

ESERO Romania: Using Outer Space in the Classroom

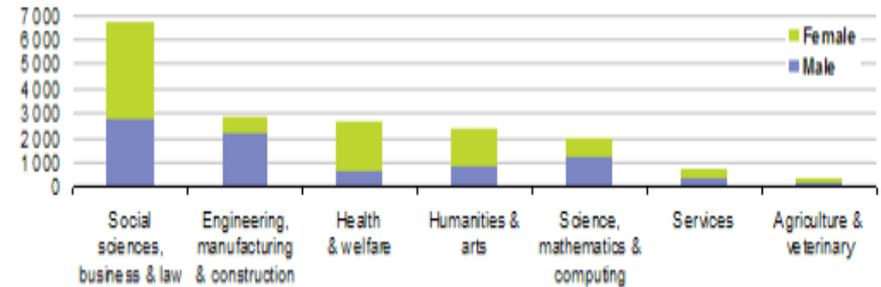
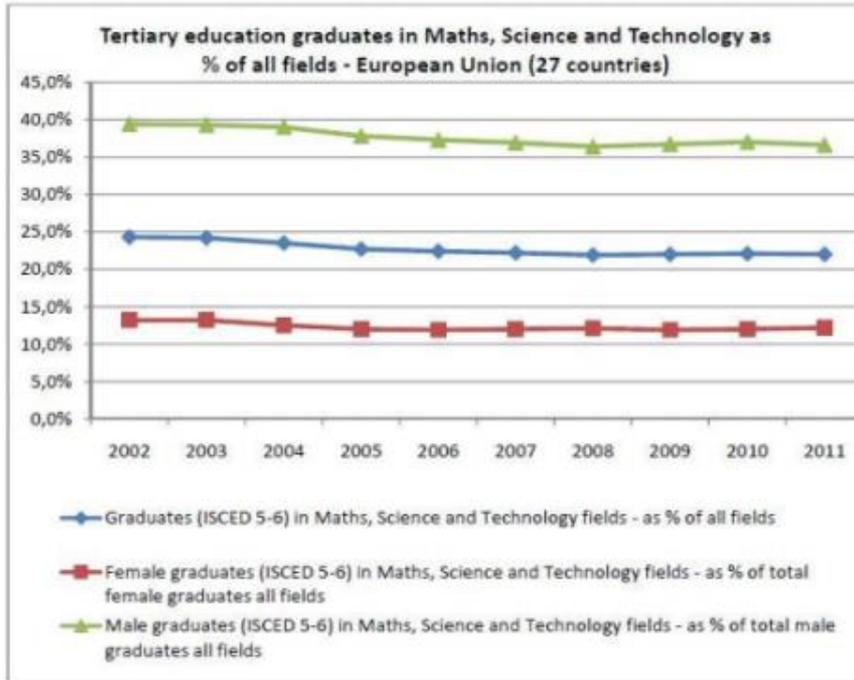
Virgiliu POP
ESERO România
Romanian Space Agency

*United Nations/Romania International Conference on Space
Solutions for Sustainable Agriculture and Precision Farming*

