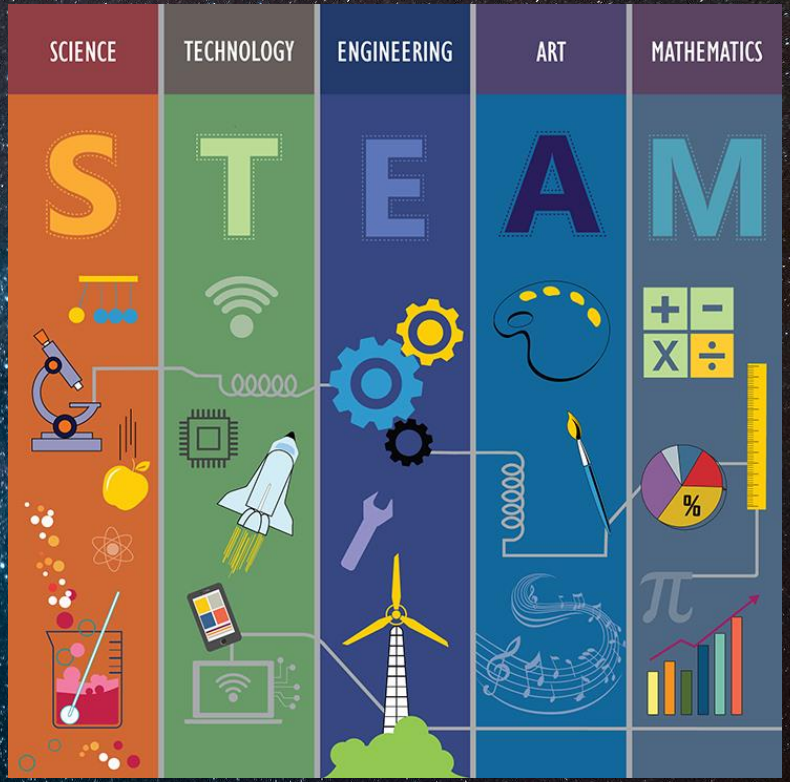
STEAM Toolkits & Apps:

Journeys without borders in our hybrid world

Yannis Kotsanis



DOUKAS SCHOOL
1917

The destinations of this 15’ journey”

A. [Journeys] [in our hybrid world] [without borders]

B. riding my bicycle…

C. the Toolkit of the Educational Infographics for STEAM

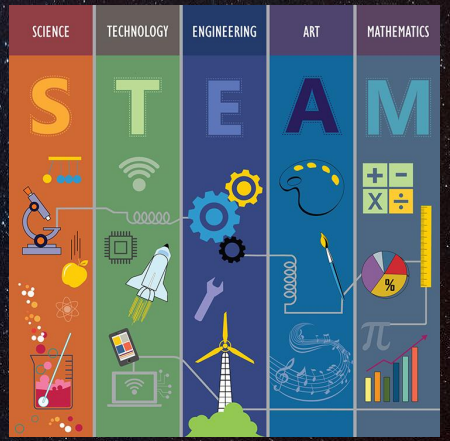
D. the Observatory of the STEAME & STEAME goes hybrid

