

Session 1: Get Started	Strand	Specific Expectations	Addressed
Introduction ● Get to know team members and think of a team name ● Watch season videos & read Engineering Notebook to learn about how <i>FIRST</i> LEGO League Challenge works and about the BIOGLOW Robot Game and Innovation Project Tasks ● Use the building instructions to build the robot game mission models ● Place each model where it belongs on the mat, using the <i>Robot Game Rulebook</i> for reference ● Explore how the models work and how they connect to the Project Sparks Clean Up & Reflection ● Groups show how the mission models work and how they relate to the Project Sparks ● Groups discuss which missions look interesting and how your team plans to have <i>Fun</i> while working on the game and project	A. STEM Skills and Connections	A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures. - A1.1 Use a scientific research process and associated skills to conduct investigations. - A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems. - A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes. A3. Demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences. - A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems. - A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems. - A3.3 Analyse contributions to science and technology from various communities.	● ● ● ● ● ● -
	B. Life Systems		
	C. Matter and Energy		
	D. Structures and Mechanisms	D1. Assess the social and environmental impacts of various systems, and evaluate improvements to the systems or alternative ways of meeting the same needs. - D1.2 Assess the impact on individuals, society, and the environment of alternative ways of meeting needs that are currently met by existing systems, taking different points of view into consideration. D2. Demonstrate an understanding of different types of systems and the factors that contribute to their safe and efficient operation. - D2.1 Identify various types of systems. - D2.2 Describe the purpose, inputs, and outputs of various systems, including systems related to food processing. - D2.3 Identify the various processes and components of a system that allow it to perform its function efficiently and safely. - D2.4 Use the scientific terms displacement, force, work, energy, and efficiency to describe everyday experiences. - D2.5 Demonstrate an understanding of the relationships between work, force, and displacement in simple systems. - D2.6 Explain the relationship between input and output forces and determine the mechanical advantage of various mechanical systems, including simple machines. - D2.7 Identify ways in which energy can dissipate from mechanical systems, and describe technological innovations that make these systems more efficient. - D2.9 Describe technological innovations involving mechanical systems that have increased productivity in various industries.	● ● ● ● ● ● - - ● - ●

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Session 2: Training Camp 1	Strand	Specific Expectations	Addressed
Introduction - Think about how you will use the Core value of <i>Discovery</i>. - Record your team's goals and what you hope to learn on the Team Progress sheet Tasks - Learn how to prepare & connect the hub, to create simple programs and to use the motors and sensors by completing the Tutorial Activities: 1 – 6 - Learn to program the robot to move forward, in reverse & turn by completing Training Camp 1: Driving Around in the Competition Ready Unit - Review the Robot Game Rulebook to learn about the mission details and use the coding skills you learned to drive the robot to one of the mission models - Discuss any Innovation Project ideas that are sparked by the mission models Clean Up & Reflection - Groups share robot skills and discuss how they can be applied in the Robot Game - Groups share how they used the Engineering Design Process in this session - Groups discuss which Project Sparks interest the team & how the team will research the problem	A. STEM Skills and Connections	A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures. A1.1 Use a scientific research process and associated skills to conduct investigations. A1.2 Use a scientific experimentation process and associated skills to conduct investigations. A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems. A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes. A2. Use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life and in STEM-related fields. A2.1 Write and execute code in investigations and when modelling concepts, with a focus on automating large systems in action. A2.2 Identify and describe impacts of coding and of emerging technologies, such as artificial intelligence systems, on everyday life, including skilled trades. A3. Demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences. A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems. A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems. A3.3 Analyse contributions to science and technology from various communities.	● ● ● ● ● ● ● ● -
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Session 3: Training Camp 2	Strand	Specific Expectations	Addressed
