STANDARDS ALIGNMENT

CASE NO	TITLE	STANDARDS
1	Pull-Ups Robot	**Next Generation Science Standards (NGSS):** **MS-ETS1-1:** Define criteria and constraints of a design problem to ensure a successful solution. **MS-ETS1-2:** Evaluate competing design solutions systematically to determine how well they meet the criteria and constraints of the problem. **MS-ETS1-4:** Develop a model to generate data for iterative testing and refinement of a proposed object, tool, or process for optimal design. **MS-PS2-2:** Plan an investigation to provide evidence that the motion of an object depends on the sum of forces and its mass. **MS-PS3-5:** Construct, use, and present arguments to support the claim that when an object's kinetic energy changes, energy is transferred to or from the object. **ISTE Standards for Students:** **1c:** Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. **2a:** Design and develop digital age learning experiences and assessments. **3a:** Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation. **4a:** Apply a deliberate design process for generating ideas, testing, creating, or solving authentic problems. **4b:** Select and use digital tools to plan and manage a design process that includes design constraints and calculated risks. **5a:** Leverage technology to apply sensor data and demonstrate knowledge in real-world applications. **CSTA K-12 Computer Science Standards:** **2-CS-02:** Design projects that integrate hardware and software components for data collection and exchange. **2-AP-10:** Use flowcharts or pseudocode to approach complex problems with algorithms. **2-AP-13:** Decompose problems into components systematically, using constructs like loops and conditionals. **2-AP-19:** Document programs to enhance ease of testing, debugging, and follow-up. **CCSS.MATH Common Core State Standards for Mathematics:** **6.RP.A.3:** Use ratio and rate reasoning to solve real-world and mathematical problems. **6.EE.9:** Represent and analyze quantitative relationships between dependent and independent variables. **7.RP.A.2:** Recognize and represent proportional relationships between quantities. **8.EE.B.5:** Graph proportional relationships, interpreting the unit rate as the slope of the graph. **CCSS.ELA-LITERACY Standards:** **SL.4.1:** Engage effectively in a range of collaborative discussions with diverse partners. **SL.4.5:** Add audio recordings and visual displays to presentations to enhance the development of main ideas or themes. **National Core Arts Standards (NCAS):** **VA:Cr1.1.5a:** Combine ideas to generate an innovative idea for art-making. **VA:Cr2.1.5a**: Experiment and develop skills in multiple art-making techniques and approaches through practice. **VA:Re.7.2.4a:** Analyze components in visual imagery that convey messages **VA:Re.7.2.5a:** Identify and analyze cultural associations suggested by visual imagery. **VA:Re.7.2.7a:** Analyze multiple ways that images influence specific audiences. **VA:Cn11.1.6a**: Analyze how art reflects changing times, traditions, resources, and cultural uses.

2	**Building a Swimming Robot**	**Next Generation Science Standards (NGSS):** **MS-ETS1-1:** Define criteria and constraints of a design problem to ensure a successful solution. **MS-ETS1-2:** Evaluate competing design solutions systematically to determine how well they meet the criteria and constraints of the problem. **MS-ETS1-4:** Develop a model to generate data for iterative testing and refinement of a proposed object, tool, or process for optimal design. **MS-PS2-2:** Plan an investigation to provide evidence that the motion of an object depends on the sum of forces and its mass. **MS-PS3-5:** Construct, use, and present arguments to support the claim that when an object's kinetic energy changes, energy is transferred to or from the object. **ISTE Standards for Students:** **1c:** Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. **2a:** Design and develop digital age learning experiences and assessments. **3a:** Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation. **4a:** Apply a deliberate design process for generating ideas, testing, creating, or solving authentic problems. **4b:** Select and use digital tools to plan and manage a design process that includes design constraints and calculated risks. **5a:** Leverage technology to apply sensor data and demonstrate knowledge in real-world applications. **CSTA K-12 Computer Science Standards:** **2-CS-02:** Design projects that integrate hardware and software components for data collection and exchange. **2-AP-10:** Use flowcharts or pseudocode to approach complex problems with algorithms. **2-AP-13:** Decompose problems into components systematically, using constructs like loops and conditionals. **2-AP-19:** Document programs to enhance ease of testing, debugging, and follow-up. **CCSS.MATH Common Core State Standards for Mathematics:** **6.RP.A.3:** Use ratio and rate reasoning to solve real-world and mathematical problems. **6.EE.9:** Represent and analyze quantitative relationships between dependent and independent variables. **7.RP.A.2:** Recognize and represent proportional relationships between quantities. **8.EE.B.5:** Graph proportional relationships, interpreting the unit rate as the slope of the graph. **CCSS.ELA-LITERACY Standards:** **SL.4.1:** Engage effectively in a range of collaborative discussions with diverse partners. **SL.4.5:** Add audio recordings and visual displays to presentations to enhance the development of main ideas or themes. **National Core Arts Standards (NCAS):** **VA:Cr1.1.5a**: Combine ideas to generate an innovative idea for art-making. **VA:Cr2.1.5a**: Experiment and develop skills in multiple art-making techniques and approaches through practice. **VA:Cr2.3.5a** : Identify, describe, and visually document places and/or objects of personal significance. **VA:Re.7.2.4a:** Analyze components in visual imagery that convey messages **VA:Re.7.2.5a:** Identify and analyze cultural associations suggested by visual imagery**.** **VA:Re.7.2.7a:** Analyze multiple ways that images influence specific audiences. **VA:Cn11.1.6a**: Analyze how art reflects changing times, traditions, resources, and cultural uses.