E. the e-Learning Platform of the STEAMitUP

F. …and what is common to all these practices?

Q. but the main question remains!

References/Acknowledgments



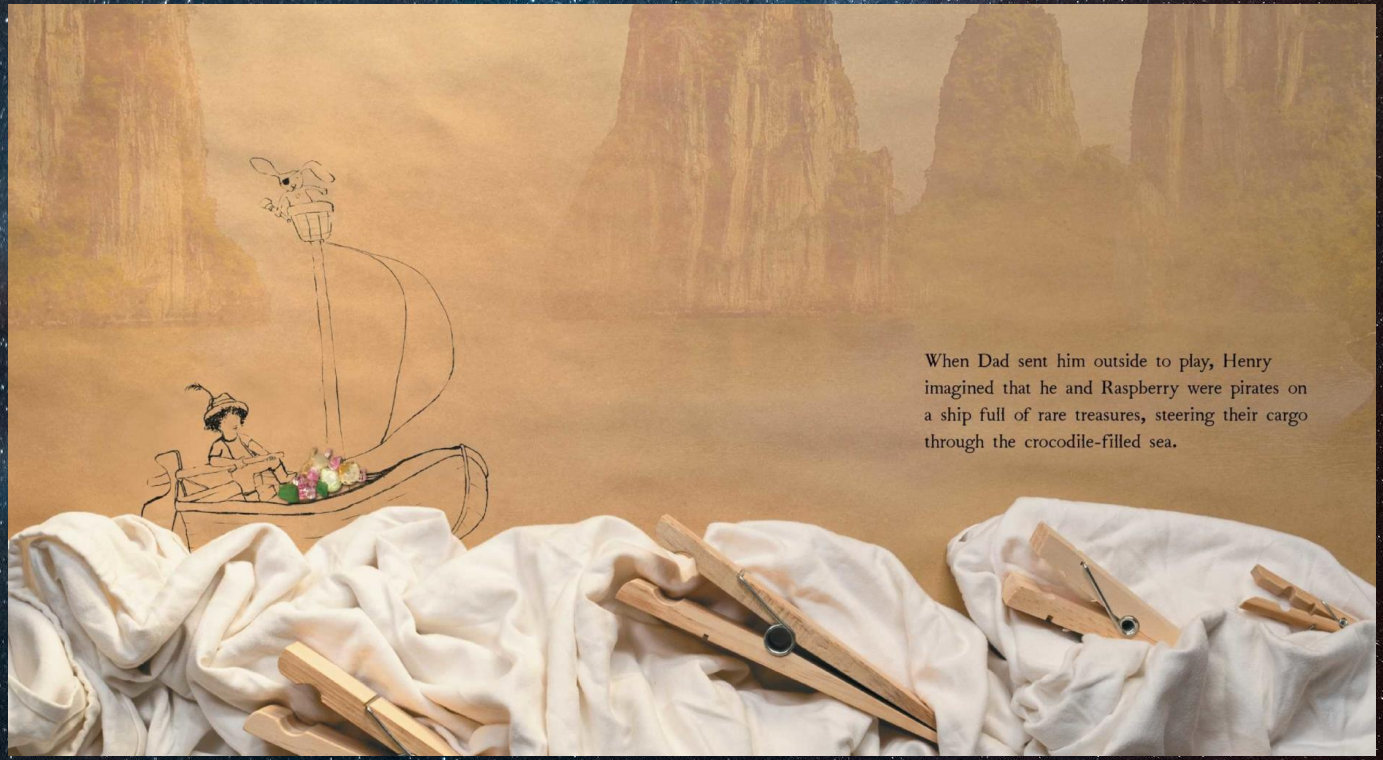
A. [Journeys]…

Pleasure
Entertainment
Knowledge
Skills
Values
Experience
Exploration
Friendship
Relationships
Collaboration
Projects

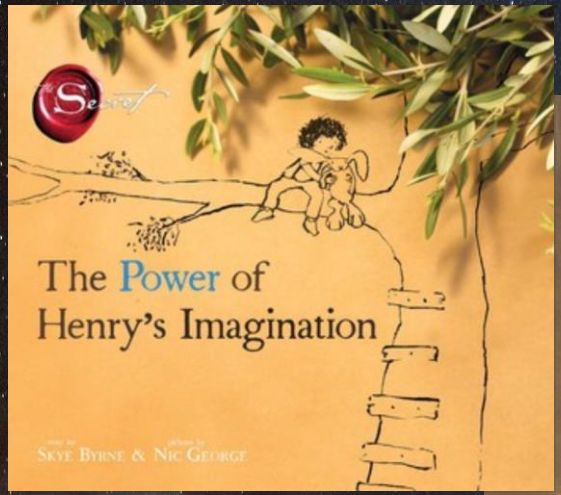
A. …[in our hybrid world]…

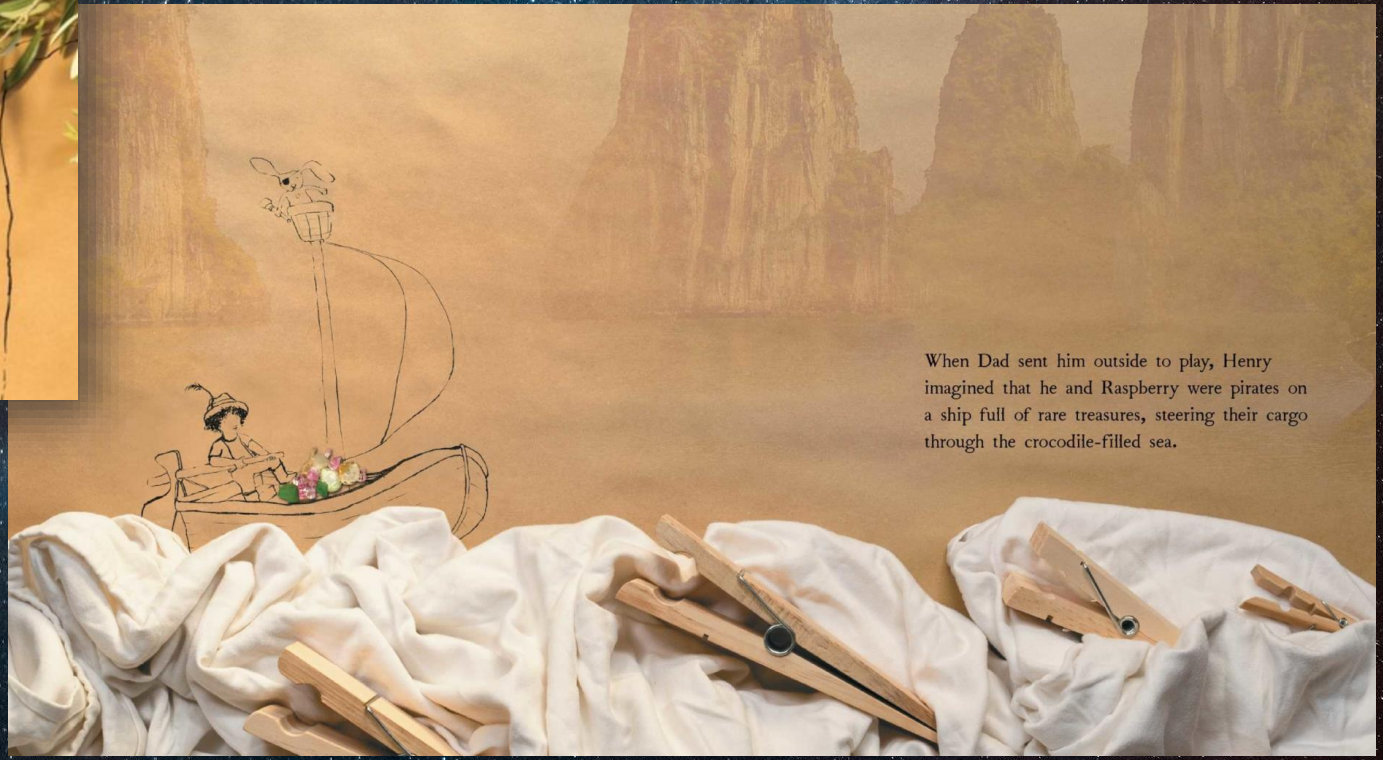
"a thing made by combining two different elements"
"something that has two different types of components performing essentially the same function"

hybrid animals
hybrid bicycles
hybrid cars
hybrid working
hybrid construction
hybrid education
hybrid reality

