

ATS2020 Learning Design



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Country: Cyprus

General description of the Learning Design

Subject	DESIGN AND TECHNOLOGY
Unit title	Energy
Year group	Gymnasium
Class	C'1
Duration	4x40
Hosted	http://mahara.ats2020.eu/group/view.php?id=228
Keywords	Energy, environmental issues
Short description	Students will learn about energy and environmental issues that come from its use, through discussion activities, searching online and presenting the outcomes of their research.

ATS2020 Learning Design Macrolevel

Subject/Unit title: DESIGN AND TECHNOLOGY/Energy **Class:** Class C', Gymnasium

Digital Tools (affordances):

- Internet access
- Mahara group

Tasks to develop these competences towards the learning outcomes

- Complete "My Learning" journals
- Teacher presentation energy and renewable energy sources – student discussion on the presentation
- Students post in a Mahara page images presenting environmental problems. They write the problems presented in the images in the comment section.
- Students create Mahara page about an environment problem
- Book exercises
- Discussion on importance of saving energy
- Students, in groups, prepare a page in Mahara, presenting the solar water heater or photovoltaic systems
- Create ePortfolio

Skills and competences necessary to reach the expected outcomes

Targeted

Information literacy

1. Locate, organise, analyse, evaluate, synthesize and ethically use information from a variety of sources and media.
2. Process information and construct new knowledge.

Emerging

Communication and Collaboration

1. Interact, collaborate, and publish with peers, experts, or others employing a variety of tools and environments.
2. Communicate information and ideas effectively to multiple audiences using a variety of media and formats.

Learning goals - expected leaning outcomes

Body of knowledge (National curriculum)

1. Recognize the importance of energy consciousness through energy saving and the use of renewable energy sources.
2. Report environmental problems and suggest ways to address them.
 - Show, through examples, the environmental impact of atmospheric pollution, the destruction of the ozone layer and the uncontrolled deforestation
3. Study and know the basic principles of how technology products and systems, work to reduce energy consumption.

Leaning outputs – through all stages (assessment)

4. My Learning journal
5. Students' ePortfolio
6. Mahara page with images (uploaded from students) that present environmental problems
7. Mahara Page with definition and impact on the environment of environmental problems
8. Mahara pages, for each student group, presenting the solar water heater or photovoltaic systems

ATS2020 Learning Design - Microlevel

LEARNING GOALS - EXPECTED LEARNING OUTCOMES

Subject area

1. Recognize the importance of energy consciousness through energy saving and the use of renewable energy sources.
2. Report environmental problems and suggest ways to address them.
 - Show, through examples, the environmental impact of atmospheric pollution, the destruction of the ozone layer and the uncontrolled deforestation
3. Study and know the basic principles of how technology products and systems, work to reduce energy consumption.

Transversal skills

Targeted

Information literacy

1. Locate, organise, analyse, evaluate, synthesize and ethically use information from a variety of sources and media.
2. Process information and construct new knowledge.

Emerging

Communication and Collaboration

3. Interact, collaborate, and publish with peers, experts, or others employing a variety of tools and environments.
4. Communicate information and ideas effectively to multiple audiences using a variety of media and formats.

**The learning goals and learning outcomes for subject area and transversal skills in the following table are presented by the number indicated in the lists above.*

Activity title	Learning goals – Learning Outcomes*		Tasks (teacher/students)	Teacher's role	Tools	Methodology – Class Arrangement	Learning Outputs (expected)	Assessment
	Subject area	Transversal skills						
1. My Learning journal	Identify previous knowledge		- Students complete in their "My Learning" journals the fields of previous knowledge, goals and strategies regarding what they know about energy.	- Gives guidelines for the completion of learning journals	- Learning journals in Mahara - Instructions in Mahara about creating and filling learning journal	- Students' individual work on the computers	- Completed fields previous knowledge, goals, strategies in "My Learning" journal	- Teacher reads students learning journals