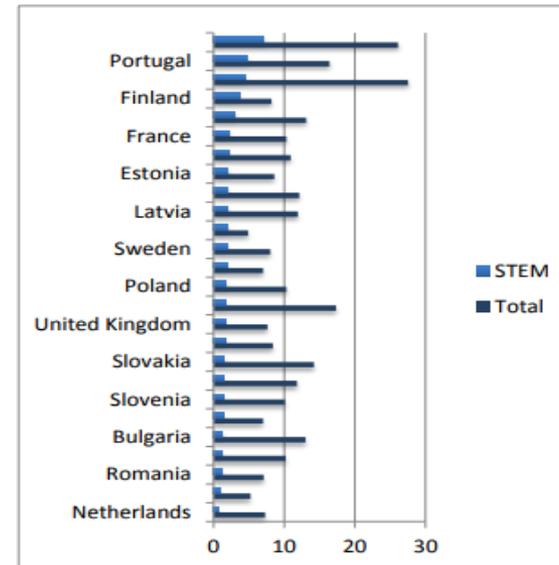
Cluj-Napoca, 10 May 2019



The importance of STEM



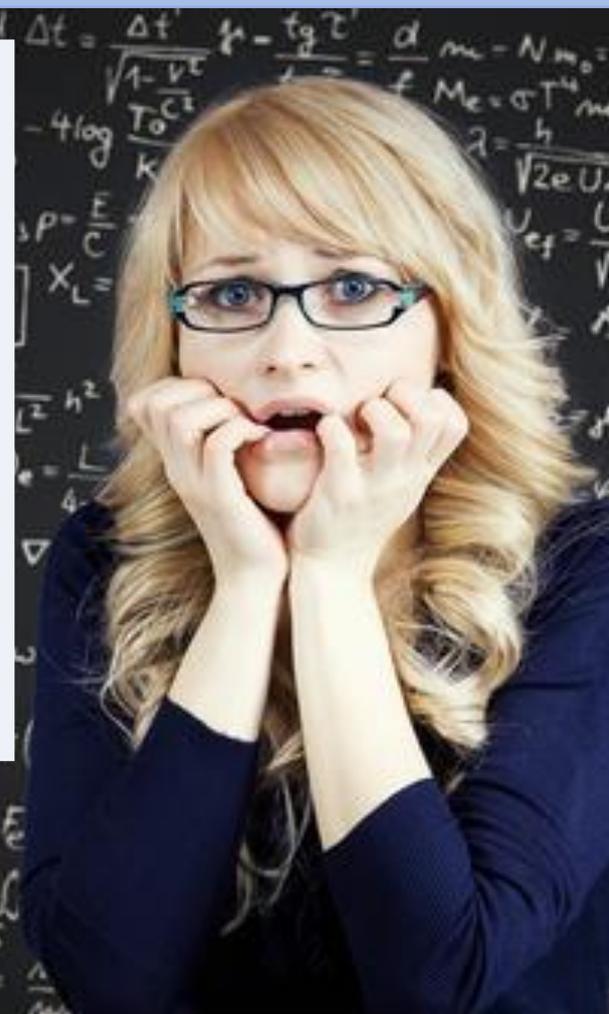
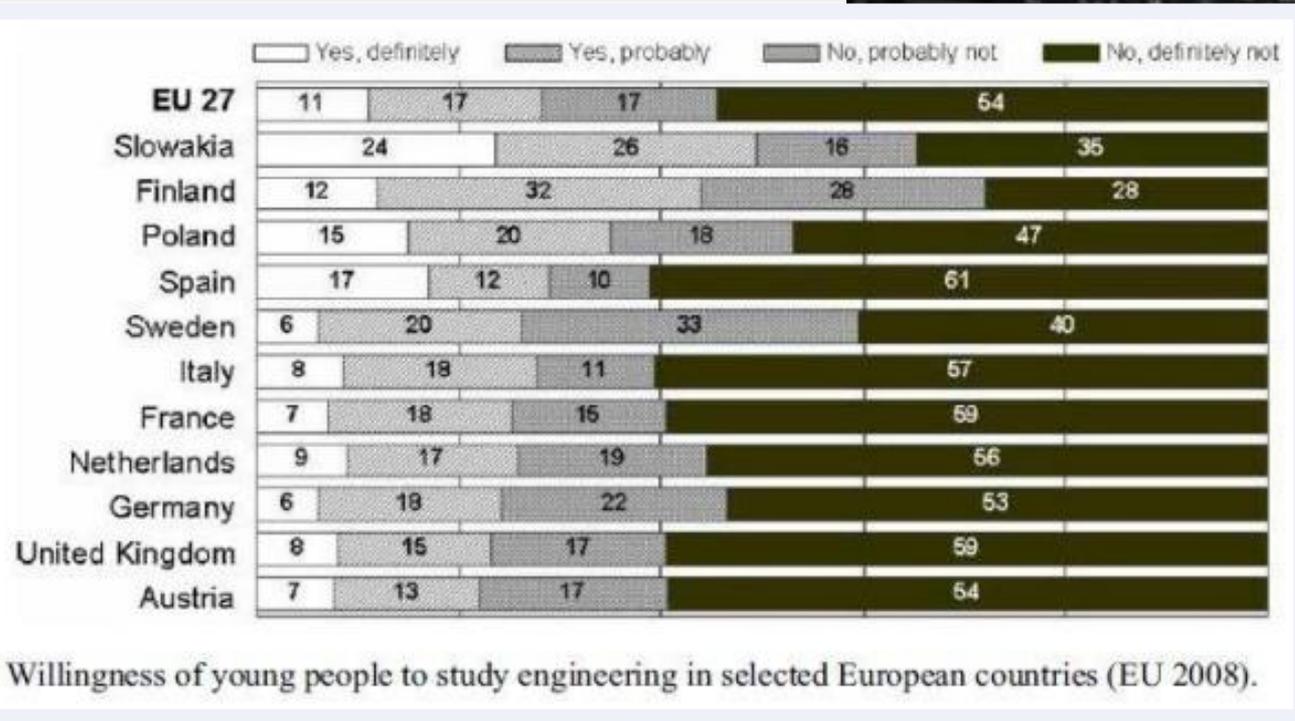
STEM unemployment rate and total unemployment rate, 2013 (%)



