

| Session 1: Get Started                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Strand                         | Specific Expectations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Addressed                                                                                                                                                         |
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| <b>Introduction</b> <ul style="list-style-type: none"> <li>Get to know team members and think of a team name</li> <li>Watch season videos &amp; read Engineering Notebook to learn about how <i>FIRST</i> LEGO League Challenge works and about the BIOGLOW Robot Game and Innovation Project</li> </ul> <b>Tasks</b> <ul style="list-style-type: none"> <li>Use the building instructions to build the robot game mission models</li> <li>Place each model where it belongs on the mat, using the <i>Robot Game Rulebook</i> for reference</li> <li>Explore how the models work and how they connect to the Project Sparks</li> </ul> <b>Clean Up &amp; Reflection</b> <ul style="list-style-type: none"> <li>Groups show how the mission models work and how they relate to the Project Sparks</li> <li>Groups discuss which missions look interesting and how your team plans to have <i>Fun</i> while working on the game and project</li> </ul> | A. STEM Skills and Connections | <p>A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures.</p> <p>A1.1 Use a scientific research process and associated skills to conduct investigations.</p> <p>A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems.</p> <p>A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes.</p> <p>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.</p> <p>A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems.</p> <p>A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems.</p> <p>A3.3 Analyse contributions to science and technology from various communities.</p>                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>-</li> </ul>                                  |
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|  | D. Structures and Mechanisms | <p>D1. Analyse personal, social, economic, and environmental factors that should be considered when designing and building structures.<br/> D1.1 Evaluate environmental, social, and economic factors that should be considered when designing and building structures to meet specific needs for individuals and communities.</p> <p>D2. Demonstrate an understanding of the relationship between structural forms and the forces acting on them.<br/> D2.2 Describe ways in which the centre of gravity of a structure affects the structure's stability.<br/> D2.3 Identify the magnitude, direction, point of application, and plane of application of the forces applied to a structure.<br/> D2.5 Describe factors that can cause a structure to fail.<br/> D2.6 Identify the factors that determine the suitability of materials for use in manufacturing a product or constructing a structure.<br/> D2.7 Describe methods engineers and other professionals use to assess, improve, and maintain the safety of structures.</p> | <p>-</p> <p>-</p> <p>•</p> <p>-</p> <p>•</p> <p>-</p> <p>-</p> <p>-</p> |
|  | E. Earth & Space Systems     | <p>E1. Assess the benefits of technologies that reduce heat loss, and analyse various social and environmental impacts of the use of energy from renewable and non-renewable sources.<br/> E1.2 Analyse various social, economic, and environmental impacts, including impacts related to climate change, of using non-renewable and renewable sources of energy.</p> <p>E2. Demonstrate an understanding of heat as a form of energy that is associated with the movement of particles and is essential for many natural processes within Earth's systems.<br/> E2.7 Describe the role of radiation in heating and cooling Earth, and explain how greenhouse gases affect the transmission of radiated heat through the atmosphere.<br/> E2.8 Identify common sources of greenhouse gases, including sources resulting from human activity, and describe how humans can reduce emissions of these gases.</p>                                                                                                                           | <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>                   |

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| Session 2: Training Camp 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Strand                         | Specific Expectations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Addressed                                                                                                                                                         |
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| <b>Introduction</b> <ul style="list-style-type: none"> <li>Think about how you will use the Core value of <i>Discovery</i>.</li> <li>Record your team's goals and what you hope to learn on the Team Progress sheet</li> </ul> <b>Tasks</b> <ul style="list-style-type: none"> <li>Learn how to prepare &amp; connect the hub, to create simple programs and to use the motors and sensors by completing the Tutorial Activities: 1 – 6</li> <li>Learn to program the robot to move forward, in reverse &amp; turn by completing Training Camp 1: Driving Around in the Competition Ready Unit</li> <li>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</li> <li>Discuss any Innovation Project ideas that are sparked by the mission models</li> </ul> <b>Clean Up &amp; Reflection</b> <ul style="list-style-type: none"> <li>Groups share robot skills and discuss how they can be applied in the Robot Game</li> <li>Groups share how they used the Engineering Design Process in this session</li> <li>Groups discuss which Project Sparks interest the team &amp; how the team will research the problem</li> </ul> | A. STEM Skills and Connections | <p>A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures.</p> <p>A1.1 Use a scientific research process and associated skills to conduct investigations.</p> <p>A1.2 Use a scientific experimentation process and associated skills to conduct investigations.</p> <p>A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems.</p> <p>A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes.</p> <p>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.</p> <p>A2.1 Write and execute code in investigations and when modelling concepts, with a focus on planning and designing programs.</p> <p>A2.2 Identify and describe impacts of coding and of emerging technologies, such as artificial intelligence systems, on everyday life, including skilled trades.</p> <p>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.</p> <p>A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems.</p> <p>A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems.</p> <p>A3.3 Analyse contributions to science and technology from various communities.</p> | <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>-</li> </ul> |
