Introduction to STEAM Turku model

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STEaM Turku

- Science and technology path in early childhood education (0-6y), comprehensive (7-15y) and secondary level (16-19y) education in Turku and Southwest Finland
- A direct route to further studies and the Turku technology campus
- STEAM comes from the words Science, Technology, Engineering, Arts and Mathematics, but let’s start with steam...

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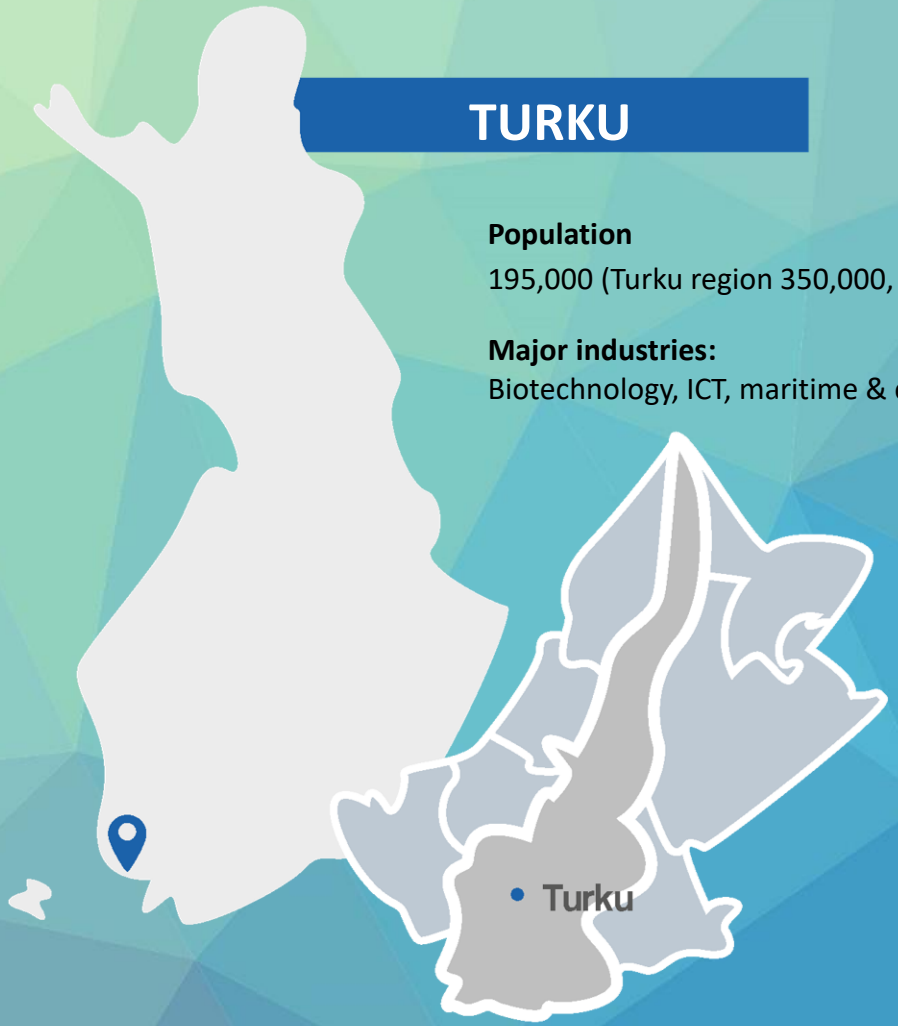
Population

195,000 (Turku region 350,000, SW Finland 700,000)

Major industries:

Biotechnology, ICT, maritime & creative industries



For more information, see www.turku.fi

City of Turku Education Division

81 daycare centers/preschools

41 comprehensive schools

10 upper secondary schools

7 vocational schools at the Turku Vocational Institute

adult education services

over **40,000** students (including daycare), number of staff **3,700**

For more information,
see **www.turku.fi/education**

STEAM Turku is part of the city of Turku's Technology Campus cooperation. The education division of Turku manages the project’s implementation, but it is also linked to the business policy of the entire city. Long-term work is made possible through the city's permanent financing, which is supported by various externally financed projects.

