# EPICS®

# Middle School Project Guideline

**Project Identification Phase**

Project Survey 1.3

Scenario Prototype

Lessons 1.6 - 1.8

Project Charter 1.12

Gantt Chart 1.14

Budget 1.15

Gate 1 Lesson 1.16

**Specification Phase**

Initial Prototype 2.1-2.3

Specifications 2.4

Prior Art 2.6

Gate 2 Lesson 2.8

**Conceptual Design Phase**

Brainstorming 3.1

Multiple Prototypes 3.2

Testing/ Redesign 3.4

Documentation 3.5- 3.7

**Detailed Design Phase**

Gate 3 Lesson 3.8

DFMEA 4.1

Field Testing 4.2

User's Manual 4.3

Safety Analysis 4.6

Assessments

Lessons 4.7 – 4.8

**Delivery**

Design Review 5.2

Project Delivery



EPICS Design Process

# EPICS®

## Middle School Curriculum

## Lesson Information

| Design Phase | Lessons or Tasks to be completed | Big Idea | Standards | Artifact | Lesson Plans | Assessments | Student Sheets | Exit Slips | Teacher Reflection | Additional Resources | Videos |
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| **Project Identification Phase** | **1.1 MS Introduction to Service-Learning** | By working in teams and systematically exploring the community and clientele, they will be able to create a brainstormed list of potential EPICS projects. | NGSS-MS-ETS1.1 ELA 6-8.9, WHST.6-8.8 | | X | | X | X | X | | |
| | **1.2 MS Brainstorming Possible Projects** | By working in teams and systematically exploring the community and clientele, they will be able to create a brainstormed list of potential EPICS projects. | NGSS MS-ETS1-3. ELA SL. 6-8b-Follow rules of collegial discussions ELA SL.6-8c-Questioning | Initial List of Potential Projects | | | | | | | |
| | **1.3 MS Survey of Members of the community** | To get a good fit with the service-learning EPICS project, the students will need to survey key members of the community to get ideas of issues that are impacting the community that would be achievable for the students. | NGSS MS-ETS1-1. ELA- RST.6-8.9, WHST.6-8.8 | Usable survey to gather information from the community | | | | | | | |
| | **1.4 MS Code of Cooperation and Conduct** | Students will explore examples of Codes of cooperation and through discussions will develop rules of engagement that will be the groundwork for the EPICS projects. | NGSS MS-ETS1-1. ELA SL. 6-8.1a ELA SL. 6-8b-Follow rules of collegial discussions ELA SL. 6-8c-Questioning | Code of conduct guide | | | | | | 1.2 Code of Conduct Debate Carousel documents | |
| | **1.5 MS Teaming Skills** | Students will use the code of conduct that they just created to determine what are the qualities of a good team relationship and the important features that will help frame a quality EPICS project. | NGSS MS-ETS1-1 ELA SL. 6-8.1a ELA SL. 6-8b-Follow rules of collegial discussions ELA SL.6-8c-Questioning | | X | | X | X | X | | Engineers without Boarders video |
| | **1.6 MS Intro into Projects using Scenarios** | Engineers must have a deep understanding of the needs of the community to create projects and products that improve the standard of living of the under-served within the community. In this activity, the students will be using scenarios from projects that have been completed by EPICS students throughout the country as a way of understanding community problems and potential projects. | NGSS MS ETS 1-1, MS-ETS 1-4 ELA- WST 6-8.7- SL. 6-8.4 | Initial Prototype that will be used to gather more information | X | | X | X | X | | |
| | **1.7 MS Prototype to Communicate** | Throughout this module, the students have been begun to explore how to gather information to be able to create a prototype that would meet the needs of their project partner. In this activity, the students will use the prototype that they have created to help gather more information about the needs of their partner. | NGSS MS ETS 1-1, ELA SL. 6-8.1a ELA SL. 6-8b-Follow rules of collegial discussions ELA SL.6-8c-Questioning | | | | | | | | |
| | **1.8 MS Proof of Concept** | Throughout this module, the students have been begun to explore how to gather information to be able to create a prototype that would meet the needs of their project partner. In this activity, the students will use the prototype that they have created for the scenarios as a way of learning about the proof of concept and background for creating their prototype in the Specification Phase. | NGSS MS ETS 1-1, ELA SL. 6-8.1a ELA SL. 6-8b-Follow rules of collegial discussions ELA SL.6-8c-Questioning | | | | | | | | |
| | **1.9 MS Engineering in the Community** | Students have learned that service-learning involves a partnership with the community. In this activity, we want to make the connection to the students and their own community, in that engineering design is all around. Students will explore their lives, researching and identifying how engineers impact their standard of living. Students present their example of engineering to the class. These examples can be any type of technology that can make life easier, anything from a cup to an electronic devise. Students will bring in a picture or the actual item. | NGSS MS ETS 1-1, ELA RI. 6-8.7 ELA SL. 6-8.4- Presenting Claims and Evidence | | X | | X | X | X | | |