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| Session 3: Training Camp 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Strand                         | Specific Expectations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Addressed                                                                                                                                             |
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| <b>Introduction</b> <ul style="list-style-type: none"><li>● Review the Innovation Project page and the Project Sparks</li><li>● 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</li></ul> <b>Tasks</b> <ul style="list-style-type: none"><li>● Record your team’s problem statement</li><li>● 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</li><li>● Reflect on how the coding &amp; building skills learned will help in the Robot Game and use them to complete a mission</li></ul> <b>Clean Up &amp; Reflection</b> <ul style="list-style-type: none"><li>● Groups share what additional skills are needed to select an idea for the project</li><li>● Groups discuss what objects the robot needs to avoid in the Robot Game</li><li>● Groups decide what mission the team wants to attempt next</li></ul> | A. STEM Skills and Connections | <p>A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures.</p> <p>A1.1 Use a scientific research process and associated skills to conduct investigations.</p> <p>A1.2 Use a scientific experimentation process and associated skills to conduct investigations.</p> <p>A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems.</p> <p>A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes.</p> <p>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.</p> <p>A2.1 Write and execute code in investigations and when modelling concepts, with a focus on planning and designing programs.</p> <p>A2.2 Identify and describe impacts of coding and of emerging technologies, such as artificial intelligence systems, on everyday life, including skilled trades.</p> <p>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.</p> <p>A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems.</p> <p>A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems.</p> <p>A3.3 Analyse contributions to science and technology from various communities.</p> | <ul style="list-style-type: none"><li>●</li><li>●</li><li>●</li><li>●</li><li>●</li><li>●</li><li>●</li><li>●</li><li>●</li><li>●</li><li>-</li></ul> |
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| Session 4: Training Camp 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Strand                         | Specific Expectations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Addressed                                                                                                                                                         |
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| <b>Introduction</b> <ul style="list-style-type: none"> <li>• Work with your team to research and learn about existing solutions</li> <li>• Determine how to use the information collected to create a solution to the problem</li> </ul> <b>Tasks</b> <ul style="list-style-type: none"> <li>• Learn how to program a driving base to follow a line by completing Training Camp 3: Reacting to Lines in the Competition Ready unit</li> <li>• Reflect on how the coding &amp; building skills learned will help in the Robot Game and use them to complete a mission</li> </ul> <b>Clean Up &amp; Reflection</b> <ul style="list-style-type: none"> <li>• Groups share how the team will record research about your chosen problem</li> <li>• Groups discuss how testing your program helped make your robot more accurate</li> <li>• Groups discuss how the lines on the mat can be used in your mission strategy</li> </ul> | A. STEM Skills and Connections | <p>A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures.</p> <p>A1.1 Use a scientific research process and associated skills to conduct investigations.</p> <p>A1.2 Use a scientific experimentation process and associated skills to conduct investigations.</p> <p>A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems.</p> <p>A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes.</p> <p>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.</p> <p>A2.1 Write and execute code in investigations and when modelling concepts, with a focus on planning and designing programs.</p> <p>A2.2 Identify and describe impacts of coding and of emerging technologies, such as artificial intelligence systems, on everyday life, including skilled trades.</p> <p>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.</p> <p>A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems.</p> <p>A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems.</p> <p>A3.3 Analyse contributions to science and technology from various communities.</p> | <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>-</li> </ul> |
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|  | D. Structures and Mechanisms | <p>D1. Analyse personal, social, economic, and environmental factors that should be considered when designing and building structures.<br/> D1.1 Evaluate environmental, social, and economic factors that should be considered when designing and building structures to meet specific needs for individuals and communities.</p> <p>D2. Demonstrate an understanding of the relationship between structural forms and the forces acting on them.<br/> D2.2 Describe ways in which the centre of gravity of a structure affects the structure's stability.<br/> D2.3 Identify the magnitude, direction, point of application, and plane of application of the forces applied to a structure.<br/> D2.5 Describe factors that can cause a structure to fail.<br/> D2.6 Identify the factors that determine the suitability of materials for use in manufacturing a product or constructing a structure.<br/> D2.7 Describe methods engineers and other professionals use to assess, improve, and maintain the safety of structures.</p> | <p>-</p> <p>-</p> <p>•</p> <p>-</p> <p>•</p> <p>-</p> <p>-</p> <p>-</p> |
|  | E. Earth & Space Systems     | <p>E1. Assess the benefits of technologies that reduce heat loss, and analyse various social and environmental impacts of the use of energy from renewable and non-renewable sources.<br/> E1.2 Analyse various social, economic, and environmental impacts, including impacts related to climate change, of using non-renewable and renewable sources of energy.</p> <p>E2. Demonstrate an understanding of heat as a form of energy that is associated with the movement of particles and is essential for many natural processes within Earth's systems.<br/> E2.7 Describe the role of radiation in heating and cooling Earth, and explain how greenhouse gases affect the transmission of radiated heat through the atmosphere.<br/> E2.8 Identify common sources of greenhouse gases, including sources resulting from human activity, and describe how humans can reduce emissions of these gases.</p>                                                                                                                           | <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>                   |

• The standard is clearly addressed by program activities.

