Natural Hazards Reconnaissance
2022 RAPID Lesson Plan

Main question: Why is it important to do reconnaissance after a disaster occurs (not just before)?

Main lesson objective: Students will learn about the RAPID research facility span of equipment, how it works & why it needs to exist.

Level of knowledge: Remember, understand and apply

1. Summary
    a. Students will simulate a natural disaster event in the classroom to learn about what disaster reconnaissance is and why it matters.
2. Engineering connection
    a. Impact of built structures on the environment
    b. Using technology to characterize damage and risk.
3. Audience
    a. 6-8 grade (middle school)
4. Lesson objectives
    a. Define disaster reconnaissance.
    b. Explain why and when disaster reconnaissance is necessary.
5. Education standards

1 Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live. [Clarification Statement: Examples of relationships could include that deer eat buds and leaves; therefore, they usually live in forested areas; and grasses need sunlight, so they often grow in meadows. Plants, animals, and their surroundings make up a system.]

a. <u>ESS3.B: Natural Hazards</u>
- Some kinds of severe weather are more likely than others in each region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. (K-ESS3-2)

b. ETS1.A: Defining and Delimiting an Engineering Problem
- Asking questions, making observations, and gathering information are helpful in thinking about problems. *(Secondary to K-ESS3-2)*

- *MATH CCSS.MATH.CONTENT.8.G.A.3*
    - *Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.*
- *CCSS.MATH.CONTENT.8.G.A.4*
    - *Understand that a two-dimensional figure is like another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and*

dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

6. Material list
    a. Protractor, ruler, meter stick
    b. Printed fieldwork sheet
    c. coloring & writing skills
7. Introduction
    a. This lesson plan will go over disaster reconnaissance in real world applications. We will work our way up to this using the educational standards in WA for math and environmental science by defining and recalling natural disasters and then simulating a natural disaster in the classroom. Students will be able to use their math understanding of geometry reflections/translations and measuring tools to quantify the extent of the disaster and then we will connect this to the work at the RAPID facility in how engineers do this work daily will a range of equipment.
8. Procedure
    a. Background knowledge
        i. What is a natural hazard versus a natural disaster?
        ii. Make a list of natural disasters in the classroom's region.
        iii. What are some ways that engineers/scientists can help provide relief to communities after a disaster in the short and long term?
    b. Before activity
        i. Tell the students a background story about a fictitious city (name of their school, similar attributes of a disaster in their region) that has had a disaster occur. The disaster itself will be simulated (desks moved over, things out of place). Each student will be given a fieldwork sheet to characterize what has happened. Groups of 3-4 will collaborate.
    c. During Activity
        i. Students will measure how things have moved in different ways that they have learned mathematically (translation, rotation, etc.) and report in on their fieldwork sheet.
    d. After Activity
        i. Students will help clean up the scene and decide who will present.
9. Assessment
    a. Students will present their procedure and what they found (each do one structure)
10. Wrap-up
    a. Short presentation of types of real-world reconnaissance equipment in the field with pictures of RAPID at work