



crossover

Sustainability & Ecology

CReating new concepts On SuSustainability training in coOperation VET and labouR market

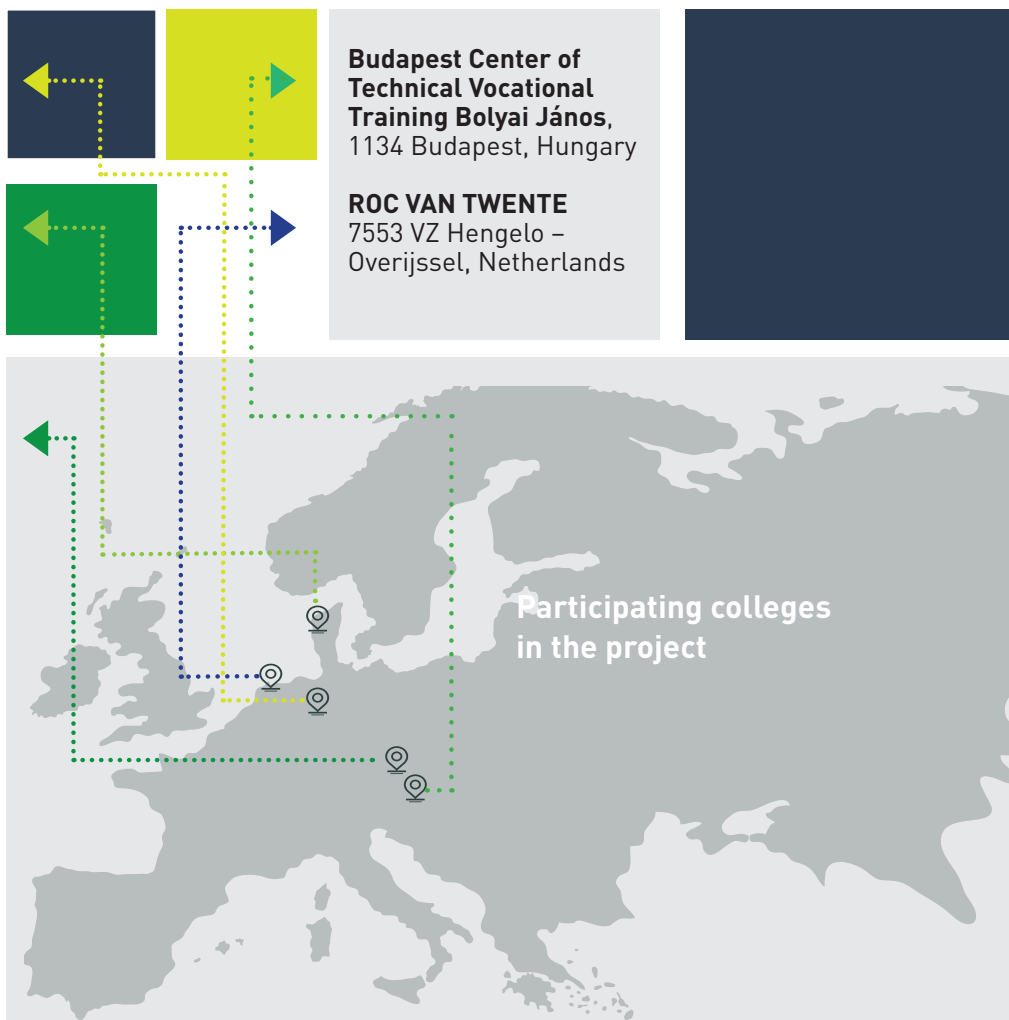
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editorial

Sustainability affects more and more all levels of life and work. Energy saving and taking care of the limited natural resources and recycling materials are serious topics for politicians, researchers, employers and (future) workers. For developing new ideas within sustainability and being able to implement them student competences in vocational training are needed.

In the project „Crossover“ (CReating new concepts On SuStainability training in coOperation VEt and labouR market) students, teachers, experts from foundations dealing with sustainability, workers and managers from companies with different national and vocational backgrounds exchanged information on how they deal with ecological issues in their different environments. Everybody gained a wider knowledge and a deeper understanding of how joint forces can contribute in the struggle for a greener world.

One of the aims of the project involved developing lessons. Before starting with the development of lesson plans the participating colleges identified different key areas concerning sustainability. In the course of this project colleges with different vocational training backgrounds such as construction, business administration, information technology, electrotechnology and mechanical engineering provided and tested lessons. These can be a valuable addition to your school curriculum as well.

Lesson plans for the following key areas have been developed and are free of charge:

Why is sustainability important?

Energy management

Water management

From waste management to circular economy

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Why is sustainability important?

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Water management

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From waste management to circular economy

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School

Subject

Target group

Duration

What?
short teaser

Skive Handelsskole (Business School – VET)

Sustainability Awareness – What is going on in your own branch?

Business School – VET area – but can easily be used by other from the age of abt. 16+. to become a more conscious consumer

4 lesson of 85 minutes

The students are going to make a presentation about their homeland/interesting facts, national dishes, traditional costumes/everything typical to their country and present a typical national product.

What?

detailed description

Lesson - Assignment 4

8:10 – 09:35

9:50 – 11:15

Work in groups of 4 persons.

Each participant has to prepare a short presentation about themselves.

Hereafter you must make a presentation about your homeland, interesting facts, national dishes, traditional costumes, everything typical to your country and finally choose a typical national product to present.

Make a presentation in English – In all it must take 5 minutes.

Some ideas to make the Product Presentation:

Introduction - What is it?

Product description

A short presentation of the company/manufacturer

Positioning of the company

Presenter – Everybody has to present some points – to be presented on stage.

Make cue cards and a Power Point.

Aftertest (enclosed) What do you know now? + evaluation of lessons

How?

Talking about the subject, testing pre-knowledge, group-work, presentations, after-test and evaluation.

Why?

learning outcome

To gain awareness of how to make a presentation about themselves, to present their country and a product/company presentation and how to present it in front of a larger group.
The students should become aware how a part of their job could be in the future when working within retail, trade or office.

Links

<http://www.infrasystems.com/product-presentations.html>

Student evaluation

1. Did you like working with a subject in this way?
a. Yes b. No
2. What was good about it?

3. What could have been better?

4. What did you learn from this lesson?

5. What was the purpose of this lesson?

Enclosure 1

pre-test and after-test

- What is a product presentation?
- What does a product presentation include?
- What is typical in your homeland?
- Interesting facts about your homeland
- What is a typical costume in your homeland?
- Why do companies make company presentations?
-

School

Subject

Target group

Duration

What?
short teaser

ROC VAN TWENTE

Sustainability Awareness – What is going on in your own branch?

Secondary Vocational Education

5 lessons of 85 minutes

The students become aware of both the local and national concerns in regards to sustainability and how they all deal with it within their own branch.

What? detailed description

Lesson 1:

8:30 – 11:30

Teacher:

Inform the students about sustainability and global heating.

Students:

The students have to watch the movie An Inconvenient truth by Al Gore. After the movie they write a report concluding the following subjects:

A)

The report must contain at least 250 words.

- the goal of the movie
- their opinion about the movie
- their conclusion about the movie
- which impression the movie gives them

B)

Find two reviews about the movie and give a short resume about it. After this give your opinion about the resumes.

Aftertest evaluation of lessons

How?

Talking about the subject, watching a movie, subscribe opinion and make an evaluation.

Why? learning outcome

To gain awareness of the importance of sustainability within the local area.

The students should become aware how they can do a difference, how they can influence the situation in the city where they are located helping them and their customers to buy conscious or become more aware of sustainability etc.

In the end, this might inspire/influence on the students in their way of doing shopping/business later on in life. Maybe they will even be able to influence their future employer to use sustainability as a strategy within sale.

Links

DVD An inconvenient truth by Al Gore available from school.

Student evaluation

1. Did you like working with a subject in this way?
a. Yes b. No
2. What was good about it?

3. What could have been better?

4. What did you learn from this lesson?

5. What was the purpose of this lesson?

Enclosure 1

pre-test and after-test

- What do you know about the Danish governments plans for sustainability?
- What do you know about the local plans for sustainability? (explain with a few sentences)
- What could sustainability be within the retail branch? (explain with a few sentences)
- What could sustainability be within the trade branch? (explain with a few sentences)
- What could sustainability be within the office branch? (explain with a few sentences)
- Do you have any suggestions to optimize sustainability in your local area?
-

School

Subject

Target group

Duration

What?
short teaser

Skive Handelsskole (Business School – VET)

Sustainability Awareness – What is going on in your own branch?

Secondary Vocational Education

2 lessons of 85 minutes

Teach your students why it is important to care about sustainability and to understand the impact of not caring. That we all can make a difference. That our buying habits have consequences on other. Fast fashion and our throw away culture has a price. Awareness of the true costs

What? detailed description

Lesson 1:

- 8.10-8.30 Pre-test: how conscious are your students? (enclosure 1)
8.30-9:35 We watch the documentary movie "The True Cost" produced in 2015 by Michael Arlen Ross. The True Cost is a documentary film exploring the impact of fashion on people and the planet.

Lesson 2:

- 8:10-8.30 Talk about the movie – and watch the last part of it, if we did not finish. Review the purpose of working with this subject.
8:30-9:00 Students are put into different groups (4-5 in each group). They have to take a position on different statements (enclosed). Purpose of this is to discuss different point of views and to see things from other perspectives.
9:00-9.10 We talk together on class about the different positions on the statements.
9:10-9:20 Teacher Presentation – how can you be more conscious when buying e.g. clothings.
9:20-9:35 Aftertest (enclosed) what do you know now? + evaluation of lessons

How?