- This standard potentially could be addressed, either by actions taken when working with students or by conditions established by the program

| Session 5: Guided Mission                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Strand                         | Specific Expectations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Addressed                                                                                                                                                         |
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| <p><b>Introduction</b></p> <ul style="list-style-type: none"> <li>Think about how you have used the Core value of <b>Teamwork</b>, and record ways in which your team has learned to work together</li> </ul> <p><b>Project</b></p> <ul style="list-style-type: none"> <li>Perform additional research about why the chosen problem exists and who or what is affected</li> <li>Decide whether to develop a new solution or improve upon an existing one and select a solution to further develop</li> </ul> <p><b>Robot</b></p> <ul style="list-style-type: none"> <li>Apply coding principles to complete the guided mission in the Competition Ready unit and continue to refine the mission until it works consistently</li> <li>Continue to practice completing other missions in the Robot Game</li> </ul> <p><b>Clean Up &amp; Reflection</b></p> <ul style="list-style-type: none"> <li>Brainstorm who your team could talk to about the chosen problem and what questions you would ask them</li> <li>Explain what the Robot Game teaches about Coopertition and how what you learned in the guided mission could help you complete additional missions.</li> </ul> | A. STEM Skills and Connections | <p>A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures.</p> <p>A1.1 Use a scientific research process and associated skills to conduct investigations.</p> <p>A1.2 Use a scientific experimentation process and associated skills to conduct investigations.</p> <p>A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems.</p> <p>A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes.</p> <p>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.</p> <p>A2.1 Write and execute code in investigations and when modelling concepts, with a focus on planning and designing programs.</p> <p>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.</p> <p>A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems.</p> <p>A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems.</p> <p>A3.3 Analyse contributions to science and technology from various communities.</p> | <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>-</li> </ul>            |
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|  | D. Structures and Mechanisms | <p>D1. Analyse personal, social, economic, and environmental factors that should be considered when designing and building structures.<br/> D1.1 Evaluate environmental, social, and economic factors that should be considered when designing and building structures to meet specific needs for individuals and communities.</p> <p>D2. Demonstrate an understanding of the relationship between structural forms and the forces acting on them.<br/> D2.2 Describe ways in which the centre of gravity of a structure affects the structure's stability.<br/> D2.3 Identify the magnitude, direction, point of application, and plane of application of the forces applied to a structure.<br/> D2.5 Describe factors that can cause a structure to fail.<br/> D2.6 Identify the factors that determine the suitability of materials for use in manufacturing a product or constructing a structure.<br/> D2.7 Describe methods engineers and other professionals use to assess, improve, and maintain the safety of structures.</p> | <p>-</p> <p>-</p> <p>•</p> <p>-</p> <p>•</p> <p>-</p> <p>-</p> <p>-</p> |
|  | E. Earth & Space Systems     | <p>E1. Assess the benefits of technologies that reduce heat loss, and analyse various social and environmental impacts of the use of energy from renewable and non-renewable sources.<br/> E1.2 Analyse various social, economic, and environmental impacts, including impacts related to climate change, of using non-renewable and renewable sources of energy.</p> <p>E2. Demonstrate an understanding of heat as a form of energy that is associated with the movement of particles and is essential for many natural processes within Earth's systems.<br/> E2.7 Describe the role of radiation in heating and cooling Earth, and explain how greenhouse gases affect the transmission of radiated heat through the atmosphere.<br/> E2.8 Identify common sources of greenhouse gases, including sources resulting from human activity, and describe how humans can reduce emissions of these gases.</p>                                                                                                                           | <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>                   |

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| Session 6: Pseudocode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Strand                         | Specific Expectations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Addressed                                                                                                                                                         |
