

# **TECHNOLOGY-10**

## **SELECTIVE UNIT 3 (S03)**

(Robotics)

(July 2017)

**Unit Statement:** The student will have the opportunity to think creatively, reason systematically, and work collaboratively through the medium of simple programming and lego-based robotics. Through the use of Lego Wedo kits, the student will learn how to create construct and control a variety of simple robotic devices, with a focus on using motors for locomotion, tilt sensors to detect direction, and motion sensors to detect movement.

This unit requires no previous knowledge of robotics or programming, although experience in these areas will enable students to attempt more complicated constructs and programming. Additionally, the use of the Lego brand Wedo kit is not strictly necessary, as the concepts and programming taught herein are transferable to many other similar products, like Makeblock and Scratch.

**Essential Outcomes:** (must be assessed for mastery)

1. The Student Will create a working model that achieves a specific purpose.
2. TSW explain how a model works using topic specific vocabulary.
3. TSW establish links between cause and effect.
4. TSW follow 2D drawings to build a 3D model.
5. TSW produce a program that causes a robot to exhibit a specific behavior.

**Introduced & Practiced Outcomes:**

1. The Student Will make systematic observations and measurements.
2. TSW reflect on how to find answers and imagine new possibilities.
3. TSW display and communicate data using tables.

**Suggested Materials/Software:**

If using the Lego Wedo kit, it comes with built in curriculum and activity documents that are highly recommended for both teachers and students. There are separate documents that tie into mathematics and the sciences.

[Mathematics and Machines](#)

[Science and Engineering](#)

If using Makeblock, additional instructional resources are available on their commercial website.

[Makeblock](#)

[Ranger Course](#)

[Kids Maker Robots](#)

Other kits may become available as time goes on. So long as they provide a foundation of robotics tied with a graphical programming interface they should be equally applicable to this unit.

**Suggested Websites:**

[Destiny Webpath Express](#) (found on QSI schools Library site) use this search engine to find age-appropriate websites that align with this unit.

[Makeblock](#)

[Lego Education](#)

**Suggested Activities, Assessment Tools, & Strategies:**

If using the Lego Wedo kit, there are 20 provided lessons on general topics ranging from gears, tilt sensors, pulleys and belts, levels, and repetition. Additionally, there are specific activities that can be used to challenge and motivate students, such as creating dancing birds, drumming monkeys, or a sailboat storm. Any or all of these activities would be appropriate for exploring the TSW's in this unit.

Additionally, a glossary of terms is provided to assist the student and the teacher with the specific vocabulary related to this unit.

*ASSESSMENT RUBRIC FOUND ON FOLLOWING PAGE.....*

### Assessment Rubric – S03 – Robotics

**Student Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_ **To**  
 receive a ‘B’ the student must show ‘B’ level mastery on ALL Essential Outcomes. (TSW’s)  
 To receive an ‘A’, the student must show ‘A’ level mastery on ALL available and ‘B’ level mastery  
 on all remaining TSW’s.

<b>TSW</b>	<b>‘A’ Level Mastery</b>	<b>‘B’ Level Mastery</b>	<b>‘P’ Comments</b>
1. The Student Will create a working model that achieves a specific purpose.		The student has constructed a robot that performs as expected.	
2. TSW explain how a model works using topic specific vocabulary.	The student can predict how a model works using topic specific vocabulary.	The student can utilize vocabulary related to robotics and programming to explain how a model works.	
3. TSW establish links between cause and effect.	The student can explain how the parts of someone else’s program will affect a robot.	The student can explain how the parts of their program affect their robot.	
4. TSW follow 2D drawings to build a 3D model.		The student can create a model by following instructions.	
5. TSW produce a program that causes a robot to exhibit a specific behavior.		The student can produce a program that causes a robot to exhibit a specific behavior.	