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| **Lesson Title : Surviving a School Shooting** | **Unit #: 1** | **Lesson #: 1** | **Activity #: 1** |
| **Activity Title: Survival Ideas** |

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| **Estimated Lesson Duration:** | **2-3 Class Periods (60 to 70 min each)** |
| **Estimated Activity Duration:** | **1 Class Period (60 to 70 min)** |

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

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| **Activity Objectives:**   1. **Students will develop guiding questions about how to survive a school shooting.** 2. **Students will discuss answers to the guiding questions in order to come up with a challenge for their class.** |

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| **Activity Guiding Questions:**   1. **Why has the frequency of school shootings increased over the past 15 years?** 2. **What types of weapons have been used in school shootings?** 3. **What would it take to stop the ammunition that has been used in school shootings?** 4. **Is there a way to provide bullet proof vests for students and teachers?** 5. **What is the cost of a bullet proof vest?** 6. **Is there an affordable way to provide bullet proof vests for schools?** 7. **Are there any homemade methods of making bullet proof material?** |

| **Next Generation Science Standards (NGSS)** | |
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| **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 |  |

| **Ohio’s New Learning Standards for Science (ONLS)** |
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| **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)** |

| **Common Core State Standards -- Mathematics (CCSS)** | |
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| **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.HSS-IC.A.1 Understand statistics as a process for making inferences about population parameters based on a random sample from that population. * CCSS.Math.Content.HSS-IC.A.2 Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. |

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| **Materials**: (Link Handouts, Power Points, Resources, Websites, Supplies)   1. Big tub of Oobleck for class demonstration. The recipe can be found:   <http://www.livescience.com/21536-oobleck-recipe.html>   1. Videos to show as a part of “The Hook”   <http://youtu.be/LlEo5MbcaX0>  <http://youtu.be/UAqMDeq5hoA>   1. Handout: (Our Challenge WS) 1.1.1.a Statistical Inference\_Activity 1 Handout |

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| **Teacher Advance Preparation:**  The teacher should anticipate the “Guiding Questions” that students will brainstorm in order to be prepared to guide the discussion. |

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| **Activity Procedures:**   1. Display the following quote to the class: “Between 1992 and 2013, there were 387 school shootings in the Unites States. Many students are afraid to go to school due to these tragedies. Is there a way to provide more protection for students and teachers in the event of a school shooting?” 2. Show the class two videos about using nanotechnology and Non-Newtonian fluids in bulletproof materials.   <http://youtu.be/LlEo5MbcaX0>  <http://youtu.be/UAqMDeq5hoA>   1. Talk about Oobleck as a Non-Newtonian fluid. Make a large tub of Oobleck and have students run across it to show that it takes on the form of a solid when it is impacted. (This tub must be made prior to class time.) 2. Pass out the “Our Challenge” worksheet and work through it. |

**Formative Assessments:**

Throughout this activity, students will be discussing “Our Challenge”, the “Big Idea”, and “The Essential Question”. During these discussions the teacher should be conducting formative assessments by listening to the team discussions and asking each team leading questions that allow the students to dig deeper into the assignment.

**Summative Assessments:**

The summative assessments for this activity will be a part of the summative assessments for the entire Unit.

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| **Differentiation:**  For students that perform at a below average level, it can be helpful to group them with students that perform at an above average level. Throughout this Unit different skills will be required, therefore the teacher should evaluate each student’s work habits and create effective teams based on that evaluation. |

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| **Reflection:** After completing the first activity, I have a better understanding of how to lead a class discussion that introduces The Big Idea, The Essential Question, and The Challenge. My students were very engaged in the conversation about school shootings and how to make things safer at school. The videos worked well to “hook” the students and the small tub of Ooblek I brought to class really “hooked” them in as well.  It’s been a while since my students showed this much interest in a project that we will do in class.  For teachers, it’s important that you understand the difference between Essential Questions and Guiding Questions. My students wanted to ask Guiding Questions as Essential Questions because they were brainstorming ideas about making bulletproof materials before the videos were shown.  After this activity, I’ve got my students hooked. Now it’s time to do the math and science. |