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| <b>Introduction</b> <ul style="list-style-type: none"> <li>Think about and record what your team has already learned and what more you still want to explore</li> <li>Complete the “Halfway There” section of the Team Progress sheet</li> </ul> <b>Project</b> <ul style="list-style-type: none"> <li>Plan how you will develop your solution using the Innovation Project Planning sheet as a tool</li> <li>Use a variety of sources and keep track of them in the Engineering Notebook</li> <li>Determine what materials are needed to create a prototype, model, or drawing of your solution</li> </ul> <b>Robot</b> <ul style="list-style-type: none"> <li>Watch the “Robot Game Missions” video, decide which missions your team will attempt next and complete the Pseudocode worksheet</li> <li>Continue to practice completing missions in the Robot Game</li> </ul> <b>Clean Up &amp; Reflection</b> <ul style="list-style-type: none"> <li>Consider the next step in developing your innovative solution and how to document your progress</li> <li>Discuss how your robot’s attachments and code support your team’s mission strategy &amp; how you can iterate to improve your</li> </ul> | A. STEM Skills and Connections | <p>A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures.</p> <p>A1.1 Use a scientific research process and associated skills to conduct investigations.</p> <p>A1.2 Use a scientific experimentation process and associated skills to conduct investigations.</p> <p>A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems.</p> <p>A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes.</p> <p>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.</p> <p>A2.1 Write and execute code in investigations and when modelling concepts, with a focus on planning and designing programs.</p> <p>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.</p> <p>A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems.</p> <p>A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems.</p> <p>A3.3 Analyse contributions to science and technology from various communities.</p> | <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>-</li> </ul>            |
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| robot's design | D. Structures and Mechanisms | <p>D1. Analyse personal, social, economic, and environmental factors that should be considered when designing and building structures.<br/> D1.1 Evaluate environmental, social, and economic factors that should be considered when designing and building structures to meet specific needs for individuals and communities.</p> <p>D2. Demonstrate an understanding of the relationship between structural forms and the forces acting on them.<br/> D2.2 Describe ways in which the centre of gravity of a structure affects the structure's stability.<br/> D2.3 Identify the magnitude, direction, point of application, and plane of application of the forces applied to a structure.<br/> D2.5 Describe factors that can cause a structure to fail.<br/> D2.6 Identify the factors that determine the suitability of materials for use in manufacturing a product or constructing a structure.<br/> D2.7 Describe methods engineers and other professionals use to assess, improve, and maintain the safety of structures.</p> | <p>-</p> <p>-</p> <p>•</p> <p>-</p> <p>•</p> <p>-</p> <p>-</p> <p>-</p> |
|                | E. Earth & Space Systems     | <p>E1. Assess the benefits of technologies that reduce heat loss, and analyse various social and environmental impacts of the use of energy from renewable and non-renewable sources.<br/> E1.2 Analyse various social, economic, and environmental impacts, including impacts related to climate change, of using non-renewable and renewable sources of energy.</p> <p>E2. Demonstrate an understanding of heat as a form of energy that is associated with the movement of particles and is essential for many natural processes within Earth's systems.<br/> E2.7 Describe the role of radiation in heating and cooling Earth, and explain how greenhouse gases affect the transmission of radiated heat through the atmosphere.<br/> E2.8 Identify common sources of greenhouse gases, including sources resulting from human activity, and describe how humans can reduce emissions of these gases.</p>                                                                                                                           | <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>                   |

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| Session 7: Create Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Strand                         | Specific Expectations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Addressed                                                                                                                                                         |
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| <b>Introduction</b><br><ul style="list-style-type: none"> <li>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</li> </ul> <b>Project</b><br><ul style="list-style-type: none"> <li>Continue to develop your innovation project solution</li> <li>Draw your solution and describe how it solves the problem</li> <li>Create a prototype, model or labelled drawing of your solution</li> <li>Document the process you use to develop your solution on the Innovation Project Planning sheet</li> </ul> <b>Robot</b><br><ul style="list-style-type: none"> <li>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</li> <li>Test and improve your robot and its programs by revisiting previous lessons to develop your coding skills or work on solving missions</li> </ul> <b>Clean Up &amp; Reflection</b><br><ul style="list-style-type: none"> <li>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</li> <li>Discuss how to iterate to improve your robot's design</li> </ul> | A. STEM Skills and Connections | <p>A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures.</p> <ul style="list-style-type: none"> <li>A1.1 Use a scientific research process and associated skills to conduct investigations.</li> <li>A1.2 Use a scientific experimentation process and associated skills to conduct investigations.</li> <li>A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems.</li> <li>A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes.</li> </ul> <p>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.</p> <ul style="list-style-type: none"> <li>A2.1 Write and execute code in investigations and when modelling concepts, with a focus on planning and designing programs.</li> <li>A2.2 Identify and describe impacts of coding and of emerging technologies, such as artificial intelligence systems, on everyday life, including skilled trades.</li> </ul> <p>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.</p> <ul style="list-style-type: none"> <li>A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems.</li> <li>A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems.</li> <li>A3.3 Analyse contributions to science and technology from various communities.</li> </ul> | <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>-</li> <li>•</li> <li>•</li> <li>•</li> <li>-</li> </ul> |
