Hometown Hazard Planning

Overarching concept: Natural disasters can strike almost anywhere on earth and scientists try to determine how much risk exists. In this instance students will assume the role of researchers who are determining the effect on the community of a local natural disaster. This project is a terminating activity for the section you choose.

Indiana Standards:

Materials required:

1. Map of the community – 1/24000 Topographical map is preferred. In Indiana these can be obtained from the Indiana Geological Survey.
2. Rulers to measure distances.
3. Calculators to convert measurements.
4. Willing community officials – Mayor, fire department, emergency management cell, Red Cross, etc.
5. Internet access or information on the type of disaster desired.

Time Requirement: This project can run from three to four days to several weeks depending on the depth of the assessment. Information from the emergency management personnel can greatly reduce time but also limits student depth of experience.

Procedure:

1. First you need to select a natural disaster that the students will do the assessment for. For examples in this document I shall use an earthquake on the Wabash Valley fault. Based on your choice there are tornadoes, hurricanes, floods, wild fires, dam failures, pipeline or factory explosions and even terrorism. This list is not all-inclusive but is a good start.
2. Using copies of your topographical map define the area of the hazard study. At this time you can break the map into sections for each student group to analyze.
3. Determine the groups and students in the groups. You can appoint students by either the job they will do (emergency services locations coordinator, building inspectors, etc.) or by a geographical area (Main street from Market Street to Sadalia Street). I use a combination of duties and locations.
4. Collect two or three reference materials to get the students started. I recommend you make contact with city officials and emergency services personnel and determine the extent of involvement they are willing to have. If they are limited, you can ask them for some information from the city plan to work off of. This can be made available as the students determine a need for it.
5. Describe the disaster you anticipate and give them the deadline by which they have to have a hazard study completed.

6. After the students have studied the topic and are broken into their groups have them brainstorm the way of getting what they need. Do not let anyone just copy from the city emergency management plan.
7. Pass out information collection sheets – these let students input information on locations of services or hazards in there study area. They can enter things like old buildings with crumbling facades to bridges with weight limits. Locations of propane tanks and trailer parks can be significant in some studies.
8. Let the students get started and mentor as needed to keep them on track.
9. As the students collect data, consolidate it into a master map. Emergency planners can then start developing emergency routes and potential problem areas.
10. Students can then develop strategies for overcoming problems they see.
11. The research and planning can then be presented to the city council or emergency planners.

Evaluation: I use a rubric, observation and the group's portfolio to evaluate the students.

Crawfordsville, Indiana Hazard Planning Exercise

Background: Crawfordsville potentially sits on the northern end of the extended New Madrid fault system we have studied. This extension is part of the Wabash Valley fault system. Local earthquakes have occurred near Waynetown and Bainbridge in recent history. Paleosiesmology has indicated large earthquakes have occurred along the Wabash Valley fault. For this exercise you must plan on a potential 6.2 magnitude earthquake occurring near Turkey Run State Park. Zone 7 on the Mercalli Scale extends to just past Crawfordsville.

Objective: Using your observations, the internet, and contacts with city officials determine the potential damage and the ability to respond to the earthquake by the city of Crawfordsville. Assume that assets from outside of Crawfordsville will not arrive until the day after the earthquake.

Duties:

1. The emergency management coordinator (EMC) and his staff (three people) will consolidate the group maps and information and produce a final presentation which Mayor Gentry will receive on December 13th, XXXX.
2. The emergency services group (three people) will visit with local firehouses and check equipment readiness and personnel training for dealing with an earthquake. They will provide the EMC their report by December 8th. They will also serve as subject matter experts to the groups surveying the potential hazards in the community.
3. Groups 1-7 will use the checklist in appendix A and the resources to determine the amount of damage to be expected in the survey area, any potential special hazards (fuel storage, dangerous chemicals, etc.), trafficability for emergency services, and restoration of services. These need to be completed by December 8th, XXXX. You have been assigned to groups as close to your home as possible.
4. Each group will maintain a portfolio of data collected, daily work sheets and drafts of their reports. These will be subject to inspection for accuracy and completeness. Each student will include in the portfolio a one-page paper reflecting on his or her participation in the project.

Resources:

Some sample resources are included to help you get started:

1. ***Physical Geology*** by () is available in the front of the room.
2. USGS earthquake website –
3. Indiana PEPP website –
4. Mayor Gentry will meet with the EMC on December 3rd, XXXX.
5. Mr. Smith from the Emergency Management Center will be here at school on December 4th, XXXX.
6. The Hazard survey check sheet is available in the front of the room.
7. Each group has a copy of the Crawfordsville topographical map with your survey area marked.

8. Information that must be printed in color will be turned in to me on a 31/2 inch floppy disk.
9. A scanner is available in the library.
10. If you need something, ask and I will try to obtain it if reasonable.

Procedure:

1. As a group look at your map, the data collection sheet, and the rubric to plan how to complete your project. Brainstorm several ways of accomplishing your tasks.
2. Check with the emergency management group if you have fire, police or emergency resources in your study area. Determine who makes contact and what information to request.
3. Using the data collection sheet, check your study area for building types, ages, and condition. Also look for items that might be affected by the damage expected from the Mercalli scale. This can include water delivery systems, sewage, septic tanks, bridges, propane tanks, gas stations, etc. If you know of local industry in your area that uses hazardous materials you can check if they might be effected by an earthquake. (Many businesses will probably be reluctant to do this due to liability concerns.) This will be done outside of school time.
4. Consolidate your individual data sheets and annotate hazard areas on your map.
5. As a group produce a written report of hazards and possible solutions in your area.
6. Write your reflection paper on your participation in the project and include it in the portfolio.
7. Turn the group portfolio into the Emergency Management Coordinator.
8. The Emergency Management Coordinator and his/her staff will consolidate the team reports and prepare a PowerPoint presentation for Mayor Gentry on the potential hazards in Crawfordsville.