
Environmental Migration
Content Index
UNIT 5. EARTH AND ITS FUNCTION
5.1 What is climate?
5.2 What regulates CO_2 in the atmosphere?
5.3 The historical human ability to adapt to climate change
5.4 Can nature have rights?
5.5. What are the differences between climate and weather and what is an extreme climate event?
UNIT 6. SOMETHING IS NOT WORKING
6.1 Signs of climate change
6.2 The Increase in CO_2 concentration
6.3 Different causes of climate change
6.4 Are we equally responsible for the increase of CO_2?
6.5 The carbon footprint of my jeans - what is it?
UNIT 7. LIMITS OF THE PLANET: CLIMATE CHANGE EFFECTS
7.1 Short, medium and long term effects of CC
7.2 Effects of climate change on water
7.3 Impact of climate change on
6.1 Signs of climate change
The average temperature on Earth is rising but this is not the only indicator of climate change. According to the IPCC - Intergovernmental Panel on Climate Change, the average global temperature and sea level have risen, oceans have become warmer and the rate of melting of snow and ice has accelerated. Scientists look at many factors for clues about climate change. For example, they examine historical records, collect measurements and observe trends in temperature, weather patterns, changes to sea level and other environmental features. An illustration of climate change indicators can be seen in Figure 6.1.1.
Air Temperature
Glacier Volume
Water Vapor
Temperature Over Land
Sea Ice Area
Marine Air Temperature
Snow Cover
Sea Surface Temperature
Sea Level
Ocean Heat Content
Class Activities Menu
Writing
The cement industry pollutes! 14+
Climate Bingo 9+
Interview - Let's talk greeny 14+
Mathematics
Opinion barometer "Reasons of climate change" 14+
Different emissions, different responsibilities 14+
How to construct a climate graph 14+
Winners or looser +11
Science
Searching in the mind 11+
Trees in the city 9+
Measuring the Weather 11+
Creativity
Make a poster on climate change 14+
Workshop
Change begins with you! 9+
Climate/breakfast 14+

Il progetto R.A.C.E.S.

Link (URL): http://www.liferaces.eu/

Pedagogical objective

The project deals with the local impact of the climate change.
R.A.C.E.S aims at:

- informing all the people of the cities involved about the local impact of the climate change
- raising awareness on the climate change within specific target groups: teachers, families and stakeholders

Main topic(s)

- Mechanism/Phenomenon: Climate change
- Causes: Human behaviour
- Impacts: To make citizens and especially families more aware of environment-friendly lifestyles
- Measures / Solutions
  - Adaptation: Adapting human lifestyle to the needs of the environment

Short presentation

The project is cofinanced by the European Commision, under the LIFE+ Programme. It's a website that includes:

- school kit on climate change
- surveys
- download material

Complementary elements provided by the online tool

Language(s) available: 2 languages, English Italian

Responsible organisation/Producer

The Florence City Council, together with other Italian cities - Trento, Modena, Potenza and Bari

Contact

Telephone: +39 055 2616792 / Fax: +39 055 2616906
email: staff@liferaces.eu

Strengths of this tool:

- school kit free

Weaknesses of this tool

- not interactive

» Per partecipare
» Osservazioni
» Per approfondire
» L'esperto risponde
» Downloads
» In città
» La città e il clima
» La Ricerca in città
» Eventi
» Le Best Practices del LIFE
» Prodotti comunicazione
» A casa
» Calcola le tue emissioni
» Le persone del progetto
» Calendario del Carbon Budget
» Quanto abbiamo risparmiato
» Contattaci
» Downloads

Modulo 1 I segnali

1. **ANALISI DELLE TEMPERATURE** Utilizza il file delle serie storiche di temperature per lavorarci con gli studenti per fare qualche analisi o grafico. Procurati i dati locali della tua città, fai qualche analisi comparativa e pubblica i dati elaborati sul sito RACES nella sezione Le Osservazioni.
2. **CLIMA e STORIA** Guarda la carta dell'evoluzione del clima nella storia e fai una riflessione con gli studenti su come le variazioni del clima hanno influenzato le vicende storiche e le evoluzioni della nostra civiltà.
   Scarica il file. Leggi l'articolo su "Clima e storia" su meteogiornale http://www.meteogiornale.it/news/read.php?id=9312
3. **MAPPE MENTALI: La mappa del cambiamento del clima**. Scrivi al centro della lavagna la parola "Cambiamento climatico" e riporta cose viene in mente ai ragazzi. Poi si dividono i ragazzi in gruppi e si riflette cercando di rispondere alla domanda "Sono convinto che il cambiamento del clima sia in atto? Su cosa si fonda la mia convinzione (esperienza diretta, materiali scientifici, influenza dei media) e si riporta a tutta la classe. Ti consigliamo di fare questo esercizio prima di affrontare la tematica in classe per far emergere le opinioni degli studenti.
4. **ESPERIMENTO:** Fai un esperimento sull'effetto serra con gli studenti: Guarda il video sul sito del progetto Meteoschool
5. **Il Cambiamento Climatico ti riguarda?** Proposta di discussione in classe (1 ora) e interviste ai cittadini: si suddividono i ragazzi in due gruppi chiedendo loro di rispondere alla domanda: "il Cambiamento Climatico ti riguarda?". Negli ultimi 25 minuti disponibili si condividono i risultati emersi. Eventualmente si può incaricare uno dei due gruppi di analizzare le motivazioni di un disinteresse rispetto al fenomeno e creare poi una sorta di contraddittorio tra i due gruppi.
6. **Play Decide!** Il gioco di ruolo proposto dall'Unione Europea con le carte delle storie, le carte dei fatti, le carte dei problemi e con la possibilità di inserire le proprie posizioni sul sito e confrontarle con le soluzioni degli altri Paesi! L'attività, molto coinvolgente e significativa, richiede 3 ore di tempo. Scaricabile alla pagina http://www.playdecide.org/download/climate/DECIDE_Italian.pdf
7. **Esperimento di estrazione della clorofilla**. Adatto per scuola secondaria di primo e secondo grado http://madscientist.altervista.org/biologia/estrcloro/clorofilla.htm
8. **Pianeta Terra QUIZ!**100 Domande sul pianeta Terra. Gli argomenti: il pianeta Terra, l'atmosfera terrestre, dentro la Terra, la superficie del pianeta, misurare la Terra. Disponendo di più PC si potrà creare una sorta di piccola competizione http://www.linguaggioglobale.com/terra/txtq/default.htm
9. **Quiz Climate Change!** (inglese) Questo quiz vi permette di testare le vostre conoscenze sul cambiamento climatico. Fa parte di una serie di 4 quiz associati agli argomenti sviluppati in Class Zero Emission (cambiamenti climatici, Regioni Polari, scienze