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| **Project Identification Phase** | **1.10 MS Survey Results** | In past lessons, the students have been in the process of gathering information to create a project that would serve the community. They have broken the potential project into tasks with standards and skills. Now the students will be taking all of the information for a potential project and evaluating which project would be most beneficial by using decision tools. | NGSS MS ETS 1-1, MS-ETS1.A-Defining and Delimiting Engineering Problems ELA RI. 6-8.1 ELA SL. 6-8.4- Presenting Claims and Evidence | Analysis of the Survey Results | | | | | | |
| | **1.11 MS Project Partners** | Students have learned that service-learning involves a partnership with the community. In this activity, we want to make the connection to the students and their own community, in that engineering design is all around. Students will explore their lives, researching and identifying how engineers impact their standard of living. Students present their example of engineering to the class. These examples can be any type of technology that can make life easier, anything from a cup to an electronic devise. Students will bring in a picture or the actual item. | NGSS MS ETS 1-1, ELA RI. 6-8.7 Compare and contrast text ELA WST 6-8.2- Writing informational texts ELA SL. 6-8.4- Presenting Claims and Evidence | | X | | X | X | X | |
| | **1.12 MS Project charter** | In this reflective lesson, the students will be taking the information that they have gathered about their community, project partner and potential stakeholders and further condense it into an action plan called a Project Charter which will be the underpinning of their service-learning project. | NGSS MS ETS 1-1, ELA RI. 6-8.7 Compare and contrast text ELA WST 6-8.2- Writing informational texts ELA SL. 6-8.4- Presenting Claims and Evidence | | X | | X | X | X | |
| | **1.13 MS Pert chart and Project Managment** | The students will continue to create a plan for their EPICS project by examining the information from their Project Charter and determine the tasks that will need to be completed for the successful delivery of the project. In this lesson they will be developing a PERT chart which will help them determine which tasks can be completed in tandem and the order in which other task will need to be accomplished. | NGSS MS ETS 1-1, ELA SL. 6-8.4- Presenting Claims and Evidence | | X | | X | X | X | |
| | **1.14 MS Gantt Chart** | The students will continue to create a plan for their EPICS project by examining the information from their Project Charter and determine the tasks that will need to be completed for the successful delivery of the project. In this lesson they will be developing a Gantt chart which will help them determine which tasks can be completed in tandem and the order in which other task will need to be accomplished. | NGSS MS ETS 1-1, ELA RI. 6-8.7 Compare and contrast text ELA WST 6-8.2- Writing informational texts ELA SL. 6-8.4- Presenting Claims and Evidence | | X | | X | X | X | |
| | **1.15 MS Budget** | The students have created a potential project based on data both qualitative and quantitative related to the needs within the community. They have gathered information that that lists the tasks and steps for the project. They will now need to develop a fiscal plan to implement this project. | NGSS MS ETS 1-1, ELA SL. 6-8.4- Presenting Claims and Evidence Mathematical Practices: MP.2- Reason abstractly and quantitatively MP.4- Model with Mathematics. | | | | | | | |
| | **1.16 MS GATE 1** | In this lesson the students reflect on all of the information they have gathered about their community and a potential service-learning project. They will present the information that they have gathered about the stakeholders and the community and will develop a list of objectives and project constraints. The artifacts that will need to be included in the project proposal are: • Project Charter • Profile of the Project Partner • Pert Chart with Critical Pathways • Gantt Chart • Projected Budget | NGSS MS ETS 1-2, MS ETS 1-4 ELA SL 6-8.1 ELA SL 6-8.4 | | X | | X | X | X | |

