



Lesson 1.1: Karel's Coding Environment

<https://codehs.com/course/20485/lesson/1.1>

Description	In this lesson, students will meet Karel the dog and explore the syntax of Karel's commands. Students will then tour the CodeHS editor and write their first Karel programs.
Objective	Students will be able to: <ul style="list-style-type: none">• Define syntax and why it is important in text coding• Use the Karel commands to write a simple Karel program
Activities	1.1.1 Video: Meet Karel 1.1.2 Notes: Explore Karel's Commands 1.1.3 Video: What is Syntax? 1.1.4 Video: Live Coding: Karel's Coding Environment 1.1.5 Example: Example Karel Program 1.1.6 Exercise: Walk Around the Pond 1.1.7 Exercise: Lesson 1 Exercise: Your Favorite Color
Prior Knowledge	<ul style="list-style-type: none">• This is an introductory lesson, no prior knowledge needed.
Planning Notes	<ul style="list-style-type: none">• If this is students' first time using CodeHS, give them some time to get acquainted with the layout and functionality of the site:<ul style="list-style-type: none">◦ Have students log into CodeHS with their usernames and passwords.◦ Give students a tour of the class page that will be used throughout the module.• You may want to print out the Karel commands and post them in the room somewhere for students to reference throughout the module.• This lesson mentions the transition from block coding (specifically in Scratch) to text coding. If students are unfamiliar with Scratch, you can skip these slides or parts of the video.• This may be students' first time writing a program. Celebrate small wins, such as writing their first Karel command, to build enthusiasm and confidence.• Getting used to the syntax of a new programming language can be tricky, and students will most likely make mistakes. Set the foundation for a growth mindset by normalizing these mistakes and

emphasizing that errors are part of the programming process! In the next lesson, students will learn some specific skills for debugging their code.

- There is an optional handout that accompanies the *Explore Karel's Commands* activity. If you choose to use it, print out enough for each student.

Standards Addressed

Teaching and Learning Strategies

Lesson Opener:

- Have students brainstorm and write down answers to the discussion questions listed below. Students can work individually or in groups/pairs. Have them share their responses. [5 mins]

Activities:

- Watch the *Meet Karel* video. [3 mins]
- Complete the *Explore Karel's Commands* activity. [10 mins]
 - Consider using the *Explore Karel's Commands* handout for this activity. Print out the handout and give students colored pencils/markers/crayons to color-code similarities they see in how the commands are written.
 - Use the [Think-Pair-Share](#) thinking routine to explore how Karel's commands are written.
 - Think: Give students time to answer the questions independently.
 - Pair: Have students share their responses with a partner. Encourage students to listen to each other's answers by adding to and revising their own answers based on their discussion.
 - Share: Discuss student responses as a class. Encourage students to connect their thoughts with their peers throughout the discussion.
- Watch the *What is Syntax?* video. [3 mins]
- Watch the *Live Coding: Karel's Coding Environment* video. [3 mins]
 - If you feel comfortable, consider coding this example program live rather than watching the video. This way, you can ask students questions throughout the model, such as, "Which command should come next?"
- Explore the *Example Karel Program* example program. [10 mins]
 - Use the guiding questions in the example description to explore the example. Note that if students alter the program, they may get a message that says "Oops!" You can tell students to ignore the message.
 - Encourage students to explore how the program works by asking, "Do you want to try anything?"
- Complete the *Walk Around the Pond* activity. [10 mins]
 - This program has some starter code that gives students an example of how to write their code. Emphasize that students should not change the starter code.
 - There are two steps to this program: programming the top of the pond and programming the left side of the pond. Consider

writing the code for the top of the pond as a guided practice with the class. Then, students can write the code for the left side of the pond with a partner or on their own.

- Complete the *Your Favorite Color* activity [10 mins]
 - Note that this item does not have a result world since each student may pick a different color/row for Karel to end on.
 - If students need additional support before beginning this exercise on their own, complete an example together. For example, you could model what the program would look like if your favorite color is orange. Then, have students create their own program based on their favorite color.
 - Have students share their program with the class or with a partner. Since students should have different programs based on their favorite colors, this is a great opportunity to highlight the differences between programs.

Lesson Closer:

- Have students reflect and discuss their responses to the end of class discussion questions. [5 mins]

Beginning of Class:

- What is programming?
 - *Student responses will vary. Students don't need to know what programming is. Instead, the goal here is to get them thinking about what programming might mean.*
- How do you use computers in your everyday life?
 - *Responses will vary.*
- Have you ever written a program before? If so, what language did you use? What did your program do?
 - *Responses will vary.*

Discussion Questions

End of Class:

- What are the 6 Karel commands?
 - *move, turnLeft, turnRight, putBall, takeBall, turnAround*
- Why does syntax matter when we program?
 - *Syntax is important because the computer will not understand our program if we do not write it exactly in the right way.*
- Use the [I Used to think... Now I think](#) thinking routine to get students thinking about how their views of programming may have changed as a result of writing some Karel programs.
 - *Sample response: I used to think that programming was only in one language, but now I think that there are many different programming languages!*

Resources/Handouts

[Exploring Karel's Commands](#)

Vocabulary

Term	Definition
Syntax	The rules for writing code in a specific programming language

Modification: Advanced	Modification: Special Education	Modification: English Language Learners
<ul style="list-style-type: none">• Have students do some research on how the JavaScript programming language is used in the real world.	<ul style="list-style-type: none">• Print out the slides for students to reference.• When working through exercises, pair students strategically.	<ul style="list-style-type: none">• Print out the slides for students to reference.• Allow students to use a translation dictionary for their primary language.