La Scuola per il Clima

Link (URL) http://www.scuolaperilclima.it/web/guest

Pedagogical objective

- informing all the people of the cities involved about the local impact of the climate change
- raising awareness on the climate change within specific target groups: families and students

Main topic(s)

- Mechanism/Phenomenon: Climate change
- Causes: Human behaviour
- Impacts: To make citizens and especially families more aware of environment-friendly lifestyles
- Measures / Solutions
  - Adaptation: Adapting human lifestyle to the needs of the environment

Short presentation

It's a website that includes:

- A test about common families behaviour
- Material/didactic pdf

Complementary elements provided by the online tool

- "Il Bosco per il clima", a project for planting new trees
- "Carbon footprint", calculating CO2 emissions

Language(s) available: Italian

Responsible organisation/Producer

Municipality of Folgaria

Contact

Tel. 0464 729333
E-mail: info@comune.folgaria.tn.it

Strengths of this tool:

- easily adaptable to other languages

Weaknesses of this tool

- very local
- only 1 language available


VUOI SAPERNE DI PIÙ?
Il problema: perché si parla tanto di CO_2?
Come si misura la temperatura al pianeta?
Cos'è la zona climatica?
Cosa sono i "Gradi Giorno"?
La differenza tra clima e tempo
Il clima e l'effetto serra
Cosa sono i gas serra
Gli elementi del clima
I fattori del clima
Il protocollo di Kyoto: cos'è?
Cosa posso fare io: il futuro lo decidiamo noi
Qualche consiglio in più ...
A casa.. per mamma e papà
IL PROBLEMA: PERCHÉ SI PARLA TANTO DI CO_2?
Si parla tanto di CO_2 risparmiata da fonti rinnovabili, ma che cosa è la CO_2 e perché si parla di risparmio.
La CO_2 (o Anidride Carbonica) è un gas inco lore e inodore formato da un atomo di carbonio e 2 di ossigeno, esso è presente naturalmente nell'atmosfera ma il suo eccesso contribuisce, insieme ad altri gas, all'effetto serra del pianeta.
L'innaturale produzione di CO_2 data dall'uso dei combustibili fossili (petrolio, carbone, gas) aumenta a dismisura questo grave problema.
Utilizzare fonti rinnovabili pulite vuol dire produrre energia utile all'uomo senza emissione nell'atmosfera di CO_2, ed è per questo che si parla di CO_2 risparmiata.
Scarica la scheda in formato pdf
SCHEDE DI APPROFONDIMENTO
La differenza tra clima e tempo
Il clima e l'effetto serra
Cosa sono i gas serra
CONSULTA TUTTE LE SCHEDE
the earth
CALCOLO DELLA CO_2
LINK UTILI
www.improntawwf.it
www.piedibus.it
www.comune.folgaria.tn.it
CONSULTA TUTTI I LINK
COMPENSAZIONE DELLA CO_2
Cosa vuol dire compensazione della

After Ice

Link (URL): https://itunes.apple.com/us/app/after-ice/id1222419939?mt=8

Pedagogical objective

Deepening awareness of climate change
Making people aware of climate change while having fun

Main topic(s)

- Mechanism/Phenomenon
  Climate change
  Visualize sea level rise where ever you are standing
  experience future scenarios of climate change

- Impacts: To make citizens aware of climate change phenomenon

Short presentation

It's a application for smartphones which allows to experience climate change and the effects of global warming through augmented reality.

After Ice simulates your location in various data-backed future scenarios of global ice melt and sea level rise.
Additionally, it lets you see the effect of sea level rise accurately within a 100 miles radius of New York City in the 2080s — within the lifetime of children alive today.

Language(s) available: English

Responsible organisation/Producer

After Ice is an artist intervention via mobile app, a collaboration between visual artist Justin Brice Guariglia and award-winning app development studios Strange Flavour and secondverse.