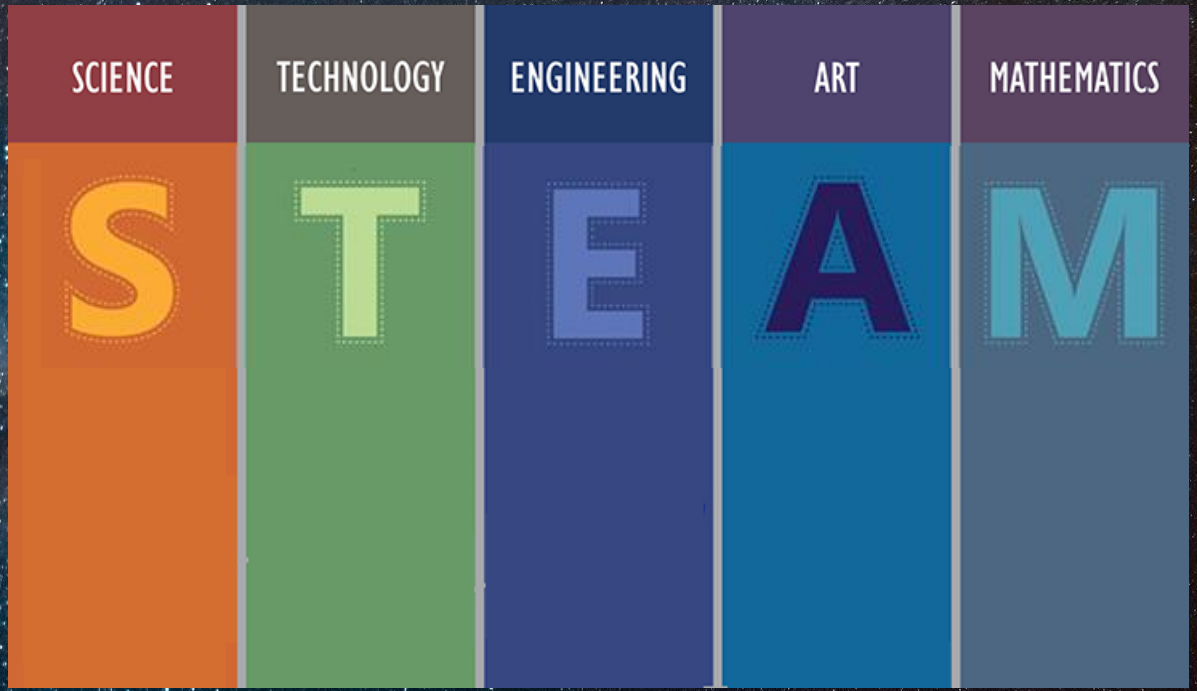


A. …[in our hybrid world]…





A. ...[without borders]

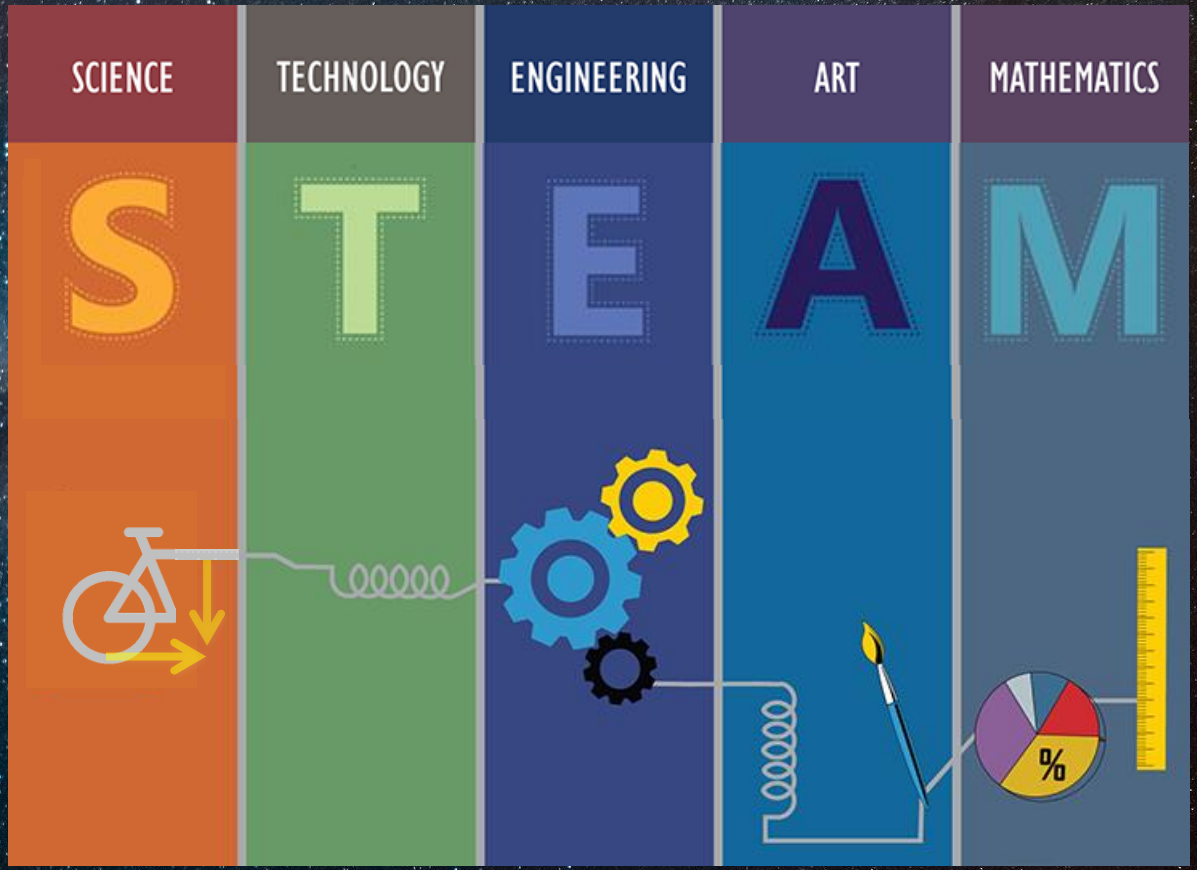


inter-disciplinary ...
multi-disciplinary ...
cross-curricular...

integration of additional disciplines and their learning actors in order to overcome the compartmentalization of knowledge?