Talking about the subject, testing pre-knowledge, group-work, presentations, after-test and evaluation.

Why? learning outcome

To gain awareness of the importance of sustainability within the local area.

The students should become aware how they can do a difference, how they can influence the situation in the city where they are located helping them and their customers to buy conscious or become more aware of sustainability etc.

In the end, this might inspire/influence on the students in their way of doing shopping/business later on in life. Maybe they will even be able to influence their future employer to use sustainability as a strategy within sale.

Links

1. A conversation with Livia Firth, the Creative Director of Eco-Age and founder of Green Carpet Challenge: <http://truecostmovie.com/interview-livia-firth/>
2. Article: Two years after Rana Plaza, have conditions improved in Bangladesh's factories. <http://www.theguardian.com/sustainable-business/2015/apr/24/bangladesh-factories-building-collapse-garment-dhaka-rana-plaza-brands-hm-gap-workers-construction>

Student evaluation

1. Did you like working with a subject in this way?

a. Yes b. No

2. What was good about it?

3. What could have been better?

4. What did you learn from this lesson?

5. What was the purpose of this lesson?

School

ROC VAN TWENTE

Subject

Sustainability Awareness – What is going on in your own branch?

Target group

Secondary Vocational Education

Duration

5 lessons of 85 minutes

What?
short teaser

The students become aware of both the local and national concerns in regards to sustainability and how they all deal with it within their own branch.

What? detailed description

Lesson 2:

8:30 – 9:30

Teacher:

Inform the students about sustainability. Tell them to make the test serious.

Students:

The students have to make a sustainability test about their own environment.

Aftertest evaluation of lessons

How?

Talking about the subject, testing their own sustainability and make an evaluation.

Why? learning outcome

To gain awareness of the importance of sustainability within the local area.

The students should become aware how they can do a difference, how they can influence the situation in the city where they are located helping them and their customers to buy conscious or become more aware of sustainability etc.

In the end, this might inspire/influence on the students in their way of doing shopping/business later on in life. Maybe they will even be able to influence their future employer to use sustainability as a strategy within sale.

Links

<https://goo.gl/forms/S6sBNLcnFS4J5PvZ2>

Student evaluation

1. Did you like working with a subject in this way?
a. Yes b. No
2. What was good about it?

3. What could have been better?

4. What did you learn from this lesson?

5. What was the purpose of this lesson?

Enclosure 1

pre-test and after-test

- What do you know about the Danish governments plans for sustainability?
- What do you know about the local plans for sustainability?
- What could sustainability be within the retail branch?
- What could sustainability be within the trade branch?
- What could sustainability be within the office branch?
- Do you have any suggestions to optimize sustainability in your local area?

School

Budapest Center of Technical Vocational Training Bolyai

Subject

Sustainability, Ecological footprint in Hungary, in Europe and on the Earth

Target group

Secondary technical school - Physics

Duration

2 lessons of 90 minutes

What?
short teaser

The lessons aim to familiarize students with the notion of ecological footprint, its calculation method and scores in different countries from all over the world. Students get some advice on how to reduce their own ecological footprints. Carrying out the measurements.

What? detailed description

Lesson 1:

10 minutes: Beginning of the lesson, a short introduction to the topic.
What sort of pre-knowledge do students have about the given topic?
Filling in the pre-test.

Starting the presentation

10 minutes: Describing the notion of ecological footprint, discussing the basic rules of the measurement.
10 minutes : Ecological footprint of Hungary and its changes during the past decades
10 minutes: Ecological footprints of the countries in the European Union, evaluating the different scores.
10 minutes: Taking a look at the other countries on the Earth.
15 minutes: Calculating Ss' own ecological footprints with the help of a calculator.
• www.glia.hu/okolabnyom
• www.kothalo.hu/labnyom
• www.footprintnetwork.org
• www.myfootprint.org
10 minutes: Ss work in groups and collect ideas how they can reduce the size of the ecological footprint.
15 minutes: Discussing and evaluating the ideas.
10 minutes: Filling in the After-test, evaluation of the lesson.

Lesson 2:

Calculating the ecological footprint of the school. Ideas of reducing the ecological footprint.
10 minutes: Revision of Ss' knowledge about the ecological footprint.
5 minutes: Creating groups, handing out worksheets.
50 minutes: Ss collect data of the tables and calculate the ecological footprint of the school. Some pieces of advice on reducing the size of the ecological footprint of our school.
15 minutes: Discussing the tasks and ideas.
10 minutes: Evaluation of the lesson.
How?

How?

Talking about the subject, testing pre-knowledge, group-work, presentations, after-test and evaluation. Why? (learning outcome)

Why? learning outcome

One of the biggest challenges of our time is that the average ecological footprint of humankind is 130%. The population of the Earth is increasing and we cannot increase the size of the liveable space. Guidelines on how to reduce our own ecological footprint.

Links

Presentation: http://prezi.com/cdca0hecdmw4/?utm_campaign=share&utm_medium=copy&rc=ex0share

Evaluation sheets: <https://docs.google.com/spreadsheets/d/11Ab7-2WXuY749gd83g7cXKQMCOsLow0KAm2WQNPJ-HI/edit?usp=sharing>

Pre-test

1. What do you think ecological footprint means?
2. Who and what can have an ecological footprint?

Lesson reflection

On the basis of the pre-test the students had only a vague conception of this notion. Some students tried to explain it on the basis of the word itself. Their curiosity that came from the gaps in their knowledge had a good impact on the lesson. They were very active throughout the lessons.

After explaining the notion of 'ecological footprint', they listed the countries with the biggest and smallest ecological footprint precisely. They could give reasons for their choices. They really enjoyed the on-line measurement of the ecological footprint. They filled the forms on several pages and the results showed only decimal differences.

The best thing in this programme is that the student can place the phantom picture of the average picture of Hungary and the Earth on a number line. On an average scale students had 3 ha (Earth: 2,2 ha, Hungary 3,7 ha) From this they could see that the measurement is not exact, but referential.

It helps to draw the students attention where they can reduce the ecological footprint in their own lives most efficiently and they gave great ideas to each other as well.

Most of the students named cycling and walking as the most important examples to be able to reduce the ecological footprint. In Budapest the possibilities of going by bike are getting better.

Students' ideas to reduce ecological footprint:

- We shouldn't buy things that we would throw out
- We should buy domestic food possibly from a grower who lives close to our place of living
- We should buy measured food instead of pre-packaged ones. Try to buy bigger packages than smaller or individually packed ones
- Let's try to use public transport, go by bike or walk, instead going by car
- We should buy energy saving items, lamps
- We should eat vegetables
- Try to reduce the amount of litter

The students were very pleased with the topic of the second lesson. They collected the scores of the school with great enthusiasm. I feel the importance of the measurement is that we should make students interest in energy saving and producing less litter. It is also essential to emphasize the importance of selective waste collection and to show recycling examples to the students.

The students evaluated the lessons with four and five points.

Worksheet

Calculating the ecological footprint

1. If you want to calculate the ecological footprint, first you have to assess the effects of the school on the environment. You can find the aspects of this assessment in the first row of the table. The calculation has a huge pedagogical power, since we have to assess everyday functions from the point of view of the environment and we have to involve people (technician staff, people working in the economy) and data, which is far away from the pedagogical work of the school.
2. You have to write the results of the assessment in these cond column metricized in the given measure unit.
3. You have to multiply the results with the factors in the third column and you have to write the min the fourth column.
4. You have to add the numbers in the fourth column and this will be the aggregated result that you have to write in the last row of the fourth column.

You can get the ecological footprint of one student in your school by dividing the results by the number of the students.

Calculating the ecological footprint of the school

Effects on the environment	Result of the calculation for a year	Factor	Result in ha
Waste treatment			
Recyclable materials in the waste			
Paper (kg)		0.0010	
Glass (kg)		0.00067	
Aluminium (cans) (kg)		0.00333	
Plastic (kg)		0.00167	
Paper collected for recycling (kg)		0.0006	
Glass/ metal collected for recycling (kg)		0.0013	
Number of students and workers		0.01 (energy used for waste collecting and making it harmless)	
Number of students and teachers		0.8 (energy used for making other materials shamless: e.g. paints, oils)	
Energy			
Oil (liter)		0.000001391	
Gas (km ³)		0.001255	

Electricity (kwh)		0.0000125	
Energy from solar energy resource (kwh)		0.00000233	
Energy produced from wind (kwh)		0.00000181	
Water			
Consumption in the last year (liter)		0.00000167	
Traffic			
Car (km per person)		0.00015	
Bus (km per person)		0.0000173	
Metro (km per person)		0.0000043	
Train (km per person)		0.000008	
Walking/ Cycling/ Scooter (km per person)		0.0	
Number of students and workers altogether		0.3 (resources used for building and maintainance of roads)	
Green area			
Floorspace of the school (m ²)		0.00001	
School yard (m ²)		0.00001	
Parking area (m ²)		0.00001	
Food			
Number of students and workers altogether		2.9 (That size of place supplies one person with food a year on an average basis)	
Result: Ecological footprint of the school			
Ecological footprint of one person			

Resource: <http://mkne.hu/pie/piekonyv3.htm#c>

School

Subject

Target group

Duration

What?
short teaser

Skive Handelsskole (Business School – VET)

Sustainability Awareness – What is going on in your own branch?