Contact

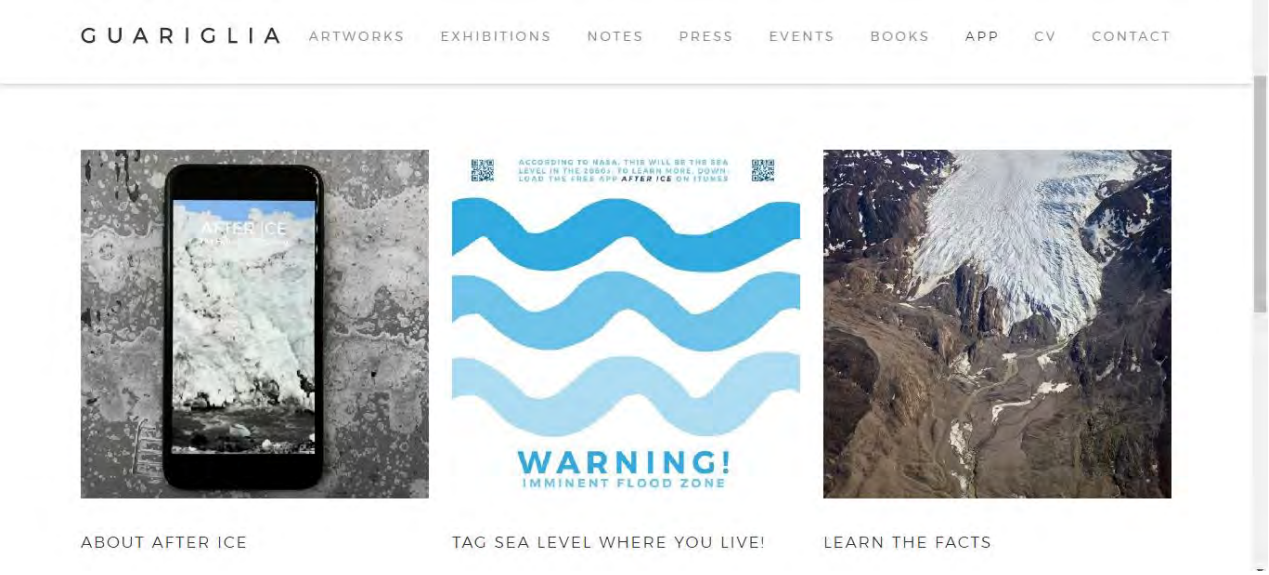
www.afterice.org

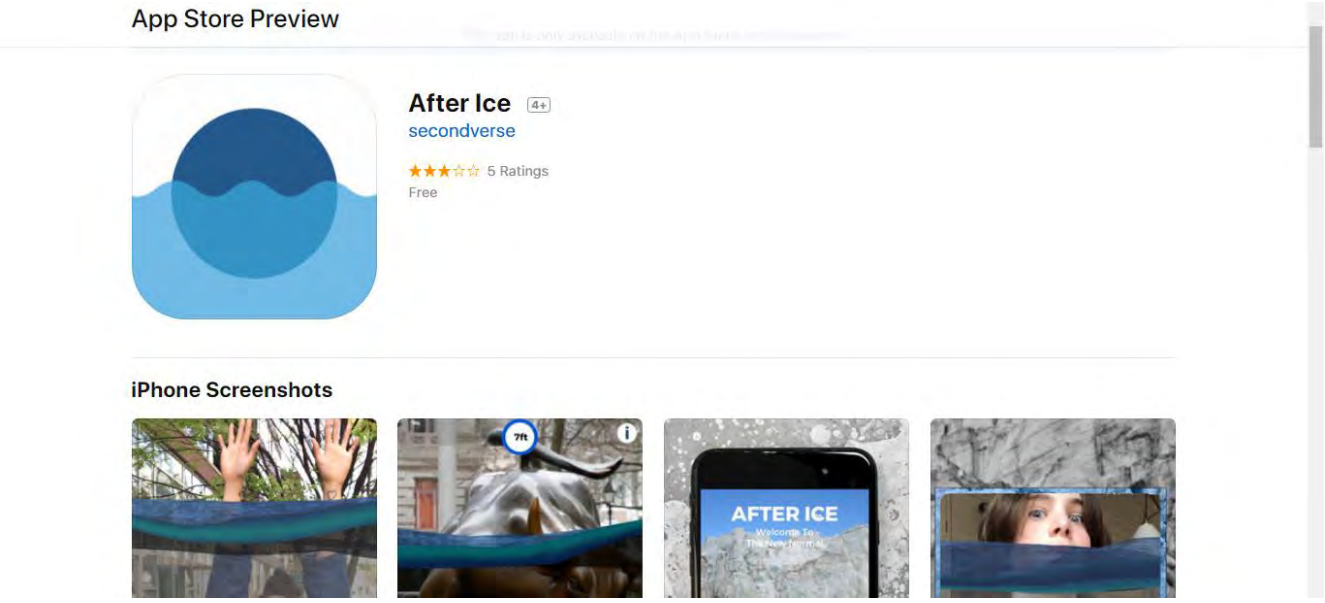
Strengths of this tool:

- free download
- adaptable to other languages
- it works all over the world with NASA data

Weaknesses of this tool

- Only for IOs





Ambiente Piemonte

Link (URL):
http://relazione.ambiente.piemonte.gov.it/2016/it/territorio/risposte/educazione-ambientale

Pedagogical objective

- Information about rules and regulations connected to four major themes: air, water, climate and land
- Deepening awareness of environment aspects in the Piedmont Region
- Making people aware of climate change

Main topic(s)

- Mechanism/Phenomenon: Climate change, quality of land, water and air
- Causes: human behavior and economics
- Impacts: To make citizens aware of environmental phenomena

Short presentation

It's a website coordinated and managed by the Regional Association for Environment in Piedmont, northern Italy (where Apro and ERICA are located).
The climate is added to the three major themes of air, water and land this year to describe the environment in Piedmont.

A path through the state, the factors that influence the resource, the consequent impacts on the environment and on people's health and finally the answers that the institutions propose.

Graphic representations offer an overview. By browsing the various levels, information is more and more punctual, with updated data.
Every section is articulated as follows:

- Intro
- Actual status
- Factors/causes
- Impacts
- Solutions

Over 150 indicators represent in a synthetic and effective form the environmental situation by interpreting and spreading a large amount of data related to each other.