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|  | D. Structures and Mechanisms | <p>D1. Analyse personal, social, economic, and environmental factors that should be considered when designing and building structures.<br/> D1.1 Evaluate environmental, social, and economic factors that should be considered when designing and building structures to meet specific needs for individuals and communities.</p> <p>D2. Demonstrate an understanding of the relationship between structural forms and the forces acting on them.<br/> D2.2 Describe ways in which the centre of gravity of a structure affects the structure's stability.<br/> D2.3 Identify the magnitude, direction, point of application, and plane of application of the forces applied to a structure.<br/> D2.5 Describe factors that can cause a structure to fail.<br/> D2.6 Identify the factors that determine the suitability of materials for use in manufacturing a product or constructing a structure.<br/> D2.7 Describe methods engineers and other professionals use to assess, improve, and maintain the safety of structures.</p> | <p>-</p> <p>-</p> <p>•</p> <p>-</p> <p>•</p> <p>-</p> <p>-</p> <p>-</p> |
|  | E. Earth & Space Systems     | <p>E1. Assess the benefits of technologies that reduce heat loss, and analyse various social and environmental impacts of the use of energy from renewable and non-renewable sources.<br/> E1.2 Analyse various social, economic, and environmental impacts, including impacts related to climate change, of using non-renewable and renewable sources of energy.</p> <p>E2. Demonstrate an understanding of heat as a form of energy that is associated with the movement of particles and is essential for many natural processes within Earth's systems.<br/> E2.7 Describe the role of radiation in heating and cooling Earth, and explain how greenhouse gases affect the transmission of radiated heat through the atmosphere.<br/> E2.8 Identify common sources of greenhouse gases, including sources resulting from human activity, and describe how humans can reduce emissions of these gases.</p>                                                                                                                           | <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>                            |

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| Session 8: Continue Creating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Strand                         | Specific Expectations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Addressed                                                                                                                                                         |
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| <b>Introduction</b> <ul style="list-style-type: none"> <li>Revisit the Core Values, with a focus on <i>Inclusion</i> and record how your team makes sure everyone is respected and their voices heard</li> </ul> <b>Project</b> <ul style="list-style-type: none"> <li>Share your solution with others and collect feedback</li> <li>Improve the solution based on feedback and determine if you can do any testing to improve your solution</li> </ul> <b>Robot</b> <ul style="list-style-type: none"> <li>Decide what missions to attempt next and develop a strategy to complete these and other missions during a 2.5-minute match</li> <li>Refine your attachments and programs so that the robot completes these missions reliably</li> <li>Document the design process and testing for each mission</li> </ul> <b>Clean Up &amp; Reflection</b> <ul style="list-style-type: none"> <li>Gather at the mat to show any new missions on which you have been working and discuss in what order you will complete the missions during the Robot Game</li> <li>Consider what changes you will make to your solution based on the feedback you received</li> </ul> | A. STEM Skills and Connections | <p>A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures.</p> <p>A1.1 Use a scientific research process and associated skills to conduct investigations.</p> <p>A1.2 Use a scientific experimentation process and associated skills to conduct investigations.</p> <p>A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems.</p> <p>A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes.</p> <p>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.</p> <p>A2.1 Write and execute code in investigations and when modelling concepts, with a focus on planning and designing programs.</p> <p>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.</p> <p>A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems.</p> <p>A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems.</p> <p>A3.3 Analyse contributions to science and technology from various communities.</p> | <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>-</li> <li>-</li> <li>-</li> <li>-</li> </ul>            |
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• The standard is clearly addressed by program activities.