Business School – VET area – but can easily be used by other from the age of abt. 16+. to become a more conscious consumer

4 lesson of 85 minutes

The students become aware of both the local and national concerns in regards to sustainability and how they all deal with it within their own branch.

What? detailed description

Lesson – Assignment 1:

8:10 – 14:50

Pre-test: How conscious are your students about the local and national awareness of sustainability? (enclosure 1)

Teachers presentation about national/local sustainability within the areas of Financial -, Social - and Green sustainability.

Student assignment: Find out what is sustainability within the branches: Retail, trade and office – both nationally where you point out the most important points for 2020 but especially locally where you must explain the plans more detailed.

You have to make your presentation material in a Power Point and prepare your presentation (what do you want to say/inform about)

Aftertest (enclosed) What do you know now? + evaluation of lessons

How?

Talking about the subject, testing pre-knowledge, group-work, presentations, after-test and evaluation.

Why? learning outcome

To gain awareness of the importance of sustainability within the local area.

The students should become aware how they can do a difference, how they can influence the situation in the city where they are located helping them and their customers to buy conscious or become more aware of sustainability etc.

In the end, this might inspire/influence on the students in their way of doing shopping/business later on in life. Maybe they will even be able to influence their future employer to use sustainability as a strategy within sale.

Links

1. file:///C:/Users/jean280a/Downloads/et%20baeredygtigt%20danmark_udvikling%20i%20balance_web_a.pdf
2. <http://www.serviceplatform.dk/blog/b%C3%A6redygtighed-i-detailbranchen>
3. <http://trendsonline.dk/2016/04/13/finalister-til-ivaerksaetterprisen-3r-kontor/>
4. <https://www.skive.dk/aktivt-liv/rent-liv/sammen-om-rent-liv/>
5. https://www.skive.dk/media/5542/skive_kommunes_erhvervspolitik_2013_2016_endelig_udgave.pdf
6. <https://www.skive.dk/media/7444/klima-og-energi-strategi-2029.pdf>

Student evaluation

1. Did you like working with a subject in this way?
a. Yes b. No
2. What was good about it?

3. What could have been better?

4. What did you learn from this lesson?

5. What was the purpose of this lesson?

Enclosure 1

pre-test and after-test

- What is a product presentation?
- What does a product presentation include?
- What is typical in your homeland?
- Interesting facts about your homeland.
- What is a typical costume in your homeland?
- Why do companies make company presentations?
-

School

Subject

Target group

Duration

What?
short teaser

Stredná priemyselná škola-Ipari Szakközépiskola Komárno

Economics-Fair Trade - Form of trade supporting sustainable development

Business School – VET area – students aged 17-19

2 lessons of 45 minutes

Teach your student

To understand the idea of sustainable development from economic aspects.

To use geographical vocabulary to examine the different factors that influence where tea is grown. To understand what the impact of Fairtrade can be for farmers and workers.

What?

detailed description

Lesson 1:

8:00-8:15 Brainstorming: students work in small groups of 3or 4- they are allowed to use internet sources for collecting their ideas about fair trade and they try to express their own opinions- logos, images of fair trade products are displayed

8:15-8:40 Presentation : see resources (1)Talk on the class or in groups about

Fair trade products:

What does the competitive advantage mean?

How does Fair trade work?

Fair Trade mark

How can be the money spent from fair trade business ?

Why is it important for sustainable developing globally?

8:40-8:45 Conclusion

Lesson 2:

8:00-8:20 Quiz: students read the questions carefully and give their answers
Show link number 2

8:20-8:30 Evaluation : Talking about the quiz

8:30-8:40 Group Work- Brainstorming:

What other products can be bought with the logo of fair Trade?

How to motivate buyers for consuming these products?

What are the benefits of purchasing fair trade products?

How can development be sustainable in your area?

How?

Talking about the subject, testing pre-knowledge, group-work, presentations, after-test and evaluation.

Why?

learning outcome

To gain knowledge about fair trade products. To become more aware of the purposes of different organisations dealing with fair trade, become a more conscious buyer, but also to understand, how companies can integrate the policy of fair trade and gain from it. In the end, to be able to give good advice/suggestions to their future employer, to adapt the idea of the advantages of local farming

Links

1. <http://schools.fairtrade.org.uk/resource/tea-in-malawi-what-happens-when-you-choose-fairtrade/>
2. <http://environment.nationalgeographic.com/environment/green-guide/quizzes/sustainable-food/>

Student evaluation

1. Did you like working with a subject in this way?

a. Yes b. No

2. What was good about it?

3. What could have been better?

4. What did you learn from this lesson?

5. What was the purpose of this lesson?

School

Subject

Target group

Duration

What?
short teaser

Skive Handelsskole (Business School – VET)

Sustainability Awareness – What is going on in your own branch?

Business School – VET area – but can easily be used by other from the age of abt. 16+. to become a more conscious consumer

4 lesson of 85 minutes

The students become aware of both the local and national concerns in regards to sustainability and how they all deal with it within their own branch.

What? detailed description

Lesson – Assignment 2:

8:10 – 14:50

Make a profile of the businesses: Retail, trade and office:
What are you working with within the 3 type of businesses?
What will your job be in the future within the businesses?

You have to make presentation material covering the above points and prepare your presentation (what do you want to say/inform about).

Make a questionnaire to companies in Skive asking them how concerned they are about sustainability and how they deal with this topic. Again it must be within your branches retail, trade and office.

Choose 10 different companies.

Visit the companies. Ask them to complete the questionnaire and bring them back to the school.

Now you have to work in groups – 4 persons each group.
Choose one company you would like to work with.
Analyse the company – make a company presentation.

Work with the questionnaire the company has filled out and find new ways to help the company become more aware of sustainability. Give them 1 to 2 new ideas of how to improve sustainability within their company and tell them how to implement it. (food waste, paper waste etc.)

Find 4 ways of how the shop/office should spread out the message to make customers aware and think about sustainability.

You have to make your presentation material in a Power Point and prepare your presentation (what do you want to say/inform about).

How?

Talking about the subject, testing pre-knowledge, group-work, presentations, after-test and evaluation.

Why? learning outcome

To gain awareness of the importance of sustainability within the local area.

The students should become aware how they can do a difference, how they can influence the situation in the city where they are located helping them and their customers to buy conscious or become more aware of sustainability etc.
In the end, this might inspire/influence on the students in their way of doing shopping/business later on in life. Maybe they will even be able to influence their future employer to use sustainability as a strategy within sale.

Links

1. file:///C:/Users/jean280a/Downloads/et%20baeredygtigt%20danmark_udvikling%20i%20balance_web_a.pdf
2. <http://www.serviceplatform.dk/blog/b%C3%A6redygtighed-i-detailbranchen>
3. <https://www.skive.dk/media/7444/klima-og-energi-strategi-2029.pdf>
4. <http://www.refood.dk/rfdk/groent-danmark/madaffald/undgaamadspild/?gclid=C0rrosuQ-9ECFUVJGQodVfEKOQ>
5. <https://www.foedevarestyrelsen.dk/Leksikon/Sider/Madspild.aspx>
6. <http://csr.dk/til-kamp-mod-det-un%C3%B8dige-papirspild>

Student evaluation

1. Did you like working with a subject in this way?
a. Yes b. No
2. What was good about it?

3. What could have been better?

4. What did you learn from this lesson?

5. What was the purpose of this lesson?

Enclosure 1

pre-test and after-test

What is retail? What are you working with and with whom?

What is trade? What are you working with and with whom?

What is the office branch? What are you working with and with whom?

Give as many new ideas of how to improve sustainability within:

- the retail branch (1 minute)
- the trade branch (1 minute)
- the office branch (1 minute).

School

Kaufmännische Schulen Tecklenburger Land

Subject

Sustainability, Job and environmental factors

Target group

Business Administration class-12th form from 17 to 19 years

Duration

1 lesson of 45 minutes

What?
short teaser

Students reflect their internship at company and propose some ideas of having a greener company

What?

detailed description

Lesson 1:

7:40-7:50 Every student shortly describes his company he attended and worked at.
(sitting in the circle)

7:50-8:00 Every student thinks about green measurements that are suitable
for his working place and writes down at least 3 measurements.

8:00-8:10 Students share their ideas in pairs

8:10-8:25 Students discuss their ideas and check whether these ideas are
feasible.

How?

Talking about green jobs, method. think, pair and share

Why?

learning outcome

This lesson creates awareness of the importance of sustainability at the workplace. Students
can provide their knowledge about the company they had been working for.

Student evaluation

1. Did you like working with a subject in this way?
a. Yes 5 students b. No 12 students
 2. What was good about it?
- got some new ideas/could give a company an advice
 3. What could have been better?
- there was not enough time
 4. What did you learn from this lesson?
- we have to change our job portfolio- more green aspects must be considered in the world of work
 5. What was the purpose of this lesson?
- have become more aware of the students' responsibility to change their job places in the future.
-

Student Evaluation (CSR-Assignment)

School

Skive Handelsskole (Business School – VET)

Subject

Sustainability: CSR

Target group

Business School – VET area – can be relevant for everyone working with CSR at a certain level.
Age: +15 years.