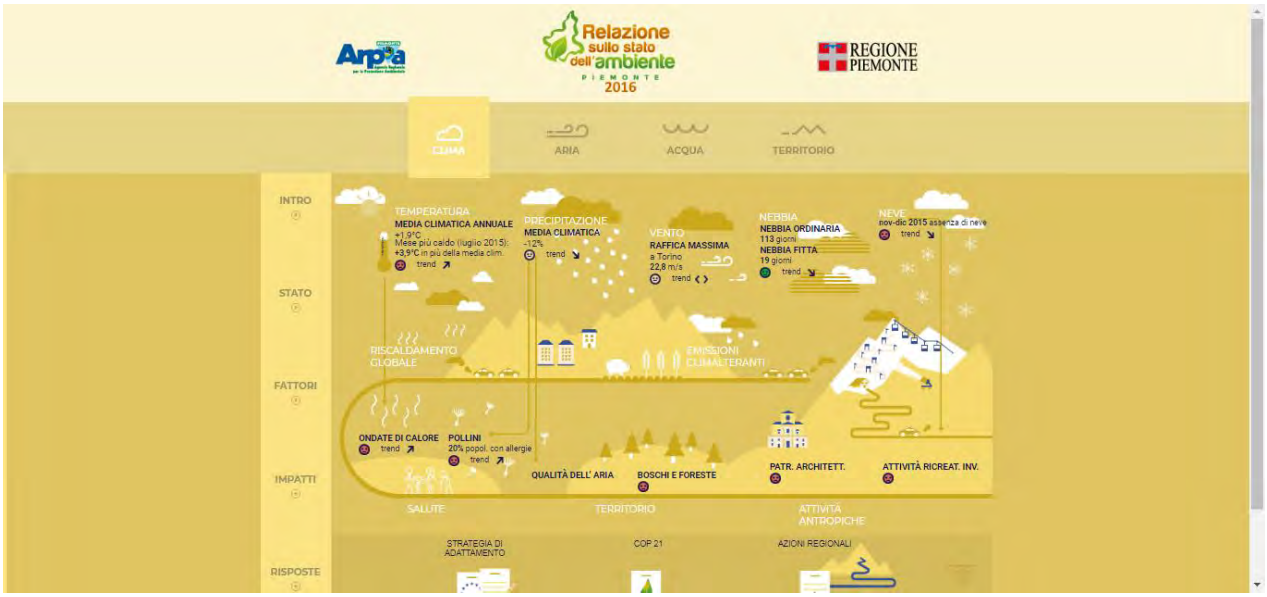
Language(s) available: Italian

Responsible organisation/Producer
ARPA Piemonte, Turin

Contact
http://www.arpa.piemonte.it/

Strengths of this tool:
- images and a big amount of data
- adaptable to other languages

Weaknesses of this tool
- only in Italian
- local


Relazione sullo stato dell'ambiente
PIEMONTE 2016
REGIONE PIEMONTE
CLIMA
ARIA
ACQUA
TERRITORIO
INTRO
STATO
FATTORI
IMPATTI
RISPOSTE
TEMPERATURA
MEDIA CLIMATICA ANNUALE
+1,9°C
Mese più caldo (luglio 2015):
+3,9°C in più della media clim.
trend
PRECIPITAZIONE
MEDIA CLIMATICA
-12%
trend
VENTO
RAFFICA MASSIMA
a Torino
22,8 m/s
trend
NEBBIA
NEBBIA ORDINARIA
113 giorni
NEBBIA FITTA
19 giorni
trend
NEVE
nov-dic 2015 assenza di neve
trend
RISCALDAMENTO GLOBALE
EMISSIONI CLIMALTERANTI
ONDATE DI CALORE
trend
POLLINI
20% popol. con allergie
trend
QUALITÀ DELL' ARIA
BOSCHI E FORESTE
PATR. ARCHITETT.
ATTIVITÀ RICREAT. INV.
SALUTE
TERRITORIO
ATTIVITÀ ANTROPICHE
STRATEGIA DI ADATTAMENTO
COP 21
AZIONI REGIONALI


CLIMA
ARIA
ACQUA
TERRITORIO
RISPOSTE
STRATEGIA DI ADATTAMENTO
In tema di Adattamento l'azione della Regione si inserisce nella cornice di indirizzi europei e nazionali delineati rispettivamente dalla Strategia Europea di Adattamento ai Cambiamenti Climatici _ EAS e dalla correlata Strategia nazionale di adattamento.
LA STRATEGIA EUROPEA DI ADATTAMENTO AI CAMBIAMENTI CLIMATICI _ EAS
LA STRATEGIA NAZIONALE DI ADATTAMENTO AI CAMBIAMENTI CLIMATICI - SNACC
LA STRATEGIA REGIONALE DI ADATTAMENTO AI CAMBIAMENTI CLIMATICI - SRACC
LA STRATEGIA EUROPEA DI ADATTAMENTO AI CAMBIAMENTI CLIMATICI _ EAS
TORNA SU

RETE CLIMA: Area download e materiali didattici

Link (URL): https://www.reteclima.it/download-materiali-didattici/

Pedagogical objective

It provides tools, data to develop knowledge and awareness of climate change through the use of best daily practices.

Main topic(s)

- Climate changes
- Greenhouse Effect
- Carbon production
- Life cycling of the objects and services
- Climate data
- Ecological footprint
- Climate footprint
- Human behavior about global warming.

Short presentation

Web site that links the main international sites that deal with climate change, subdividing them by type and category. It provides data, video, audio, games, quiz experiments and tests, animations.

Language(s) available: Italian, English, French

Responsible

Rete Clima

Contact:

tel: +39 031 5476951
email: info@reteclima.it
skype: reteclima

Strengths of this tool

- Many different links to many different tools
- Many different target

Weaknesses of this tool

- Tools too much different
- Not always three languages available


LA STORIA DELLE COSE
rete clima®
compensazione locale per effetti globali
"Rete Clima®: informazione ed azione per la sostenibilità ed il contrasto al cambiamento climatico"
home
la rete
progetti
portfolio
metodo
faq
news
Area download e materiali didattici
Tweet
Condividi
Mi piace 17
Educare.....al clima che cambia!
Su questa pagina del sito sono linkati materiali e strumenti utilizzabili in percorsi di educazione ambientale e climatica verso bambini e ragazzi.
Si tratta di una raccolta di materiali identificati su vari siti web, validi ed efficacemente testati in progetti di educazione energetica e climatica già realizzati da personale di Rete Clima®.
Cerca
follow
contatti
Via Cacciatori delle Alpi 1/A
22070 Capiago Intimiano (CO)
tel: +39 031 5476951
email: info@retecllma.it
skype: retecllma
percorso emissioni zero
emissioni co2 zero