Introduction - Review the Innovation Project page and the Project Sparks - Select a Project Spark or one of your own ideas and think of the problem you're your team will explore, ensuring that everyone has a chance to share Tasks - Record your team's problem statement - Learn to program your robot to avoid obstacles using a sensor and power an attachment by completing Training Camp 2: Playing with Objects in the Competition Ready unit - Reflect on how the coding & building skills learned will help in the Robot Game and use them to complete a mission Clean Up & Reflection - Groups share what additional skills are needed to select an idea for the project - Groups discuss what objects the robot needs to avoid in the Robot Game - Groups decide what mission the team wants to attempt next	A. STEM Skills and Connections	A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures. A1.1 Use a scientific research process and associated skills to conduct investigations. A1.2 Use a scientific experimentation process and associated skills to conduct investigations. A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems. A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes. A2. Use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life and in STEM-related fields. A2.1 Write and execute code in investigations and when modelling concepts, with a focus on automating large systems in action. A2.2 Identify and describe impacts of coding and of emerging technologies, such as artificial intelligence systems, on everyday life, including skilled trades. A3. Demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences. A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems. A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems. A3.3 Analyse contributions to science and technology from various communities.	● ● ● ● ● ● ● ● ● ● -
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Session 4: Training Camp 3	Strand	Specific Expectations	Addressed
Introduction ● Work with your team to research and learn about existing solutions ● Determine how to use the information collected to create a solution to the problem Tasks ● Learn how to program a driving base to follow a line by completing Training Camp 3: Reacting to Lines in the Competition Ready unit ● Reflect on how the coding & building skills learned will help in the Robot Game and use them to complete a mission Clean Up & Reflection ● Groups share how the team will record research about your chosen problem ● Groups discuss how testing your program helped make your robot more accurate ● Groups discuss how the lines on the mat can be used in your mission strategy	A. STEM Skills and Connections	A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures. A1.1 Use a scientific research process and associated skills to conduct investigations. A1.2 Use a scientific experimentation process and associated skills to conduct investigations. A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems. A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes. A2. Use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life and in STEM-related fields. A2.1 Write and execute code in investigations and when modelling concepts, with a focus on automating large systems in action. A2.2 Identify and describe impacts of coding and of emerging technologies, such as artificial intelligence systems, on everyday life, including skilled trades. A3. Demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences. A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems. A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems. A3.3 Analyse contributions to science and technology from various communities.	● ● ● ● ● ● ● -
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Session 5: Guided Mission	Strand	Specific Expectations	Addressed
Introduction - Think about how you have used the Core value of Teamwork, and record ways in which your team has learned to work together Project - Perform additional research about why the chosen problem exists and who or what is affected - Decide whether to develop a new solution or improve upon an existing one and select a solution to further develop Robot - Apply coding principles to complete the guided mission in the Competition Ready unit and continue to refine the mission until it works consistently - Continue to practice completing other missions in the Robot Game Clean Up & Reflection - Brainstorm who your team could talk to about the chosen problem and what questions you would ask them - Explain what the Robot Game teaches about Coopertition and how what you learned in the guided mission could help you complete additional missions.	A. STEM Skills and Connections	A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures. A1.1 Use a scientific research process and associated skills to conduct investigations. A1.2 Use a scientific experimentation process and associated skills to conduct investigations. A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems. A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes. A2. Use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life and in STEM-related fields. A2.1 Write and execute code in investigations and when modelling concepts, with a focus on automating large systems in action. A3. Demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences. A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems. A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems. A3.3 Analyse contributions to science and technology from various communities.	• • • • • • • • -
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Session 6: Pseudocode	Strand	Specific Expectations	Addressed
Introduction - Think about and record what your team has already learned and what more you still want to explore - Complete the “Halfway There” section of the Team Progress sheet Project - Plan how you will develop your solution using the Innovation Project Planning sheet as a tool - Use a variety of sources and keep track of them in the Engineering Notebook - Determine what materials are needed to create a prototype, model, or drawing of your solution Robot - Watch the “Robot Game Missions” video, decide which missions your team will attempt next and complete the Pseudocode worksheet - Continue to practice completing missions in the Robot Game Clean Up & Reflection - Consider the next step in developing your innovative solution and how to document your progress - Discuss how your robot’s attachments and code support your team’s mission strategy & how you can iterate to improve your	A. STEM Skills and Connections	A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures. A1.1 Use a scientific research process and associated skills to conduct investigations. A1.2 Use a scientific experimentation process and associated skills to conduct investigations. A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems. A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes. A2. Use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life and in STEM-related fields. A2.1 Write and execute code in investigations and when modelling concepts, with a focus on automating large systems in action. A3. Demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences. A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems. A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems. A3.3 Analyse contributions to science and technology from various communities.	• • • • • • • • -
