🤖 CODEBOT MISSION 7 LOG - Lesson 1

Pre-Mission Warm-Up	
How does a line sensor work?	A possible answer could be: It has an emitter that shines IR light and a detector that judges how bright the reflected light is.
How do you think CodeBot can "see" objects?	Answers can be anything. A student may have no idea, or they may think it has a camera. They may relate the proximity sensor to line sensors in that it senses reflectivity. This question is just to get them prepped for the mission and ready to think about the new concepts.

Mission 7 Lesson 1 – Hot Pursuit	
Mission 7 Introduction	
What does the proximity sensor use to detect objects?	It uses IR or infrared light that is reflected.
What will you write code for during this mission?	Code to detect, pursue and avoid objects.
What will you write code for during this mission?	Students can pick any of the six goals. You may want to ask them why they selected the goal when they are sharing out. ● Use the basic proximity sensors detect() function to make a presence detector. ● Experiment with light and dark ground-surfaces to find the best emitter power and detection threshold levels for each environment. ● Use the range() function to make an interactive display of object reflectivity. ● Write calibration functions so CodeBot can adapt to its environment. ● Bring in the motors for a FaceOff challenge. ● Code a "curious puppy bot" that will chase a ball around.
Mission 7 Objective 1	
Where is the LED emitter on CodeBot?	It is behind Line Sensor LED #2.
What does the LED emitter do?	It emits IR light to light up objects in front of the 'bot.
Run the code with the 'bot on a dark surface. Then move the 'bot to a white surface. What happens?	Both LEDs turn on and stay on. Both proximity sensors are detecting the light surface.
Mission 7 Objective 2	

What are the optional parameters for prox.detect(), and what are their ranges?	Power, with a range of 1 to 8. Detection threshold, with a range of 0% to 100%

Fill out the charts for a white surface and a black surface. *Answers will vary. The chart is filled with my values, so you can see an example.*	

White Surface

Power	Thresh	Left distance	Right distance
1	75	6.5 cm	True
5	50	True	True
2	50	9 cm	True
1	25	4 cm	5 cm
1	40	10 cm	9 cm
2	10	12.5 cm	14 cm

Black Surface

Power	Thresh	Left distance	Right distance
1	75	15 cm	True
5	50	True	True
2	25	True	12 cm
1	25	9 cm	8.5 cm
2	10	True	12 cm
1	10	8 cm	8 cm

Mission 7 Objective 3

Fill out the charts for a white surface and a black surface *Answers will vary. The chart is filled with my values, so you can see an example.*.	

White Surface

Power	Result
1	(72, 6)
2	(20, 0)
3	(0, 0)
6	(0, 0)
8	(0, 0)

Black Surface

Power	Result
1	(92, 0)
2	(76, 2)
3	(36, 0)
4	(13, 0)
7	(-1, 0)

Post-Mission Reflection

How does a proximity sensor work?	Possible answer: CodeBot uses reflected IR light to detect obstacles. The emitter shines IR light, and the sensor detects reflected light.

What is the difference between prox.detect() and prox.range()?	Possible answer: The prox.detect() function has two optional parameters. The programmer sets the power and threshold. The prox.range() function has four parameters. It scans multiple thresholds to find the best sensitivity to detect an object given a specific power.