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| **Lesson Title : Designing a Disaster Relief Plan** | **Unit #:1** | **Lesson #:2** | **Activity #:3** |
| **Activity Title: Test Necessary Skills** |  |  |  |

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| **Estimated Lesson Duration:** | **7 Class Periods** |
| **Estimated Activity Duration:** | **2 Class Periods** |

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| **Setting:** | **Classroom** |

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| **Activity Objectives:** |

Upon completion of the activity, students will be able to:

1. Give accurate navigational directions using bearings.
2. Give enough clues to allow other groups to calculate missing distances.
	1. Force other groups to use Law of Sines and Law of Cosines as necessary.
3. Develop a Search & Rescue Mission clue card for another group of students to follow.
4. Follow another groups’ Search & Rescue Mission clue card instructions all the way to the location.

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| **Activity Guiding Questions:** |

1. How do we give accurate navigational directions?
2. How do we calculate missing distances that are necessary for planning?

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| **Next Generation Science Standards (NGSS)**  |  |
| **Science and Engineering Practices (Check all that apply)**  | **Crosscutting Concepts (Check all that apply)** |
| ☒ Asking questions (for science) and defining problems (for engineering) | ☐ Patterns |
| ☐ Developing and using models | ☒ Cause and effect |
| ☒ Planning and carrying out investigations | ☐ Scale, proportion, and quantity |
| ☒ Analyzing and interpreting data | ☐ Systems and system models |
| ☒ Using mathematics and computational thinking | ☐ Energy and matter: Flows, cycles, and conservation |
| ☐ Constructing explanations (for science) and designing solutions (for engineering) | ☐ Structure and function.  |
| ☐ Engaging in argument from evidence | ☐ Stability and change.  |
| ☒ Obtaining, evaluating, and communicating information  |  |

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| **Ohio’s New Learning Standards for Science (ONLS)** |
| **Expectations for Learning - Cognitive Demands (Check all that apply)** |
| ☐ Designing Technological/Engineering Solutions Using Science concepts **(T)** |
| ☒ Demonstrating Science Knowledge **(D)** |
| ☒ Interpreting and Communicating Science Concepts **(C)** |
| ☐ Recalling Accurate Science **(R)** |

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| **Common Core State Standards -- Mathematics (CCSS)** |  |
| **Standards for Mathematical Practice (Check all that apply)** |  |
| ☒ Make sense of problems and persevere in solving them | ☒ Useappropriate tools strategically |
| ☒ Reason abstractly and quantitatively | ☒ Attendto precision |
| ☒ Construct viable arguments and critique the reasoning of others | ☐ Look for and make use of structure |
| ☒ Model with mathematics | ☐ Look for and express regularity in repeated reasoning |

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| **Unit Academic Standards (NGSS, ONLS and/or CCSS):** |

[CCSS.Math.Content.HSG-SRT.D.11](http://www.corestandards.org/Math/Content/HSG/SRT) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

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| **Materials**: (Link Handouts, Power Points, Resources, Websites, Supplies) |

Search & Rescue Mission Worksheet and Grading Rubric

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| **Teacher Advance Preparation:** |

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| **Activity Procedures:** |

1) The day before, introduce the idea of creating a Search & Rescue Mission around the school building.

 a. Instructions must use bearings, Law of Sines, and Law of Cosines.

 b. Must be able to complete entire route within 15-20 minutes.

 c. Try to have an Amazing Race clue card type feel

 i. Groups can use building floor plans upon request, but should not be necessary

 ii. Use compass Apps to determine bearing directions

 iii. Use yard sticks to approximate step length

2) Give out Search & Rescue Worksheet at the end of class the day before allowing students one night to think about the activity individually.

3) Classtime the first day will be spent creating the Search & Rescue Mission clue card as a group.

 a. If time allows, have two groups pair up and follow each other’s clue card to give feedback

4) On the second day, redistribute clue cards to a new group that has not seen it before.

 a. Award prizes for the fastest group to complete the Mission and return back to the classroom



In step 3, if time allowed, groups will pair up for a practice run to give each other feedback. During this step students are getting a chance to make adjustments before they are graded or tested.



Each group’s clue card will be graded according to the grading rubric provided on the Search & Rescue Mission worksheet and grading rubric.

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| **Differentiation:** Describe how you modified parts of the Lesson to support the needs of different learners.Refer to Activity Template for details. |

Depending on a student’s’ prefered learning styles, I would guide them towards contributing certain aspects of the group project.

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| **Reflection:** Reflect upon the successes and shortcomings of the lesson. |

This turned out to be one of my favorite activities in the Unit. The students got so creative with their clue cards and routes that they mapped out. Then the groups were even more curious to see where another group was going to send them around the school. One group even hid a treasure of chocolate for the group as a prize at the end of their “Search & Rescue Mission.” When I teach this next year though I might consider waiting until a time of year where it could be done outdoors so that the compasses work more accurately than they did indoors.