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International cooperation

Cooperation with University of Strathclyde

Other international networks and projects

National cooperation

FITech, Technology industries of Finland, other stakeholders

National development projects

STEAM Turku

- Increasing the appeal of science and technology
- A science and technology path combining early childhood, basic, and secondary education
- New digital solutions, contents of instruction, learning materials and learning environments
- New paths to higher education
- Creating new forms of cooperation between all levels of education, universities and companies
- Development projects (a total of 18 in September 2019)

STEAM South-West Finland

Cooperation with the Education Forum for Maritime Industry and Technology

Dissemination and productization of results

Common development projects

New forms of cooperation

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STEAM Process 2020

Education Division

Science and technology path

Smart learning environments for the future
AR learning environment

Worklife specialist

Kindergarten

- Support for new pedagogy in early childhood learning environments

Comprehensive school

- My Tech -program basic education
- G.A. STEM
- Comprehensive School is best!

Upper Secondary Schools

- Working Life Collaboration in Upper Secondary Schools
- Spatial and Open Data
- Marine Track in Upper Secondary
- TASE

VET

- Live
- ROBOREEL
- 365/12
- ViSu
- HyGGe
- Roboboost

Participation

There is a personal path for every pupil, student and teacher into the world of science and technology

Openness

All information and practices are shared, everyone can participate in the cooperation, we are ready to learn from others

Innovativeness

We want to seek and find new solutions and opportunities we also believe that failures are learning experiences

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Results

- Over 15 000 participants during the first two years
- Higher education opportunities in technology in Turku –tour (14 schools, more than a thousand participants)
- New models for increasing the attractiveness of secondary vocational education
- New operating models for university co-operation at different school levels (e.g. science passport, university and polytechnic courses at secondary level, joint development pilots and events, STEM cooperation, the Junior University of Applied Sciences as part of the Culture Path and Culture Yards)
- New direct routes to university studies

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Results

- New business cooperation models in secondary level education (e.g. working life agents, learning environments in companies, upper secondary working life projects, etc.)
- Innovative experiments: STEAMit!, STEAM Junior, Baltic Sea Challenge, Beyond 2030 Challenge
- Creating and developing the role of Work Life Specialist (the only one in Finland and in the known universe)
- MyTech experiments in collaboration with the Technology Finland
- New pedagogical solutions: åppi mobile application, AR / VR, new high school courses, TuOMO, developing new pedagogies related to robotics, etc.