Activity title	Learning goals – Learning Outcomes*		Tasks (teacher/students)	Teacher's role	Tools	Methodology – Class Arrangement	Learning Outputs (expected)	Assessment
	Subject area	Transversal skills						
2. Teacher presentation	Goal: 1		- The teacher presents: energy definition, renewable energy sources (examples, advantages and disadvantages), non-renewable energy sources (examples, advantages and disadvantages). (With the use of software, presentation, video). A discussion with students about the presentation follows.	-Presents the basic concepts of the unit	- Software use - Presentation - Video	- Teacher presentation		<u>Teacher</u> Observes students participation in the discussion
3. Mahara page on environmental problems	Goal: 2	Skills: 1, 2	- Students locate an image online that presents an environmental problem. Then they upload it to a common page in Mahara's environment. - In the comment section on the page, everyone writes the environmental problems presented by the images all the students have uploaded.	-Gives instructions -Helps students to locate pictures online	- Computers - Internet - Mahara page	- Students' individual work on the computers - Students comments on Mahara page	- Mahara page with images with environmental problems that the students located and in the comment section of the page, comments from each student mentioning the environmental problems of the images	<u>Teacher</u> Checks whether the students have done their exercise in the Mahara page
4. Information on environmental problems	Goals: 1,2	Skills: 1, 2, 3, 4	Students search for information about an environmental problem (mainly from the Internet), prepare a definition of the problem and write its impact on the environment. They present their work on a shared Mahara	-Gives instructions -Assists students to use Mahara and locate and choose useful information from the internet	- Mahara page - internet	- Pair work	- Mahara page where environmental problems are presented	<u>Teacher</u> Checks whether the students have done their exercise in the Mahara page Observes the

Activity title	Learning goals – Learning Outcomes*		Tasks (teacher/students)	Teacher's role	Tools	Methodology – Class Arrangement	Learning Outputs (expected)	Assessment
	Subject area	Transversal skills						
			page. They should cover the following environmental problems: atmospheric pollution, ozone layer destruction, uncontrolled deforestation. They should cite the sources they used. - [If there is time, a discussion follows about natural gas and LPG, the reasons it is important to find gas in a country and examples of how it is used.]					material that the students have uploaded and provides comments for improvement
5. Saving energy	Goals: 1,2,3		- Energy markings and their meaning (book exercise -page 52) - Calculation of energy consumption (book exercise with a Power Authority account -page 53) - Discussion with students about the necessity of energy saving in the current era and systems that help reduce energy consumption.	-Εξηγεί τις οδηγίες -Καθοδηγεί στη λύση -Συζητά με τους μαθητές για την ανάγκη εξοικονόμησης ενέργειας. -Explains the instructions -Guides to the solutions -Discusses with the students about saving energy	- Student's book	- Individual work - Whole class discussion	- Completed student's book - worksheets	<u>Teacher</u> Checks the correctness of the students answers and discusses with them the way of solving the exercises
6. Mahara page - solar water heater or photovoltaic	Goals: 1,2,3	Skills: 1, 2, 3, 4	- Students in couples prepare a page in Mahara where they present the solar water heater or photovoltaic systems. They locate information online.	-Gives instructions -Helps students to use Mahara and search information online	- Mahara - Internet	- Pair work	- Mahara page (for every 2 students) - for solar water heater or photovoltaic	<u>Peer evaluation</u> Appendix (formative assessment tool)

Activity title	Learning goals – Learning Outcomes*		Tasks (teacher/students)	Teacher's role	Tools	Methodology – Class Arrangement	Learning Outputs (expected)	Assessment
	Subject area	Transversal skills						
systems			Students are asked to be careful about the credibility of their sources and to cite their sources. They should include photos and videos. - Peer evaluation of their work (based on a rubric)				systems - Completed self-assessment tools	
7. ePortfolio creation		Skill: 4	- "My Learning" journal – Reflection - Students create their ePortfolios	- Gives instructions	- Mahara	- Individual work	- Completed learning journals - ePortfolio for every student	<u>Teacher</u> Gives comments for improving students' ePortfolios

APPENDIX

Formative assessment scaffolding tool – Peer Assessment – Activity 6

<i>INSTRUCTIONS: Check the page your classmates created and evaluate it based on the following table. Mark an X in the box that you think is more appropriate. Save your file and upload it as a comment under their Mahara page.</i>			
Name:			
Surname:			
Group that I evaluate:			
	Very good	average	Needs improvement
They explained what the solar water heater/photovoltaic systems is/are.			
They explained the function of the solar water heater/photovoltaic systems.			
They used simple and easy to understand words to give their descriptions.			
They referenced their sources.			
They used relevant images.			
They used relevant videos			
They page is well organized (information are clear, arrangement is good, I can understand what the subject and the message is)			
Suggestions for improvement:			

Exemplar ePortfolio

Μαριαλένα - ePortfolio- Σ&Τ- Ενέργεια

από [Marialena Kazamia](#)

Επεξεργασία σελίδας

Copy



Αυτή είναι η σελίδα του ePortfolio μου για την ενότητα ενέργεια

Profile information

Πληροφορίες προφίλ

Επάγγελμα: Μαθήτρια
Υπηρεσία/Επιχείρηση: Γυμνάσιο
 Λύκειο Λευκάρων Γ1
Όνομα: Marialena
Επώνυμο: Kazamia