# Specifications Development Phase

| Activity | Description | Standards | Deliverable | | Rubric/Assessment | | | | Document | |
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| **2.1 MS Developing a Prototype** | The students will create a prototype using the information that they have gathered about their potential stakeholders as a way of empathizing with an underrepresented member of the community. | NGSS MS ETS 1-1, MS-ETS 1-4 ELA SL. 6-8.4- Presenting Claims and Evidence ELA- WST 6-8/7 | | X | | X | X | X | | |
| **2.2 MS Prototype to communication** | Throughout this module, the students have been begun to explore how to gather information to be able to create a prototype that would meet the needs of their project partner. In this activity, the students will use the prototype to gather more information about the needs of their partner | NGSS MS ETS 1-1, MS-ETS 1-4 ELA SL. 6-8.4- Presenting Claims and Evidence ELA- WST 6-8/7 | | | | | | | | |
| **2.3 MS Testing prototype** | In this activity, the students will be taking the information that they have gathered from the stakeholders about the prototype and use that to develop a Proof of Concept Plan for their project. This process allows the students a way of testing and validating the project that they have developed to this point quantitatively. They will be evaluating the information, develop a testing protocol based on the project specifications, test and measure the prototype and draw conclusions about the viability and usefulness of the proposal. | NGSS MS ETS 1-1, MS-ETS 1-4 ELA SL. 6-8.1c- ELA- WST 6-8.1d | Testing Data for the Prototype | | | | | | Testing protocol guide sheet | |
| **2.4 MS Specifications** | The students have built a basic 3D prototype which has been used as a discussion tool with their community partner. The students are now ready to determine the specifications that are the framework for the creation of the project. In this lesson the students will be examining the prototype extensively to determine the design specifications. | NGSS MS ETS 1-1, MS-ETS 1-4 ELA SL. 6-8.4- Presenting Claims and Evidence ELA- WST 6-8/7 | Specifications for the Project | X | | X | X | X | Specifications Document | |
| **2.5 MS Persona and Scenarios** | The students continue to gather information about the needs of their community and particularly a specific stakeholder. They are now going to create a scenario and persona as a way of further identifying the needs that this project addresses while protecting the identity of the stakeholders and their particular situations. The Scenarios and Personas will be used throughout the project as a way of visualizing the stakeholders. | NGSS MS ETS 1-1, MS-ETS 1-4 ELA SL. 6-8.1c ELA- SL.6-8.1d | Personas and Scenarios for the Project | X | Rubric Assessment of Persona and Scenario | X | X | X | Persona and Scenario development document | |
| **2.6 MS Prior Art** | The students are developing a good understanding of the problem and the stakeholder and have developed an initial prototype. In this activity they are going to refine their thinking by looking for projects or products that are already on the market. The students will be examining why these products do not meet the needs of the stakeholders and how a new project would be needed. | NGSS MS ETS 1-1, MS-ETS 1-4 ELA SL. 6-8.1c ELA- SL.6-8.1d | List of State of the Art products similar to the project | | | | | | Prior Art documentation sheet | |
| **2.7 MS Debrief Specifications** | In this lesson the students reflect on all of the information they have gathered about their community and a potential service-learning project. They will present the information that they have gathered about the stakeholders and the community and will develop a list of objectives and project constraints. The artifacts that will need to be included in the project proposal are: • 2.3 Project Charter • 1.13 PERT Chart • 1.14 Gant Chart • 2.1 Specifications • 2.5 Persona and Scenarios • 2.6 Benchmark of Prior Art | NGSS MS ETS 1-2, MS ETS 1-4 ELA SL 6-8.1 ELA SL 6-8.4 | | | * Rubric for Specification Debrief * Individual Evaluation Rubric | | | | GATE Student Sheet | |
| **2.8 MS GATE 2 Specifications Phase** | In this lesson the students will present the information they have collected about a need in the community and how they would address that need through the planning reflected in the Gantt Chart and the PERT chart and other artifacts from Phases 1 and 2 in the EPICS Design cycle. Because you may have multiple projects in your EPICS classroom, the suggestion is that students present using flipsnacks which are hosted on the web. This way each student group can present when they are ready to pass through GATE 2 into the Conceptual Design Phase. | NGSS MS ETS 1-2, MS ETS 1-4 ELA SL 6-8.1 ELA SL 6-8.4 | | X | Rubric for Gate 2 * Peer Evaluation Rubric * Self Reflection for Presentation | X | X | X | GATE Student Sheet | |