Per ogni link viene specificato il tipo di supporto (video, testo, presentazione, immagine o pagina web di approfondimento), ed il target verso cui tale strumento è utilizzabile (bambini, ragazzi o adulti) insieme una breve descrizione dei contenuti e a qualche suggerimento "pratico" già sperimentato con successo durante la nostra attività educativa.
Buon lavoro!
Elenco dei materiali utilizzabili:
1. LA SCELTA GIUSTA: IL CICLO DI VITA DEGLI OGGETTI, LA LORO CARBON FOOTPRINT, IL VALORE DEL RIUSO
DESTINATARI: SCUOLE PRIMARIE E SECONDARIE.
Questo sito contiene un tool per poter navigare dentro il ciclo di vita degli oggetti, consultando ogni fase delle vita delle cose e comprendendo le emissioni di CO2 collegate alle fasi produttive. Realizzato da Rete Clima® per Subito.it, con questo strumento web interattivo è possibile comprendere la quantità di CO2 risparmiata in relazione alla scelta del riuso, che permette di dare una seconda vita alle cose evitando che ne siano prodotte di nuove (e quindi evitando gli impatti ambientali collegati alla loro produzione).
subito
la tua email
iscriviti
risorse
Archivio News
Siti web interessanti
Download e Materiali Didattici
Sitemap
PLANT FOR THE PLANET
co2 emission zero website

2. **SITO WEB PER SPUNTI E IDEE PER L'EDUCAZIONE AMBIENTALE**

DESTINATARI: SCUOLE PRIMARIE.

Questo è il sito che prendiamo a riferimento per il "come fare" educazione in ambito scolastico. Si tratta di un ottimo progetto a cui abbiamo partecipato insieme ad AISA (Associazione Italiana Scienze Ambientali) al WWF ed al Politecnico di Milano dentro alcune scuole primarie dell'area milanese: interessante leggere lo spirito che sorregge questo progetto, i suoi obiettivi, le fasi di lavoro ed i materiali scaricabili. Interessante l'osservatorio sull'educazione energetica. Utile farci un giretto. In lingua italiana.

3. **SITO WEB CON GIOCHI, VIDEO E ANIMAZIONI CLIMATICHE – NASA**

DESTINATARI: SCUOLE PRIMARIE E SI

SITO WEB CON GIOCHI, VIDEO E ANIMAZIONI CLIMATICHE – NASA

Sito molto interessante, realizzato dalla NASA nell'ambito delle sue attività educative. Ci presenta una grande abbondanza di dati, materiali e vari strumenti ambientali che permettono una chiare e semplice illustrazione dell'effetto serra, dei cambiamenti climatici e delle loro conseguenze sui vari comparti ambientali. Interessante anche la "Climate Time Machine", che permette di vedere gli effetti nel tempo dei cambiamenti climatici sul livello dei ghiacci, dei mari, dei contributi emissivi nazionali, della temperatura media terrestre registrata. Utilizzabile in aula a supporto delle attività ambientali o quale modalità di insegnamento alternativo della lingua inglese. Assolutamente da visitare. In lingua inglese.

4. **SITO WEB CON DATI SU CLIMA E CAMBIAMENTI CLIMATICI – US-EPA**

DESTINATARI: SCUOLE SUPERIORI, GIOVANI E ADULTI.

Sito realizzato dall'US-EPA (Agenzia di protezione dell'ambiente Statunitense), dove è possibile recuperare dati, elaborazioni grafiche, trend storici su clima, gas serra e cambiamenti climatici. E' un sito di approfondimento, per chi desidera fruire di dati storici e di lungo periodo: utile da consigliare per lavori di ricerche scolastiche e/o di approfondimento. In lingua inglese.

5. **SITO WEB CON GIOCHI, VIDEO E ANIMAZIONI CLIMATICHE – SOLAR CENTER**

DESTINATARI: SCUOLE PRIMARIE E SECONDARIE.

Sito curato dallo Stanford SOLAR Center; offre vari strumenti per conoscere il sole ed i suoi benefici effetti verso il Pianeta Terra.

Impariamo le Energie

Link (URL) http://www.impariamolenergia.it/

Pedagogical objective

Educational website with all material realized for school, lesson, to develop knowledge and awareness of energy policies.

Main topic(s)

- Climate changes
- Natural resources.
- Carbon production
- Ecological footprint
- Different types of energy
- Environmental impact of a different types of energy

Short presentation

Several support materials researched by subject and by school level with main topic "energy":

- Educational information for class lesson
- Many support materials to deepen the knowledge
- Exercises

Language(s) available: Italian

Responsible

ENGIE Italia - https://www.engie.it

Strengths of this tool

- Many different tools
- Well-defined target

Weaknesses of this tool

- Too specific about energy policies
- Only Italian languages available


Impariamo l'Energia
LE RISORSE
Docente : Le mie attività/partite • Il mio account • Disconnettersi
Like 3K
SERIOUS GAME
CONCORSO
ORIENTAMENTO
NEWS
Cercare
HOME
RISORSE
KIT DIDATTICO ESSENZIALE
Benvenuti nell'area risorse didattiche
PRIMARIE
SECONDARIE DI 1°GRADO
SECONDARIE DI 2° GRADO
Ricercate per tema e per livello scolastico i diversi materiali di supporto per affrontare in classe l'argomento "energia".
Informazioni precise e didattiche per lo svolgimento del corso.
Abbondante materiale di supporto per approfondire le conoscenze.
Esercizi.
Le risorse contenute in questo strumento didattico sono state ideate in collaborazione con consulenti pedagogici ed esperti di diverse discipline scientifiche.
YouTube
Scoprite il nostro canale Youtube con i video didattici sulle nostre professioni e le nostre centrali
PRIMARIE
CAVALIERI