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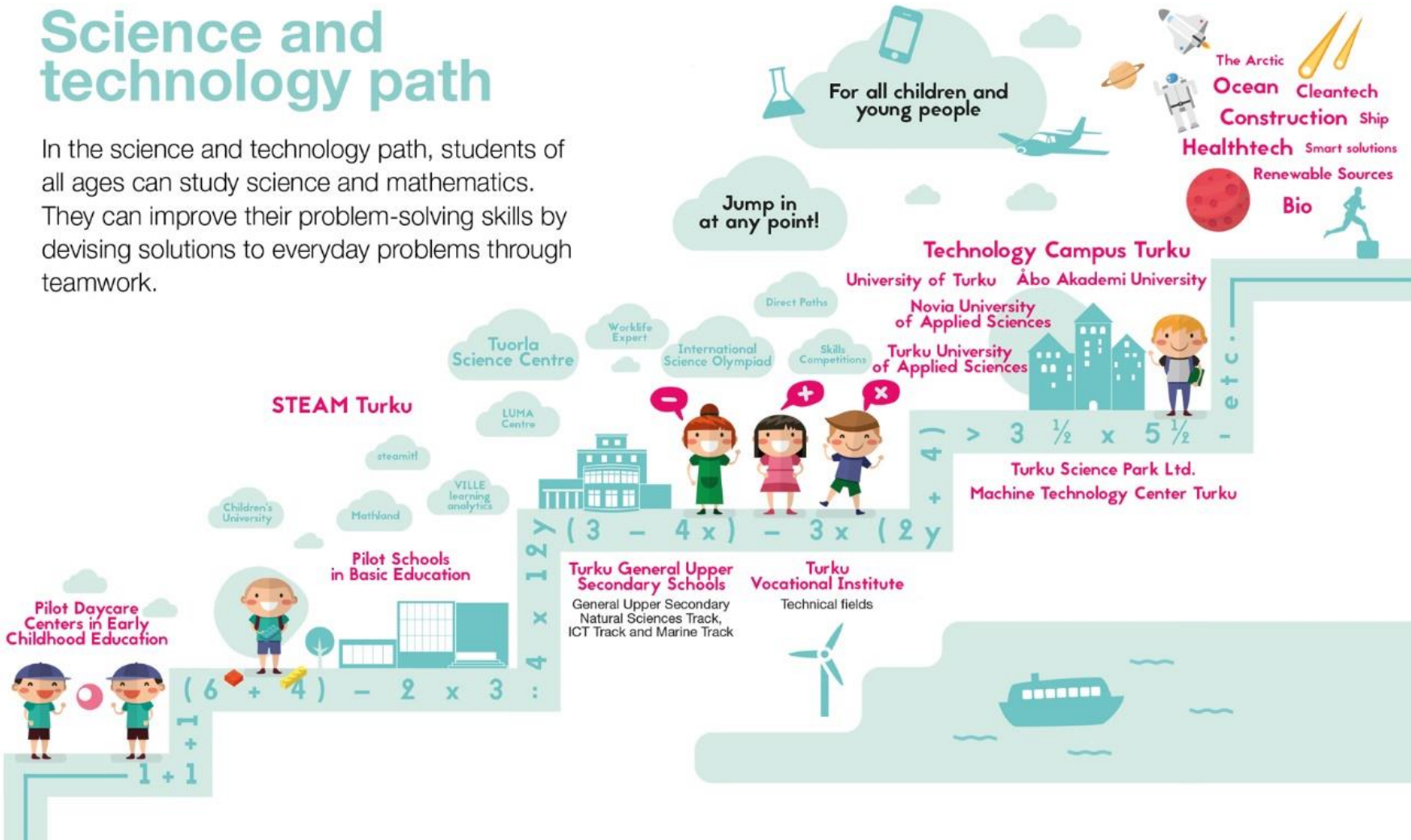
Results

- Development of the cooperation in Southwest Finland (university and business cooperation, joint projects, etc.)
- Development of business cooperation (joint development, common learning environments, working life agents, development projects, etc.)
- Increasing cooperation between different levels of education (e.g. robot experiments in early childhood education produced by high school students)
- Development of international cooperation (Strathclyde, UBC, Goethe Institut)
- Science and Technology Path 2.0 (updating and completion of the model continues)

Science and technology path

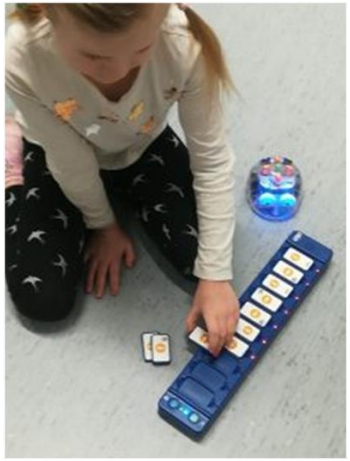
In the science and technology path, students of all ages can study science and mathematics. They can improve their problem-solving skills by devising solutions to everyday problems through teamwork.



2. STEAM path in detail

STEAM Turku 2021 Early Childhood Education (0-6y)

- Project: developed older kindergartens learning environments
  - e.g. science rooms, sciencebag, robot bag + digital bag
  - Equipments, materials
  - *”The biggest wish is that children will have a natural relationship with technology, both girls and boys, and that children will find that devices can be used for much more than just playing”* -ece teacher



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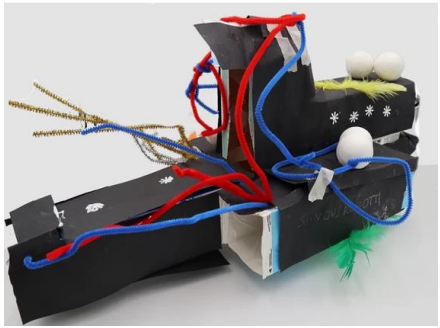
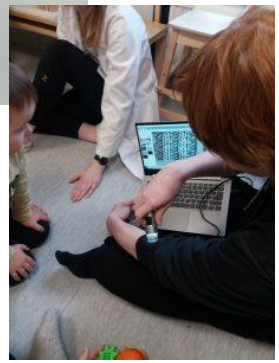
STEAM Turku 2021 ECE

- Robot day and science day in collaboration with high school students (STEAMit!)





