

**Name:** \_\_\_\_\_

### **CHEMISTRY STEM PROJECT**

**Team Name:** \_\_\_\_\_

**Climate:** \_\_\_\_\_

**Team Members:**

\_\_\_\_\_

**Team Jobs: ( all will help with research)**

**Project Manager** \_\_\_\_\_

**Digital Portfolio** \_\_\_\_\_

**Model Creator** \_\_\_\_\_

**Researcher Collector** \_\_\_\_\_

#### **Objective:**

**Student Teams will answer the question: How would you as a chemist assist contractors from Brasfield & Gorrie decide materials best suited for a certain climate in building a new school?**

- Decide what materials would be best suited for an assigned climate zone (take into consideration how the materials react to different types of weather conditions such as temperature and precipitation).
- 1. Students will choose from a list of 9 materials- Gallium, Regular Steel ( Fe and C), Brass, Iron, Copper, Galvanized Steel, Wood, Aluminum, Concrete blocks- you can choose 1-3 materials and be able to explain why.
- 2. Cost of materials (think about the elements that the material is made from).
- 3. Why is your material you chose better than the other materials for the same climate area?

**Project Managers from each team will check in with the Teacher, using Scrum for each day. (trello.com) We will set up together in class.**

**Students will present their project in 2 ways:**

1. Poster, 3-D Model, or Digital Model (picture of project must be included in digital journal).
2. Digital Journal, which will serve as a resume:
  - To show why you are a better company than your competitors.
  - To present the process used to come up with the best suited materials for the given climate.

- Page titles for your Digital Journal should be:
  1. Title page- Include Team Name, Team Members/jobs and Climate area.
  2. Hypothesis page- Can be revised or added onto throughout the project
  3. Research Page- include materials needed for project. Research Chart, Building Materials, Article Questions, and all other research notes.
  4. Model Page- Picture of your model.
  5. Conclusion Page.- Did you prove your hypothesis correct? If yes, how did you prove your hypothesis correct? What evidence can you provide? If not, state why and what would you have changed or how you would have corrected it.

**Background:** “Buildings can be vulnerable to climate change. In the future there may be an increase in the risk of collapse, declining health and significant loss of value as a result of more storms, snow or substance damage, water encroachment, deteriorating indoor climate and reducing building lifetime.” In Chemistry, we are studying the Periodic Table, elements, compounds and mixtures, such as alloys, ( alloys are mixtures of metals) and chemical reactions. When building a structure, construction companies and architects have to decide on what materials would be best used based on the climate the structure is being built in. The elements used to build these structures last longer in certain climates. The following are some the materials used during the building process, some are pure elements, others are combination of elements ( you will need to tell the elements involved in the compounds or mixtures):

- |                           |                     |
|---------------------------|---------------------|
| 1. Gallium                | 6. Galvanized Steel |
| 2. Regular Steel ( Fe+ C) | 7. Wood             |
| 3. Brass                  | 8. Aluminum         |
| 4. Iron                   | 9.. Concrete Blocks |
| 5. Copper                 |                     |

You must help Brassfield and Gorrie, decide which materials would be best suited to build a school in a certain climate area. **Be Creative!** You will need to let them know which of the 9 materials they should use. You can suggest 1-3 of the above materials and tell why they would work best. You will build the structure ( Model, poster, digital picture and present the structure and your findings from research through a digital portfolio, by entering a picture of it on the Model Page of your DJ.

You will first compete against teams in your class, then the best team from each of the 4 classes will compete against each other. Finally the last team standing will compete against the best team from another 8th grade team.

**Research:** Put your research on the Research Paper provided at the end of the packet. This will be a rough draft. You will need to choose the research that best supports your hypothesis to include on the Research Page of your Digital Journals. You will also have a Research Chart to complete, which will be copied into your Digital Journals.

**Hypothesis:** (Write as an if, then and because statement.) You might want to revise or add onto your hypothesis. This will be a page in your digital journals.

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**Materials:** LIST the element/s that you will be using, along with any other materials needed. Tell why you used these materials.

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**Test:** Tell how you could test the materials and shape of your school structure to stand up to the climate area that you are building in. Examples will be talked about as a class.

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**Analyse Data :** Use the Materials Research Chart on Day 4 to record data from research. Incorporate this into your Digital Portfolios.

**Conclusions:**

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