Approach that has to be simultaneously cultural, technical/technological, social, political etc., in real problems?

A. ...[without borders]



B. riding my bicycle…

S *what forces are exerted on a bike?*

T *what is the effect of aerodynamics?*

E *how bike mechanisms work?*

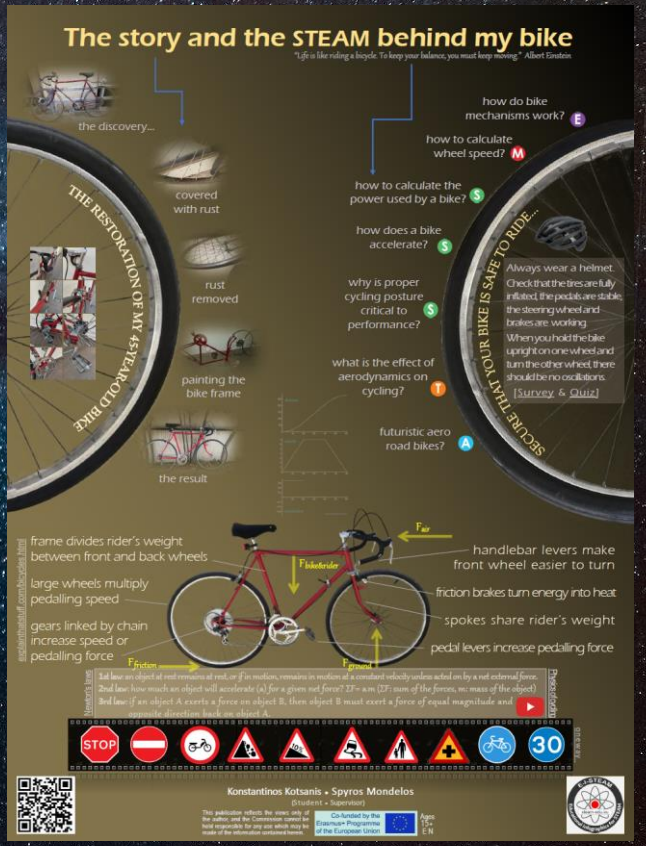
A *how can I decorate my bike?*

M *how can we calculate the speed?*

3+ Projects

B. riding my bicycle…

- **S** *what forces are exerted on a bike?*
- **T** *what is the effect of aerodynamics?*
- **E** *how bike mechanisms work?*
- **A** *how can I decorate my bike?*
- **M** *how can we calculate the speed?*

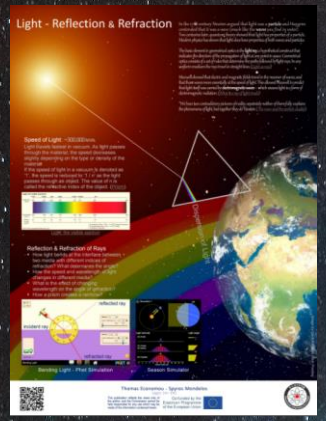


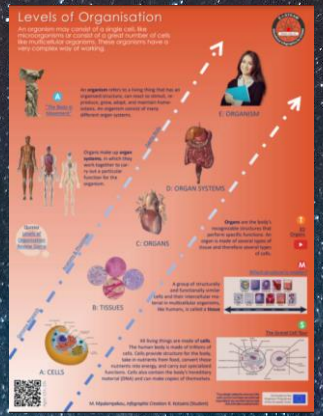
("output" links: 14)

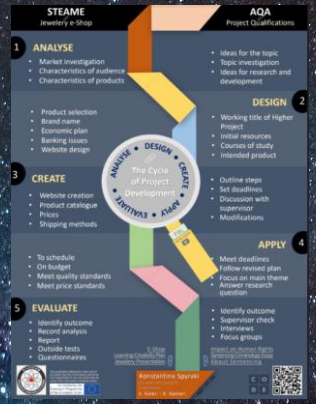
C. the toolkit of the Educational Infographics for STEAM

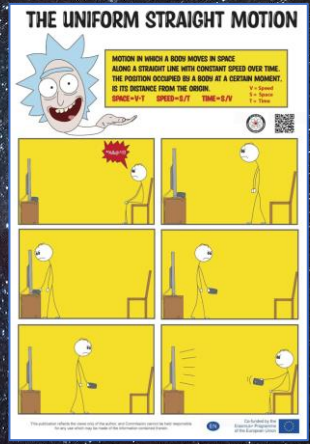
CASE A: Individual Teacher Role in Design-Creation independently from the Classroom Implementation (that follows?). The infographic is an independent Learning Object that can be integrated into the education process. (*e.g.* BIOL-009)
CASE B: Individual Student Role with a Teacher Supervising independently from the Classroom Implementation (that follows?). The infographic is an independent Learning Object that can be integrated into the education process. (*e.g.* TECH-003)
CASE C: Collaborative work of Students and Teacher(s) in Design-Creation embedded in Classroom Activities. Steps of design, creation, applying, evaluation, presentation or other additional steps of the production of infographics can be integrated into the education process, as separate concept/topics of the curriculum. (*e.g.* CHEM-002)
CASE D: Embed the whole Cycle of Infographic Development as a Classroom Project-Based Activity. The cycle of development is integrated into the education process, and the infographic is produced during this process, not independently. (*e.g.* PHYS-002)