3	**Weightlifting Robot**	**Next Generation Science Standards (NGSS):** **MS-PS2-1:** Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. **MS-PS3-1:** Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object. **MS-ETS1-2:** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. **ISTE Standards for Students:** **1c:** Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. **2a:** Design and develop digital age learning experiences and assessments. **3a:** Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation. **4a:** Apply a deliberate design process for generating ideas, testing, creating, or solving authentic problems. **4b:** Select and use digital tools to plan and manage a design process that includes design constraints and calculated risks. **5a:** Leverage technology to apply sensor data and demonstrate knowledge in real-world applications. **CSTA K-12 Computer Science Standards:** **2-CS-02:** Design projects that integrate hardware and software components for data collection and exchange. **2-AP-10:** Use flowcharts or pseudocode to approach complex problems with algorithms. **2-AP-13:** Decompose problems into components systematically, using constructs like loops and conditionals. **2-AP-19:** Document programs to enhance ease of testing, debugging, and follow-up. **CCSS.MATH Common Core State Standards for Mathematics:** **6.RP.A.3:** Use ratio and rate reasoning to solve real-world and mathematical problems. **7.RP.A.2:** Recognize and represent proportional relationships between quantities. **8.EE.B.5:** Graph proportional relationships, interpreting the unit rate as the slope of the graph. **CCSS.ELA-LITERACY Standards:** **SL.4.1:** Engage effectively in a range of collaborative discussions with diverse partners. **SL.4.5:** Add audio recordings and visual displays to presentations to enhance the development of main ideas or themes. **National Core Arts Standards (NCAS):** **VA:Cr1.1.5a:** Combine ideas to generate an innovative idea for art-making. **VA:Cr2.1.5a**: Experiment and develop skills in multiple art-making techniques and approaches through practice. **VA:Re.7.2.4a:** Analyze components in visual imagery that convey messages **VA:Re.7.2.5a:** Identify and analyze cultural associations suggested by visual imagery**.** **VA:Re.7.2.7a:** Analyze multiple ways that images influence specific audiences. **VA:Cn11.1.6a**: Analyze how art reflects changing times, traditions, resources, and cultural uses.