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Session 7: Create Solutions	Strand	Specific Expectations	Addressed
Introduction - Revisit the Core Values, with a focus on <i>Gracious Professionalism</i> and record ways in which your team demonstrates this in everything you do Project - Continue to develop your innovation project solution - Draw your solution and describe how it solves the problem - Create a prototype, model or labelled drawing of your solution - Document the process you use to develop your solution on the Innovation Project Planning sheet Robot - Continue to test and improve your robot and its attachments to complete missions in the Robot Game, with the option to combine mission solutions into one program - Test and improve your robot and its programs by revisiting previous lessons to develop your coding skills or work on solving missions Clean Up & Reflection - Consider how to describe your solution in a way that is easy for others to understand and with whom you can share your solution for feedback - Discuss how to iterate to improve your robot's design	A. STEM Skills and Connections	A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures. - A1.1 Use a scientific research process and associated skills to conduct investigations. - A1.2 Use a scientific experimentation process and associated skills to conduct investigations. - A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems. - A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes. A2. Use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life and in STEM-related fields. - A2.1 Write and execute code in investigations and when modelling concepts, with a focus on automating large systems in action. - A2.2 Identify and describe impacts of coding and of emerging technologies, such as artificial intelligence systems, on everyday life, including skilled trades. A3. Demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences. - A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems. - A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems. - A3.3 Analyse contributions to science and technology from various communities.	• • • • • • - • • • -
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Session 9: Iterate & Improve	Strand	Specific Expectations	Addressed
Introduction - Revisit the Core Values, with a focus on <i>Impact</i>, and record ways your team has had a positive influence on one another and on others Project - Test, iterate and improve your Innovation Project, as time allows Robot - Think about your mission strategy and continue to create solutions for each mission, as time allows - Iterate and improve your robot design and code Clean Up & Reflection - Gather around the mat to show any work completed on the Innovation Project and Robot Game - Review the Core Values rubric and discuss how you will demonstrate Core Values at the event and during judging sessions - Groups discuss and record any changes made to your innovation project and robot design based on feedback and testing	A. STEM Skills and Connections	A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures. A1.1 Use a scientific research process and associated skills to conduct investigations. A1.2 Use a scientific experimentation process and associated skills to conduct investigations. A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems. A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes. A2. Use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life and in STEM-related fields. A2.1 Write and execute code in investigations and when modelling concepts, with a focus on automating large systems in action. A3. Demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences. A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems. A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems. A3.3 Analyse contributions to science and technology from various communities.	• • • • • • • - - - -
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	E. Earth & Space Systems	E1. Assess the impact of human activities and technologies on the sustainability of water resources. E1.1 Assess the social and environmental impact of the scarcity of fresh water, and propose a plan of action to help address fresh water sustainability issues. E1.3 Assess the impact of scientific discoveries and technological innovations on local and global water systems. E2. Demonstrate an understanding of the characteristics of Earth's water systems and of factors that affect these systems. E2.3 Explain how human activity and natural phenomena cause changes in the water table. E2.6 Describe various indicators of water quality, and explain the impact of human activity on those indicators.	- - - - - - -

Session 10: Iterate Solutions	Strand	Specific Expectations	Addressed