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STEAM Turku 2021 ECE

- SCIENCE BAG -pilot
  - microscopes, magnifiers, various measuring vessels, pipettes, pH-paper, etc

- Science education

  -> Early childhood education plan

  -> Pri-primary education curriculum

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STEAM Turku Basic school
(grades 1-9)

Guiding principle:

STEAM is for everyone regardless of age and teachers' motivations.

To accomplish this we:

1. Add STEAM so that it affects as many students as possible.
2. Add STEAM to the structures of the comprehensive school.
3. Emphasize co-operation with companies and higher education.

Juniori AMK (=University of Applied Sciences)

- Massive cooperation between the Turku University of Applied Sciences (TUAS) and the comprehensive school.
- All the 5th graders (12y) visit the TUAS during the school year. This amounts to 1600 students.
- TUAS students guide them and tell them about their studies. We also encourage them to do different experiments.
- University of Applied Sciences

STEAMit!

- An annual endeavour, where a teacher comes up with a STEAM project, and we fund it. The money can be used on new equipment, materials, planning etc.
- Very popular, usually >20 applicants.
- The teachers are required to report their projects to others, so they get even more ideas and begin networking.

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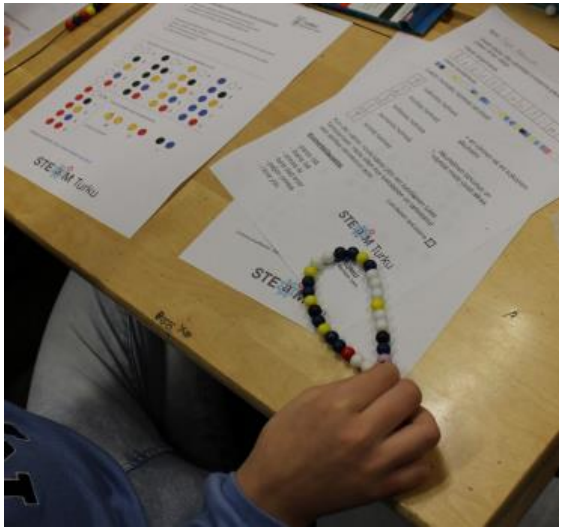

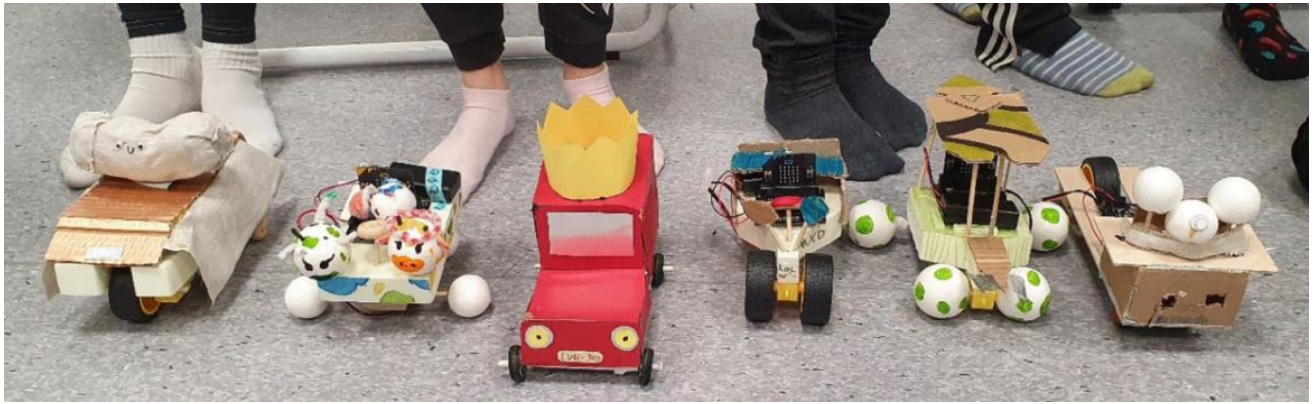

Upper secondary education

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STEAM Turku Upper Secondary School