4	**Balancing Act: Building a Unicycle Robot**	**Next Generation Science Standards (NGSS):** **MS-ETS1-1:** Define criteria and constraints of a design problem to ensure a successful solution. **MS-ETS1-2:** Evaluate competing design solutions systematically to determine how well they meet the criteria and constraints of the problem. **MS-ETS1-4:** Develop a model to generate data for iterative testing and refinement of a proposed object, tool, or process for optimal design. **MS-PS2-1:** Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. **MS-PS2-2:** Plan an investigation to provide evidence that the motion of an object depends on the sum of forces and its mass. **ISTE Standards for Students:** **1c:** Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. **2a:** Design and develop digital age learning experiences and assessments. **3a:** Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation. **4a:** Apply a deliberate design process for generating ideas, testing, creating, or solving authentic problems. **4b:** Select and use digital tools to plan and manage a design process that includes design constraints and calculated risks. **5a:** Leverage technology to apply sensor data and demonstrate knowledge in real-world applications. **CSTA K-12 Computer Science Standards:** **2-CS-02:** Design projects that integrate hardware and software components for data collection and exchange. **2-AP-10:** Use flowcharts or pseudocode to approach complex problems with algorithms. **2-AP-13:** Decompose problems into components systematically, using constructs like loops and conditionals. **2-AP-19:** Document programs to enhance ease of testing, debugging, and follow-up. **CCSS.MATH Common Core State Standards for Mathematics:** **6.RP.A.3:** Use ratio and rate reasoning to solve real-world and mathematical problems. **7.RP.A.2:** Recognize and represent proportional relationships between quantities. **8.EE.B.5:** Graph proportional relationships, interpreting the unit rate as the slope of the graph. **CCSS.ELA-LITERACY Standards:** **SL.4.1:** Engage effectively in a range of collaborative discussions with diverse partners. **SL.4.5:** Add audio recordings and visual displays to presentations to enhance the development of main ideas or themes. **National Core Arts Standards (NCAS):** **VA:Cr1.1.5a**: Combine ideas to generate an innovative idea for art-making. **VA:Cr2.1.5a**: Experiment and develop skills in multiple art-making techniques and approaches through practice. **VA:Cr2.3.5a** : Identify, describe, and visually document places and/or objects of personal significance. **VA:Re.7.2.4a:** Analyze components in visual imagery that convey messages **VA:Re.7.2.5a:** Identify and analyze cultural associations suggested by visual imagery**.** **VA:Re.7.2.7a:** Analyze multiple ways that images influence specific audiences. **VA:Cn11.1.6a**: Analyze how art reflects changing times, traditions, resources, and cultural uses.

5	**The Kaleidoscope Robot**	**Next Generation Science Standards (NGSS):** **MS-ETS1-1:** Define criteria and constraints of a design problem to ensure a successful solution. **MS-ETS1-2:** Evaluate competing design solutions systematically to determine how well they meet the criteria and constraints of the problem. **MS-ETS1-4:** Develop a model to generate data for iterative testing and refinement of a proposed object, tool, or process for optimal design. **MS-PS2-2:** Plan an investigation to provide evidence that the motion of an object depends on the sum of forces and its mass. **MS-PS3-5:** Construct, use, and present arguments to support the claim that when an object's kinetic energy changes, energy is transferred to or from the object. **ISTE Standards for Students:** **1c:** Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. **2a:** Design and develop digital age learning experiences and assessments. **3a:** Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation. **4a:** Apply a deliberate design process for generating ideas, testing, creating, or solving authentic problems. **4b:** Select and use digital tools to plan and manage a design process that includes design constraints and calculated risks. **5a:** Leverage technology to apply sensor data and demonstrate knowledge in real-world applications. **CSTA K-12 Computer Science Standards:** **2-CS-02:** Design projects that integrate hardware and software components for data collection and exchange. **2-AP-10:** Use flowcharts or pseudocode to approach complex problems with algorithms. **2-AP-13:** Decompose problems into components systematically, using constructs like loops and conditionals. **2-AP-19:** Document programs to enhance ease of testing, debugging, and follow-up. **CCSS.MATH Common Core State Standards for Mathematics:** **6.RP.A.3:** Use ratio and rate reasoning to solve real-world and mathematical problems. **6.EE.9:** Represent and analyze quantitative relationships between dependent and independent variables. **7.RP.A.2**: Recognize and represent proportional relationships between quantities. **8.EE.B.5:** Graph proportional relationships, interpreting the unit rate as the slope of the graph. **CCSS.ELA-LITERACY Standards:** **SL.4.1:** Engage effectively in a range of collaborative discussions with diverse partners. **SL.4.5:** Add audio recordings and visual displays to presentations to enhance the development of main ideas or themes. **National Core Arts Standards (NCAS):** **VA:Cr1.1.5a**: Combine ideas to generate an innovative idea for art-making. **VA:Cr2.1.5a**: Experiment and develop skills in multiple art-making techniques and approaches through practice. **VA:Cr2.3.5a** : Identify, describe, and visually document places and/or objects of personal significance. **VA:Re.7.2.4a:** Analyze components in visual imagery that convey messages **VA:Re.7.2.5a:** Identify and analyze cultural associations suggested by visual imagery**.** **VA:Re.7.2.7a:** Analyze multiple ways that images influence specific audiences. **VA:Cn11.1.6a**: Analyze how art reflects changing times, traditions, resources, and cultural uses.

