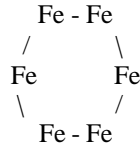


Visit the "Scouting with Mr. R." web site at:
<http://www.relia.net/~thedane/scouting.html>

Q: What do chemists call a benzene ring with iron atoms replacing the carbon atoms?

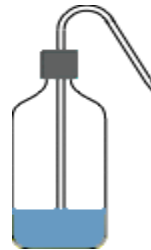
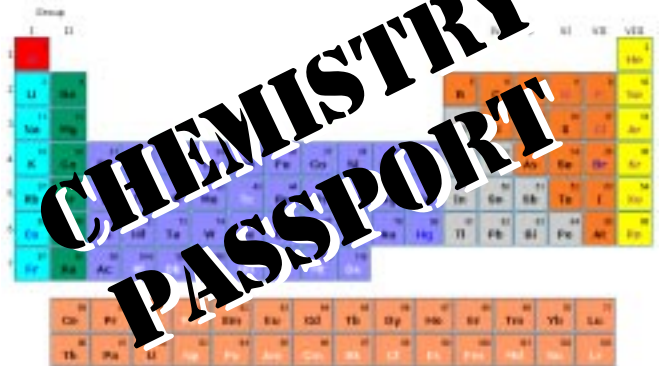
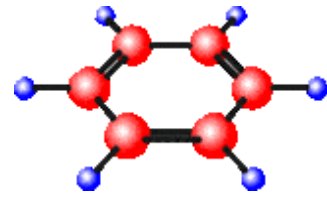
A: *A ferrous wheel!*



This passport belongs to:



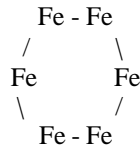
© 2005 Kerry Rasmussen, Mr. R.

$$\begin{array}{c}
 238 \\
 92 \\
 \text{U}
 \end{array}$$


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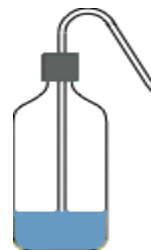
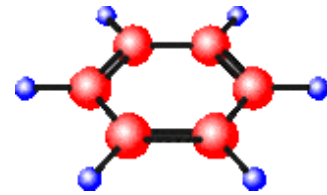
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© 2005 Kerry Rasmussen, Mr. R.

$$\begin{array}{c}
 238 \\
 92 \\
 \text{U}
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SAFETY (1)

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

1) _____

reason _____

2) _____

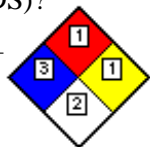
reason _____

3) _____

reason _____

b. What a material safety data sheet (MSDS)?

Why is it used? _____

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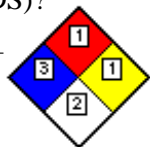
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**CHEMISTRY**

P C O S A L U M R O F C L C C
 T H I Z O E M Z O F N A A H I
 B M O T O L V O Y O G R C E N
 O Q F S Y N U D I X N T I M A
 A U Z N P L E T N U S E M I G
 M K Z J F H A L I H F S E S R
 S F J I E V A N M O J I H T O
 D G X E R C O T A Y N A C L O
 S U Q E I R B Y E A O N B X A
 J B S S G C F T H S A F E T Y
 N B Y A S D U R E A C T I O N
 O H N O I T U L L O P E I O X
 P I F O G B F J S C U Q Y N N
 C Q R F V T K H N N Z E E X D
 E X P E R I M E N T D C T T W

ANALYTIC

CARTESIAN

CHEMICAL

CHEMIST

EXPERIMENT

FORMULA

INORGANIC

MSDS

OBSERVATION

ORGANIC

OZONE

PHOSPHATES

PHYSICAL

POLLUTION

REACTION

SAFETY

SOLUTION

CHEMISTRY

P C O S A L U M R O F C L C C
 T H I Z O E M Z O F N A A H I
 B M O T O L V O Y O G R C E N
 O Q F S Y N U D I X N T I M A
 A U Z N P L E T N U S E M I G
 M K Z J F H A L I H F S E S R
 S F J I E V A N M O J I H T O
 D G X E R C O T A Y N A C L O
 S U Q E I R B Y E A O N B X A
 J B S S G C F T H S A F E T Y
 N B Y A S D U R E A C T I O N
 O H N O I T U L L O P E I O X
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VISITS (8)