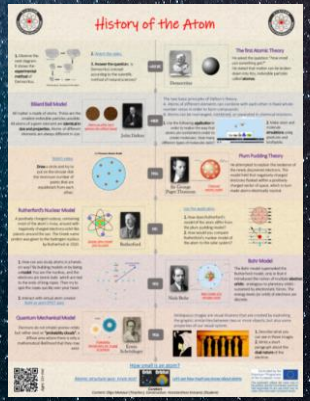
C. Infographics for STEAM

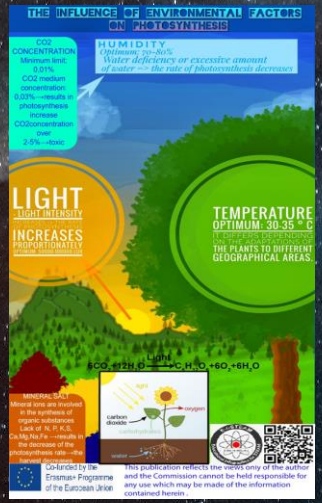


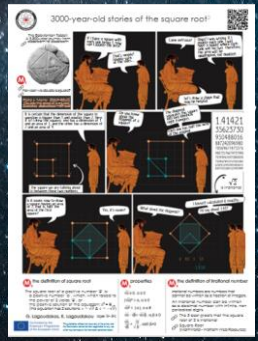


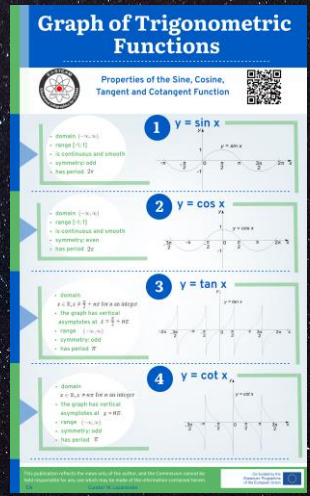






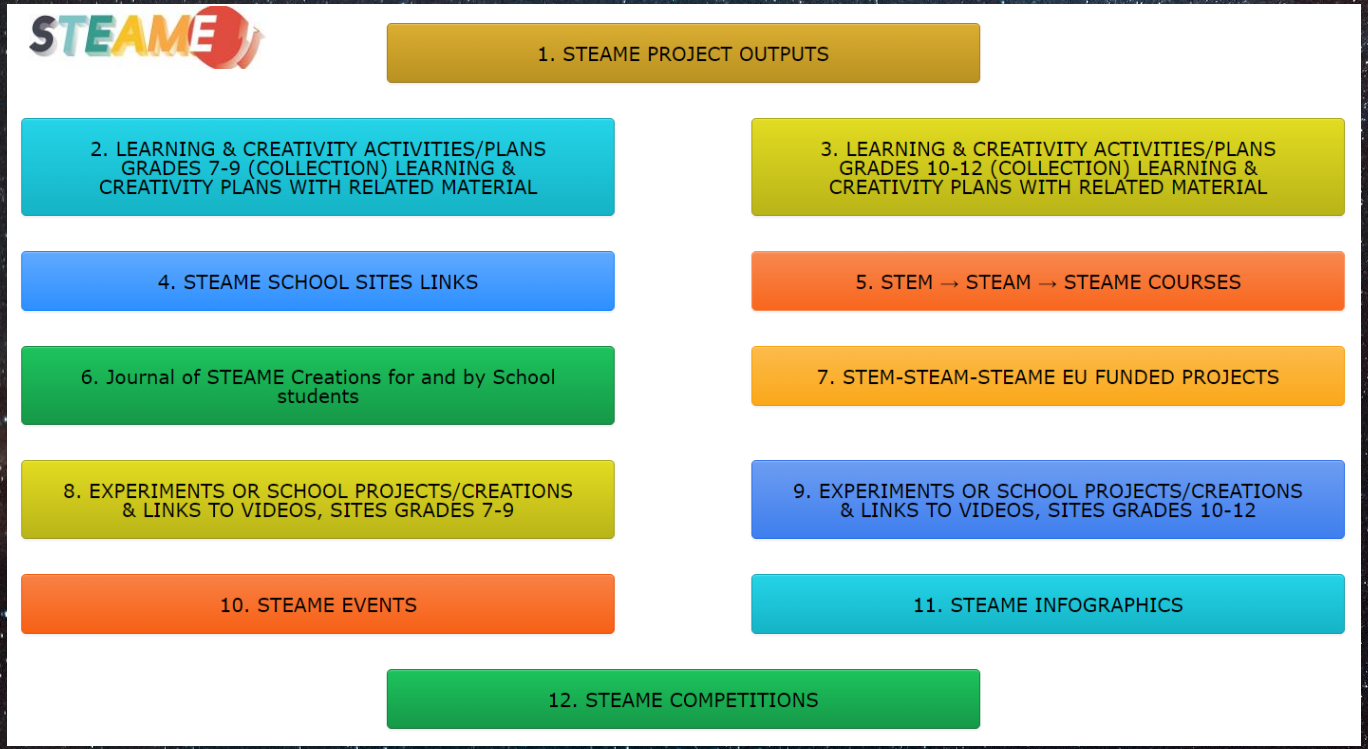






D. the Observatory of the STEAME & STEAME goes hybrid

STEAME Observatory



("output" links: 12)

Example 1: e-Shop Presentation (student work)

JEWELLERY

WHY?

1. Is a great fit for ecommerce
2. They are lightweight
3. Easy to ship
4. Come in many variations
5. They can be customized

AIM

To investigate if jewellery is a suitable and profitable product for an e-shop

SRUCTURE

BILLING AND PRICING

❖ Total revenue

Neclaces→ 20 x 100= 2.000€
Rings→ 15 x 100= 1.500 €
Earings→ 20 x 100= 2.000
Bracelets→ 12 x 100= 1.200