New National core curriculum for general upper secondary schools August 2021:

“Contacts with the world around the students, and especially internationalization and cooperation with higher education institutions, the world of work and entrepreneurs, will be emphasized increasingly”

Three of six high schools in Turku are specialized on STEAM:

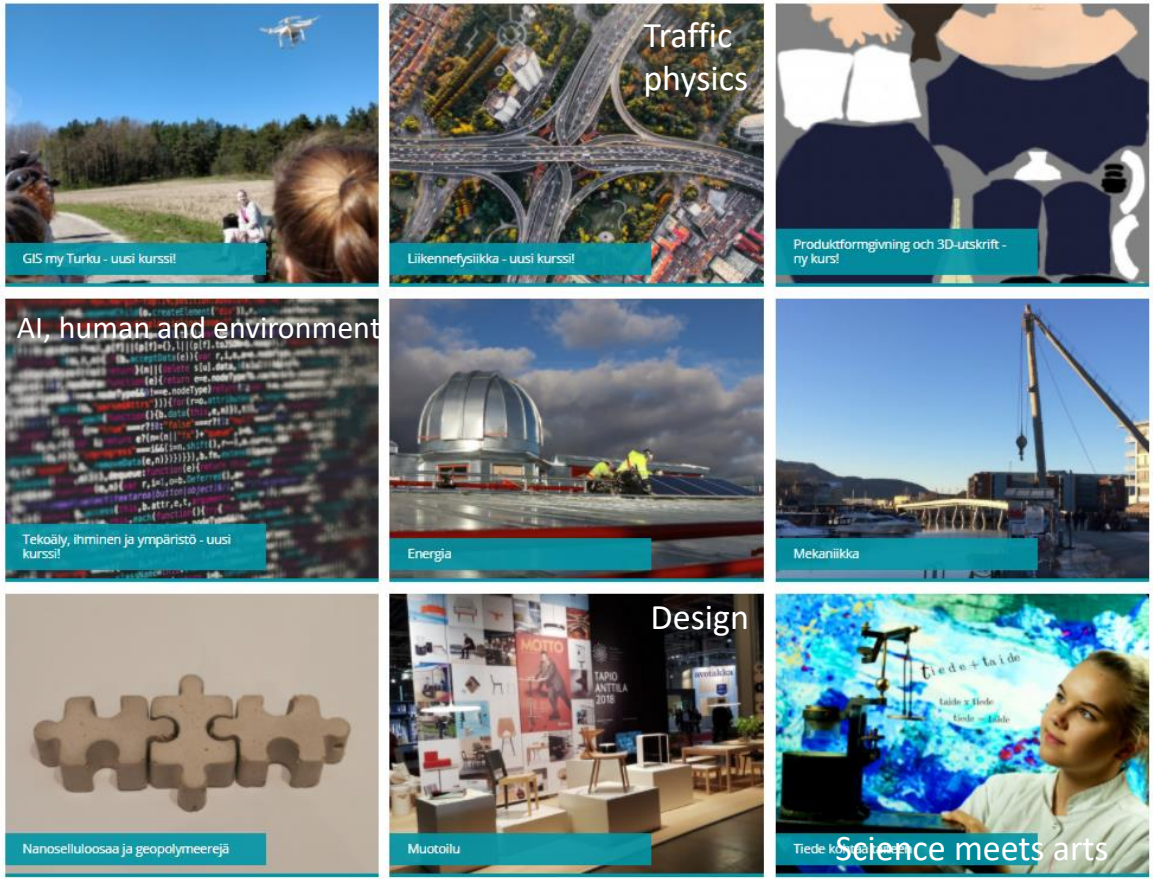
The TSYK High School’s **NATURAL SCIENCE** and **MARINE tracks** and the Kerttuli High School’s **ICT track**

Co-operation with universities or/and companies -> STEAM courses

Direct routes to university and university of applied sciences studies

New digital solutions and learning environments, for example AR application made by high school and university students & CTRL reality ltd -> åppi

Examples of STEAM courses – available for all Turku City high school students



Crossing the boundaries of individual subjects – building a sustainable future

STEAM Turku Vocational education and training (VET)