- This standard potentially could be addressed, either by actions taken when working with students or by conditions established by the program

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|  | D. Structures and Mechanisms | <p>D1. Analyse personal, social, economic, and environmental factors that should be considered when designing and building structures.<br/> D1.1 Evaluate environmental, social, and economic factors that should be considered when designing and building structures to meet specific needs for individuals and communities.</p> <p>D2. Demonstrate an understanding of the relationship between structural forms and the forces acting on them.<br/> D2.2 Describe ways in which the centre of gravity of a structure affects the structure's stability.<br/> D2.3 Identify the magnitude, direction, point of application, and plane of application of the forces applied to a structure.<br/> D2.5 Describe factors that can cause a structure to fail.<br/> D2.6 Identify the factors that determine the suitability of materials for use in manufacturing a product or constructing a structure.<br/> D2.7 Describe methods engineers and other professionals use to assess, improve, and maintain the safety of structures.</p> | <p>-</p> <p>-</p> <p>•</p> <p>-</p> <p>•</p> <p>-</p> <p>-</p> <p>-</p> |
|  | E. Earth & Space Systems     | <p>E1. Assess the benefits of technologies that reduce heat loss, and analyse various social and environmental impacts of the use of energy from renewable and non-renewable sources.<br/> E1.2 Analyse various social, economic, and environmental impacts, including impacts related to climate change, of using non-renewable and renewable sources of energy.</p> <p>E2. Demonstrate an understanding of heat as a form of energy that is associated with the movement of particles and is essential for many natural processes within Earth's systems.<br/> E2.7 Describe the role of radiation in heating and cooling Earth, and explain how greenhouse gases affect the transmission of radiated heat through the atmosphere.<br/> E2.8 Identify common sources of greenhouse gases, including sources resulting from human activity, and describe how humans can reduce emissions of these gases.</p>                                                                                                                           | <p>-</p> <p>-</p> <p>-</p> <p>-</p> <p>-</p>                            |

| Session 9: Iterate & Improve                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Strand                         | Specific Expectations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Addressed                                                                                                                                                         |
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| <b>Introduction</b><br><ul style="list-style-type: none"> <li>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</li> </ul> <b>Project</b><br><ul style="list-style-type: none"> <li>Test, iterate and improve your Innovation Project, as time allows</li> </ul> <b>Robot</b><br><ul style="list-style-type: none"> <li>Think about your mission strategy and continue to create solutions for each mission, as time allows</li> <li>Iterate and improve your robot design and code</li> </ul> <b>Clean Up &amp; Reflection</b><br><ul style="list-style-type: none"> <li>Gather around the mat to show any work completed on the Innovation Project and Robot Game</li> <li>Review the Core Values rubric and discuss how you will demonstrate Core Values at the event and during judging sessions</li> <li>Groups discuss and record any changes made to your innovation project and robot design based on feedback and testing</li> </ul> | A. STEM Skills and Connections | <p>A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures.</p> <p>A1.1 Use a scientific research process and associated skills to conduct investigations.</p> <p>A1.2 Use a scientific experimentation process and associated skills to conduct investigations.</p> <p>A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems.</p> <p>A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes.</p> <p>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.</p> <p>A2.1 Write and execute code in investigations and when modelling concepts, with a focus on planning and designing programs.</p> <p>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.</p> <p>A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems.</p> <p>A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems.</p> <p>A3.3 Analyse contributions to science and technology from various communities.</p> | <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>-</li> <li>-</li> <li>-</li> <li>-</li> </ul> |
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|  | E. Earth & Space Systems     | <p>E1. Assess the benefits of technologies that reduce heat loss, and analyse various social and environmental impacts of the use of energy from renewable and non-renewable sources.<br/> E1.2 Analyse various social, economic, and environmental impacts, including impacts related to climate change, of using non-renewable and renewable sources of energy.</p> <p>E2. Demonstrate an understanding of heat as a form of energy that is associated with the movement of particles and is essential for many natural processes within Earth's systems.<br/> E2.7 Describe the role of radiation in heating and cooling Earth, and explain how greenhouse gases affect the transmission of radiated heat through the atmosphere.<br/> E2.8 Identify common sources of greenhouse gases, including sources resulting from human activity, and describe how humans can reduce emissions of these gases.</p>                                                                                                                           | -<br>-<br><br>-<br>-<br>-           |