A decreasing number of young people in Europe take up Science, Technology, Engineering, Mathematics (STEM)-related studies and careers. This number is insufficient – there is a mismatch between demand and supply. [Graph sources: European Parliament , Eurostat]



The (lack of) interest in STEM careers



Source: Eurostat, Alexa Joyce (European Schoolnet)



Outer space comes to the rescue !



ESERO – European Space Education Resource Offices



- The European Space Agency is helping reverse the negative trends through an Education program which targets European students starting from an early age.
- ESA is addressing primary and secondary education in Europe through its European Space Education Resource Office (ESERO) project.
- The ESERO project is ESA's main way of supporting the primary and secondary education community in Europe.
- Kids like space (and dinosaurs)
- ESERO uses space related themes and the genuine fascination felt by youngsters for space to enhance school pupils' literacy and competence in STEM-related subjects. The ESERO project also raises awareness of the generous career prospects in the space field.



The ESERO network



“The activities of the Agency shall include mandatory activities, in which all Member States participate ... With respect to the mandatory activities, the Agency shall ensure the execution of basic activities, such as education” (ESA Convention, Article V)

ESEROs are distributed across ESA Member States, and staffed by local experts who work in strong synergy and partnership with their national education authorities and networks



ESERO România

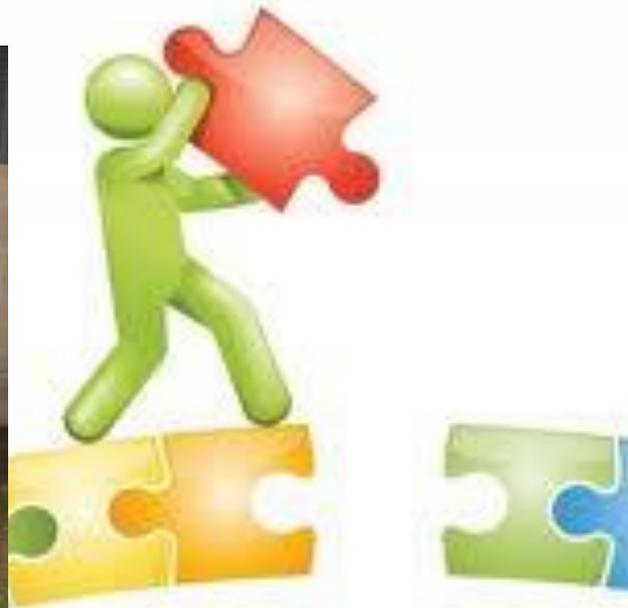


- Established in 1991, the Romanian Space Agency (ROSA) became in 1995 an independent public institution under the authority of the Ministry of Education and Research
- Mission:
 - ◆ Coordinate the national space research and applications programs
 - ◆ Promote space development
 - ◆ Be the Government representative for international space cooperation
- Romania is a full member of ESA.