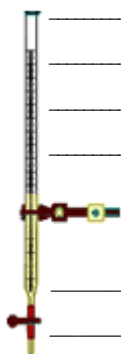
Do **ONE** of the following activities:

Visit a laboratory and talk to a practicing chemist.

Ask what the chemist does, and what training and education are needed to work as a chemist.

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 our jobs, find out the education and training requirements.

Report: _____

**VISITS (8)**

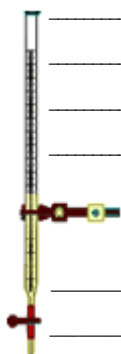
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Report: _____



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 (brand):

Toxicity	
Disposal	
Safe-handling	

INSECTICIDE (brand):

Toxicity	
Disposal	
Safe-handling	

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Toxicity	
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Safe-handling	

d. Discuss the safe storage of chemicals.

How does the safe storage of chemicals apply to your:

home _____

school _____

community _____

the environment _____



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community _____

the environment _____



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



Explain how the use of phosphates in fertilizers affects the environment. Also, explain why phosphates have been removed from laundry detergents.

Visit a county farm agency or similar governmental agency and learn how chemistry is used to meet the needs of agriculture in your county.

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b. How you would separate the following? Name the practical processes that require these kinds of separations.

Sand from Water

process name _____

how? _____

Table Salt from Water

process name _____

how? _____

Oil from Water

process name _____

how? _____

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how? _____

Explain the chemical effects of:

ozone _____

global warming _____

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.

Problem: _____

Solution: _____



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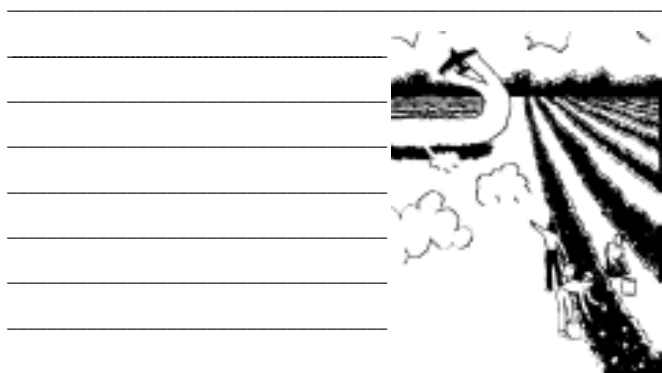
MORE ACTIVITIES (6)

Name two government agencies that are responsible for tracking the use of chemicals for commercial or industrial use.

- 1) _____
- 2) _____

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

Define pollution: _____



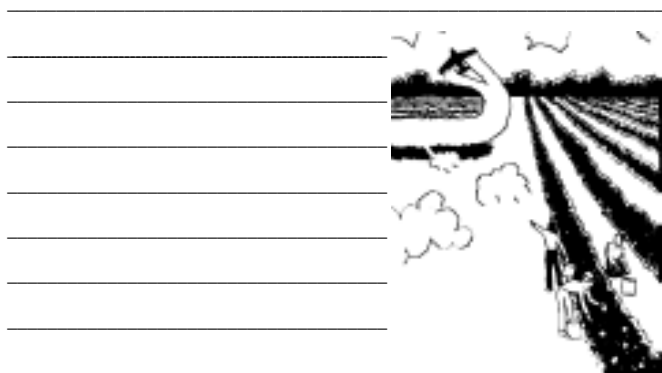
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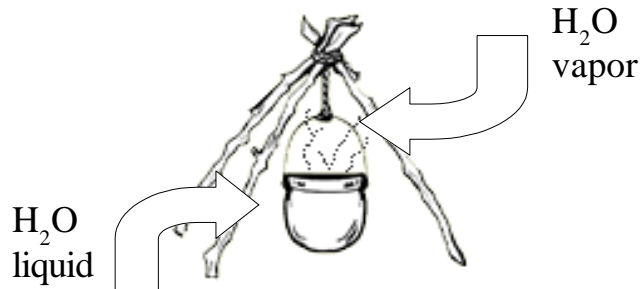
Define pollution: _____



