

Introduction to Computer Programming



Learn computational thinking, get ready for **Python coding**

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Help Karel the Robot find his missing friend by playing games and solving puzzles! Learn cool computer programming skills while earning badges and certificates of completion. All you need is basic keyboarding skills and a great desire to learn!
Ages: 10+ through high school.

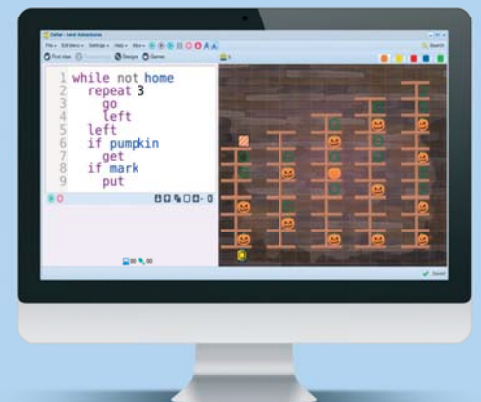
About the course

The course is fully self-paced - the instructor does not have to be an expert in computer programming. It has two parts with a total of 77 game-like levels. In the first games students guide the robot by clicking on buttons. Then they start typing simple commands, and eventually they become capable of writing their own programs. The course uses a simplified Python language, which ensures a smooth transition to a follow-up Python programming course. It is recommended that students take the Karel programming course prior to the Python course.



Learning outcomes

Students will develop logic, critical thinking, systematic problem solving skills, and perseverance in solving problems. They will type code in a simplified Python language and become ready for a follow-up course in Python programming. Python is a modern programming language used in many science, engineering, and business applications today. Please send any questions to support@nclab.com



Alignment with Common Core Standards

The Karel Programming Course is aligned with all eight common core standards for mathematical practice.

1 Make sense of problems and persevere in solving them

Students learn to understand the problem, find a way to attack it, and work until it is done and they can pass to the next game level.

2 Reason abstractly and quantitatively

Students learn that it helps to break complex problems into simpler ones. Designing algorithms requires using logic and abstract thinking.

3 Construct viable arguments and critique the reasoning of others

Your students will work together, exchange ideas, and discuss various strategies to solve the problems. There will be students in your class who surprisingly and unexpectedly will excel at it.

4 Model with mathematics

While working through Karel mazes, students use X and Y coordinates, spatial directions, find shortest paths, measure distances, calculate areas, work with random numbers and more.

5 Use appropriate tools strategically

Most programming tasks can be solved in several different ways. Students learn that selecting the appropriate tool can save them much time and effort.

6 Attend to precision

For a computer program to work, the logic of the underlying algorithm must be precise, and moreover the program needs to be written and formatted very carefully.

7 Look for and make use of structure

Looking for patterns and making use of structure is a fundamental component of computer programming. Students learn that finding a pattern simplifies the logic, and makes the solution of the problem easier.

8 Look for and express regularity in repeated reasoning

Computer programming teaches students to generalize their thinking. They learn to use solutions to previously solved problems to attack more complicated ones.