| Phase | Activity | Description | Standards | | | | | | | Materials | Resources |
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| **Conceptual Design Phase** | **3.1 MS Brainstorming with SCAMPER** | The students have been gathering important information about their community to identify potential needs and stakeholders that would benefit from a service-learning project. In this activity, the students will be not only brainstorming ideas that will help solidify thoughts, but learning important techniques that are used by engineers to problem-solve and think creatively. | NGSS MS ETS 1-1, MS-ETS 1-4 ELA SL. 6-8.1c ELA- SL.6-8.1d | | X | | X | X | X | SCAMPER Cards | Video- IDEO https://www.youtube.com/watch?v=IJMeLbFLqW8 |
| | **3.2 MS Multiple Prototype** | Creating multiple prototypes is a natural progression of the design process and the idea generation that has occurred through the brainstorming. The students will work to create multiple prototypes that will be used as visuals for ideas and also discussion tools with stakeholders, peers and teachers. | NGSS MS ETS 1-1, MS-ETS 1-4 ELA SL. 6-8.1c ELA- SL.6-8.1d | | X | | X | X | X | Multiple Prototypes Student sheet * Multiple Prototype Interview sheet | |
| | **3.3 MS Prototype to communicate** | The students have created multiple prototypes, and have discussed these prototypes with each other in the group. They are now going to take the best designs to the stakeholders to get more information so they can begin working on the final working prototype. | NGSS MS ETS 1-1, MS-ETS 1-4 ELA SL. 6-8.4 ELA WST 6-8.7 | | X | Rubric reflection on the use of Multiple prototypes | X | X | X | | |
| | **3.4 MS Testing and Redesign** | In this activity, the students will be taking the information that they have gathered from the stakeholders about the prototype and use that to develop a Proof of Concept Plan for their project. This process allows the students a way of testing and validating the project that they have developed to this point quantitatively. They will be evaluating the information, develop a testing protocol based on the project specifications, test and measure the prototype and draw conclusions about the viability and usefulness of the multiple prototypes as they related to the needs of the stakeholders. | NGSS MS ETS 1-1, MS-ETS 1-4 MS-ETS 1-3 MS-ETS 1-4 ELA SL. 6-8.1c ELA- S>.6-8.1d | | X | | X | X | X | | |
| | **3.5 MS Modifying the Budget** | As the students continue to add information about their project and are updating their specifications, they need to include this information in an updated budget. This document will be a "living" document which will be adjusted as materials are purchased and requisitioned. | NGSS MS ETS 1-1, ELA RI 6-8.7 ELA WST 6-8.2 ELA SL 6-8.4 | | X | Modified Budget Sheet | X | X | X | | |
| | **3.6 MS Revisit the Gantt Chart** | The students will continue to create a plan for their EPICS project by examining the information from their Project Charter and determine the tasks that will need to be completed for the successful delivery of the project. In this lesson they will review the PERT chart which was created earlier in the design process and will update the information based on decisions made about the project. | NGSS MS ETS 1-1, ELA RI 6-8.7 ELA WST 6-8.2 ELA SL 6-8.4 | | | Updated Gantt Chart | | | | | |
| | **3.7 MS Revisit Timeline** | In this lesson, the students will be taking this information and further condensing it, looking to create a comprehensive project management document that will further guide the project by modifying the existing Gantt chart. In this lesson, we have included another Gantt template. The students may find that they have modified their original plan drastically and may only be able to use the original Gantt chart as a reference. You as the expert for your students will help them decide what is best for their project. | NGSS MS ETS 1-1, ELA RI 6-8.7 ELA WST 6-8.2 ELA SL 6-8.4 | | | | | | | | |
| | **3.8 EPMS Preparation for GATE 3** | In this lesson, the teams have evaluated the general design of their product, leaving the smaller details for the Detailed Design Phase. The students will compile all of the documentation for the Conceptual Design Phase and create a presentation for GATE 3. This information will include: • Brainstorming ideas that you have created integrated in the Gantt and PERT charts • Information from your stakeholders gathered from the multiple prototypes • Information from the testing and redesign of your prototype • The updated budget for the project. Purpose of the Gate 3: This document and presentation will be the foundation for the Detailed Design phase of your project and must be approved by your teacher and your community partner | NGSS MS ETS 1-2, MS ETS 1-4 ELA SL 6-8.1 ELA SL 6-8.4 | | | | | | | | |
| | **3.9 EPMS GATE 3** | Purpose of the Gate 3: This document and presentation will be the foundation for the Detailed Design phase of your project and must be approved by your teacher and your community partner | NGSS MS ETS 1-2, MS ETS 1-4 ELA SL 6-8.1 ELA SL 6-8.4 | | X | | X | X | X | | |