| Session 10: Iterate Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Strand                         | Specific Expectations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Addressed                                                                                                                                                         |
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| <b>Introduction</b><br><ul style="list-style-type: none"> <li>Revisit the Core Values, with a focus on <i>Cooperation</i>, and record ways your team will demonstrate it when competing with other teams</li> </ul> <b>Project</b><br><ul style="list-style-type: none"> <li>Plan your project presentation by writing a script and making any required props or displays</li> <li>Refer to the criteria in the Innovation Project Rubric to ensure that you are covering everything in your presentation</li> </ul> <b>Robot</b><br><ul style="list-style-type: none"> <li>Continue to create, test and iterate on your robot solution</li> <li>Practice a 2.5-minute Robot Game with all of your completed missions</li> </ul> <b>Clean Up &amp; Reflection</b><br><ul style="list-style-type: none"> <li>Discuss how you know whether your solution will have a positive impact on others</li> <li>Discuss what your team is proud of in your work on the project and robot design</li> <li>Consider what skills you have developed through participation in FIRST LEGO league and discuss how to include everyone in the Innovation Project presentation</li> </ul> | A. STEM Skills and Connections | <p>A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures.</p> <p>A1.1 Use a scientific research process and associated skills to conduct investigations.</p> <p>A1.2 Use a scientific experimentation process and associated skills to conduct investigations.</p> <p>A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems.</p> <p>A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes.</p> <p>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.</p> <p>A2.1 Write and execute code in investigations and when modelling concepts, with a focus on planning and designing programs.</p> <p>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.</p> <p>A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems.</p> <p>A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems.</p> <p>A3.3 Analyse contributions to science and technology from various communities.</p> | <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>-</li> <li>-</li> <li>-</li> <li>-</li> </ul> |
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| Session 11: Presentation Planning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Strand                         | Specific Expectations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Addressed                                                                                                                                                         |
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| <b>Introduction</b> <ul style="list-style-type: none"> <li>Revisit the Core Values, with a focus on <b>Fun</b>, and record ways your team has had fun throughout this experience and celebrated your work</li> <li>Complete the “Event Time” section of the Team Progress sheet</li> </ul> <b>Project</b> <ul style="list-style-type: none"> <li>Continue to work on your Innovation Project presentation</li> </ul> <b>Robot</b> <ul style="list-style-type: none"> <li>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</li> <li>Refer to the criteria in the Robot Design Rubric to ensure that you are covering everything in your presentation</li> </ul> <b>Clean Up &amp; Reflection</b> <ul style="list-style-type: none"> <li>Discuss how the parts of your robot reflect how you used the Engineering Design Process</li> <li>Discuss each person’s role in the Robot Design presentation and show what missions are completed by running a 2.5-minute match</li> <li>Consider how <i>FIRST</i> LEGO League has made a difference for you</li> </ul> | A. STEM Skills and Connections | <p>A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures.</p> <p>A1.1 Use a scientific research process and associated skills to conduct investigations.</p> <p>A1.2 Use a scientific experimentation process and associated skills to conduct investigations.</p> <p>A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems.</p> <p>A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes.</p> <p>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.</p> <p>A2.1 Write and execute code in investigations and when modelling concepts, with a focus on planning and designing programs.</p> <p>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.</p> <p>A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems.</p> <p>A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems.</p> <p>A3.3 Analyse contributions to science and technology from various communities.</p> | <ul style="list-style-type: none"> <li>•</li> <li>-</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>-</li> <li>-</li> <li>-</li> <li>-</li> </ul>            |
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| Session 12: Practice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Strand                         | Specific Expectations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Addressed                                                                                                                                                         |
