iCOMPUTE Level 2
Parent FAQs

What is iCOMPUTE?

iCOMPUTE is program aimed at Ismaili youth. It aims to bolster participation in STEM, specifically Computer Science and Software Engineering, by providing youth with exposure to the field and opportunities and support to build pertinent skills and develop a growth mindset.

iCOMPUTE consists of three levels. In Level 1, participants work with Scratch to learn basic computational concepts. In Level 2, participants apply computational concepts to build an app using Appinventor. In Level 3, participants are introduced to the basic principles of descriptive and inferential statistics using Python.

Is iCOMPUTE Level 2 right for my child?

In iCOMPUTE Level 2, participants will apply computational concepts to design and build an app that solves a real-world problem.

iCOMPUTE Level 2 is designed for youth between the ages of 11 and 13. For individuals falling in this age bracket, no prior experience is necessary.

As participants will be building their own apps, to benefit fully from the program, your child should have access to a computer and be prepared to spend time outside of the classroom developing their app.

What will my child learn in iCOMPUTE LEVEL 2?

The curriculum is divided into six modules. The modules are designed to provide participants with necessary knowledge and skills to further the development of their own app.

In each module, participants will be introduced to one or more computational concepts through a brief demonstration and a skill building exercise. Participants will apply these concepts by creating a toy app with limited functionality, and reflect on how this concept can be used in their own app. Computational concepts include: algorithms, events, data, databases, loops, conditionals and abstraction.

Each module will also lead participants through a step in product design and development to enable them to structure the development of their own app. Steps include: identifying a problem, personae and a unique value proposition; performing competitor analysis; creating a lo-fi prototype; and pitching.

What is the schedule for iCOMPUTE Level 2?

iCOMPUTE Level 2 is taught over eight (8) weekly sessions of 3 hours each. Participants are expected to spend 2 - 3 hours of their own time per week to use knowledge learnt in the weekly session to develop their own apps. Participants will present their progress to facilitators and their peers each week.

Weeks 1 to 4 will be spent teaching Modules 1 – 4 (see below), and the remaining four weeks will be working sessions allowing time for participants to complete their apps for presentation.

Module One:

1. Product Design and Development: Identifying a problem and personae
2. Computational Concepts: Algorithms and Events

Module Two:

1. Product Design and Development: Unique Value Proposition
2. Computational Concepts: Objects and Data

Module Three:

1. Product Design and Development: Competition Analysis
2. Computational Concepts: Data Structures and Databases

Module Four:

1. Product Design and Development: Lo-Fi Prototype
2. Computational Concepts: Conditions and Loops

My child can only attend some weeks - can I still enroll them in iCOMPUTE Level 2?

iCOMPUTE Level 2 runs on a tight schedule; each session introduces new concepts that build on concepts from previous sessions. If your child misses a week, this will hinder their learning and will also create a challenge for facilitators. Please ensure that your child can attend all sessions prior to registering him/her.

What technology does my child need to attend iCOMPUTE Level 2?

Your child should have access to a computer and the internet as they will need to spend time outside of class working on their project. As Appinventor runs on Android, an Android tablet or phone will be a useful tool in troubleshooting.

We would like to ensure that all children are able to access the program, so if you have difficulty getting access to a computer or laptop, please contact your local AKEB Excellence in Education Member.

Why should I send my child to iCOMPUTE Level 2?

iCOMPUTE Level 2 aims to teach computational thinking by expanding on computational concepts introduced in iCOMPUTE Level 1 and focuses on how they can be employed to create an app. Participants will also be introduced to the basic principles of product design and development.

iCOMPUTE Level 2 aims to promote a growth mindset by presenting deliberate practice as a means to skill acquisition. In particular, participants will be encouraged to exercise a growth mindset when troubleshooting and debugging.

What is computational thinking?

> "Computational Thinking is the thought processes involved in formulating problems and their solutions so that the solutions are represented in a form that can be effectively carried out by an information-processing agent"[1]

Why is computational thinking important?

In her article "Computational Thinking", Jeannette M. Wing the head of the Computer Science Department at Carnegie Mellon University argues: "Computational thinking is a fundamental skill for everyone, not just for computer scientists. To reading, writing, and arithmetic, we should add computational thinking to every child's analytical ability."[2]

In justifying why, she outlines many of the skills that computational thinking encompasses, skills that are transferable to almost all domains.[3] Such skills include problem solving, designing systems, thinking recursively, using abstraction and decomposition, using heuristic reasoning and thinking in terms of prevention, protection and recovery from worst-case scenarios.[4]

What is a growth mindset?

Growth mindset is an idea first articulated by Carol Dweck, a Stanford psychologist. Individuals with a growth mindset believe that traits such as talent and intelligence can be

[1] Jan Cuny, Larry Snyder, and Jeannette M. Wing, "Demystifying Computational Thinking for Non-Computer Scientists," work in progress, 2010.
[2] Wing, J.M., *Computational thinking.* Commun. ACM, 2006. **49**(3): p. 33-35
[3] Wing, J.M., *Computational thinking.* Commun. ACM, 2006. **49**(3): p. 33-35
[4] Wing, J.M., *Computational thinking.* Commun. ACM, 2006. **49**(3): p. 33-35

developed by hard work and dedication[5]. The alternative to a growth mindset is a fixed mindset in which individuals believe that their traits are static[6].

Why is a growth mindset important?

Individuals with a growth mindset embrace effort and take setbacks well, while individuals with a fixed mindset eschew challenges and withdraw when faced with failure[7].

Dweck's research found that a growth mindset amongst students is associated with an upwards trajectory in academic performance while a fixed mindset is associated with flat trajectory[8]. Furthermore, an intervention that introduces students to a growth mindset can reverse a downwards trend in academic performance[9].

I have a question, who can I contact?

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[5] Dweck, C. (2006). Mindset: The New Psychology of Success. Random House: New York.
[6] Dweck, C. (2006). Mindset: The New Psychology of Success. Random House: New York.
[7] Dweck, C. (2006). Mindset: The New Psychology of Success. Random House: New York.
[8] Blackwell, L., Trzesniewski, K., & Dweck, C. (2007). Implicit Theories of Intelligence Predict Achievement Across an Adolescent Transition: A Longitudinal Study and an Intervention. Child Development, Vol. 78, No. 1, pp. 246-263.
[9] Blackwell, L., Trzesniewski, K., & Dweck, C. (2007). Implicit Theories of Intelligence Predict Achievement Across an Adolescent Transition: A Longitudinal Study and an Intervention. Child Development, Vol. 78, No. 1, pp. 246-263.