Duration

2 lessons of 85 minutes

What?
short teaser

Teach your students about CSR? Learn to understand the meaning of CSR, about the CSR-Foundations e.g. in Denmark, hear about CSR-Awards, CSR (Prizes, Prize-winners and argumentations for picking winners) and hereby obtain knowledge about companies who got nominated and prizes. Finally, understand why companies invest in CSR. This will expand your student's knowledge within the area of sustainability.

What?

detailed description

Lesson 1:

9.50-10.10 Pre-test: what do the student already know about CSR?
(enclosure 1)

10.10-10.30 PowerPoint from teacher about CSR and the Student assignment
(enclosure 2)

10.30-11.15 Students work in groups of 3 with the assignment. They have to:

1. Explain what CSR-Awards is? Moreover, how often it takes place.
2. Tell about the prize you have picked/gotten:
 - a) What is the purpose of the prize?
 - b) Who were the nominated?
 - c) Who were in the Jury?
 - d) Why did the Jury pick exactly this company as the winning company?
3. Why do you think companies choose to invest in "social Responsibility"? What do they gain?

Lesson 2:

11:45-13.10 Student Presentations – All groups in front of the class
In this way the students (5-7 min each group)

12:55-13.10 After-test & Evaluation. (enclosure 3+4)

How?

Testing pre-knowledge, giving information (teacher presentation), group-work, presentations, after-test and evaluation.

Why?

learning outcome

To gain knowledge about CSR. To become more aware of the purposes of CSR and to gain knowledge about companies concerned about CSR. In this way, the student will be able to understand company strategies and, herewith, be able to influence future work places and employers.

Links

<http://www.csrfonden.dk/>

Student evaluation

1. Did you like working with a subject in this way?

a. Yes b. No








2. What was good about it?

3. What could have been better?

4. What did you learn from this lesson?

5. What was the purpose of this lesson?

Annexe work sheet

Labels	Describe the label – what does it mean/stand for? Is it Danish, Nordic, European or even internationally known?
	
	
	
	
	
	
	

School

Subject

Target group

Duration

What?
short teaser

Stredná priemyselná škola-Ipari Szakközépiskola Komárno

Alternative Energy Resources

Secondary School of Technology –students aged 17-19– but can easily be changed into another area with substitution of other branch relevant labels.

4 lessons of 45 minutes

Teach your students to new technologies of producing the electric energy forcefully on using renewable energy sources with minimal negative environmental impact. Why is it a weighty problem? Expand your students' horizons on types of renewable energy: solar, wind, geothermal and bioenergy. Clear up the differences in power and ecology.

What?

detailed description

Lesson 1:

8.00-8.10 Energy sources today: which kind of energy is used. What kind of resources do students know. Current energy sources:

- thermal power station
- nuclear power station
- hydroelectric power plants

Renewable energy – definition.

8.10-8.20 photovoltaic/PV systems

8.20-8.30 solar electricity

8.30-8.35 solar hot water

- 8.35-8.45
 - PV concentrators
 - PV arrays,
 - What do students know?

Lesson 2:

8.00-8.10

- household wind turbines

8.10-8.20

- industrial wind power plants

8.20-8.40

- wind turbines combined with a photovoltaic (solar cell) system.

8.40-8.45

- working principle

Lesson 3:

8.00-8.10

- biomass energy sources

8.10-8.20

- biofuels

8.20-8.30

- biopower

8.30-8.40

- bioproducts

8.40-8.45

- ask students to tell about using bioenergy in their places

Lesson 4:

8.00-8.15

- geothermal energy technologies

8.15-8.30

- energy produced by ocean

8.30-8.45

- benefits of green power

How?

Talking about the subject, testing pre-knowledge, group-work, presentations and evaluation.

Why?

learning outcome

To gain knowledge about green power, but also to understand that it is necessary for their better future. In the end, to be able to give good advice/suggestions to their future employer.

Links

1. Obnovite né zdroje energie D.Petráš a kol.
2. Elektrický proud ze slunce A. Henze
3. <http://www.renewableenergyworld.com/index.html>

Student evaluation

1. Did you like working with a subject in this way?

a. Yes b. No

2. What was good about it?

3. What could have been better?

4. What did you learn from this lesson?

5. What was the purpose of this lesson?

School

Subject

Target group

Duration

What?
short teaser

Stredná priemyselná škola-Ipari Szakközépiskola Komárno

Electrotechnology - Low-power mode in circuits with controllers

Secondary School of Technology –students aged 17-19– but can easily be changed into another area with substitution of other branch relevant labels.

3 lessons, 1 x 45 minutes theory 2 x45 minutes practices

Teach your students to programming low-power mode for their circuits with microcontroller boards Arduino Uno. What is sleep mode of digital controllers, why is it weighty? Expand your students' horizons on low-power components and technologies. Show them how companies note low-power products. Teach them how to determine the duration of a rechargeable battery connected to an Arduino microcontroller board.

What? detailed description

Lesson 1:

8.00-8.10 Pre-test: which low-power technologies does the students know from electronic lessons

8.10-8:20 refresh the technical specifications of Arduino Uno:

- Microcontroller type?
- Operating Voltage?
- Input Voltage?
- Do you know what is the difference between them?
- DC Current per I/O Pin?
- Clock Speed?

8:20-8:40 Sleep mode:

- to save power on Arduino boards
- for reducing power and extending battery life
- use interrupts to wake up the Arduino

8:40-8:45 Make a schematic for the practice

Lesson 2 (PRACTICE):

8:00-8.10 Connect Your Arduino board to PC, start the Arduino software.

8:10-8:25 Exercises to programming sleep and wake up the board.

8:25-8:45 Connecting the hardware to the board. Use the schematic from the lesson. Prepare the multimeter to measure the voltage or current.

Lesson 3 (PRACTICE):

8:00-8:20 write a code to control pushbutton for switch board to sleep – low-energy mode and wake it up.

8:20-8:35 Upload the code to the Arduino board and make a measurement of power during normal and sleep mode.

8:35-8:40 Talk about the results of measurement.

8:40-8:45 Practical examples for digital equipments, where energy can be saved by upgrading and new software technologies or to extend the life of the battery

9:40-9:50 Evaluation – did you like working with a subject in this way?

What was good about it? What could have been better? Did you learn anything? Do you understand the purpose of this subject?

How?

Talking about the subject, testing pre-knowledge, group-work, presentations and evaluation.

Why?

learning outcome

To gain knowledge about reducing power and extending battery life, but also to understand the content of the data sheets of devices, how to select from the technically different products for built the better future. In the end, to be able to give good advice/suggestions to their future employer.

Links

1. Reducing Arduino Power Consumption:
<https://learn.sparkfun.com/tutorials/reducing-arduino-power-consumption>
2. How to let your Arduino go to sleep and wake up on an external event:
<http://playground.arduino.cc/Learning/ArduinoSleepCode>

Student evaluation

1. Did you like working with a subject in this way?
a. Yes b. No
2. What was good about it?

3. What could have been better?

4. What did you learn from this lesson?

5. What was the purpose of this lesson?

School

Subject

Target group

Duration

What?
short teaser

BMSZC Bolyai János Secondary Technical School (VET)

Presenting Hungary's electricity production

Secondary Technical School - IT lesson – age group 16-17

1 lesson of 90 minutes

Collecting and analyzing the data of different types of electricity production in Hungary

What? detailed description

Preparation

Students copy the Excel sheets.

0-10 mins Discussion :The importance of electric energy in the present industry (aluminum industry, manufacturing industry) transportation (trains, trams, trolley buses, hybrid vehicles) IT

Discuss what sources of energy there are
renewable energy resources

water

wind

solar

biomass

non-renewable energy resources

fossil fuels

nuclear fuels

10-45 mins The sheets attached contains Hungary's power plants.
Find the missing data of different power plants with the help of the internet.
Copy the website link where you have found the data on the given worksheet

Summarize their output according to the different types.

Sort the charts of the output of power plants in increasing order.

Create a new worksheet where you present the sum of the output data according to the type of power plants.

Summarize the generated amounts.

Make a bar chart and a pie chart about the energy production of the different types of power plants on a different worksheet.

The exact values should be presented

Make sure the legend is displayed

45-55 mins Which type of power plant generates most of the energy?
Which type of power plant do you think has the smallest effect on the environment?
What other less frequently used resources of energy are there in Hungary?

Create a new diagram showing the grouped sum of renewable and non-renewable sources of energy

What is your conclusion?

e.g. We should make more use of the resources of renewable energy.

- 55-65 mins Form three groups (wind, thermal, hydro-electric)
Each group should find the 9 power plants of the given type with the highest output and mark them on the map.
You can edit it into a picture editor program too.
Completing the task you should put it back to the worksheet.
(Those who work with the hydro-electric power should find the nuclear power station too.)
Students work in groups, using maps on the internet and working with Paint or other programs.
- 65-70 mins What kind of power stations are there in different parts of the country?
How is the energy production geographically distributed?
What sources of energy could we use more? (wind, water)
- 70-90 mins Find on the internet alternative options for traditional (incandescent) light bulbs and show how much energy they need compared to incandescent light bulbs
Click on the lights sheet.
Find the output of the LED and CFL lights equivalent to a 60W incandescent light.
Count the annual use if they are on 2 hours a day.
How much is the annual use?
Count the annual cost of the different lights with the help of the given Wh fees.
Make a bar chart about the costs of the different lights
What is your conclusion?

How?