Introduction - Revisit the Core Values, with a focus on <i>Coopertition</i>, and record ways your team will demonstrate it when competing with other teams Project - Plan your project presentation by writing a script and making any required props or displays - Refer to the criteria in the Innovation Project Rubric to ensure that you are covering everything in your presentation Robot - Continue to create, test and iterate on your robot solution - Practice a 2.5-minute Robot Game with all of your completed missions Clean Up & Reflection - Discuss how you know whether your solution will have a positive impact on others - Discuss what your team is proud of in your work on the project and robot design - Consider what skills you have developed through participation in FIRST LEGO league and discuss how to include everyone in the Innovation Project presentation	A. STEM Skills and Connections	A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures. A1.1 Use a scientific research process and associated skills to conduct investigations. A1.2 Use a scientific experimentation process and associated skills to conduct investigations. A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems. A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes. A2. Use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life and in STEM-related fields. A2.1 Write and execute code in investigations and when modelling concepts, with a focus on automating large systems in action. A3. Demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences. A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems. A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems. A3.3 Analyse contributions to science and technology from various communities.	• • • • • • - - - -
	B. Life Systems		
	C. Matter and Energy		

	D. Structures and Mechanisms	D1. Assess the social and environmental impacts of various systems, and evaluate improvements to the systems or alternative ways of meeting the same needs. D1.2 Assess the impact on individuals, society, and the environment of alternative ways of meeting needs that are currently met by existing systems, taking different points of view into consideration. D2. Demonstrate an understanding of different types of systems and the factors that contribute to their safe and efficient operation. D2.1 Identify various types of systems. D2.2 Describe the purpose, inputs, and outputs of various systems, including systems related to food processing. D2.3 Identify the various processes and components of a system that allow it to perform its function efficiently and safely. D2.4 Use the scientific terms displacement, force, work, energy, and efficiency to describe everyday experiences. D2.5 Demonstrate an understanding of the relationships between work, force, and displacement in simple systems. D2.6 Explain the relationship between input and output forces and determine the mechanical advantage of various mechanical systems, including simple machines. D2.7 Identify ways in which energy can dissipate from mechanical systems, and describe technological innovations that make these systems more efficient. D2.9 Describe technological innovations involving mechanical systems that have increased productivity in various industries.	• • • - • • • - - • - -
	E. Earth & Space Systems	E1. Assess the impact of human activities and technologies on the sustainability of water resources. E1.1 Assess the social and environmental impact of the scarcity of fresh water, and propose a plan of action to help address fresh water sustainability issues. E1.3 Assess the impact of scientific discoveries and technological innovations on local and global water systems. E2. Demonstrate an understanding of the characteristics of Earth's water systems and of factors that affect these systems. E2.3 Explain how human activity and natural phenomena cause changes in the water table. E2.6 Describe various indicators of water quality, and explain the impact of human activity on those indicators.	- - - - - - -

Session 11: Presentation Planning	Strand	Specific Expectations	Addressed
Introduction - Revisit the Core Values, with a focus on Fun, and record ways your team has had fun throughout this experience and celebrated your work - Complete the “Event Time” section of the Team Progress sheet Project - Continue to work on your Innovation Project presentation Robot - Plan your Robot Design presentation by writing a script to let each person on the team know what they will say about the robot design and programs - Refer to the criteria in the Robot Design Rubric to ensure that you are covering everything in your presentation Clean Up & Reflection - Discuss how the parts of your robot reflect how you used the Engineering Design Process - Discuss each person’s role in the Robot Design presentation and show what missions are completed by running a 2.5-minute match - Consider how <i>FIRST</i> LEGO League has made a difference for you	A. STEM Skills and Connections	A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures. A1.1 Use a scientific research process and associated skills to conduct investigations. A1.2 Use a scientific experimentation process and associated skills to conduct investigations. A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems. A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes. A2. Use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life and in STEM-related fields. A2.1 Write and execute code in investigations and when modelling concepts, with a focus on automating large systems in action. A3. Demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences. A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems. A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems. A3.3 Analyse contributions to science and technology from various communities.	• - • • • • • - - - -
	B. Life Systems		
	C. Matter and Energy		