| Detail Design Phase | | | | | | | | | | |
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| **4.1 MS DFMEA** | In this lesson, the students will be taking this information that they have gathered from the Gantt and PERT chart along with the Specifications document and go through the Engineering Design process of DFMEA (Design Failure Mode Effects Analysis). They will be examining the project to date to determine any potential design flaws and how those can be minimized for the success of the project. | NGSS MS ETS 1-1, MS ETS 1-2, MS ETS 1-3, MS ETS 1-4 | Design Failure Mode listings for future testings | DFMEA chart DFMEA Planning | X | X | X | X | | |
| **4.2 MS Field Testing** | In this activity, the students will be working to test their prototype for usability and reliability with the stakeholders. To make sure that the design is viable, the students will be taking quantitative evidence from testing protocols that will be developed based on the DFMEA and qualitative evidence of the teams observing the use of the product by the stakeholders. | NGSS MS ETS 1-1, MS ETS 1-2 ELA RI 6-8.7 ELA WST 6-8.2 ELA SL 6-8.4 | Testing Data for the Prototype | Field Testing Plan | | | | | Usability and Reliability Testing Document | |
| **4.3 MS User's Manual** | As the students are preparing to deliver their working prototype, they need to determine what information will be essential for the stakeholders to be able to continue to use the project after the initial design and implementation is complete. The students will evaluate the information that is essential and create a user's manual that will be given to the stakeholder upon delivery that will help with troubleshooting and basic maintenance of the working prototype. | NGSS MS ETS 1-2, MS ETS 1-4 ELA WHST 6-8.7 ELA WST 6-8.8 ELA WST 6-8.9 | user's Manual for the project | Rubric for evaluation of the User's Manual for the Project | | | | | Template to create a User's Manual | |
| **4.4 MS Materials List** | The students have a good idea of the specifications for the project and have created the budget and updated said budget at least once to this point. They are now ready to create a materials list that will help them further define the project. This materials list and the budget will be presented to the teacher as a way of documenting the cost of the project and an easy way for the teacher, administrator or school to have a document to order supplies for the project. | NGSS MS ETS 1-2, MS ETS 1-4 ELA WHST 6-8.7 ELA WST 6-8.8 ELA WST 6-8.9 | List of materials for the project | | | | | | Template embedded in the student sheet to list materials | |
| **4.5 MS Demonstration with Stakeholders** | In this activity, the students will be observing the stakeholders use the prototype and will be recording this information for possibly one last adjustment to the product. To make sure that the design is viable, the students will be taking quantitative evidence from testing protocols that have been collected and the redesigned prototype. The students will use this information to complete the final testing of the working prototype before delivery. | NGSS MS ETS 1-1, ELA RI 6-8.7 ELA WST 6-8.2 ELA SL 6-8.4 | Stakeholder Observation sheet using the prototype | | | | | | | |
| **4.6 MS Safety Analysis** | In this activity, the students will be conducting a hazard and safety analysis of their project to determine if there are specific problems that might be eliminated or controlled through a redesign. The students will be using their DFMEA and their field testing as the benchmarks of data for this testing. This should give the students a basic understanding of possible safety issues that will need to be the focus of this assessment. | NGSS MS ETS 1-1, MS ETS 1-2, MS ETS 1-4 ELA WHST 6-8.7 ELA WST 6-8.8 ELA WST 6-8.9 | Safety Analysis for Prototype | | | | | | Safety Analysis Template | |
| **4.7 MS Peer Evaluation** | The students have gone through almost 4 phases of the EPICS design cycle and have worked with their team to create a working prototype that is due to be delivered during the 5th phase of the cycle. The students have evaluated the projects at each of the GATES, but this is the first time that they will be evaluating each other. The EPICS program adheres to the philosophy that assessments are important for students to learn to help each other through positive, yet authentic feedback. | NGSS MS ETS 1-1, MS ETS 1-2, MS ETS 1-4 ELA WHST 6-8.7 ELA WST 6-8.8 ELA WST 6-8.9 | Peer Evaluation | | | | | | Peer Evaluation Rubric | |
| **4.8 MS Self Evaluation** | The students are on the last leg of their project and are ready to critique their progress and the progress of their project. In this lesson, the students will evaluation their contributions to the project and the overall success of the project. It is your decision WHEN the students do a formal self-evaluation. A suggestion is that the students do the Individual Self-Evaluation at the end of each semester. Additionally it is essential to conduct informal assessment just to "check in" with the groups to make sure they are making progress. | NGSS MS ETS 1-2, MS ETS 1-4 ELA SL 6-8.1 ELA SL 6-8.4 | Self Evaluation Project Evaluation Engineering Notebook Evaluation | Self Evaluation Project Evaluation Engineering Notebook Evaluation | | | | | Self Evaluation Project Evaluation Engineering Notebook Evaluation | |
| **4.9 MS Project Feedback** | This lesson is to be used as a way of communicating with the individual students and the teams. As your students are completing their project, you will need to meet with students individually and with their groups. This will be a time to review the individual assessment and the project assessment for the students to get feedback that will help them solidify their service-learning engineering experience. | NGSS MS ETS 1-2, MS ETS 1-4 ELA SL 6-8.1 ELA SL 6-8.4 | Engineering Notebook Checklist Individual Evaluation Rubric | Engineering Notebook Checklist Individual Evaluation Rubric | | | | | | |
| **4.10 MS Preparation for GATE 4** | In this phase, the teams have evaluated the general design of their product, leaving the smaller details for the Detailed Design Phase. The students will compile all of the documentation for the Detailed Design Phase and create a presentation for GATE 4. This information will include:<br>• Using the information from the DFMEA to create new testing for the prototype to prepare for delivery.<br>• Information from the testing and redesign of your prototype<br>• The updated budget for the project.<br>• Creation of the user's manual<br><br>**Purpose of the Gate 4**: This document and presentation will be the foundation for the Detailed Design phase of your project and must be approved by your teacher and your community partner. | NGSS MS ETS 1-2, MS ETS 1-4 ELA SL 6-8.1 ELA SL 6-8.4 | | | | | | | | |