Computers, Excel, internet, Paint, individual and group work

Why?

learning outcome

Expanding the students' knowledge about energy generation. Raising the students' awareness of the importance of energy conservation and energy efficiency. Drawing attention to the advantages of advanced technologies

Links

references

Excel file:
<https://drive.google.com/open?id=10-XGFnKEvhPCekTpLZ9w6NUXhHvIw8HErxkVB4nJlJs>
 Lesson evaluation: <http://goo.gl/forms/Ra0mnaldNfTKGjjH2>
 Results of evaluation: https://docs.google.com/spreadsheets/d/1WAU3lQVOUF0rd_nx5xxvTj0L4TX8PWB6VKBDa0yKT-c/edit?usp=sharing
www.wikipedia.com
<http://www.mert.hu/hu/eromu>
www.atomeromu.hu/
<http://www.energiakaland.hu/>

School

Subject

Target group

Duration

What?
short teaser

BMSZC Bolyai János Secondary Technical School (VET)

Sustainability, producing electrical energy in Hungary and in Europe using renewable sources

Secondary school - Electronics and electrotechnics area

2 lessons of 90 minutes

Teach students about the ways electrical energy is produced, which are eco-friendly and what does it take to spread it. Expand your students' horizons on the use of solar, wind, geothermal and hydropower energy. Plan a device that runs on one of these energies.

What? detailed description

Lesson 1:

10 minutes – Pre-test:

- How is electrical energy produced?
- What is a generator and how does it work?
- What is a turbine and what is its role in the energy production?
- What drives the turbine and how is it produced?

30 minutes – Frontal work (presentation):

- Classifying power plants based on what drives the turbine
- Thermal power plants (fossil-fueled such as coal-fired, oil-fired and gas-fired stations, waste-to-energy plants or waste incineration plants)
- Hydropower plants (pumped storage plants, run of river plants, tidal power plants)
- Renewable energy power stations (wind turbines, geothermal power plants, solar stations)

15 minutes – Research: find answers on the internet to questions about power plants in Hungary.

20 minutes – Frontal work (presentation) Renewable energies

- Wind turbines – how they work (video1)
- Solar power plants – solar towers (video2) and photovoltaic cells, types, what are the differences and how they work

15 minutes – Measurements: measuring a single photovoltaic panel's maximum working voltage and current, output voltage and short circuit current, connecting PV cells in series and parallel and measuring the same electric features.

Used instrument(s): DMM

70-90 mins

- Find on the internet alternative options for traditional (incandescent) light bulbs and show how much energy they need compared to incandescent light bulbs
- Click on the lights sheet.
- Find the output of the LED and CFL lights equivalent to a 60W incandescent light.
- Count the annual use if they are on 2 hours a day.
- How much is the annual use?
- Count the annual cost of the different lights with the help of the given Wh fees.
- Make a bar chart about the costs of the different lights
- What is your conclusion?

Lesson 2:

10 minutes – Brainstorming: How does the (mobile phone) charger work and how to use photovoltaic cells as the main part of the device?

20 minutes – Frontal work (presentation and program description): Getting familiar with CADSoft's Eagle 7.6 printed circuit board designer program.

60 minutes – Planning the schematics and designing printed circuit board for a mobile phone charger that operates with two 4V cells connected in series. Output voltage is strictly regulated to 5 volts, constant current is maximized in 1 ampere.

How?

Talking about the subject, testing pre-knowledge, group-work, presentations, circuit designing and evaluation.

Why?

learning outcome

Expanding the students' knowledge about energy generation. Raising the students' awareness of the importance of energy conservation and energy efficiency. Drawing attention to the advantages of advanced technologies

Links

references

<http://www.renewableenergyworld.com/>

<http://www.iflscience.com/>

Evaluation:

<https://docs.google.com/spreadsheets/d/1ESyZ1fipGsfXKS0CjxLCmf44s57U2j5DRyXnF4wllaA/edit?usp=sharing>

Reflection

The students were interested in the topic since they are studying this area (electronics and electrotechnics). The pre-test showed that they know a lot about electrical energy production, the different types of power plants, their locations in the country and some of them even knew how the generator and the turbine work.

During the presentation they were paying attention, some were passing notes as well.

Embedding videos in the presentation was a good idea, several examples were mentioned by the students after the one describing the wind turbines.

The measurements went well since they were familiar with the instrument and the measuring methods we used. The results showed that the PV panel's output voltage will be high enough for the project: to design (and later to build) an electrical network-independent mobile phone charger using photovoltaic panels.

Since the students had never used a printed circuit board planner software before, it took me a while to introduce CADSoft's Eagle 7.6 to them, but they got along with it later on.

At the end of the second lesson we had the schematics and the board plan completed for the device.

School

Subject

Target group

Duration

What?
short teaser

BMSZC Bolyai János Secondary Technical School (VET)

Sustainability, talking about energy conservation and energy efficiency in everyday

Secondary Technical School – English lesson – pre-intermediate – intermediate level

3 lessons of 90 minutes

The lessons look at the different ways of energy conservation and energy efficiency in our homes, teach new vocabulary related to energy conservation, expand students' horizons on actions they can do in their homes to save energy, make students realize how changing their behaviours and appliances will affect the energy they use. Students will produce presentations or posters and write emails giving advice on saving energy and lower the electricity bill in the home.

What? detailed description

Lesson 1:

- I. Aim of the lesson (time: 2')
T writes "Saving energy" on the board and asks Ss to raise their hands if they try to save energy in any ways, then tells them that they will be learning and speaking about energy saving topics in the next 3 lessons.
- II. Warmer – Scrambler - online game 1 – pair work (time: 30')
T tells Ss to pair up and play an online game related to the topic.
In the game Ss place letters in the correct order to form a completed sentence related to the topic.
Ss work in pairs, one student works on the computer, the other one writes down the completed sentences into their exercise books.
The winning pair has the most completed correct sentences within 30 minutes.
Answer key:
 1. Keep your computer in sleep mode so it sleeps when you are not using it.
 2. Open your curtains on sunny winter days to let the sun shine in.
 3. Plant trees around your house to keep it cool in the summer time.
 4. Close your curtains at night to keep your home heated.
 5. Turn off the water while you brush your teeth.
 6. When you are using the oven try to cook more than one dish.
 7. Turn off the lights and electronics when you leave a room.
- III. Testing Ss' prior knowledge - individual work (time: 20')
T finds out what Ss know about energy savings, what advice they can give to others on the topic, and how aware they are of the ways people waste or save energy.
Ss fill in a pre-test.
- IV. Grouping - (time: 2')
Ss pick a picture (picture of a kitchen, a bathroom and a living room)3 from a box and form 3 groups with the same pictures.
- V. Brainstorming – group work (time: 8')
 - A. Actions that need electricity(e.g.: cooking dinner, hovering carpets, writing an email)
 - B. Energy sources (e.g.: sun, water, wind, coal, gas, oil, biomass, uranium)
 - C. Items that use electricity(e.g.: computer, washing machine, air conditioner, light bulb)Checking: Teacher writes the Ss' ideas on the board
- VI. Class discussion on saving energy - frontal work (time: 14')
Possible discussion questions: (depending on the level, speaking skills and interests of the students)
 - Why is saving energy so important?

- (energy is not free; most of the energy sources can't be replaced; most forms of energy can cause pollution;)
- How would it affect people if they ran out of energy resources?
- Have you ever heard about energy conservation and energy efficiency? (T writes new words on the board.)
- What's the difference between energy conservation and energy efficiency?

(T explains new words and expressions.

Energy conservation: an act of using less energy; (E.g.: Drying clothes outside on sunny days.)

Energy efficiency: products + an act of using less energy (E.g.: buying or using products - LED bulbs- that use less energy.)

- Can we or should we use less energy? Why? /Why not?
- Do people have a responsibility to conserve energy?
- Tell me some examples of "good" energy saving behaviours. (E.g.: I always turn the lights off when I leave the room.)
- Tell me some examples of "bad" energy-wasting behaviours. (E.g.: I open the fridge door too often.)
- What gives you information about the energy efficiency of a fridge or a washing machine?
(In Europe: Energy labels with energy ratings;
In the USA: Energy Star labels; - energy star qualified appliances/ appliances with Energy Star labels use less energy)
- Have you ever heard about energy efficient appliances with A, A+, A++ or even A+++ energy ratings? Which one is the most energy efficient?

VII. Presenting resources 4 and setting the task - frontal work - (time: 10')

Presenting and talking about the links and videos Ss can use to get ideas for making their presentations.

VIII. Making a group decision on the task - group work - (time: 4')

After studying the links and videos Ss make a group decision on how to give their presentations. They can give a poster or a PowerPoint presentation on how to save energy in the kitchen (group 1), in the bathroom (group 2), and in the living room (group 3).

Lesson 2:

I. Warmer: Water Sense online game – pair work (time: 30')

T tells Ss to pair up and play an online game related to the topic.

Ss play Water Sense Game in pairs. In the game Ss use the keyboard's arrows to run "Flow" the Water Saver Hero through the maze to reach one of the four pictures (a sink, a toilet, a sprinkler and a water glass). At each picture Ss are asked two questions. If the answers are correct, "Flow" the Water Saving Hero will be protected from Water Waster Monsters for a short time.

If both questions are correct, Ss can grab "Golden Water Drops" for bonus points. Ss should avoid Water Waster Monsters because "Flow" only has 3 lives. If a Water Waster Monster catches "Flow" three times, the game is over.

T writes new words on the board and explains them.

