**Behaviors: “Move Until Sound”**

**Basic 8 pts. 8/10**

**+Challenge 1 2 pts. 10/10**

**Group Score \_\_\_\_\_/10**

**Task Sheet and Challenges**

**Team Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Team Members’ Names \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Successfully program your robot to detect sound and silence

Successfully demonstrate how the sound sensor works

Successfully demonstrate understanding of the term “Threshold” and how it works

**OBJECTIVES**

**MOVE UNTIL SOUND: Program a robot to respond to sound and silence**

**Date**

 **BASIC**

**VIEW** video in Connect 1: “Grace: Social Robot.”

**USE** Connect 2 to construct your robot according to the directions in VT. ***(Student Sign) (Teacher Sign)***

**VIEW** Construct 3, “Lesson Overview,” and answer questions 3.1 - 3.3

3.1\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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3.3\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**VIEW** Construct 4, “Move Until Sound,” *Calculating the Threshold*,” answer questions 4.1- 4.3 and compute your robot’s threshold.

4.1\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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4.3\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**COMPUTE** in the space below to find your threshold. Be sure it is **neat, well labeled** and **easy to read**.

**VIEW** Construct 5, “Move Until Sound,” *Forward Until Sound*, and answer question 5.1.

**DEMONSTRATE** “Move Until Sound,” *Forward Until Sound*, first to a classmate and then to a teacher.

Answer question 5.1 AFTER you have demonstrated your program.

5.1\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**READ**, **REVIEW AND** **STUDY** Construct 6, “Program Review,” *Forward Until Dark Program.*

**VIEW** Contemplate 7, “Move Until Sound,” *Forward Until Silence*, and answer questions 7.1 and 7.2

7.1\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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7.2\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**DEMONSTRATE** “Move Until Sound,” *Forward Until Silence*, first to a classmate and then a teacher.

**READ**, **REVIEW AND** **STUDY** Contemplate 8, “Contemplate…” and perform the Sound Sensor Position Challenge. Use your observations to answer question 8.1 in your own words.

8.1\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**READ**, **REVIEW AND** **STUDY** Contemplate 9, “Calculated Thresholds.” **In your own words,** answer the questions 9.1-9.3.

9.1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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9.2\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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9.3 a.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**READ**, **REVIEW AND** **STUDY** Contemplate 10, “Sound Sensors.” **In your own words,** briefly

describe how a sound sensor detects sound.

10.1\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**\_\_\_\_\_\_\_\_\_8 Points**

**CHALLENGES: In order to reach 10/10, you must successfully complete the Clapper Challenge. Once you feel you have completed a challenge, demonstrate for another team first. Once they have signed off on it, then demonstrate for the teacher.**

Follow the directions below to complete the **CLAPPER CHALLENGE.** You can view an animation of the challenge by clicking on the picture in “Continue 11” in the NXT Video Trainer.

**CLAPPER CHALLENGE:** *In this challenge, you must program your robotic vehicle to start driving when someone claps, then stop with a second clap.*

**Rules and Procedures:**

1. Write a program that creates the following behavior:

* The robot begins stationary, and stays that way until...
* You clap.
* The robot starts moving, and doesn’t stop until...
* You clap again.
* The robot stops.

2. Beat the challenge by demonstrating this behavior!

**Hints:**

* A clap looks like a large spike in sound volume.
* A spike is composed of two parts: a sharp rise, and a sharp drop in volume.
* Make sure the first clap is done before you start listening for the second one!
* You may need to account for the difference in “quiet” levels when the robot’s motors are running vs. still.

When you have successfully programmed the **Clapper Challenge**, have another team sign off your demonstration before arranging with the teacher for your presentation.

|  |  |  |
| --- | --- | --- |
| **Date** |  **Challenge** |  **Sign-off** |
|  | **Successful Clapper Challenge** |  |
|  | **SUCCESSFUL CLAPPER CHALLENGE DEMONSTRATION** | (Teacher) |