6	**The Dancing Robot**	**Next Generation Science Standards (NGSS):** **MS-ETS1-1:** Define criteria and constraints of a design problem to ensure a successful solution. **MS-ETS1-2:** Evaluate competing design solutions systematically to determine how well they meet the criteria and constraints of the problem. **MS-ETS1-4:** Develop a model to generate data for iterative testing and refinement of a proposed object, tool, or process for optimal design. **MS-PS2-2:** Plan an investigation to provide evidence that the motion of an object depends on the sum of forces and its mass. **MS-PS3-5:** Construct, use, and present arguments to support the claim that when an object's kinetic energy changes, energy is transferred to or from the object. **ISTE Standards for Students:** **1c:** Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. **2a:** Design and develop digital age learning experiences and assessments. **3a:** Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation. **4a:** Apply a deliberate design process for generating ideas, testing, creating, or solving authentic problems. **4b:** Select and use digital tools to plan and manage a design process that includes design constraints and calculated risks. **5a:** Leverage technology to apply sensor data and demonstrate knowledge in real-world applications. **CSTA K-12 Computer Science Standards:** **2-CS-02:** Design projects that integrate hardware and software components for data collection and exchange. **2-AP-10:** Use flowcharts or pseudocode to approach complex problems with algorithms. **2-AP-13:** Decompose problems into components systematically, using constructs like loops and conditionals. **2-AP-19:** Document programs to enhance ease of testing, debugging, and follow-up. **CCSS.MATH Common Core State Standards for Mathematics:** **6.RP.A.3:** Use ratio and rate reasoning to solve real-world and mathematical problems. **6.EE.9:** Represent and analyze quantitative relationships between dependent and independent variables. **7.RP.A.2:** Recognize and represent proportional relationships between quantities. **8.EE.B.5:** Graph proportional relationships, interpreting the unit rate as the slope of the graph. **CCSS.ELA-LITERACY Standards:** **SL.4.1:** Engage effectively in a range of collaborative discussions with diverse partners. **SL.4.5:** Add audio recordings and visual displays to presentations to enhance the development of main ideas or themes. **National Core Arts Standards (NCAS):** **VA:Cr1.1.5a**: Combine ideas to generate an innovative idea for art-making. **VA:Cr2.1.5a**: Experiment and develop skills in multiple art-making techniques and approaches through practice. **VA:Cr2.3.5a** : Identify, describe, and visually document places and/or objects of personal significance. **VA:Re.7.2.4a:** Analyze components in visual imagery that convey messages **VA:Re.7.2.5a:** Identify and analyze cultural associations suggested by visual imagery**.** **VA:Re.7.2.7a:** Analyze multiple ways that images influence specific audiences. **VA:Cn11.1.6a**: Analyze how art reflects changing times, traditions, resources, and cultural uses.

7	**Crawling Robot**	**Next Generation Science Standards (NGSS):** **MS-ETS1-1:** Define criteria and constraints of a design problem to ensure a successful solution. **MS-ETS1-2:** Evaluate competing design solutions systematically to determine how well they meet the criteria and constraints of the problem. **MS-ETS1-4:** Develop a model to generate data for iterative testing and refinement of a proposed object, tool, or process for optimal design. **MS-PS2-2:** Plan an investigation to provide evidence that the motion of an object depends on the sum of forces and its mass. **MS-PS3-5:** Construct, use, and present arguments to support the claim that when an object's kinetic energy changes, energy is transferred to or from the object. **ISTE Standards for Students:** **1c:** Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. **2a:** Design and develop digital age learning experiences and assessments. **3a:** Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation. **4a:** Apply a deliberate design process for generating ideas, testing, creating, or solving authentic problems. **4b:** Select and use digital tools to plan and manage a design process that includes design constraints and calculated risks. **5a:** Leverage technology to apply sensor data and demonstrate knowledge in real-world applications. **CSTA K-12 Computer Science Standards:** **2-CS-02:** Design projects that integrate hardware and software components for data collection and exchange. **2-AP-10:** Use flowcharts or pseudocode to approach complex problems with algorithms. **2-AP-13:** Decompose problems into components systematically, using constructs like loops and conditionals. **2-AP-19:** Document programs to enhance ease of testing, debugging, and follow-up. **CCSS.MATH Common Core State Standards for Mathematics:** **6.RP.A.3:** Use ratio and rate reasoning to solve real-world and mathematical problems. **6.EE.9:** Represent and analyze quantitative relationships between dependent and independent variables. **7.RP.A.2:** Recognize and represent proportional relationships between quantities. **8.EE.B.5:** Graph proportional relationships, interpreting the unit rate as the slope of the graph. **CCSS.ELA-LITERACY Standards:** **SL.4.1:** Engage effectively in a range of collaborative discussions with diverse partners. **SL.4.5:** Add audio recordings and visual displays to presentations to enhance the development of main ideas or themes. **National Core Arts Standards (NCAS):** **VA:Cr1.1.5a**: Combine ideas to generate an innovative idea for art-making. **VA:Cr2.1.5a**: Experiment and develop skills in multiple art-making techniques and approaches through practice. **VA:Cr2.3.5a** : Identify, describe, and visually document places and/or objects of personal significance. **VA:Re.7.2.4a:** Analyze components in visual imagery that convey messages **VA:Re.7.2.5a:** Identify and analyze cultural associations suggested by visual imagery**.** **VA:Re.7.2.7a:** Analyze multiple ways that images influence specific audiences. **VA:Cn11.1.6a**: Analyze how art reflects changing times, traditions, resources, and cultural uses.