1 gallon= 4,5 litre (GB) 1 gallon=3,7 liter (USA)

faucet (USA) = tap (GB) sprinkler= a piece of equipment used for scattering drops of water

II. Preparing the presentations - group work (time: 60')

Ss work in groups and prepare their presentations. T monitors and helps.

Before the lesson T creates a facebook group where students can upload their slides to share information, share their projects with the rest of the class.

III. Optional time-filler tasks: (Supplemental activities for early finishers)

1. Make an Energy Quiz for the others
2. Write as many new words from the word "conservation" as you can
3. Write slogans related to energy conservation

Lesson 3:

- I. Warmer: Energy saving online game - pair work (time: 25')
T tells Ss to pair up and play an online game related to the topic.
Ss play Water Sense Game in pairs.
In the game SS select items in the house to see how they can reduce energy. At each selected item Ss are given a question and asked to select the correct answer out of 3 choices. If the answer is correct Ss make the energy usage meter go down.
The winner is whose energy usage meter goes down first or goes down the lowest within 25 minutes.
- II. Giving presentations (time: 30')
Ss give their presentations in front of the class.
- III. Testing Ss' knowledge gain - Writing a post-test - (time: 20')
Ss write a post-test (the same as the pre-test) testing their improvement.
- IV. Filling in an evaluation sheet (time: 10')
Ss evaluate the lessons.
- V. Homework assignment (time:5')
Ss write an email of 50-80 words in which they give advice how the teacher's family could save energy at home and lower the electricity bill as well.

How?

Talking about the subject, testing pre-knowledge and improvement, preparing and giving presentations, writing a letter of advice, playing online games, discussing energy related questions, doing optional time-filler tasks, evaluating, working in groups, pairs and individually.

Why? learning outcome

Expanding the students' knowledge about energy conservation and energy efficiency. Raising the students' awareness of the importance of energy conservation and energy efficiency in their homes to become more environmentally conscious citizens of Europe. Revising and expanding the students' vocabulary related to the topic. Providing practice on giving energy and water saving advice.

Links references

1. Warmer (lesson 1) – Scrambler online game
<http://www.energyquest.ca.gov/games/scrambler.html>
2. Warmer (lesson 2) – Water Sense – online game
<http://epa.gov/WaterSense/kids/games.htm>
printed version of the quiz questions with an answer key:
<https://www3.epa.gov/watersense/docs/kidsquiz.pdf>
3. Warmer (lesson 3) – Saving energy – online game
<http://www.olliesworld.com/club/gamehouse.htm>
4. Resources for learning and getting ideas for making presentations
<https://www.britishgas.co.uk/help-and-advice/save-energy-save-money/Energy-saving-tips/top-10-energy-saving-tips.html> (British website)
<https://www.energystar.gov/campaign/waysToSave>
(American website; Click "Show all" to see all the pictures)
https://www.youtube.com/watch?v=LVjn_BrhnLk
("Saving energy at home" – video – time: 3.51)
<http://www.youtube.com/watch?v=1-g73ty9v04> (" Energy, let's save it!" – video Time: 3.39)
5. Online dictionaries
<http://www.macmillandictionary.com> (monolingual dictionary)
<http://www.ldoceonline.com/dictionary> (monolingual dictionary)
<http://www.thefreedictionary.com> (monolingual dictionary)
<http://www.dictzone.com/angol-magyar-szotar> (bilingual dictionary)
<http://topszotar.hu/angolmagyar> (bilingual dictionary)
6. Evaluation sheets

Reflection

It was really challenging for me to create a lesson plan on sustainability as a teacher of English. It was not easy to find out what to do and how to do it to meet the objectives or the teaching goals of the lessons. I also had difficulty in finding authentic and suitable teaching material, online resources to reach my goals.

I wanted something to do with computers to make the lessons interesting, motivating and up-to-date for my teenage students. As I was teaching the lessons I felt I managed to reach what I wanted.

I believe that my instructional goals were eventually met. I wanted to expand my students' knowledge about energy conservation and energy efficiency and raise their awareness of the importance of the topic. Also, I intended to revise and expand my students' vocabulary and provide practice on giving advice on saving energy and water at home. I also wanted my students to prepare a presentation related to the topic.

The warmer tasks were the strength of the lessons. These were the activities my students enjoyed most. These online games were not only interesting and motivating for my students but also very useful for activating and expanding the students' vocabulary as well as getting tips on saving energy and water in the home. While I was monitoring, it was great to see the pairs working on the task intensely and helping each other.

It was a good idea to use videos in the lessons as my students liked them very much and could profit from them as well. These videos gave my students a great opportunity to practise their listening skills and expand their vocabulary. The videos also provided the students with lots of information related to our topic.

As for presentations, it was also a good idea to create a facebook group before the lesson where the students could upload their slides. In that way they could have a look at each other's work, share ideas and learn from each other.

While preparing their presentations, I let my students be creative with their work and therefore there was lots of laughter which helped to contribute to a relaxed atmosphere.

During the presentation stage I altered my lesson plan as the majority of the students were too anxious to speak in front of the whole class. I did not want to put too much pressure on them so I decided to play a game instead. I divided the students into 3 groups again according to their presentation tasks and showed them one of the pictures I used for grouping (living room, bathroom, and kitchen). The first team to shout a correct energy or water saving tip related to the picture won a point. My students enjoyed the game very much. Besides, it was an effective way to summarize the important ideas from the lessons and track the students' progress on the topic.

To finish our lessons as energy savers, we completed our lesson evaluation sheets online so that we could save paper.

When I teach this lesson again I'm going to make some changes to make it more effective. First, I'm going to let my students use more lifehack videos (as resources) from YouTube since my students enjoy them very much. Besides, these short films are very useful for developing listening skills and expanding vocabulary. Also, at the end of the lesson I'm going to distribute the completed pre-tests again instead of distributing post-tests, and ask the students to complete the task sheet with as many new tips on saving energy and water as they can using a pen with a different colour. In that way we could save lots of paper and my students could see their progress on the same piece of paper. What's more, my students would be very pleased to write less in the lesson as they really hate handwriting.

Overall, the lessons went really well. I believe that my students achieved the learning goals. They did really well on the post test and were actively engaged throughout the lessons. Each student was participating. At the end of the lesson they were able to correctly give advice on saving energy and water in their homes.

My colleagues made some very good comments on my lesson plan. One of my colleagues mentioned that she liked the tasks, especially the online games and intended to try them out in her classes, too.

Most of my students gave me very positive feedback and it seems that they really liked the lesson.

Appendix

pre-test task sheet

1. Describe 1 - 4 ways you and your family waste energy.

2. List 1-4 energy saving tips for lighting.

3. List 1-4 energy saving tips for cooking.

4. List 1-4 energy saving tips for appliances and machines.

5. List 1-4 energy saving tips for windows.

6. List 1-4 energy saving tips for heating

Appendix

pictures for grouping



Student evaluation

with 1 = most negative and 5 = most positive

	–				+
1. Did you like working with a subject in this way?	1	2	3	4	5
2. Was the lesson efficient to improve your knowledge about sustainability?	1	2	3	4	5
3. Did the lesson give ideas about sustainability?	1	2	3	4	5
4. Did the lesson give ideas about how to					
a) save energy in your home?	1	2	3	4	5
b) give advice to others on saving energy and water?	1	2	3	4	5
c) become more energy efficient?	1	2	3	4	5
5. Overall, how would you rate the lesson?	1	2	3	4	5
6. Was your interest held?	1	2	3	4	5
7. Were the topics covered interesting to you?	1	2	3	4	5
8. Were the tasks of the lesson clear to you?	1	2	3	4	5
9. Was the content of the lesson easy to follow?	1	2	3	4	5
10. Were the materials distributed helpful?	1	2	3	4	5
11. Will the lesson be helpful in your future life/work?	1	2	3	4	5
12. Was the purpose of the lesson met?	1	2	3	4	5
13. Did you learn a lot from the lesson?	1	2	3	4	5
14. Did your knowledge improve about sustainability?	1	2	3	4	5

School

Subject

Target group

Duration

What?
short teaser

Kaufmännische Schulen Tecklenburger Land

Sustainability, Environmentally friendly cars

Business Administration class-12th form from 17 to 19 years

2 lessons of 45 minutes

Which car manufacturer has a green range of cars?

What? detailed description

Lesson 1:

7:40-7:45 What kind of energy source can cars be operated with? Teacher and students develop a mindmap on the blackboard.

7:45-8:15 Internet research: Each group (3 – 4 students) gets a certain card with a car manufacturer. Find out what kind of energy used to operate the car of this manufacturer.

8:15-8:25 Students present their results and decide which car manufacturer has the best green ideas.

How?

Talking about the subject green cars

Why? learning outcome

This lesson encourages students to recognize that environmentally friendly features are also important for finding the right car.

Student evaluation

1. Did you like working with a subject in this way?
a. Yes 17 students b. No 12 students
 2. What was good about it?
- got some new ideas of green features
 3. What could have been better?
actually need more time to get more detailed information, an excursion to a car dealer would have been helpful.
 4. What did you learn from this lesson?
- green cars can also save money because of some governmental subsidies.
 5. What was the purpose of this lesson?
- to find more information about green cars
-

School

Subject

Target group

Duration

What?
short teaser

ROC VAN TWENTE

Sustainability Awareness within the students' branches – What is going on in your own branch?

Secondary Vocational Education

5 lessons of 85 minutes

The students become aware of both the local and national concerns in regards to sustainability and how they all deal with it within their own branch.

