

Jurupa Mountains Cultural Center – 7621 Granite Hill Drive – Riverside, CA. 92509

Phone: (951) 685-5818 Fax: (951) 685-1240

Email: [jmccmail@hotmail.com](mailto:jmccmail@hotmail.com) Website: [www.jmcc.us](http://www.jmcc.us)



# CHEMISTRY

Scout Name: \_\_\_\_\_

Troop Number: \_\_\_\_\_

Date: \_\_\_\_\_

Requirement #1: Do each of the following:

A. Describe three examples of safety equipment used in a chemistry lab and the reason each one is used.

1. \_\_\_\_\_

Reason: \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

Reason: \_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

Reason: \_\_\_\_\_

\_\_\_\_\_

B. Describe what a material safety data sheet (MSDS) is and tell why it is used.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

C. Obtain an MSDS for both a paint and an insecticide. Compare and discuss the toxicity, disposal and safe handling sections for these two common household products.

Paint: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Insecticide: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

D. Discuss the safe storage of chemicals. How does the safe storage of chemicals apply to your home, your school, your community and the environment?

Home: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

School: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Community: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Environment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Requirement #2: Do each of the following:

A. Predict what would happen if you placed an iron nail in a copper sulfate solution. Then put an iron nail in a copper sulfate solution. Describe your observations and make a conclusion based on your observations. Compare your prediction and original conclusion with what actually happened. Write the formula for the reaction you described.

Prediction: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Observations: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Conclusion: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Formula: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B. Describe how you would separate:

Sand from water:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Table salt from water:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Oil from water:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Gasoline from motor oil:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Name the practical processes that require these kinds of separations.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Requirement #4: Do each of the following:

- A. Cut a round onion into small chunks. Separate the onion chunks into three equal portions. Leave the first portion raw. Cook the second portion of onion chunks until the pieces are translucent. Cook the third portion until the pieces are caramelized or brown in color. Taste each type of onion. Describe the taste of raw onion versus partially cooked onion versus caramelized onion. Explain what happens to molecules in the onion during the cooking process.

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- B. Describe the similarities and differences between toothpaste and an abrasive household cleanser. Explain how the end use or purpose of a product affects its chemical formulation.

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- C. In a clear container, mix a half a cup of water with a tablespoon of oil. Explain why the oil and water do not mix. Find a substance that will help the two combine, and add it to the mixture. Describe what happened, and explain how the substance worked to combine the oil and water.

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Requirement #5: List the four classical divisions of chemistry. Briefly describe each one and tell how it applies to your everyday life.

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
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3. \_\_\_\_\_  
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4. \_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_

Requirement #6: Do each of the following.

A. Name two government agencies that are responsible for tracking the use of chemicals for commercial or industrial use. Pick one agency and briefly describe its responsibilities to the public and the environment.

1. \_\_\_\_\_

2. \_\_\_\_\_

Pick one agency and briefly describe its responsibilities to the public and the environment.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B. Define Pollution:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Explain the chemical effects of ozone global warming and acid rain.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Pick a current environmental problem as an example. Briefly describe what people are doing to resolve this hazard and to increase understanding of the problem.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B. Using reasons from chemistry, describe the effect on the environment of ONE of the following:

1. The production of aluminum cans or plastic milk cartons:

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2. Sulfur from burning coal:

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3. Used motor oil:

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4. Newspaper:

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C. Briefly describe the purpose of phosphates in fertilizer and laundry detergent.

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Explain how the use of phosphates in fertilizers affects the environment.

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Also, explain why phosphates have been removed from laundry detergents.

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Requirement #7: Do one of the following:

- B. Using resources found at the library and in periodicals, books and the internet (with your parent's permission) learn about two different kinds of work done by chemists, chemical engineers, chemical technicians or industrial chemists. For each of the four positions, find out the education and training requirements.

**\* This is a pre-requisite \* Bring your research to class!**