**gAP CSP CodeBot**

| **MISSION 7 Obj 10-11 Hot Pursuit** | **Time: 45 minutes** |
| --- | --- |
| **Project Goal:** Students will use proximity sensors to program the ‘bot to track and chase an object.**Learning Targets*** I can apply previous knowledge of the motors to rotate and face an object moving in front.
* I can follow an **algorithm** to track an object and chase after it.
 | **Key Concepts*** The prox.detect(power, thresh) function lets you adapt to different environments.
* Using auto calibration functions for power and thresh allows the ‘bot to adapt to a new environment.
 |
| **Assessment Opportunities*** Mission 7 Obj 10-11 Assignment
* Submit the “HotPursuit” program (final)
* [Mission 7 Kahoot Review](https://create.kahoot.it/share/firia-labs-codebot-mission-7/d66d1ea8-5156-459d-aeea-d3038dc638b6)
 | **Success Criteria*** Use motors to follow a detected object.
* Calculate and use a turn ratio for a more smooth movement when chasing an object.
 |
| **AP CSP Framework****DAT-2.E** Explain how programs can be used to gain insight and knowledge from data.**AAP-1.A** Represent a value with a variable.**AAP-2.F** Write expressions using logical operators and evaluate those expressions.**AAP-3.C** Develop procedural abstractions to manage complexity in a program by writing procedures. **Computational Practice 2.B** Implement and apply an algorithm.**Computational Practice 4.C** Identify and correct errors in algorithms and programs, including error discovery through testing. | **Materials*** An object to detect
* Mission 7 Obj 10-11 Assignment / Answers
* Solution code for HotPursuit\_final
* [Mission 7 Kahoot Review](https://create.kahoot.it/share/firia-labs-codebot-mission-7/d66d1ea8-5156-459d-aeea-d3038dc638b6)
 |
| **Teacher Notes*** Objective 10: This objective is pretty straightforward. Follow CodeTrek to add a Boolean constant for SPEED and use it in the if selection block. No other changes need to be made. The students already have the if block. The order of the branches can be different than what is shown in CodeTrek.
* Objective 11: A drive() function is introduced in this objective. It uses different parameters than the drive() functions used in previous programs. There is a bit of reading involved in CodeSpace to understand the turn ratio.
* Objective 11: The code can get a little complicated to follow. I suggest keeping order in your code. Group all variables and constants together, all the functions together, and all the code in the main program at the bottom. Then it will be easier to find what you need for any modifications.
* Objective 11: The suggested speed is 50. I found that to be very fast, particularly when testing and debugging. I recommend a much slower initial speed, like 20. Then if things are working well, try increasing the speed incrementally. You really don’t want a bunch of CodeBots just zooming all over the place out of control.
* This lesson isn’t very long. Students have plenty of time for testing and debugging. Then have them make modifications. The instructions in CodeSpace say there are many ways to improve the ChaseBot. See how creative the students are and challenge them. It could be changing the sample size, reverting back to the code in objective 9 and make modifications from there, or any other ideas.
* There is also a Kahoot review for mission 7. If you have time, you can include it as part of this lesson.
* If students are working more quickly, they can start their remix project, or do a unit 3 review.
 |