Lesson 4.7: General For Loops

https://codehs.com/course/9293/lesson/4.7

Description	In this lesson, students will explore in more detail how they can modify the initialization statement, test statement, and increment statement in a for loop.
Objective	Students will be able to: • Explain the three parts of the for loop (initialization statement, test statement, increment statement) • Create for loops that iterate differently than the basic for loop structure (ie count by twos or count backwards)
Activities	4.7.1 Video: General For Loop 4.7.2 Check for Understanding: General For Loop Quiz 4.7.3 Example: Countdown 4.7.4 Example: Count By Twos 4.7.5 Exercise: Count By Sevens 4.7.6 Exercise: Powers of Two 4.7.7 Video: Iterations 4.7.8 AP Practice: Iterative Pseudocode Activity - Part 1
Prior Knowledge	• For loops • Arithmetic Expressions in JS • Increments and decrements
Planning Notes	• Review student programs from earlier and Karel lesson on for loops if necessary. • It might be necessary to view Using Graphics in JavaScript lesson. • In this lesson, a good point to emphasize is the that using a for loop will allow us to create graphics and calculate numbers very easily. We can't write out thousands lines of code in one day, but we CAN write a single for loop that repeats a thousand times! We make the computer do all the repetition for us. • Decide if students will take notes in a notebook, on paper handouts, or through the "Take Notes" function on CodeHS.
Standards Addressed	

Teaching and Learning Strategies	**Lesson Opener:**
	
	• Consider using the beginning of class discussion questions (listed below) to aid in this conversation.Have students brainstorm and write down answers to the discussion questions. Students can work individually or in groups/pairs. Have them share their responses.
	[5 mins]
	    ○ Students should struggle a bit to come up with an answer to the discussion question, as they haven't yet learned that they can manipulate the initialization variable in a for loop.
	
	Activities:
	
	• Watch *General For Loop* and complete the corresponding quiz. [5- 7 mins]
	• Explore *Countdown* and *Count By Twos* examples. [5 mins]
	    ○ Have students try inputting different values into the increment to see how this changes the outcome of the for loop.
	• Complete *Count by Sevens* and *Powers of Two*. [10 mins]

	Lesson Closer: • Have students complete the end of class discussion questions either as a whole class, or have students complete the questions as an exit ticket to check their understanding of the materials. [5 mins]

Discussion Questions	**Beginning of Class:**
	
	• Write a for loop that prints the values 0 - 10.
	
	```\nfor(var i = 0; i < 11; i++)\n{\n println(i);\n}\n```
	
	• How could we change this code so that the countdown goes from 10 - 0?
	   ○ *Change the initialization variable so that it starts at 10 and decreases with each iteration, OR keep the loop the same, but find the absolute value of the value of i - 10.*
	
	End of Class:
	
	• Given the same for loop header that was discussed at the beginning of class:
	
	```\nfor(var i = 0; i < 10; i++)\n```
	
	• How would you make a for loop that starts at 2 instead of 0?
	• How would you make a for loop that counts up by 2s instead of by 1?

Resources/Handouts	

Vocabulary

Term	Definition

Modification: Advanced	**Modification: Special Education**	**Modification: English Language Learners**
• Have students return to previous for loop exercises, and have them modify the for loop headers based on what they learned in this lesson. • Give students an opportunity to work in the Sandbox to create more problems using for loops.	• Change the scale of the exercise so students don't have to use such large numbers when iterating through the for loop.	• Change the scale of the exercise so students don't have to use such large numbers when iterating through the for loop.