ATELIER FOR STE@M	STE(A)M activity
Title	• Computer cooling study
Content knowledge	• Main parts of computer cooling • Heat, thermal conductivity Materials Characteristics
Methodology	• Online Research • Measuring and testing • Registering Values
Technology	• PowerPoint • Software measuring tools • Analogic measuring tools
Duration	• Various sessions for two weeks
Target group (age, course)	16-18 years /11° Grade

Resources	• Mobile Phones
	• Computer programs
	    o CoreTemp (measuring program)
	    o HWMonitor (measuring program)
	    o Intel Burn Test (stress program)
	• Analogic thermometer
	• Computer parts
	    o Motherboard, CPU, Thermal Paste, Fans, RAM, PSU

Learning Objectives, Skills and competencies or. **(Aims to be accomplished)**	• Deeper understanding about the computer cooling system and computer parts • Know tools for monitoring and stressing the computer • Measuring how different cooling parts influences the CPU temperature, using the scientific method • Wok cooperatively. • Learn safety precautions while dealing with heat and electricity • Learning by experience • Analyze values and establish a conclusion.

Didactic sequence -Description of every lesson with added attention to the diversity of students	• The lesson is presented as a challenge to lower as low as possible the operating temperature of a computer. • Groups are formed and each group must pick the fundamental computer parts of a computer from parts scattered in the schools maintenance and workshop room. • Then they need to check if their parts are working. If not, they need to trade them for working parts. • When the computer is working they need to install different programs to monitor and stress the computer. • Each group then research about the main principles of cooling a computer or any other device (heat, heat dissipation, materials) and then answers a questionnaire. • At this time its given to the students different thermal pastes, coolers and fans. • The students start applying and assembling the materials received and then they test the cooling performance of their systems. They need to optimize then to get optimal cooling performance. • They log the values reached and create a PowerPoint presentation that explains the whole process and the results achieved.
Evaluation (what are we going to evaluate, how, whom...)	The students were evaluated in how well they organized their work, team spirit, answered questionnaires, CPU temperature values reached PowerPoint created and results presented
Conclusions	The students really liked the competitive nature of the work. They learned so much about how to optimize the computer performance and cooling.
Improvements	Make it a real contest with prizes and more diverse hardware scenarios.