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| **Detail Design Phase Gate 4** | **4.11 MS GATE 4** | The students will be presenting the information that has brought them to the final phase of the design process, the Delivery Phase. The students will be presenting the information to be able ot determine if they are indeed ready to deliver their project and that it meets the needs of the stakeholder with evidence presented from the testing of the prototype. | NGSS MS ETS 1-2, MS ETS 1-4 ELA SL 6-8.1 ELA SL 6-8.4 | | | Rubic for elements of the Presentation | | | Peer Evaluation of the Presentation | |
| **Delivery Phase** | **5.1 MS Design Review Preparation** | In this final element of the project, the teams are preparing the presentation of their working prototype and the process and documentation that have moved the project to completion. This information will include:<br>• Using the information from the DFMEA that was used to guide the testing that improved the design of the prototype.<br>• Information from the testing and redesign of the prototype<br>• The updated budget and materials for the project.<br>• Creation of the user's manual<br>Purpose of the Design Review: The design review presentation along with the project documentation is the capstone of the project and is the "story" of the design process of going from an idea to an end working prototype that meets the needs of the stakeholders in the community.<br>The artifacts that will need to be included in the Design Review GATE 5 include but are not limited to:<br>• Project Charter<br>• Updated Gantt Chart<br>• Specifications<br>• Decision Matrix<br>• DFMEA Rating Chart<br>• Testing data which includes:<br>o Testing Plan<br>o Safety Analysis<br>o Updated Field Testing<br>• Updated Budget and Materials<br>• User's Manual<br>• Working prototype | NGSS MS ETS 1-2, MS ETS 1-4 ELA SL 6-8.1 ELA SL 6-8.4 | Rubric for Design Review Self Evaluation of the Project Self reflection of the presentation Peer Evaluation of the Project | Rubric for Design Review Self Evaluation of the Project Self reflection of the presentation Peer Evaluation of the Project | | | | |
| | **5.2 MS Design Review** | In the Design Review the students will be presenting all of the informaiton associated with their project and will explain clearly with evidence the prototype and how it has been tested and will meet the needs of the stakeholders. | NGSS MS ETS 1-2, MS ETS 1-4 ELA SL 6-8.1 ELA SL 6-8.4 | | | | | | Student Sheet Reflection on Design | |
| | **5.3 MS Reflection on Design** | This is a reflective lesson where the students will be examining what the students have learned through the project and moving through the EPICS Engineering design cycle. | NGSS MS ETS 1.3 ELA SL 6-8.1 ELA SL 6-8.4 | | Rubric Reflection on Design | | | | | |
| | **5.4 MS Celebration of Delivery Debrief** | In this final activity, the students will be presenting their posters that were created through and after 5.11 to the class with reflection after. They will then celebrate the success of delivering their project. | NGSS MS ETS 1.3 ELA SL 6-8.1 ELA SL 6-8.4 | Student Certificates for Project Delivery | | | | | | |