2.000+1.500+2.000+1.200=6.700

Total revenue: 6.700 € per/month

❖ Total cost

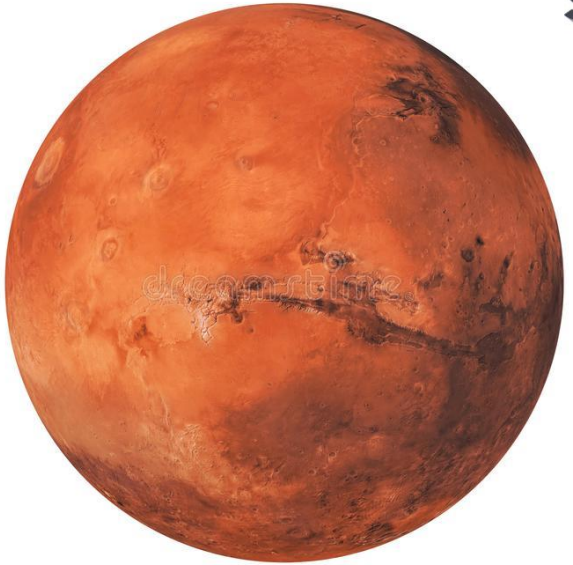
TC= (150+70+80+50)+(2.000+150+250+600)
TC=350+3000
TC= 3.350 € per/month

❖ Profit

Profit=6.700-3.350
Profit= 3.350 € per/month

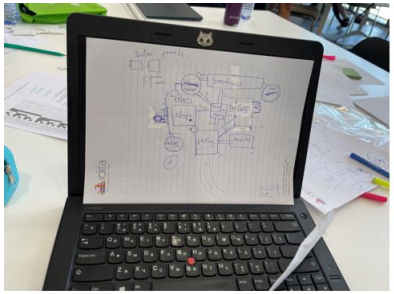
Project Number: 2019-1-CY01-KA201-058240
Erasmus+

Example 2:



Αποικισμός του πλανήτη Άρη

Επιστημονική φαντασία ή εφικτός στόχος;
Αναγκαιότητα ή περιττή πολυτέλεια;



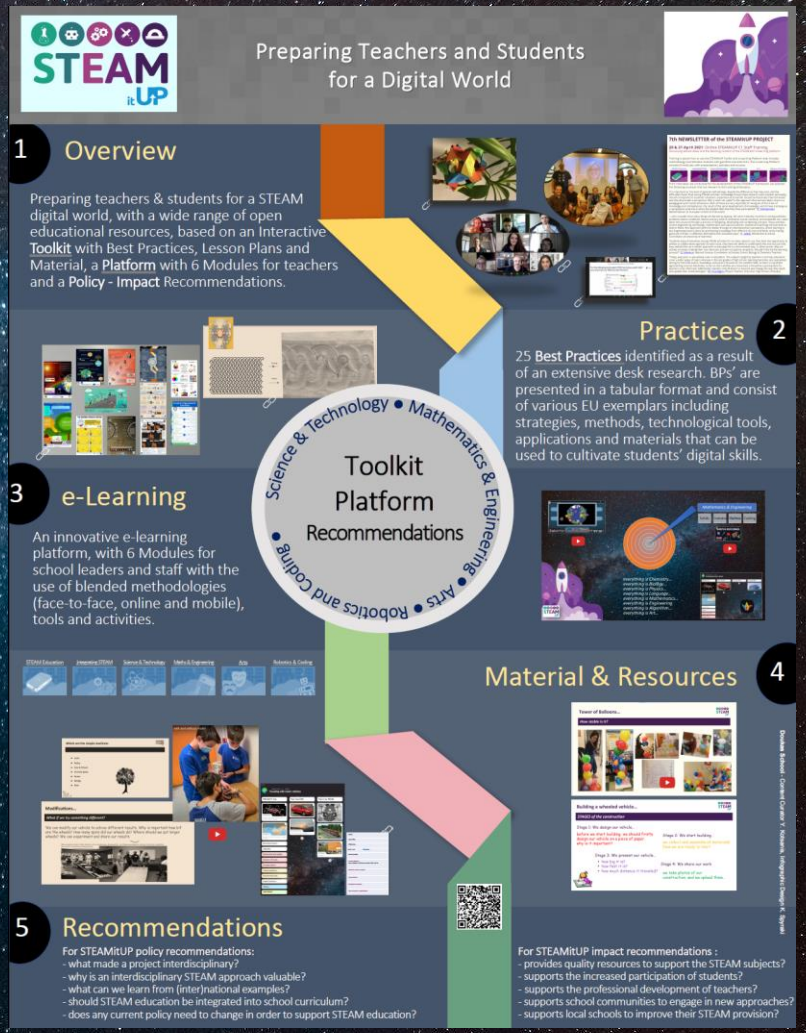
Γιατί στον πλανήτη Άρη;
Σχεδιάζοντας μια αποστολή στον πλανήτη Άρη
Υλοποίηση μίας βάσης στον πλανήτη Άρη

CYPRUS PEDAGOGICAL INSTITUTE
Institute of Accelerating Systems and Applications
DOUKAS SCHOOL
ITCSPACLE "E. MORANTE " LIMBIATE
Prof. Ivan Apostolov ENGLISH LANGUAGE SCHOOL

E. the e-Learning Platform of the STEAMitUP

ready STEAM material
for the classroom…

(“output” links: 17)