What? detailed description

Lesson 3:

8:30 – 10:30

Teacher:

Inform the students about sustainability in their community. Explain what they need to do.

Students:

The students have to make a report about the three following subjects. They need to have the results of their energy meters from about a month before.

A)

Compare energy meters. After a month of reporting the results they need to talk with each other about it. What are surprising results and why is this so.

B)

Which initiative takes your community about sustainability? Compare the results.

C)

Formulate two points about sustainability to improve by your community and subscribe how to do this.

Aftertest evaluation of lessons

How?

Talking about the subject, testing their own sustainability and make an evaluation.

Why? learning outcome

To gain awareness of the importance of sustainability within the local area.

The students should become aware how they can do a difference, how they can influence the situation in the city where they are located helping them and their customers to buy conscious or become more aware of sustainability etc.

In the end, this might inspire/influence on the students in their way of doing shopping/business later on in life. Maybe they will even be able to influence their future employer to use sustainability as a strategy within sale.

Student evaluation

1. Did you like working with a subject in this way?
a. Yes b. No
2. What was good about it?

3. What could have been better?

4. What did you learn from this lesson?

5. What was the purpose of this lesson?

Appendix

pre-test and after-test

- What do you know about the Danish governments plans for sustainability?
- What do you know about the local plans for sustainability? (explain with a few sentences)
- What could sustainability be within the retail branch? (explain with a few sentences)
- What could sustainability be within the trade branch? (explain with a few sentences)
- What could sustainability be within the office branch? (explain with a few sentences)
- Do you have any suggestions to optimize sustainability in your local area?
-

School

Subject

Target group

Duration

What?
short teaser

Stredná priemyselná škola-Ipari Szakközépiskola Komárno

Civic Education- Our Most Valuable Resource

Secondary School s – VET area – students aged 17-19

2 lessons of 45 minutes

Teach your student

To be aware of our most valuable resource-fresh water, take responsibility of wasting water, to understand the importance of doing small steps, to learn about charity organisations

What?

detailed description

Lesson 1:

8:00-8:15 Brainstorming: students work in small groups of 3 or 4- they are allowed to use the Internet sources for collecting their ideas about clean water access around the world, water usage in western countries

8:15-8:30 Watching video: see resources (1)

Talk on the class or in groups

About : how to collect rain water and use it in households

Droughts and famine in many African countries

8:30-8:45 Discussion: Low-Tech ways to purify water – newspaper articles and internet resources (2 and 3)

Lesson 2:

8:00-8:20 Quiz: students read the questions carefully and give their answers

Show link number4

8:20-8:30 Evaluation : Talking about the quiz

8:30-8:40 Group Work- Brainstorming:

Water is essential, people in some parts of the world who don't have enough clean water

How can we help

water Aid charity and UNICEF

8:40-8:50 Evaluation

How?

Talking about the subject, testing knowledge, group-work, watching video, discussion

Why?

learning outcome

To gain knowledge about water resources. To become more aware of the purposes of different charity dealing with aid, become more conscious bin household's water supply, but also to understand, how people can help with their our contributions and gain from it. In the end, to be able to give good advice/suggestions how to save water.

Links

1. Life Intermediate Coursebook by National Geographic Unit 4
2. Bridge- Magazine for English-language students Level B1-B2
3. <https://www.globalcitizen.org/en/content/5-innovative-ways-people-in-the-developing-world-p>
4. <http://environment.nationalgeographic.com/environment/freshwater/freshwater-01-quiz/>

Student evaluation

1. Did you like working with a subject in this way?

a. Yes b. No

2. What was good about it?

3. What could have been better?

4. What did you learn from this lesson?

5. What was the purpose of this lesson?

School

Subject

Target group

Duration

What?
short teaser

BMSZC Bolyai János Secondary Technical School (VET)

Sustainability, quality measurements of water, wastewater treatment in Hungary and in Europe.

Secondary school - Chemistry lesson

2 lessons of 45 minutes

The lessons aim at drawing students' attention to the important role of water in our lives and giving them new knowledge about the different water-measuring methods. The lessons try to enable students to carry out qualitative measurements with different kinds of natural water. The lessons provide knowledge about the good practices of wastewater treatment in different European countries and rainwater harvesting. Ss visit a wastewater treatment plant.

What? detailed description

Lesson 1:

- 10 minutes: Beginning of the lesson, a short introduction to the topic. What sort of pre-knowledge do students have about the given topic? Filling in the pre-test.
- 10 minutes: Starting the presentation
- 10 minutes: Students write down what they know about water in general. We take a look at the presentation as a summary. Self-checking. Those who have written down the most features will get some kind of reward.
- 10 minutes: Taking a look at the water supply of the Earth by the help of the slides of the presentation.
- 10 minutes: Revising the water measurement, creating the groups, handing out worksheets. (Visocolor-ECO Analysenkoffer Macherey-Nagel GmbH&Co)
- 40 minutes: Group-work: water measuring and filling in the worksheets.
- 5 minutes: Comparing the result of the measurements and taking a look at how precisely different groups worked.
- 10 minutes: Having a discussion on how different materials could get into the water. Summary slide in the presentation. By this we take a look at the following lesson on how water can be decontaminated from the measured materials, how the quality of the water can be improved.

Lesson 2:

- 10 minutes: Revising the knowledge gained on the previous lesson.
- 35 minutes: Wastewater treatment in Hungary and in Europe - On the basis of the presentation.
- 10 minutes: Watching videos about the presentation.
- 10 minutes: Producing biogas from organic waste - presentation
- 10 minutes: The possibilities of rainwater harvesting - brainstorming pictures about the presentation.
- 15 minutes: Summary, after-test and evaluation.

Lesson 3:

A visit to a wastewater treatment plant.

How?

Talking about the subject, testing pre-knowledge, group-work, presentations, after-test and evaluation.

Why?

learning outcome

One of the biggest challenges nowadays is the preservation of the clarity of water. Mainly the preservation of natural water. We have to draw our students' attention to the importance of saving water, preserving the clarity of water and being aware of the mechanism of water treatment.

Links

Presentation:

http://prezi.com/vl1glehyxr0m/?utm_campaign=share&utm_medium=copy&rc=ex0share

Link to the results of the evaluation sheets:

<https://docs.google.com/spreadsheets/d/1oHCMY4R9yUSDGMEZf1KxJU5GyCXKDcD9gEMB3RceRM/edit?usp=sharing>

Appendices

Pre-test:

1. What can be dangerous for the water supply on the Earth?
2. What per cent do you think the sewage can be re-used?
3. Do you think it is important to talk about these topics?

Worksheet:

fill-in form for water measurements in 3 water samples

Values to be filled-in for:

Suspended matter / Colour / Odour / pH / Temporary hardness / Permanent hardness

Nitrate-ion (NO_3^-)

Nitrite-ion (NO_2^-)

Phosphate-ion (PO_4^{3-})

Ammonium-ion (NH_4^+)

Reflection

On the basis of the pre-test we can say that students have a lot of information about water. The class gathered all the important information in connection with water. The lesson gave them an opportunity to classify their previous knowledge. Their knowledge is not structured. According to the students the aims of the lesson are important from different perspectives.

Some of their descriptions:

1. The topic of the lessons made it clear that we should take recycling much more seriously.
2. We learn how to utilize water and how to clean it.
3. Probably people wouldn't pollute water if they were informed about its consequences.
4. Our future problem will be the fight for drinking water.
5. In the lesson we learnt which water can be drunk.
6. I think the lesson was important in connection with sustainability.
7. It is important for everybody to be aware of the water polluting effects.

Only one student out of 29 thought that the topic was not of crucial importance. On the basis of the pre-test we can say that most of the students are able to think responsibly.

In connection with wastewater treatment, students judge the situation much better than the real situation. The reason behind this is that our secondary school is in the capital, and here the problem of water treatment has already been solved to a great extent. Unfortunately the situation is much worse in the country, which was by mentioned by our commuting students.

In the lesson the students were very active and they were really interested in the topic. Obviously they liked the measurement activity the most. They were very good at doing the tasks. They were really interested in wastewater treatment, especially the recycling (sand, biogas, compost) They really made good use of their previous knowledge. They asked the engineers great questions.

Overall, the students really enjoyed all the three lessons and they gave 4 and 5 points on the evaluation sheets to each question.

School

Subject

Target group

Duration

What?
short teaser**Stredná priemyselná škola-Ipari Szakközépiskola Komárno**

English Language-School-Leaving Exam Topic-Man and Nature

Secondary School Students- age 17-19

2 lessons of 45 minutes

Teach your students to describe the life of most of our waste. Get the students to start thinking about what products are actually made, to know more about why we need to recycle, to know what kinds we need to recycle, to understand what we mean under raw materials and meanwhile improving their English language skills

What?
detailed description

Lesson 1:

8:00-8:10 Short brainstorming:

what kind of waste do we produce
what happens with them (different pictures can be taken to the class)
going through the classroom bin and identifying and counting the different waste products that are found.

8:10-8:30

Activity 1:

This activity involves going through the classroom bin and identifying and counting the different waste products that are found.
After that students complete the waste worksheet- {2.}

8:30- 8:40

Activity 2:

Watching a youtube short video:
How this town produces no trash-{3.}

8:40-8:45

Conclusion

Lesson 2:

8:00-8:20

Activity 1:

The first activity is relatively brief and involves thinking about what kind of things we can recycle. Look at the resource showing pictures of different types of recycling and have a brief discussion about what is on it.
Do we personally recycle everything that we could? Do they think that people should do more as individuals? - students work in groups of four and share their ideas.