ESERO România



ESERO România



30% cred că oamenii au fost contemporani cu dinozaurii

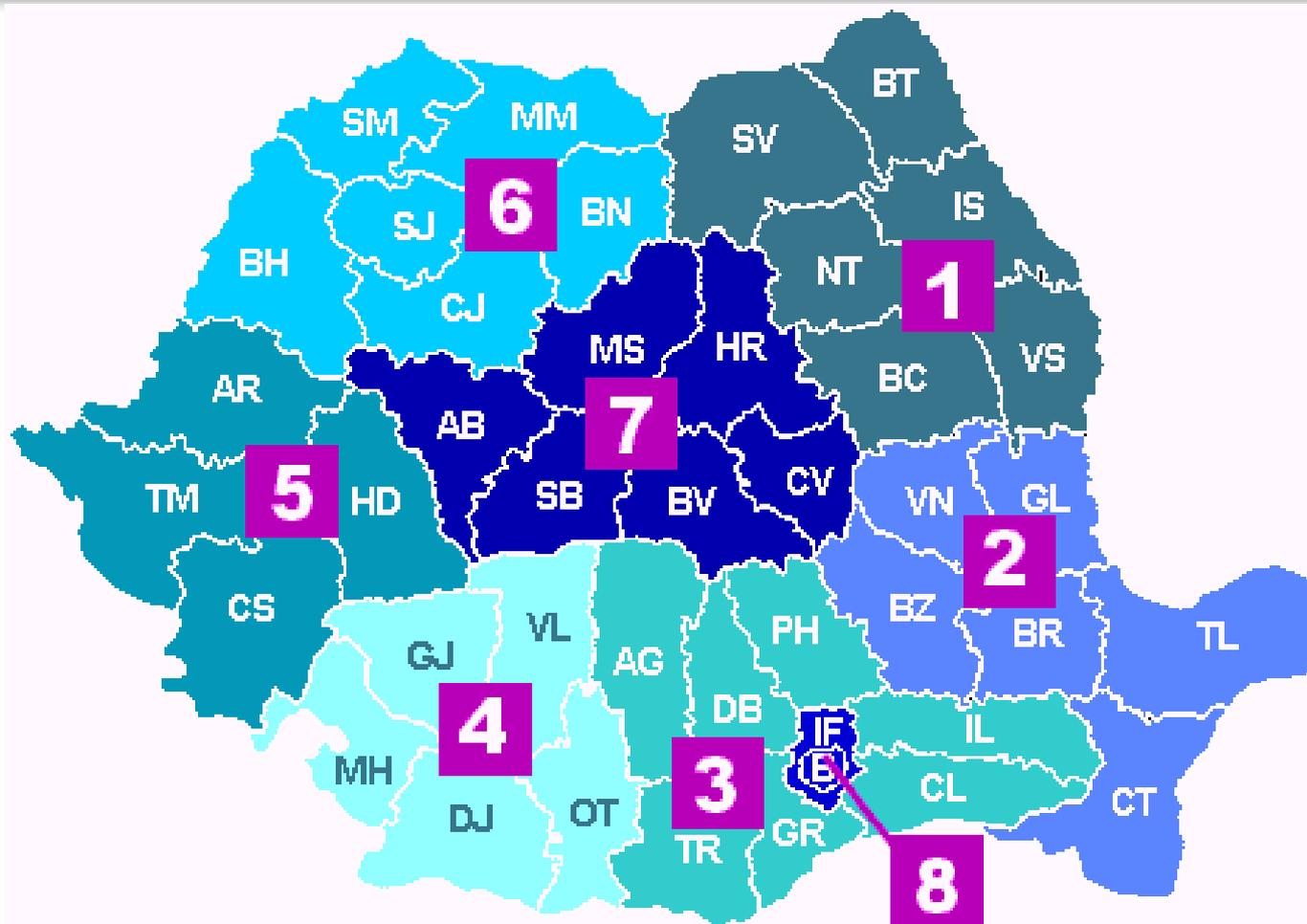
34% nu cred că genele tatălui determină sexul copilului

42% cred că Soarele se învâрте în jurul Pământului

36% nu cred că oamenii au evoluat din alte animale

34% cred că laptele radioactiv devine comestibil prin fierbere

Space ambassadors and consuls



Online presence



Romania **esero** EUROPEAN SPACE EDUCATION RESOURCE OFFICE
A collaboration between ESA & national partners

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România reprezentată la Workshopul de vară anual ESA pentru profesori

40 de cadre didactice din 17 state membre ESA au luat parte la workshopul de vară organizat anual de către ESA pentru profesori și găzduit la Centrul European de Cercetări și Tehnologii Spațiale (European Space Research and Technology Centre -...)