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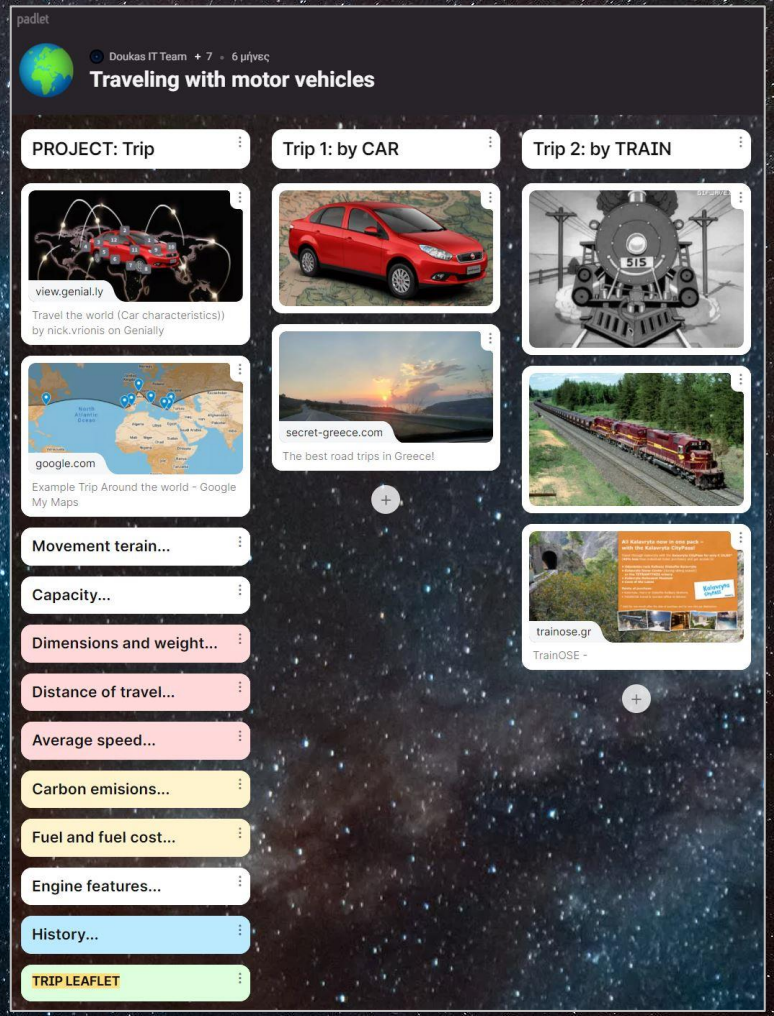

F. …and what is common to all these practices?

Mathematics is in everything is OR everything is Mathematics?

F. …and what is common to all these practices?

Mathematics is in everything is OR

everything is Mathematics?
everything is Physics…
everything is Chemistry…
everything is Biology…
everything is Engineering
everything is Algorithm…
everything is Art…

F. …and what is common to all these practices?

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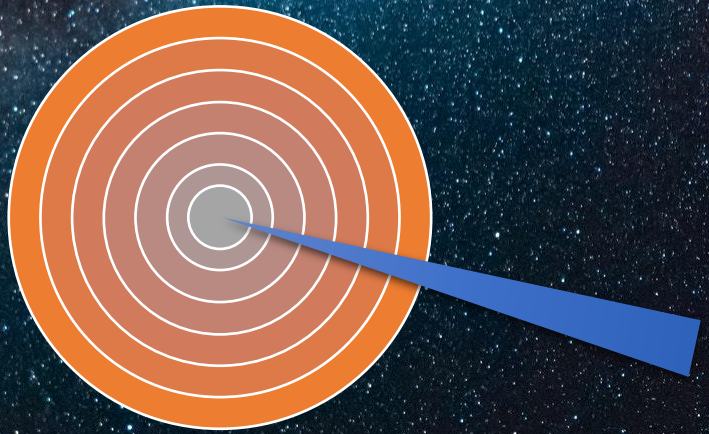
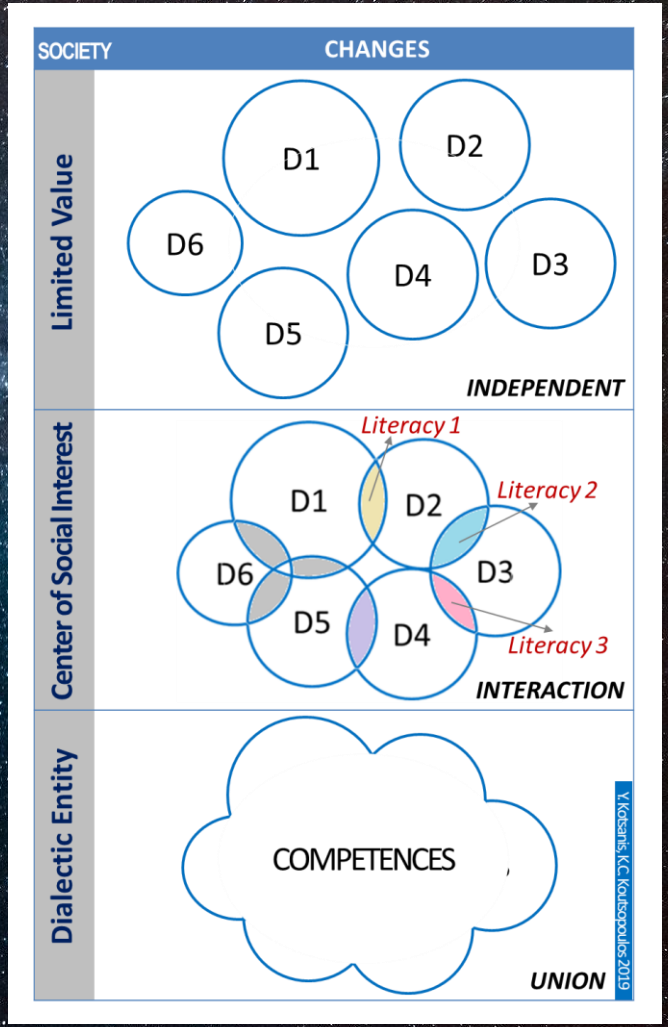


Mathematics & Engineering

Solids | Constructions | Machines | Coding

F. …and what is common to all these practices?

Multi-Disciplinary Literacies	Inter-Disciplinary Literacies
1. Language 2. Mathematics-Logic 3. Physical Sciences 4. Social-Human Sciences 5. Digital and Cloud-based Technologies 6. Physical Fitness and Healthy Life 7. Cultural, Arts, Civic 8. Economics, Entrepreneurship	Cloud-based Learner/Teacher/Leader Personal Career Counselling Learning & Teaching "1:1 Computing" Personal Movement Learning Personal Professional Development …