HOME
RISORSE
KIT DIDATTICO ESSENZIALE
LIVELLO
Primaria
Secondaria di 1° grado
Secondaria di 2° grado
TEMA
Efficienza energetica
Energia geotermica
Energia nucleare
Energie fossili
Energie marine
Energie non rinnovabili
Energie rinnovabili
L'energia da biomassa
L'energia eolica
L'energia idroelettrica
L'energia solare
Orientamento
Trasporto Distribuzione
TIPO
Fotografie
Poster
Scheda attività
Schema
Serious game
Video
L'energia nucleare
Livello : Primaria
Un esempio di fonte energetica utilizzabile: l'energia nucleare
Accedi a questa risorsa
I combustibili fossili
Livello : Primaria
Un esempio di fonte energetica utilizzabile: i combustibili fossili
Accedi a questa risorsa
La centrale nucleare - Esercizio
Livello : Primaria
Uno schema da mostrare agli studenti, cliccando e trascinando, per memorizzare gli elementi principali della centrale.
Accedi a questa risorsa
La centrale termoelettrica - Esercizio


LE SFIDE BETA DELL'ENERGIA
NUOVA VERSIONE 3.0
Un Serious Game per gli studenti delle scuole secondarie di primo e secondo grado.
Ottimizzate il mix energetico del vostro territorio, tenendo conto della domanda, dei costi e dell'ambiente.
SCOPRIRE LE SFIDE DELL'ENERGIA
• Produzione • Distribuzione • Consumo • Ambiente •

LA PRODUZIONE DI ENERGIA ELETTRICA - PRODURRE ENERGIA ELETTRICA
Paname
0

CLIMALTERANTI

Link (URL): http://www.climalteranti.it/2011/05/17/didattica-sul-clima-una-miniera-sul-web/

Pedagogical objective

It provides tools, data to develop knowledge and awareness of climate change in classroom lesson.

Main topic(s)

- Climate changes
- Fossil energies
- Greenhouse Effect
- Carbon production
- Climate data
- Human behavior about global warming.

Short presentation

Web site that links the main international sites that deal with climate change, subdividing them by type and category. It provides:

- Experiments in the laboratory
- Exercises, lessons, games
- Handouts
- Projects
- Videos and animations
- Books (educational cut, others are here)
- Slides
- Post from Climalteranti

Language(s) available: Italian, English

Responsible

Scientific Committee: http://www.climalteranti.it/info/

Strengths of this tool

- Many different links to many different tools
- Many different target

Weaknesses of this tool

- Tools too much different
- Not always English languages available

CLIMALTERANTI.IT

HOME | CHI SIAMO | SOSTENITORI | LIBRI | NETIQUETTE | CONTATTI | PREMIO | LINK
DIDATTICA | REALCLIMATE – ITA | RECENSIONI | TUTTI I POST | FAQ

Notizie e approfondimenti sul clima che cambia — Posts RSS — Comments RSS

Didattica sul clima, una miniera sul web

Sul web è disponibile molto materiale per parlare di cambiamenti climatici nelle scuole.
In questo post viene presentato un primo elenco, senza alcuna pretesa di esaustività, invitando studenti e insegnanti a segnalare nei commenti altro materiale utile.

MATERIALE DIDATTICO

Progetto "Consumi amici del clima"
Un progetto congiunto WWF – Politecnico di Milano con il contributo della Fondazione Cariplo, per sensibilizzare i ragazzi al problema dei cambiamenti climatici, stimolandoli ad adottare comportamenti e stili di vita "amici del clima", ovvero che producono meno emissioni di gas serra in atmosfera.
Il progetto ha reso disponibile sul web materiale didattico molto interessante, a partire dalla presentazione in powerpoint introduttiva, gli esercizi per i 6 moduli o il glossario.
Una descrizione sintetica delle attività e dei risultati è disponibile in questo articolo.

Ricerca per:
Cerca

COMMENTI RECENTI

alsarago58 su Arriverà del freddo (d'inverno succede), mentre il riscaldamento globale continua

macio su Arriverà del freddo (d'inverno succede), mentre il riscaldamento globale continua

homoereticus su Arriverà del freddo (d'inverno succede), mentre il riscaldamento globale continua

TWITTER @CLIMALTERANTI

VIDEO e ANIMAZIONI

Quattro passi nel clima
4 videoclip di circa 5 minuti l'uno, curati da Luca Lombroso.

Progetto Andrill-Flexhibit
Due animazioni didattiche interattive sull'Antartide, complete di test online. Una è realizzata su dati scientifici e permette di simulare i movimenti della piattaforma di ghiaccio al cambiare delle temperatura del mare circostante mentre una è sulla geografia dell'Antartide.

15 video molto belli, sulla scienza del clima dell'Antartide, sottotitolati in italiano da Matteo Cattadori.

Animals save the planets
6 clip da 30 secondi molto efficaci e di grande successo, su alcune piccole buone pratiche per risparmiare energia, rifiuti, acqua, sacchetti di plastica, sull'efficienza energetica e le emissioni di metano. Sono in inglese, anche se il senso si capisce.

Ciclo del carbonio
Molti videoclip scientifici son disponibili su youtube, a partire da questo video sul Ciclo del Carbonio, molto chiaro pur se senza commento.
Sullo stesso tema, un video didattico molto bello con Ben Santer, purtroppo solo in inglese.

Effetto serra – Animazione interattiva molto bella ed esplicativa, anche in Italiano, realizzata dal progetto PhET dell'Università del Colorado

caratteristiche...
fb.me/1UOqYgp5j
15 febbraio 2018 19:31

CATEGORIE

20-20-20 (7)
Abbagli (16)
Accordo (3)
Accordo di Parigi (2)
Acidificazione (2)
Acqua (5)
Adattamento (12)
Agricoltura (7)
Analisi della decomposizione (1)
Animazioni (1)
Annozero (1)
Anomalie (4)
Antartide (1)
Aria (1)
Artico (3)
Artico e Antartico (13)
Attivismo (3)
Attribuzione (2)
Bilancio radiativo (1)
Black Carbon (3)
Blog (6)
Bufale (33)
Buone pratiche (2)
Catastrofismo (12)
Censura (1)
Chimica (1)

LIBRI PER RAGAZZI

Il Clima che cambia di Roberto Luciani
Un libro per i più piccoli, con tante immagini e spiegazioni, realizzato nell'ambito del progetto EDURISK ed edito da Giunti Progetti Educativi con CMCC e INGV
Sul sito web di Edurisk e' possibile scaricare l'intero pdf del libro.