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Training pentru profesori la Marisel, jud. Cluj, 4-7 Septembrie



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ESERO Romania Education

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ESERO Romania shared a link: What have you been up to?



Specialists meetings



(Virtual) presence in the classroom



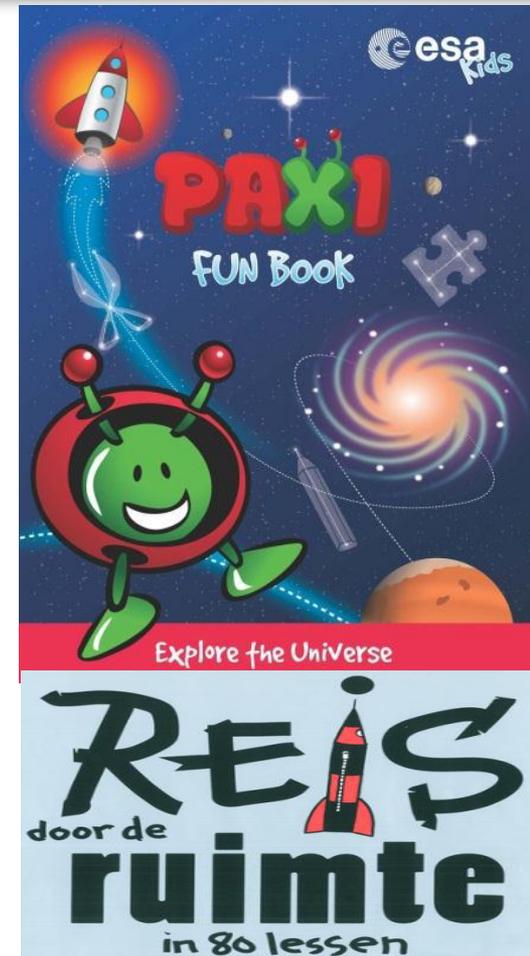
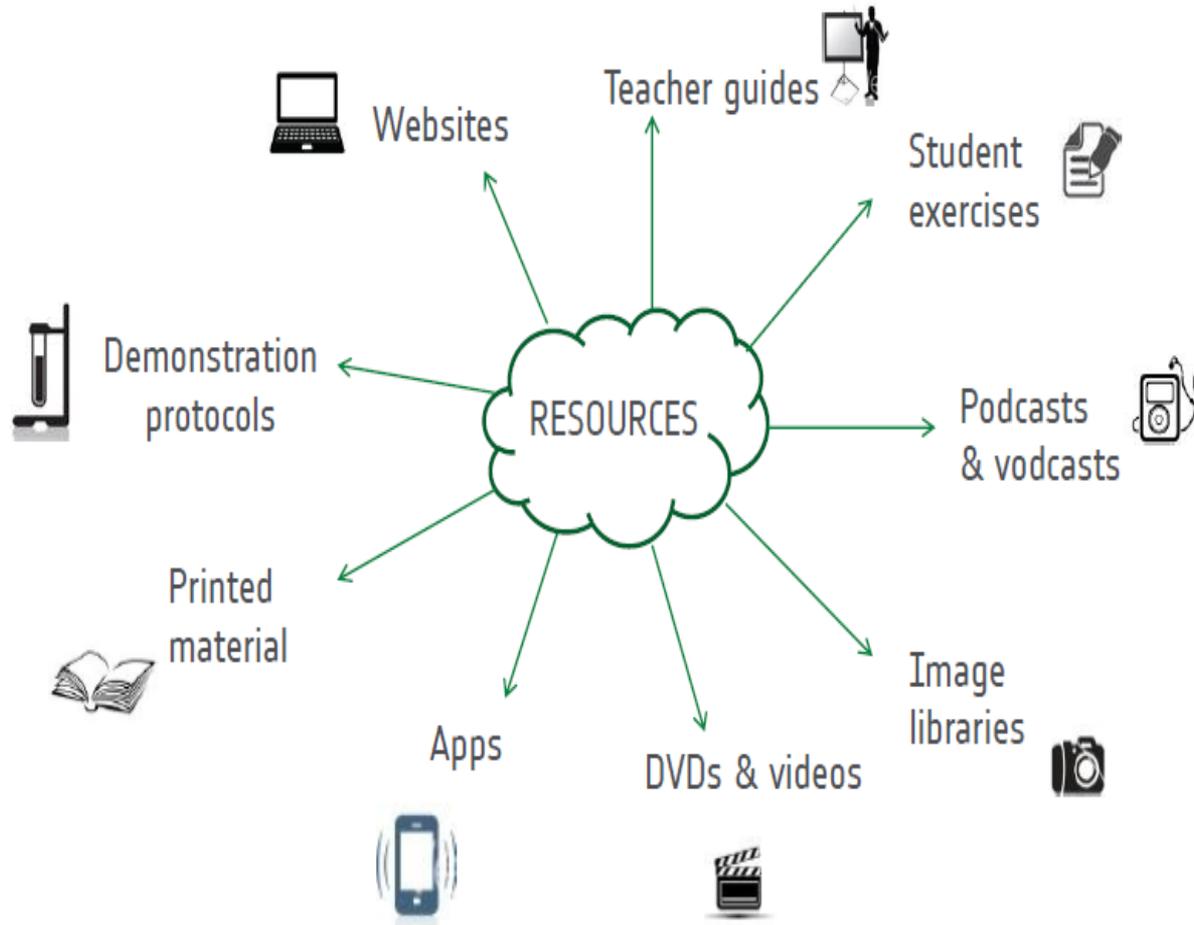
In-Flight Call with Thomas Pesquet, Timisoara (UVT)



