Laura Zumbach

Performance Based Assessment-Physical and Chemical Properties Unit

4th Grade

**Standards: Iowa Common Core Standards**

ICC-Identify and generate questions that can be answered through scientific investigations.

ICC-Plan and conduct scientific investigations.

ICC-Use appropriate tools and techniques to gather, process, and analyze data.

ICC- Communicate scientific procedures and explanations.

ICC-Follow appropriate safety procedures when conducting investigations.

**Teacher instructions:**

Students will be grouped into groups of two or three. Decide on the students in which they learn best together. Hand the sheet out to the students as you are reading the statement below. Explain to them what they are being graded on from the rubric. The supplies will be in a box ready for each group to grab a kit that is all ready for them.

You will need to have a kit ready per partner or trio of the following:

1 dropper bottle of water

1 dropper bottle of vinegar

1 dropper bottle of iodine

1 dropper bottle of red cabbage juice

¼ cup of mystery mixture (talcum powder, baking soda, and cornstarch)

4 stirring sticks

1 pair of googles per student

**This is what you will read to each student:**

“I am the president of a chemical company that has some job openings for scientists. You have applied for a job as scientists who go out to check chemicals that have been spilled on the highway. I am looking for workers who record data carefully and work as helpful team members. I would like to see how you work. Using your test kit, work as a team to identify the chemicals in the spill, as much as possible without my help. There are 3 chemicals and they are all chemicals that you have already tested in you Chemical and Physical Properties Unit. You may also use the information from your science journal and our charts to help you remember things we have discovered. Be sure to clean up your test area when you are finished.”

Then review the recording sheet with them. Each person does one sheet, they may talk as about what they record and help each as needed. Make sure the students know that they are being graded on finding out what the mystery powders are and how they do the experiment.

“Raise your hand if you have any questions. You may begin. Make sure your goggles are on.”

Name ­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class \_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mystery Chemical Spill

|  |  |  |
| --- | --- | --- |
| We used this bottle: | What happened?  State what you see happening with the chemicals. | What chemical(s) could it be?  Circle your response as you do the chemicals |
| WATER |  | Salt  Alum  Talcum Powder  Baking Soda  Cornstarch |
| VINEGAR |  | Salt  Alum  Talcum Powder  Baking Soda  Cornstarch |
| IODINE |  | Salt  Alum  Talcum Powder  Baking Soda  Cornstarch |
| RED CABBAGE JUICE |  | Salt  Alum  Talcum Powder  Baking Soda  Cornstarch |

**Summary:** What are the mystery powders?

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| --- | --- | --- | --- | --- | --- | --- |
| Rubric for Physical & Chemical Changes  Student Name: | | | | | | |
|  | **Needs Improvement-1** | **Good-2** | | | **Excellent-3** | Total |
| Team Work | • I need to prepare for and join team discussions  • I am sometimes open-minded to suggestions | • I am usually prepared for and join team discussions  •I am usually open-minded to suggestions | | | • I am always prepared for work with the team  • I am always open-minded to suggestions |  |
| Respects Others | * I am sometimes polite. * I struggle listening to others | • I am usually polite and kind to teammates  • I usually listen to other points of view and disagree kindly | | | • I am always polite and kind to teammates  • I always listen to other points of view and disagree kindly |  |
| Collecting/  Recording Data | • Data is not recorded   * Student organizes some data | | • Data is recorded correctly   * Student organizes most data | * Data is recorded correctly with details * Student organizes data in appropriate format (chart, graph, etc.) | |  |
| Scientific Tools | • Attempted to use all of the appropriate tools (wore goggles, use of hand lenses, use of powders and liquids) to gather and analyze data | | • Used all of the appropriate tools (wore goggles, use of hand lenses, use of powders and liquids) to gather and analyze data | • Accurately used all of the appropriate tools (wore goggles, use of hand lenses, use of powders and liquids) to gather and analyze data | |  |
| Conclusion on Powders | • Conclusion included:   * 1 or none of the 3 powders were accurate * No explanation * No scientific terms | | • Conclusion included:   * 2 of the 3 powders were accurate * Some explanation * Use of some scientific terms | • Conclusion included:   * Accurate * Detailed explanation * Use of several scientific terms | |  |