Il Clima, di Daniele Pernigotti
Un libro semplice, con simpatiche illustrazioni, spunti per attività didattiche, giochi, steacker adesivi, adatto ai ragazzi ma anche ricco di spunti e approfondimenti che non guastano pure agli adulti. Edito da Giunti Junior, 2011

L'Antartide e i segreti del clima
Di LuAnn Dahlman. Libro molto bello con molti esercizi pratici da fare con studenti
Il libro è disponibile gratuitamente in forma digitale.
"Antartide e i segreti del clima" è anche il titolo di una mostra itinerante realizzata dal Museo Nazionale dell'Antartide.

Altri libri da segnalare: Il clima a piccoli passi, di George Faterman (Motta Junior, 2006) e Il clima ed i suoi cambiamenti, di Pascal Desjours (Editoriale Scienza , 2003), L'atmosfera e l'effetto serra di Valerie Masson-Delmotte e Marc Delmotte.

INQUIRE BOTANY

Link (URL): http://www.inquirebotany.org/it/resources/categories/esempi-attivit-cambiamenti-climatici-1.html

Pedagogical objective

It provides teaching material for student of secondary school: tools and data to develop knowledge and awareness of climate change using practical experiments.

Main topic(s)

- Climate changes
- Rising seas
- Greenhouse Effect
- Carbon production
- Climate data

Short presentation

Web site that links the main international sites that deal with climate change, subdividing them by type and category. It provides:

- Experiments in the laboratory
- Exercises, lessons
- Projects
- Videos and animations
- Slides

Language(s) available: Italian, English

Responsible

European project IBSE

Strengths of this tool

- Very interesting experiments
- Many different target

Weaknesses of this tool

- Older news
- At the moment, only English version available

Iscriviti alla newsletter | Registrati e accedi al sito | Italiano

INQUIRE

HOME NEWS CORSI DI FORMAZIONE SU IBSE MATERIALI DIDATTICI CHI SIAMO

MATERIALI DIDATTICI

In questa sezione trovate una serie di materiali didattici inerenti l'approccio IBSE: dalla teoria IBSE agli esempi sia degli strumenti di valutazione che delle attività educative in chiave IBSE. Abbiamo cercato tra numerosi libri e siti web in modo da recuperare le risorse più rilevanti da utilizzare nelle scuole, nei giardini botanici, nei musei e in altri luoghi di educazione informale. Tutto il materiale è a disposizione di coloro che sono registrati al sito INQUIRE. Per poter ricevere ulteriori informazioni contattateci!

Cambiamenti climatici in una bottiglia

Attività Inquiry sui cambiamenti climatici. Target: scuola secondaria di primo grado (11-12 anni).

+ Allarga per visualizzare i commenti | 0 commenti

Esempi attività - Cambiamenti climatici |

CATEGORIE

- Esempi attività - Cambiamenti climatici
- Esempi attività - Biodiversità
- Esempi attività - Conservazione
- Esempi attività - Biologia delle piante
- Esempio attività - Alimentazione
- Tecniche IBSE
- Esempi attività - Geologia/Chimica/Fisica
- Strumenti di valutazione in IBSE
- Cos'è l'IBSE
- Pratica riflessiva
- Educazione informale (giardini botanici, musei e parchi naturali)
- Altri progetti europei che parlano di IBSE

meglio quanto "vero" approccio IBSE c'è in Europa?

Ecco a voi l'elenco aggiornato di tutti i progetti europei che si occupano di Inquiry

00 Commenti

Relazione tra l'innalzamento del livello del mare e il riscaldamento climatico

I nostri colleghi di Hannover hanno sviluppato un percorso didattico IBSE sul tema dei cambiamenti climatici. Target: scuola secondaria di primo grado (11-14 anni)

Allarga per visualizzare i commenti | 5 commenti

Esempi attività - Cambiamenti climatici |

My Test

Link (URL): http://www.museoscienza.org/myTest/

Pedagogical objective

This web tool has been created as part of the SETAC project with the prime aim to encourage students to engage in researching, reflecting and communicating science-oriented topics.

Main topic(s)

- Climate changes
- Rising seas, Greenhouse Effect, Carbon production
- Climate data
- Life cycling of the objects and services
- Ecological footprint
- Climate footprint
- Human behavior about global warming.

Short presentation

It allows for the construction of tests by groups or individuals who aim to examine a certain topic. It also invites groups or individuals to take a chance in responding questions regarding different topics. More than looking into the scientific value of the questions, for the project what is important is to use this tool as a method for stimulating critical thinking, research of the information that would be necessary to answer a certain question and an inquiry attitude towards science.