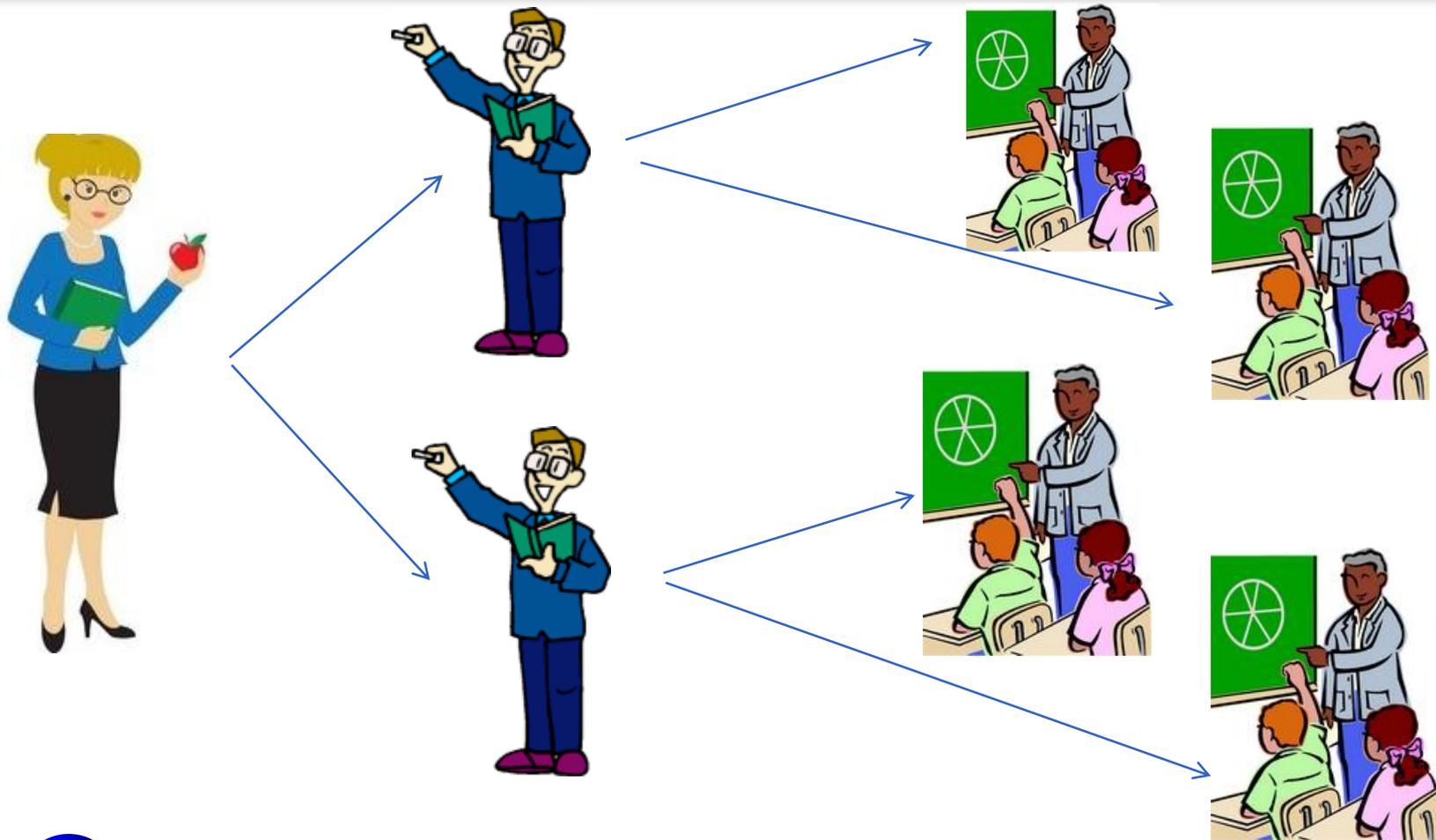
Resource distribution



Classroom support



Teacher trainings



Primary school teacher trainings



Primary school teacher trainings



Secondary school teacher trainings



CanSat competition – Hands-On for pupils



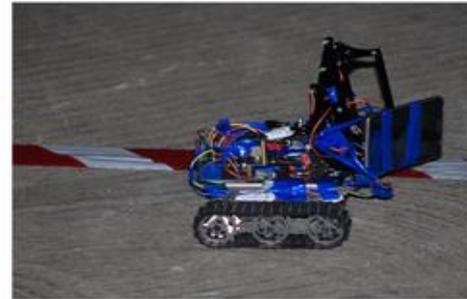
CanSat competition – Hands-On for pupils



Exo-Ro competition – Hands-On for pupils



Exo-Ro competition – Hands-On for pupils



Mission X: Train like an Astronaut



30 June: Asteroid Day



4-10 October: World Space Week



World Space Week



Astro-Pi



Space STEM – Agriculture: Food from Spirulina



- In 2014-2015, schools throughout Europe participated in the 'Food from Spirulina' biological experiment, which called upon students aged 14 to 16 to perform an experiment on cyanobacteria *Arthrospira platensis*, also known as Spirulina.
- The experiment was inspired by the Micro-Ecological Life Support System Alternative programme (MELiSSA) - an ESA initiative with the aim to develop the technology for a future regenerative life support system for long term human space missions.
- The experiment generated over 80% success rate and clear O₂ production in the samples the students exhaled into whilst the controls slowly withered away due to a lack of carbon sources



Space STEM - Agriculture: Rocket Science



Space STEM - Agriculture: Rocket Science



- In 2016, one million (2 kg) rocket salad (*Eruca Sativa*) seeds spent six months on board ISS with Tim Peake
- They were returned to Earth.
- 600,000 British school children in 10,000 schools cultivated these seeds, comparing them with “normal” seeds
- On average, the space seeds grew less well than the seeds that stayed on Earth.
- Reason: Radiation!

Climate Detectives



→ CLIMATE DETECTIVES



Climate Detectives



→ CLIMATE DETECTIVES

- 2018-2019: Climate Detectives is an ESA school project for students between 8 and 15 years old. Students are challenged to ‘make a difference’ in understanding and protecting Earth’s climate. They identify a climate problem by observing their local environment and are tasked to investigate it as ‘Climate Detectives’. To this end, they use available Earth Observation data or take measurements on the ground.
- Based on their investigation, teams propose ways to help reduce the problem.
- Examples: soil erosion, deforestation



Thank you for your attention!
romanian space agency
Space tools for a better life

- **Science**
- **Technology**
- **Enterprise**
- **Capacity building**
- **Security**