8	**Walking Robot**	**Next Generation Science Standards (NGSS):** **MS-ETS1-1:** Define criteria and constraints of a design problem to ensure a successful solution. **MS-ETS1-2:** Evaluate competing design solutions systematically to determine how well they meet the criteria and constraints of the problem. **MS-ETS1-4:** Develop a model to generate data for iterative testing and refinement of a proposed object, tool, or process for optimal design. **MS-PS2-1:** Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. **MS-PS2-2:** Plan an investigation to provide evidence that the motion of an object depends on the sum of forces and its mass. **ISTE Standards for Students:** **1c:** Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. **2a:** Design and develop digital age learning experiences and assessments. **3a:** Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation. **4a:** Apply a deliberate design process for generating ideas, testing, creating, or solving authentic problems. **4b:** Select and use digital tools to plan and manage a design process that includes design constraints and calculated risks. **5a:** Leverage technology to apply sensor data and demonstrate knowledge in real-world applications. **CSTA K-12 Computer Science Standards:** **2-CS-02:** Design projects that integrate hardware and software components for data collection and exchange. **2-AP-10:** Use flowcharts or pseudocode to approach complex problems with algorithms. **2-AP-13:** Decompose problems into components systematically, using constructs like loops and conditionals. **2-AP-19:** Document programs to enhance ease of testing, debugging, and follow-up. **CCSS.MATH Common Core State Standards for Mathematics:** **6.RP.A.3:** Use ratio and rate reasoning to solve real-world and mathematical problems. **7.RP.A.2:** Recognize and represent proportional relationships between quantities. **8.EE.B.5:** Graph proportional relationships, interpreting the unit rate as the slope of the graph. **CCSS.ELA-LITERACY Standards:** **SL.4.1:** Engage effectively in a range of collaborative discussions with diverse partners. **SL.4.5:** Add audio recordings and visual displays to presentations to enhance the development of main ideas or themes. **National Core Arts Standards (NCAS):** **VA:Cr1.1.5a:** Combine ideas to generate an innovative idea for art-making. **VA:Cr2.1.5a**: Experiment and develop skills in multiple art-making techniques and approaches through practice. **VA:Re.7.2.4a:** Analyze components in visual imagery that convey messages **VA:Re.7.2.5a:** Identify and analyze cultural associations suggested by visual imagery**.** **VA:Re.7.2.7a:** Analyze multiple ways that images influence specific audiences. **VA:Cn11.1.6a**: Analyze how art reflects changing times, traditions, resources, and cultural uses.