Language(s) available: Italian, English

Responsible

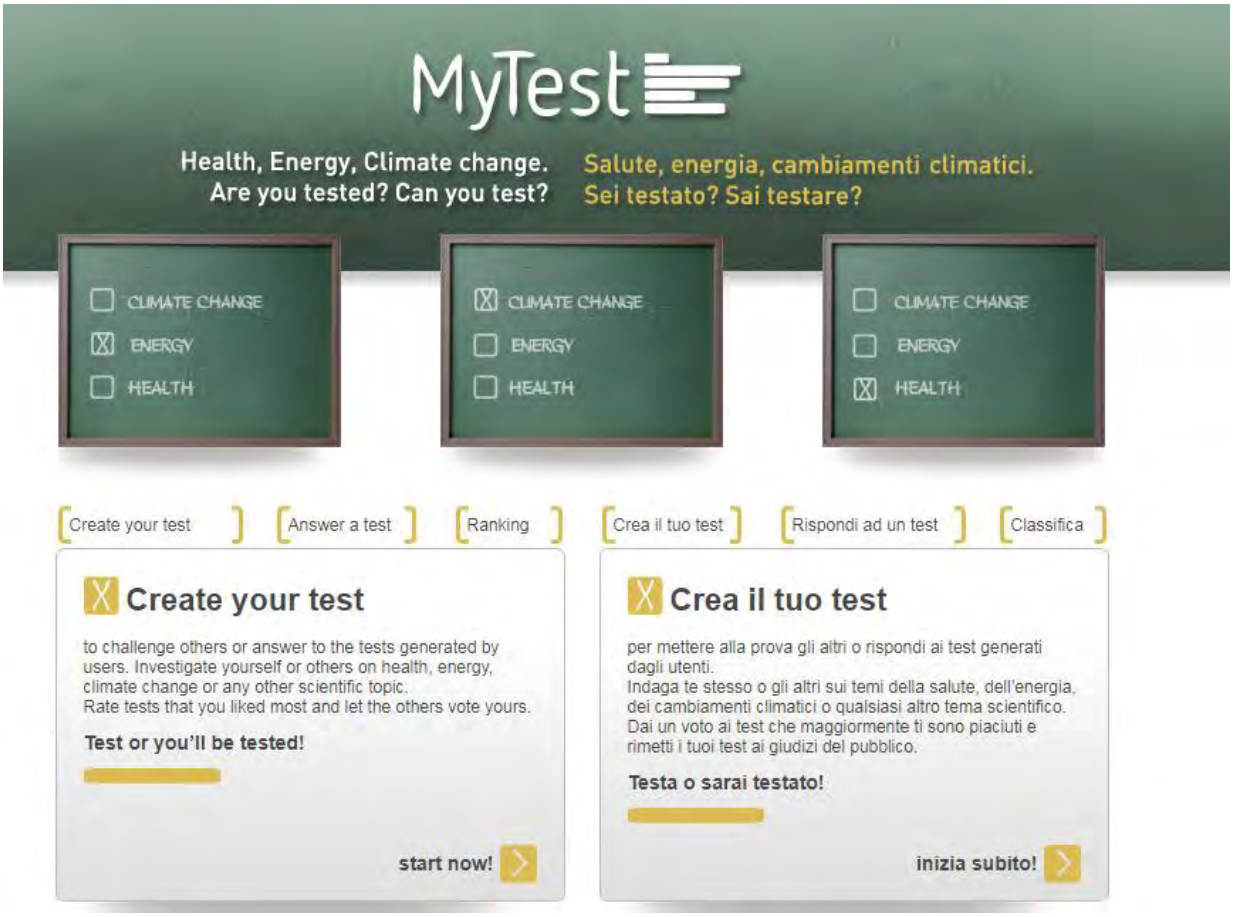
SETAC (Science Education As a Tool for Active Citizenship) is funded by the European Union Lifelong Learning Programme and focuses on science education as among the fundamental tools for developing active citizens in the knowledge society. It is aimed at teachers, students, museum explainers and explores the themes of Health, Energy, Climate Change.

Strengths of this tool

- Interactive tools
- Many different target
- Many themes to be explored

Weaknesses of this tool

- No material to read, deepen and learn


MyTest
Health, Energy, Climate change.
Are you tested? Can you test?
Salute, energia, cambiamenti climatici.
Sei testato? Sai testare?
CLIMATE CHANGE
ENERGY
HEALTH
CLIMATE CHANGE
ENERGY
HEALTH
CLIMATE CHANGE
ENERGY
HEALTH
Create your test
Answer a test
Ranking
Crea il tuo test
Rispondi ad un test
Classifica
Create your test
to challenge others or answer to the tests generated by users. Investigate yourself or others on health, energy, climate change or any other scientific topic.
Rate tests that you liked most and let the others vote yours.
Test or you'll be tested!
start now!
Crea il tuo test
per mettere alla prova gli altri o rispondi ai test generati dagli utenti.
Indaga te stesso o gli altri sui temi della salute, dell'energia, dei cambiamenti climatici o qualsiasi altro tema scientifico.
Dai un voto ai test che maggiormente ti sono piaciuti e rimetti i tuoi test ai giudizi del pubblico.
Testa o sarai testato!
inizia subito!

Crea il tuo test

Rispondi ad un test

Classifica

Scegli il test

*ordina per: data creazione | alfabetico | **argomento** | lingua*

CLIMATE CHANGE / CAMBIAMENTI CLIMATICI

ENGLISH EVALUATION FOR TEENS

USE THE TENSES AS ITS NEEDED.

lingua: english
Creato da: CARLOS COREAS.

5 risposte

Condividi

Ice Age, the period of changes

a test to value your knowledge of climate changes of the Ice Age .

lingua: ungherese
Creato da: Judit Holler

4 risposte

Condividi

ENERGY / ENERGIA

L'elettricità

Rispondi, ma senza fulminarti

Crea il tuo test

Rispondi ad un test

Classifica

ENGLISH EVALUATION FOR TEENS

USE THE TENSES AS ITS NEEDED.
Età autore: 30-59anni

1. What is a flood?

- It is a large part of wet land.
- It is a large part of land cover by water.
- It is land slices when rain.

2. What is a flood?

- It is a large part of land wet
- It is a large part of land cover by water.
- It is land slice when rain.

3. What is known as pollution?

- Contamination of land
- Contamination of water
- Contamination of everyparts where life is being.

4. What can we do to avoid pollution?

- Drop garbage in a speciple place.
- Be concious in caring our planet and do actions to protect our environtment.
- .

5. Mention the names of three animals consider in extintion

- dog,cat,snakes.
- hens, rooster, donkey
- lion,tiger,parrot.