

Curriculum Framework – Gateway (2015-2016)

Automation and Robotics – Lesson 1 What is Automation and Robotics?

Desired Results (stage 1)

ESTABLISHED GOALS

It is expected that students will...

- G1 – Demonstrate an ability to identify, formulate, and solve engineering problems.
- G2 – Demonstrate an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- G3 – Demonstrate an ability to design and conduct experiments, as well as to analyze and interpret data.
- G4 – Demonstrate an ability to apply knowledge of mathematics, science, and engineering.

Transfer

TRANSFER: *Students will be able to independently use their learning to ...*

- T1 – Understand the impact of engineering solutions in a global, economic, environmental, and societal context.

Meaning

UNDERSTANDINGS: *Students will understand that ...*

- U1 – Automation is the use of technology to ease human labor or to extend the mental or physical capabilities of humans.
- U2 – Robotics is the specialized field of engineering and computer science that deals with the design, construction, and application of robots.
- U3 – The use of automation and robotics affects humans in various ways, both positively and negatively, including their safety, comfort, choices, and attitudes about a technology's development and use.
- U4 – Automation and robotics have had an influence on society in the past and present and will influence society in the future.
- U5 – Engineers, designers, and engineering technologists are in high demand for the development of future technology to meet societal needs and wants.

ESSENTIAL QUESTIONS: *Students will keep considering ...*

- Q1 – What limitations do you think should be placed on the use of robots?
- Q2 - What type of robot do you think makes the most significant contribution to our lives today and why?
- Q3 - What is the greatest concern that should be considered before converting a factory from human workforce to robotic workforce?
- Q4 - What impact do you think robots will have on your life in 10 years and in 50 years?

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| <ul style="list-style-type: none"> • G5 – Demonstrate an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. • G6 – Pursue the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context. • G7 – Demonstrate an understanding of professional and ethical responsibility. • G8 – Demonstrate an ability to function on multidisciplinary teams. • G9 – Demonstrate an ability to communicate effectively. • G10 – Gain knowledge of contemporary issues. • G11 – Recognize the need for, and develop an ability to engage in life-long learning. | Acquisition | |
| | <p>KNOWLEDGE: <i>Students will ...</i></p> <ul style="list-style-type: none"> • K1 – Describe the purpose of automation and robotics and its effect on society. U1, U2, U3, U4 • K2 – Describe positive and negative effects of automation and robotics on humans in terms of safety and economics. U3, U4 | <p>SKILLS: <i>Students will ...</i></p> <ul style="list-style-type: none"> • S1 – Summarize ways that robots are used in today's world and the impact of their use on society. U3, U4 • S2 – Provide examples of STEM careers and the need for these professionals in our society. U5 |

| Evidence (stage 2) | | |
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| Activities (A) Projects (P) Problems(B) | Assessment FOR Learning | Assessment OF Learning |
| A.2.1.1a Sandwich Algorithm or A.2.1.1b VEX build | <ul style="list-style-type: none"> • Essential Questions | <ul style="list-style-type: none"> • Conclusion Questions |
| A2.1.2a Understanding Robots | <ul style="list-style-type: none"> • Essential Questions | <ul style="list-style-type: none"> • Conclusion Questions |
| A2.1.2 What do we use Robots For? | <ul style="list-style-type: none"> • Essential Questions • What do we use Robots For Rubric | <ul style="list-style-type: none"> • Conclusion Questions • What do we use Robots For Rubric |
| A1.1.5 Engineering Careers | <ul style="list-style-type: none"> • Essential Questions | <ul style="list-style-type: none"> • Conclusion Questions |

| Learning Plan (stage 3) | |
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| Activities (A) Projects (P) Problems(B) | Knowledge and Skills |
| A.2.1.1a Sandwich Algorithm or A.2.1.1b VEX build | K1, S1 |
| A2.1.2a Understanding Robots | K1, K2, S1 |
| A2.1.2 What do we use Robots For? | K1, K2, S1 |
| A1.1.5 Engineering Careers | K1, K2, S1, S2 |