Institutions and **on-the-job learning**

Projects commissioned by companies

Companies and educational institutions shared new technology-oriented learning environments like **Machine Technology Center Turku Ltd.**

Opportunity to complete university of applied sciences level courses

Direct routes to university of applied sciences studies

Beyond 2030 Challenge – science competition organized by Turku City, Bayer Nordic and Technology Campus-> university students as mentors for our students

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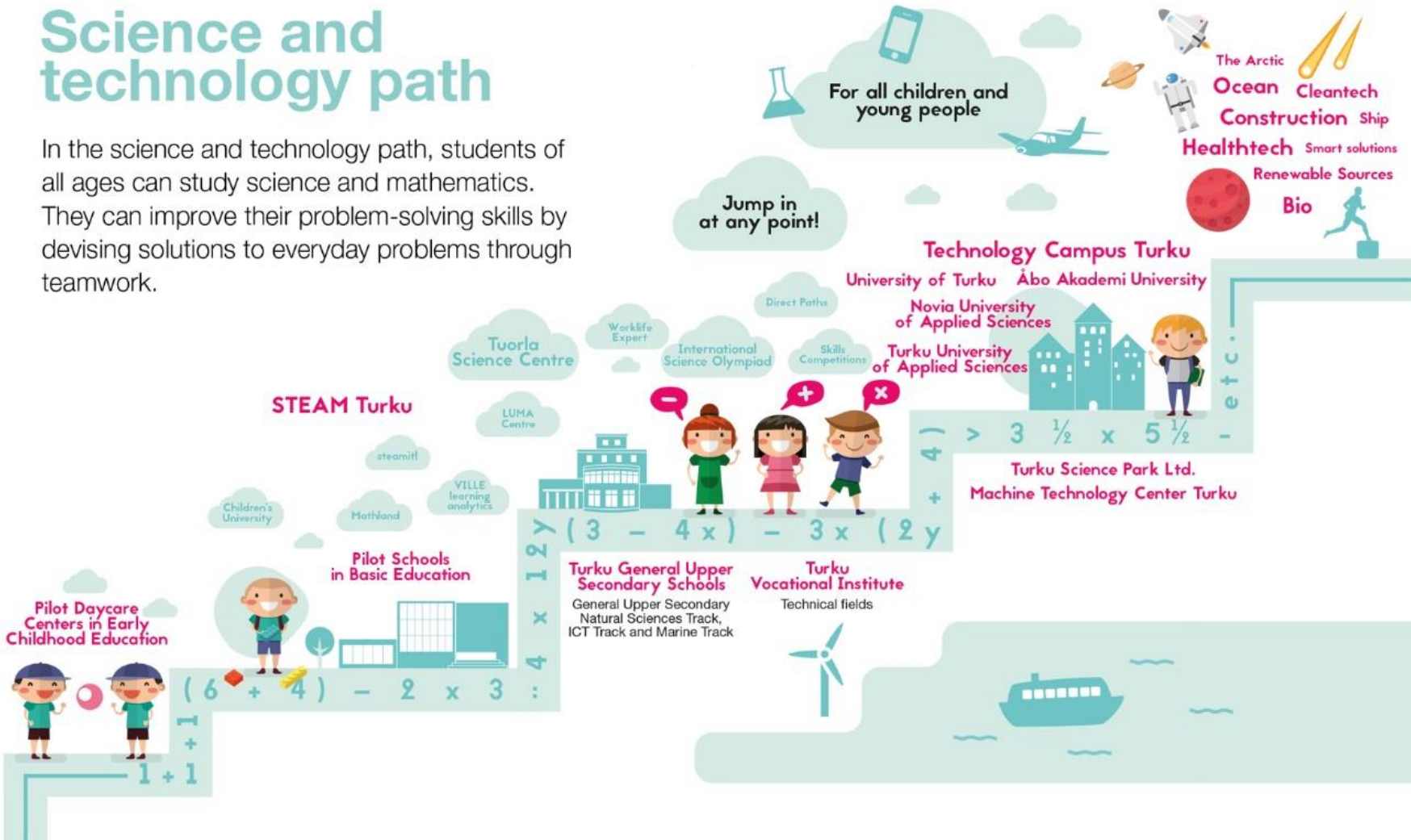

Thank you!

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