9	**Building a Scorpion Robot**	**Next Generation Science Standards (NGSS):** **ETS1.A:** Defining and Delimiting Engineering Problems. **ETS1.B:** Developing Possible Solutions. **ETS1.C:** Optimizing the Design Solution. **MS-PS2-1:** Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. **MS-PS3-5:** Construct, use, and present arguments to support the claim that when an object's kinetic energy changes, energy is transferred to or from the object. **MS-PS2-2:** Plan an investigation to provide evidence that the motion of an object depends on the sum of forces and its mass. **ISTE Standards for Students:** **1c:** Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. **2a:** Design and develop digital age learning experiences and assessments. **3a:** Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation. **4a:** Apply a deliberate design process for generating ideas, testing, creating, or solving authentic problems. **4b:** Select and use digital tools to plan and manage a design process that includes design constraints and calculated risks. **5a:** Leverage technology to apply sensor data and demonstrate knowledge in real-world applications. **CSTA K-12 Computer Science Standards:** **1A-AP-10:** Develop programs with sequences and loops to express ideas or address problems. **2-AP-13:** Decompose problems into smaller, manageable tasks which may themselves be decomposed. **2-CS-02:** Design projects that integrate hardware and software components for data collection and exchange. **CCSS.MATH Common Core State Standards for Mathematics:** **6.RP.A.3:** Use ratio and rate reasoning to solve real-world and mathematical problems. **7.RP.A.2:** Recognize and represent proportional relationships between quantities. **8.EE.B.5:** Graph proportional relationships, interpreting the unit rate as the slope of the graph. **CCSS.ELA-LITERACY Standards:** **SL.4.1:** Engage effectively in a range of collaborative discussions with diverse partners. **SL.4.5:** Add audio recordings and visual displays to presentations to enhance the development of main ideas or themes. **National Core Arts Standards (NCAS):** **VA:Cr1.1.5a**: Combine ideas to generate an innovative idea for art-making. **VA:Cr2.1.5a**: Experiment and develop skills in multiple art-making techniques and approaches through practice. **VA:Cr2.3.5a** : Identify, describe, and visually document places and/or objects of personal significance. **VA:Re.7.2.4a:** Analyze components in visual imagery that convey messages **VA:Re.7.2.5a:** Identify and analyze cultural associations suggested by visual imagery**.** **VA:Re.7.2.7a:** Analyze multiple ways that images influence specific audiences. **VA:Cn11.1.6a**: Analyze how art reflects changing times, traditions, resources, and cultural uses.

10	**Building a Mechanical Crawler: Mimicking Nature with Robotics**	**Next Generation Science Standards (NGSS):** **MS-ETS1-1:** Define criteria and constraints of a design problem to ensure a successful solution. **MS-ETS1-2:** Evaluate competing design solutions systematically to determine how well they meet the criteria and constraints of the problem. **MS-ETS1-4:** Develop a model to generate data for iterative testing and refinement of a proposed object, tool, or process for optimal design. **MS-LS1.A:** Structure and Function – How the design of the crawler mimics caterpillar movement. **MS-PS2-2:** Plan an investigation to provide evidence that the motion of an object depends on the sum of forces and its mass. **ISTE Standards for Students:** **1c:** Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. **2a:** Design and develop digital age learning experiences and assessments. **3a:** Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation. **4a:** Apply a deliberate design process for generating ideas, testing, creating, or solving authentic problems. **4b:** Select and use digital tools to plan and manage a design process that includes design constraints and calculated risks. **5a:** Leverage technology to apply sensor data and demonstrate knowledge in real-world applications. **CSTA K-12 Computer Science Standards:** **2-CS-02:** Design projects that integrate hardware and software components for data collection and exchange. **2-AP-10:** Use flowcharts or pseudocode to approach complex problems with algorithms. **2-AP-13:** Decompose problems into components systematically, using constructs like loops and conditionals. **2-AP-19:** Document programs to enhance ease of testing, debugging, and follow-up. **CCSS.MATH Common Core State Standards for Mathematics:** **6.RP.A.3:** Use ratio and rate reasoning to solve real-world and mathematical problems. **6.EE.9:** Represent and analyze quantitative relationships between dependent and independent variables. **7.RP.A.2:** Recognize and represent proportional relationships between quantities. **8.EE.B.5:** Graph proportional relationships, interpreting the unit rate as the slope of the graph. **CCSS.ELA-LITERACY Standards:** **SL.4.1:** Engage effectively in a range of collaborative discussions with diverse partners. **SL.4.5:** Add audio recordings and visual displays to presentations to enhance the development of main ideas or themes. **National Core Arts Standards (NCAS):** **VA:Cr1.1.5a**: Combine ideas to generate an innovative idea for art-making. **VA:Cr2.1.5a**: Experiment and develop skills in multiple art-making techniques and approaches through practice. **VA:Cr2.3.5a** : Identify, describe, and visually document places and/or objects of personal significance. **VA:Re.7.2.4a:** Analyze components in visual imagery that convey messages **VA:Re.7.2.5a:** Identify and analyze cultural associations suggested by visual imagery**.** **VA:Re.7.2.7a:** Analyze multiple ways that images influence specific audiences. **VA:Cn11.1.6a**: Analyze how art reflects changing times, traditions, resources, and cultural uses.