The teacher will supervise the students.

8:25-8:30

Activity 2:

Watching a youtube short video: Recycling waste materials at home – {4.}

8:30-8:40

Activity 3:

Brainstorming- collecting and discussing ideas for recycling and reusing waste in groups-short group-presentations

8:40-8:45

Conclusion- expanding and improving students' ideas at home, presenting them in the next lesson. The best ideas should be designed and awarded .

8:40-8:50

Evaluation**How?**

Talking about the subject, testing pre-knowledge, group-work, presentations

Why?
learning outcome

To gain knowledge about types of wastes and recycling To become more aware of waste management and types of recycling, possibilities of zero-waste households. Developing English language skills in the given area by learning new expression.

Links

1. Pictures about different types of waste
2. Waste Worksheet
3. <https://www.youtube.com/watch?v=eym10GGidQU>
4. https://www.youtube.com/watch?v=tByCDBWmY5A&list=PLE2dVnnwBeF17FjnrwAWGZ_meCChpBKxM

Student evaluation

1. Did you like working with a subject in this way?
a. Yes b. No
2. What was good about it?

3. What could have been better?

4. What did you learn from this lesson?

5. What was the purpose of this lesson?

Appendix

waste work sheet

1. How many types of waste did we find in the classroom bin?
2. How many of these can not be recycled?
3. Which type of waste did we find the most of?
4. Can this be recycled?
5. How many categories did we use to put all the types of waste in?
6. What were the categories?
7. What do you think the most common type of waste in the school kitchen bin would be?
8. Can this be recycled?
9. Can you think of any other types of waste that the school produces?
10. Where does most of our waste go?
11. What does the school recycle?
12. Do you recycle at home?
13. What can we recycle at home?

School

Subject

Target group

Duration

What?
short teaser

Kaufmännische Schulen Tecklenburger Land

Sustainability, Environmentally friendly cars

Business Administration class-12th form from 17 to 19 years

1 lesson of 45 minutes

Is recycling easy?

What? detailed description

Lesson 1:

7:40-8:00 How do we have to separate our rubbish? Discussion within the class.

8:00-8:15 Split the class into groups of 3 to 4 students. Each group gets a set of 20 cards. The cards show various types waste. Students decide which waste belongs to the most suitable recycling box (paper, glass, metal, toxic, biological)

8:15-8:25 The groups get the right solution and find out how many credits they have got. Winning team gets a small prize.

How?

Discussion, interactive card game

Why? learning outcome

This lesson creates awareness of the topic recycling

Student evaluation

1. Did you like working with a subject in this way?
a. Yes 17 students b. No 12 students
 2. What was good about it?
- got some new ideas of green features
 3. What could have been better?
actually need more time to get more detailed information, an excursion to a car dealer would have been helpful.
 4. What did you learn from this lesson?
- green cars can also save money because of some governmental subsidies.
 5. What was the purpose of this lesson?
- to find more information about green cars
-

School

Subject

Target group

Duration

What?
short teaser

Kaufmännische Schulen Tecklenburger Land

What is Upcycling?

Business Administration class-12th form from 17 to 19 years

4 lessons of 45 minutes

Does upcycling make fun?

What?

detailed description

Lesson 1:

7:40-8:00 What do you already know about upcycling? discussion

8.00-8:25 Teacher asks: What sort of musical instrument can you design with already used materials? Teacher divides the class into groups of 3 to 4 students.

Students think about an instrument of their choice and decide recycled materials or appropriate waste with them for the next lesson.

Lesson 2 and 3 on the next day:

8:25-8:35 Students present and select their materials

8:35-11:00 Students start building their instruments

Lesson 4:

11:20-11:40 All groups practice the German national anthem as an orchestra performance.

11:40-12:05 Students play their instruments in front of a class that has not been involved in this project. They have to guess the title the orchestra plays.

12:05-12:15 Reflection round: students sit in a circle. Each student says shortly (30 seconds) what he has learnt.

How?

Talking about the subject upcycling, designing an instrument, group work

Why?

learning outcome

These lessons create awareness of the topic upcycling and students recognize that environmental behaviour can also be fun

Student evaluation

1. Did you like working with a subject in this way?
a. Yes 17 students b. No 12 students
 2. What was good about it?
- got some new ideas of green features
 3. What could have been better?
actually need more time to get more detailed information, an excursion to a car dealer would have been helpful.
 4. What did you learn from this lesson?
- green cars can also save money because of some governmental subsidies.
 5. What was the purpose of this lesson?
- to find more information about green cars
-

School

Subject

Target group

Duration

What?
short teaser

Skive Handelsskole (Business School – VET)

Fashion Show

Business School – VET area – but can easily be used by other from the age of abt. 16+. to become a more conscious consumer

4 lessons of 85 minutes

The students are going to make a fashion show. "Clothes" to be made from recyclable material.

What? detailed description

Lesson – Assignment 3:

8:10 – 14:50 You are going to be part of an international Fashion Show showing clothes made from recyclable materials.

The Fashion Show will take place in Budapest

Wednesday 25th March afternoon: 15.00 – 17.00 hrs

You have to create one girl and one boy Day – or evening dress.

Search the internet and the links below for ideas. Remember that you have to be able to bring the dresses by plane.

Choose 1 girl and 1 boy to present the clothes at the Fashion Show.

You have to make a short catwalk presentation in English about the materials / design etc.

Choose the speaker who has to present at the stage in English.

Make cards to the speaker.

Aftertest What do you know now? + evaluation of lessons

How?

Talking about the subject, testing pre-knowledge, group-work, presentations, after-test and evaluation.

Why? learning outcome

To gain awareness of the importance of recyclable material.

In the end, this might inspire/influence on the students in their way of doing shopping/business later on in life. Maybe they will even be able to influence their future employer to use sustainability as a strategy within sale

Student evaluation

1. Did you like working with a subject in this way?
a. Yes b. No
 2. What was good about it?
 3. What could have been better?
 4. What did you learn from this lesson?
 5. What was the purpose of this lesson?
-

School

ROC van Twente, Education Bouw, Infra en Interieur, Hengelo

Subject

Innovation oriented circular procurement

Target group

Secondary Vocational Education

Duration

5 lessons of 85 minutes

What?
short teaser

The students become aware of both the local and national concerns in regards to sustainability and how they all deal with it within their own branch.

What? detailed description

Lesson 4:

8:30 – 10:30

Teacher:

Inform the students about a guest lesson with the subject circular economy. Explain what they need to do.

Students:

The students have to make a report about the guest lesson. And they need to make a presentation about their own chosen subject.

A) Write a summary about the main subject of the guest lesson circular economy. The summary must contain at least 150 words.

B) The students make a presentation about their own chosen subject from circular economy and present this to other students. (peer to peer)

Aftertest evaluation of lessons

How?

Talking about the subject, testing their own sustainability and make an evaluation.

Why? learning outcome

To gain awareness of the importance of sustainability within the local area.

The students should become aware how they can do a difference, how they can influence the situation in the city where they are located helping them and their customers to buy conscious or become more aware of sustainability etc.

In the end, this might inspire/influence on the students in their way of doing shopping/business later on in life. Maybe they will even be able to influence their future employer to use sustainability as a strategy within sale.

Links

<https://teams.rocvantwente.nl/mponderwijs/S03SS03L04LS00T05TS12/Documenten/On-derwijs/Projecten/Project%20CROSSOVER/Greenworks%20Academy%20%20SCE%20%20Erick%20Wuestman%201%200.pdf>

Student evaluation

1. Did you like working with a subject in this way?
a. Yes b. No
 2. What was good about it?
 3. What could have been better?
 4. What did you learn from this lesson?
 5. What was the purpose of this lesson?
-

School

ROC van Twente, Education Bouw, Infra en Interieur, Hengelo

Subject

Innovation oriented circular procurement

Target group

Secondary Vocational Education

Duration

5 lessons of 85 minutes

What?
short teaser

The students become aware of both the local and national concerns in regards to sustainability and how they all deal with it within their own branch.

What? detailed description

Lesson 5:

8:30 – 11:30

Teacher:

Inform the students that they have to make a maquette about their chosen subject in assignment 4.

Students:

The students have to make a maquette about their chosen subject from circular economy. They need to use sustainable materials and make a scale model 1:100 of their concept.

A) Make a scale model 1:100 about their chosen subject with the use of the next materials:

- ◆ cellotape
- ◆ glue
- ◆ paper
- ◆ scissors
- ◆ knife
- ◆ ruler
- ◆ paint
- ◆ other materials

B) The students make a presentation about their own chosen subject from circular economy and present this to other students. (peer to peer)

Aftertest evaluation of lessons

How?

Talking about the subject, testing their own sustainability and make an evaluation.

Why? learning outcome

To gain awareness of the importance of sustainability within the local area.

The students should become aware how they can do a difference, how they can influence the situation in the city where they are located helping them and their customers to buy conscious or become more aware of sustainability etc.

In the end, this might inspire/influence on the students in their way of doing shopping/business later on in life. Maybe they will even be able to influence their future employer to use sustainability as a strategy within sale.

Student evaluation

1. Did you like working with a subject in this way?
a. Yes b. No
 2. What was good about it?
 3. What could have been better?
 4. What did you learn from this lesson?
 5. What was the purpose of this lesson?
-