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| <b>Introduction</b><br><ul style="list-style-type: none"> <li>Revisit the Core Values, with a focus on <b>Fun</b>, and record ways your team has had fun throughout this experience</li> </ul> <b>Project</b><br><ul style="list-style-type: none"> <li>Rehearse your Innovation Project presentation, remembering to demonstrate and mention how your team has used the Core Values</li> </ul> <b>Robot</b><br><ul style="list-style-type: none"> <li>Rehearse your Robot Design presentation, remembering to demonstrate and mention how your team has used the Core Values</li> <li>Collect and implement feedback about your presentation</li> <li>Practice multiple 2.5-minute Robot Game matches</li> </ul> <b>Clean Up &amp; Reflection</b><br><ul style="list-style-type: none"> <li>Review all of the rubrics and use them to evaluate and improve upon your presentations</li> <li>Consider what your team will do if a mission does not work during a match</li> <li>Create a plan for having all of your attachments ready for the Robot Game</li> <li>Review how to “Prepare for your Event” in your Engineering Notebook and make final preparations</li> </ul> | A. STEM Skills and Connections | <p>A1. Use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures.</p> <p>A1.1 Use a scientific research process and associated skills to conduct investigations.</p> <p>A1.2 Use a scientific experimentation process and associated skills to conduct investigations.</p> <p>A1.3 Use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems.</p> <p>A1.5 Communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes.</p> <p>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.</p> <p>A2.1 Write and execute code in investigations and when modelling concepts, with a focus on planning and designing programs.</p> <p>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.</p> <p>A3.1 Describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems.</p> <p>A3.2 Investigate how science and technology can be used with other subject areas to address real-world problems.</p> <p>A3.3 Analyse contributions to science and technology from various communities.</p> | <ul style="list-style-type: none"> <li>•</li> <li>-</li> <li>-</li> <li>•</li> <li>•</li> <li>•</li> <li>-</li> <li>-</li> <li>-</li> <li>-</li> </ul>            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | B. Life Systems                | <p>B1. Assess the impact of human activities and technologies on the environment, and analyse ways to mitigate negative impacts and contribute to environmental sustainability.</p> <p>B1.1 Assess the impact of various technologies on the environment.</p> <p>B1.2 Assess the effectiveness of various ways of mitigating the negative and enhancing the positive impact of human activities on the environment.</p> <p>B1.3 Analyse how diverse First Nations, Métis, and Inuit practices and perspectives contribute to environmental sustainability.</p> <p>B2. Demonstrate an understanding of interactions between and among biotic and abiotic components in the environment.</p> <p>B2.1 Explain that an ecosystem is a network of interactions among living organisms and their environment.</p> <p>B2.2 Identify biotic and abiotic components in an ecosystem, and describe the interactions between them.</p> <p>B2.3 Describe roles and relationships between producers, consumers, and decomposers within an ecosystem.</p> <p>B2.4 Describe the transfer of energy in a food chain, and explain the effects of altering any part of the chain.</p> <p>B2.5 Describe how matter is cycled within the environment, and explain how the cycling of matter promotes sustainability.</p> <p>B2.7 Explain how biotic and abiotic factors limit the number of organisms an ecosystem can sustain.</p>                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>-</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>-</li> <li>-</li> </ul> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | C. Matter and Energy           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                   |

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|  | D. Structures and Mechanisms | <p>D1. Analyse personal, social, economic, and environmental factors that should be considered when designing and building structures.<br/> D1.1 Evaluate environmental, social, and economic factors that should be considered when designing and building structures to meet specific needs for individuals and communities.</p> <p>D2. Demonstrate an understanding of the relationship between structural forms and the forces acting on them.<br/> D2.2 Describe ways in which the centre of gravity of a structure affects the structure's stability.<br/> D2.3 Identify the magnitude, direction, point of application, and plane of application of the forces applied to a structure.<br/> D2.5 Describe factors that can cause a structure to fail.<br/> D2.6 Identify the factors that determine the suitability of materials for use in manufacturing a product or constructing a structure.<br/> D2.7 Describe methods engineers and other professionals use to assess, improve, and maintain the safety of structures.</p> | -<br>-<br><br>-<br>-<br>-<br>-<br>- |
|  | E. Earth & Space Systems     | <p>E1. Assess the benefits of technologies that reduce heat loss, and analyse various social and environmental impacts of the use of energy from renewable and non-renewable sources.<br/> E1.2 Analyse various social, economic, and environmental impacts, including impacts related to climate change, of using non-renewable and renewable sources of energy.</p> <p>E2. Demonstrate an understanding of heat as a form of energy that is associated with the movement of particles and is essential for many natural processes within Earth's systems.<br/> E2.7 Describe the role of radiation in heating and cooling Earth, and explain how greenhouse gases affect the transmission of radiated heat through the atmosphere.<br/> E2.8 Identify common sources of greenhouse gases, including sources resulting from human activity, and describe how humans can reduce emissions of these gases.</p>                                                                                                                           | -<br>-<br><br>-<br>-<br>-           |