Σ&Τ- Ενέργεια

Ενέργεια



Group activity on photovoltaic systems

Εργασία για Ηλιακό θερμοσίφωνα

Ο ηλιακός θερμοσίφωνας είναι ένα **ενεργητικό ηλιοθερμικό σύστημα παραγωγής ζεστού νερού** χρήσης χρησιμοποιώντας την **ηλιακή ενέργεια**:

- Χρησιμοποιείται ευρύτατα στις χώρες που έχουν μεγάλη **ηλιοφάνεια**, όπως για παράδειγμα στις χώρες της **Μεσογείου**.
- Ο ηλιακός θερμοσίφωνας είναι η απλούστερη και η γνωστότερη ηλιακή συσκευή. Κατά την

Προηγούμενη γνώση

Ξέρω

1. Τρεις πηγές ενέργειας
2. Υπάρχουν Ανανεώσιμες πηγές ενέργειας
3. Υπάρχουν Μη Ανανεώσιμες πηγές ενέργειας

Στόχοι και κριτήρια επιτυχίας

Στόχος:

1. Να μάθω όλες τις πηγές ενέργειας
2. Να μπορώ να εξηγή σε κάποιον τι είναι η ενέργεια.
3. Να ξέρω πότε εμφανίζεται η ενέργεια

Στρατηγικές

Στρατηγικές:

1. Power Point
2. Εκδρομή σε ειδικούς χώρους

Αναστοχασμός και αυτοαξιολόγηση

Έμαθα να ξεχωρίζω τις αναλώσιμες πηγές ενέργειας και τις μη αναλώσιμες πηγές ενέργειας. Ναι είμαι ικανοποιημένη από την συνεργασία που είχα με τους συμμαθητές μου. Βρήκα εύκολα πληροφορίες από το διαδίκτυο, δεν είχα κάποια δυσκολία. Μου φάνηκε πολύ ωραία η εμπειρία να ετοιμάσω σελίδα στο Mahara. Θα μπορούσα να βελτιωθώ στο να μαθαίνω πιο πολλά πράγματα καθώς τα ψάχνω στο διαδίκτυο.

“My Learning”
journal



Add content

Activity on atmospheric
pollution (definition)

Εργασία περιγραφή περιβαλλοντικού
προβλήματος

Ατμοσφαιρική Ρύπανση

ΟΜΑΔΑ: Μαθαίος, Μαριαλένα

Ατμοσφαιρική ρύπανση είναι η ρύπανση της ατμόσφαιρας, δηλαδή η προσθήκη ουσιών (ρύπων) στην ατμόσφαιρα που υπό φυσιολογικές συνθήκες δε θα υπήρχαν. Στη σύγχρονη εποχή, συχνά η ρύπανση είναι αποτέλεσμα της ανθρώπινης δραστηριότητας.



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φυσικών φαινομένων. Με την **αρχή του θερμοσιφώνου** επιτυγχάνεται η κυκλοφορία του νερού με φυσικό τρόπο χωρίς μηχανικά μέρη ενώ η θέρμανση του νερού γίνεται με την εκμετάλλευση του **φαινομένου του θερμοκηπίου** που αναπτύσσεται στους συλλέκτες του.

- Ο ηλιακός θερμοσίφοντας άρχισε να χρησιμοποιείται μετά την **πετρελαϊκή κρίση** της δεκαετίας του '70 και ιδιαίτερα τη δεκαετία του '80 άρχισε να χρησιμοποιείται ευρύτατα στις χώρες με ηλιοφάνεια.

Διακρίνουμε δύο είδη ηλιακών θερμοσιφώνων ανάλογα με το κύκλωμα κυκλοφορίας του θερμαινόμενου μέσου:

- **Ανοικτού κυκλώματος:** απευθείας θέρμανση του νερού.
- **Κλειστού κυκλώματος:** έμμεση θέρμανση του νερού.

Οι ηλιακοί θερμοσίφωνες, ανεξάρτητα από το είδος τους, αποτελούνται από δύο βασικά μέρη:

- **Το τμήμα συλλογής**
 - Την πλάκα συλλογής της ακτινοβολίας
 - Τους σωλήνες ροής του νερού
 - Την κάλυψη (κρύσταλλο) της πλάκας απορρόφησης και
 - Το **θερμικά μονωμένο** πλαίσιο πάνω στο οποίο στερεώνονται τα υπόλοιπα εξαρτήματα.