CS in K-12 Education In Israel

Michal Armoni

Science Teaching Department

Weizmann Institute of Science

CS in K-12 Education in Israel

- Primary school
  - ♦ Starting from the 4th grade (about 9-10 years old).
  - ♦ Mandatory
  - ♦ In about 400 schools (of about 1800)

- Junior high school
  - ♦ 7th-9th grade
  - ♦ A mandatory subject within an elective program
  - ♦ In 270 schools (of about 1000)

- High school
  - ♦ 10th-12th grade
  - ♦ Elective
  - ♦ Almost in every school

CS in K-12 Education in Israel

- Primary school

  ♦ Starting from the 4th grade (about 9-10 years old)

  ♦ Mandatory

  ♦ In about 400 schools (of about 1800)

  ♦ A new program

  ♦ Short development process

  ♦ 2 hours per week each year

    ■ 4th grade: programming in Scratch

    ■ 5th grade: Scratch + mBlock (robotics)

    ■ 6th grade: currently one alternative (advanced programming in Scratch).

  ♦ Untrained teachers

  ♦ No pre-service teacher training and very limited professional development for in-service teachers

CS in K-12 Education in Israel

- Junior high school
  - ♦ 7th-9th grade
  - ♦ a mandatory subject within an elective program
    - STEP – Science and Technology Excellence Program
  - ♦ In 270 schools (of about 1000)
  - ♦ Since 2012
  - ♦ Currently being updated
  - ♦ 2 hours per week each year
    - 7th grade: Introduction to algorithmics (using Scratch)
    - 8th grade: Advanced algorithmics (using Python), in development
    - 9th grade: Cyber security and cryptography, to be developed, and a final project
  - ♦ Mostly former and current high school teachers
  - ♦ Basic professional development for in-service teachers

CS in K-12 Education in Israel

- High school
  - ♦ 10th-12th grade
  - ♦ Elective
  - ♦ Almost in every school
  - ♦ Since the 1990's
  - ♦ Long development process with regular updates
  - ♦ 540 hours CS / 540 hours CS + 540 hours SE
  - ♦ Trained teachers with CS background
  - ♦ Accredited pre-service training programs
  - ♦ Professional development for teachers

CS in K-12 Education in Israel

High school

	CS	CS+SE
10th grade	Fundamentals of CS 1	Fundamentals of CS 1
		Fundamentals of CS 2
		A flexible module
11th grade	Fundamentals of CS 2	Data structures
	A flexible module	One of available alternatives
		Software engineering project
		An external matriculation pen-and-paper exam
12th grade	Data structures	Software engineering project
	One of available alternatives	An external project defense
	An external matriculation pen-and-paper exam	

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High school - CS

- ♦ Fundamentals of CS 1+2 (90 hours each)
  - ■ Algorithmics
  - ■ Object Oriented Programming (first or second)
  - ■ Using Java or C#
- ♦ A flexible module (usually project-based)
  - ■ Assembly language programming
  - ■ Web programming
  - ■ Logic programming
  - ■ …

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High school - CS

♦ Data structures (90 hours)

  ■ OOD (Java or C#)

♦ Alternatives for the last unit (90 hours):

  ■ Advanced OOD (inheritance, polymorphism)

  ■ Computational models (theoretical)

  ■ Operations research

  ■ Computer systems (software-hardware)

CS in K-12 Education in Israel

High school - SE

- ♦ Mobile embedded systems
- ♦ Cyber defense systems
- ♦ Web services
- ♦ Operating systems
- ♦ Expert systems
- ♦ Graphic systems
- ♦ Information systems
- ♦ Asynchronous applications