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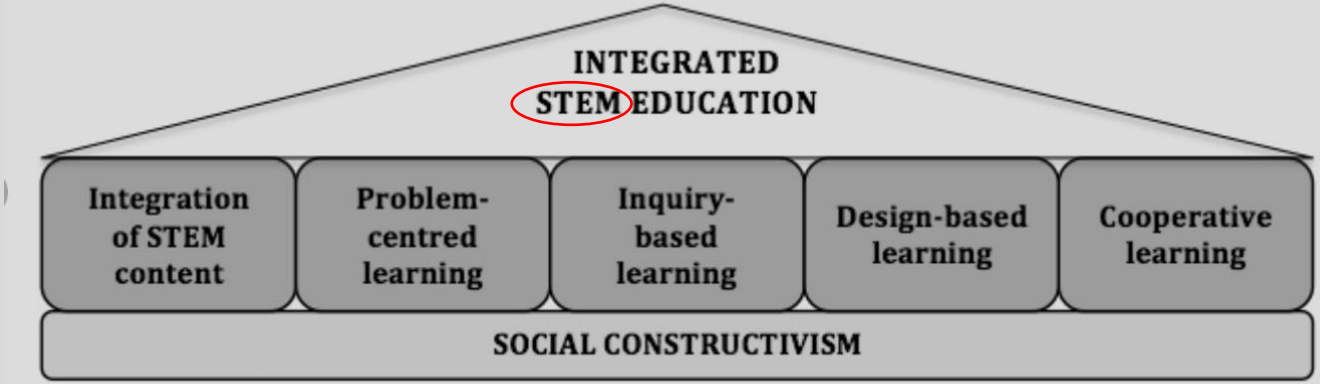

Thibaut et al., 2018

Kotsanis 2018

F. …and what is common to all these practices?

Project Development, Realisation Processes

Competences *(knowledge, skills, values)*

Evaluation!

Criterion	basic/beginning	emerging/developing	accomplished/strong	exemplary	NA
LLP goal/objective achievement and motivation	achieves no or weak the LLP goals	partially achieves the LLP goals without particularly obvious motivation	is committed and responsible for taking action toward LLP goals achievement and has strong motivation	fully achieves LLP goals with exemplary motivation	☐
resources, references	does not use appropriate resources and references or uses resources not related to the project	uses some appropriate resources available, not at correct level (i.e., valid and up-to-date)	uses appropriate resources generally available at correct level, with appropriate tools	uses appropriate resources always available at multiple levels, with appropriate tools	☐
oral - written language	uses limited vocabulary, makes many grammatical errors, does not use formal language and structures	uses adequate vocabulary, makes various grammatical errors, uses appropriate language and some structures	uses satisfactory vocabulary, makes few grammatical errors, uses precise language and satisfactory structures	Uses vivid vocabulary, makes no grammatical errors, uses accurate language and unique structures	☐
digital skills	searches, organizes, processes information in a limited way	searches, organizes, processes information adequately to produce poor digital content	searches, organizes, processes information in a satisfactory way to produce digital content	searches, organizes, processes information in a systematic way to produce digital content	☐
creativity, innovation	selects one idea without evaluating the quality of ideas, does not elaborate on the selected idea, reproduces existing ideas	develops & evaluates some original ideas for product(s), but doesn't thoroughly, demonstrate imagination within conventional boundaries	uses idea-generating techniques to develop several original ideas & carefully evaluates the quality of ideas and selects the best one to shape into a product	takes different perspectives to improve selected ideas and uses imagination, going outside conventional boundaries to shape into a product	☐
critical thinking	accepts arguments for possible answers to the questions without valid reasoning	recognizes the need for valid reasoning and strong evidence, but does not evaluate it carefully	evaluates arguments for answers to questions by assessing whether reasoning is valid and evidence is relevant & sufficient	justifies choice of answers used to evaluate ideas, product prototypes or problem solutions, with personal criteria	☐
collaboration	does not help the team or give feedback, does not ask probing questions, express ideas, or elaborate in response to questions in discussions	cooperates & gives feedback but not actively, sometimes expresses ideas clearly & elaborates in response to questions in discussions	helps the team solve problems & gives useful feedback, makes discussions effective by clearly expressing ideas	collaborates with exemplary motivation asking probing questions, making sure everyone is heard, responds thoughtfully to new information and perspectives	☐
social and emotional behavior	consistently ignores expected behavior and does not respect others; unable to cope with new situations and challenges;	sometimes ignores the expected behavior and respect of others; copes with new situations and challenges with support;	usually behaves appropriately and respects others; participates in new situations and challenges with minimal support;	consistently behaves appropriately and respects others; independently accepts new situations and challenges;	☐
visualization and/or presentation skills	does not visualize/present information, arguments, ideas, or findings clearly, concisely, logically, with evidence and reasoning	visualizes/presents information, findings, arguments & supporting evidence, in a way that is not always clear, concise, and logical, with hard to follow reasoning	visualizes/presents information, findings, arguments and supporting evidence clearly, concisely, and logically, with reasoning, easy to follow	visualizes/presents information, findings, arguments and supporting evidence, in original way, using imagination, with exemplary reasoning	☐
overall student participation in LLP activities and artifacts production	limited or partial participation in the activities and/or artifacts with little or slight connection to the goals	presents an adequate and acceptable participation in the activities and/or artifacts that contribute to a certain extent to the goals	presents a substantial and satisfactory participation in the activities and/or artifacts that provide evidence to the goals	presents a detailed and exceptional participation in the activities and/or artifacts that provide robust evidence to the goals	☐

Based on STEAME L&C Plan Evaluation; Sources: Assessment and Rubrics, ReadWriteThink Rubrics, iRubric: Build, Assess, Share, Collaborate, Better Feedback for Better Teaching

E-I-STEAM steam-edu.eu Educational Infographics for STEAM

Q. but the main question remains!

What is the impact on students?

Pleasure
Entertainment
Knowledge
Skills
Values
Experience
Exploration
Friendship
Relationships
Collaboration
Projects

References/Acknowledgments

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- STEAME (Erasmus+ Projects)
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70+ “input” and “output” links in this presentation as a digital artifact!

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Journeys without borders in our hybrid world

Many thanks for your attention!

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