	D. Structures and Mechanisms	D1. Assess the social and environmental impacts of various systems, and evaluate improvements to the systems or alternative ways of meeting the same needs. D1.2 Assess the impact on individuals, society, and the environment of alternative ways of meeting needs that are currently met by existing systems, taking different points of view into consideration. D2. Demonstrate an understanding of different types of systems and the factors that contribute to their safe and efficient operation. D2.1 Identify various types of systems. D2.2 Describe the purpose, inputs, and outputs of various systems, including systems related to food processing. D2.3 Identify the various processes and components of a system that allow it to perform its function efficiently and safely. D2.4 Use the scientific terms displacement, force, work, energy, and efficiency to describe everyday experiences. D2.5 Demonstrate an understanding of the relationships between work, force, and displacement in simple systems. D2.6 Explain the relationship between input and output forces and determine the mechanical advantage of various mechanical systems, including simple machines. D2.7 Identify ways in which energy can dissipate from mechanical systems, and describe technological innovations that make these systems more efficient. D2.9 Describe technological innovations involving mechanical systems that have increased productivity in various industries.	• • • - • • • - - • - -
	E. Earth & Space Systems	E1. Assess the impact of human activities and technologies on the sustainability of water resources. E1.1 Assess the social and environmental impact of the scarcity of fresh water, and propose a plan of action to help address fresh water sustainability issues. E1.3 Assess the impact of scientific discoveries and technological innovations on local and global water systems. E2. Demonstrate an understanding of the characteristics of Earth's water systems and of factors that affect these systems. E2.3 Explain how human activity and natural phenomena cause changes in the water table. E2.6 Describe various indicators of water quality, and explain the impact of human activity on those indicators.	- - - - - - -

Session 12: Practice	Strand	Specific Expectations	Addressed
Introduction - Revisit the Core Values, with a focus on Fun, and record ways your team has had fun throughout this experience Project - Rehearse your Innovation Project presentation, remembering to demonstrate and mention how your team has used the Core Values Robot - Rehearse your Robot Design presentation, remembering to demonstrate and mention how your team has used the Core Values - Collect and implement feedback about your presentation - Practice multiple 2.5-minute Robot Game matches Clean Up & Reflection - Review all of the rubrics and use them to evaluate and improve upon your presentations - Consider what your team will do if a mission does not work during a match - Create a plan for having all of your attachments ready for the Robot Game - Review how to “Prepare for your Event” in your Engineering Notebook and make final preparations	A. STEM Skills and Connections	A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures. A1.1 Use a scientific research process and associated skills to conduct investigations. A1.2 Use a scientific experimentation process and associated skills to conduct investigations. A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems. A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes. A2. Use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life and in STEM-related fields. A2.1 Write and execute code in investigations and when modelling concepts, with a focus on automating large systems in action. A3. Demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences. A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems. A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems. A3.3 Analyse contributions to science and technology from various communities.	• - - • • • • - - - -
	B. Life Systems		
	C. Matter and Energy		

	D. Structures and Mechanisms	D1. Assess the social and environmental impacts of various systems, and evaluate improvements to the systems or alternative ways of meeting the same needs. D1.2 Assess the impact on individuals, society, and the environment of alternative ways of meeting needs that are currently met by existing systems, taking different points of view into consideration. D2. Demonstrate an understanding of different types of systems and the factors that contribute to their safe and efficient operation. D2.1 Identify various types of systems. D2.2 Describe the purpose, inputs, and outputs of various systems, including systems related to food processing. D2.3 Identify the various processes and components of a system that allow it to perform its function efficiently and safely. D2.4 Use the scientific terms displacement, force, work, energy, and efficiency to describe everyday experiences. D2.5 Demonstrate an understanding of the relationships between work, force, and displacement in simple systems. D2.6 Explain the relationship between input and output forces and determine the mechanical advantage of various mechanical systems, including simple machines. D2.7 Identify ways in which energy can dissipate from mechanical systems, and describe technological innovations that make these systems more efficient. D2.9 Describe technological innovations involving mechanical systems that have increased productivity in various industries.	• • • - • • • - - • - -
	E. Earth & Space Systems	E1. Assess the impact of human activities and technologies on the sustainability of water resources. E1.1 Assess the social and environmental impact of the scarcity of fresh water, and propose a plan of action to help address fresh water sustainability issues. E1.3 Assess the impact of scientific discoveries and technological innovations on local and global water systems. E2. Demonstrate an understanding of the characteristics of Earth's water systems and of factors that affect these systems. E2.3 Explain how human activity and natural phenomena cause changes in the water table. E2.6 Describe various indicators of water quality, and explain the impact of human activity on those indicators.	- - - - - - -