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| Lesson 4: Gather Information |

Problem Statement:

The city of Bothell/Mill Creek (your school’s location) needs help! In the event of a natural disaster (e.g., earthquake, fire, flood, land/mudslides, and storms), power goes out, methods of communication and transportation are often lost or damaged, medical care is needed, and basic survival resources need to be maintained and distributed to those in the disaster area. Often, resources are low or have been damaged/contaminated. Your goal is to aid the community in the event of a disaster, with each group in charge of an area within the city affected by the disaster. Groups will identify two problems that can occur within a city grid, then develop a physical solution (build/repair) or a conceptual solution to a problem in future lessons.

Learning Objectives: Students will…

* Gather Information: Students will research each problem identified, including historical reference information for how each problem has been addressed during a disaster.
* Research the potential solutions: Students will research already in place solutions and revise or develop new solutions to the problem.
* Each group has a specific problem either physical solution (build) or a conceptual solution (digital presentation).

Lesson Standards (NGSS, CCSS, CTE):

* MS-ETS1-2. Evaluate competing design solutions (through researching current design solutions) using a systematic process to determine how well they meet the criteria and constraints of the problem.
* MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions already in place, to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

Materials:

* Computers and access to internet for research
* Lesson worksheet for students to record researched information

Lesson Preparation:

* Reserve computer devices, access to internet if needed. If students bring personal devices inform students ahead of class period to bring computer to class.
* Photo copy research organizer to assist students in gathering information

Time Required:

40 - 80 minutes (at least 2 class session -time depends on the time needed for students to fully research current solutions to their problem)

Grouping of students for instruction:

* Students will be in their “anchor groups” which is their assigned seating. These groups are based on prior performance in order to scaffold each group to have a strong leader, strong academic performer, and a social individual. Each group should have 3-4 students.

(TEACHER SPECIFIC)

* Teacher will need to organize groups to assign each group member a part in researching. Student research should be organized so each student is researching different aspects to the solution. This can be student selected or supported by teacher assigning research roles as follows:
  + Physical problems: One-two students research current designs in place to address solution used to address the problem, one student addresses cost of placing in a specific design idea, one-two students research the specific constraints associated with their proposed solution.
  + Conceptual problems: One-two students research current conceptual solutions that are in place and how this proposed solution has worked. One- two students research the specific constraints associated with their proposed solution (example: cost of items, size of items, delivery methods).
* Students need to know how to access information from resources and how to narrow down specifics to evaluate solutions..
* Teacher can facilitate with suggestions of looking up local information that is relevant to city area and relates to their solution. For example, what does PUD currently recommend for this problem, local city websites, national non-profit emergency response agencies.

LESSON PROCEDURE:

Physical problem:

* Students research their physical problem, current solutions used that are in place to solve the physical problem. For example, road design, researching current road designs that allows or adapts for excess water flow.

Conceptual problem:

* Students research their conceptual problems, current solutions that are in place to address the problem. For example, emergency kits, students will research already existing emergency kits, their contents and cost.Students will then evaluate a pugh chart to estimate the cost of the kit, nutritional value of kit, and comparing and contrasting emergency items.

Accommodations:

Each student will have access to a computer. Teacher ensures that each student is engaged and working well in group with a specific task of what to research related to their problem’s solution.

Extensions:

Students that finish researching will continue to work with their team to develop a plan for their problem. What would drawing a diagram of their solution look like? What would be procedural steps to carry out this solution?