Gasoline from Motor Oil

process name _____

how? _____



c. Describe the difference between the following:

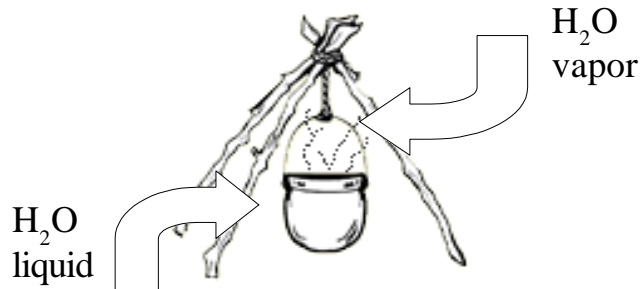
a chemical reaction _____

a physical change _____

Gasoline from Motor Oil

process name _____

how? _____



c. Describe the difference between the following:

a chemical reaction _____

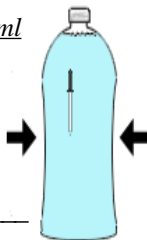
a physical change _____

CARTESIAN DIVER (3)

□ Construct a Cartesian diver.

● <http://www.fatlion.com/science/cartesian.html>

Describe its function in terms of how gases in general behave under different pressures and different temperatures.



Describe how the behavior of gases affects a back-packer at high altitudes and a scuba diver underwater.



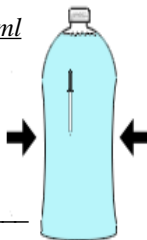
René Descartes (1596-1650) also known as **Cartesius**, used this experiment to explain various principles of density and buoyancy. He worked as a philosopher and mathematician. He achieved wide fame as the inventor of the Cartesian coordinate system, which influenced the development of modern calculus.

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O _____ Chemistry

Description: _____

Application: _____

P _____ Chemistry

Description: _____

Application: _____

“Do you have mole problems? If so, call Avogadro at 602-1023.” -- Jay Leno

O _____ Chemistry

Description: _____

Application: _____

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Description: _____

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DIVISIONS OF CHEMISTRY (5)

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

A _____ Chemistry

Description: _____

Application: _____

I _____ Chemistry

Description: _____

Application: _____

PHYSICAL CHEMISTRY (6)

Define physical chemistry: _____

Construct a Cartesian diver.

See <http://www.fatlion.com/science/cartesian.html>

Why does the medicine dropper sink to the bottom when the sides are squeezed? _____



René Descartes (1596-1650) also known as **Cartesius**, used this experiment to explain various principles of density and buoyancy. He worked as a philosopher and mathematician. He achieved wide fame as the inventor of the Cartesian coordinate system, which influenced the development of modern calculus.

ACTIVITIES (4)

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 onions 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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Describe chemical similarities and differences between:
toothpaste

an abrasive household cleanser

Explain how the end use or purpose of a product affects its chemical formulation.

...keeping the mouth clean dates all the way back to the religious figure Buddha. It has been recorded that he would use a "tooth stick" from the God Sakka as part of his personal hygiene regimen.

The earliest record of an actual toothpaste was in 1780 and included scrubbing the teeth with a formula containing burnt bread.

In the 19th century, charcoal became very popular for teeth cleaning. The 20th Century saw Liquid cleansers (mouth rinses) and pastes became more popular, often containing chlorophyll to give a fresh green color.



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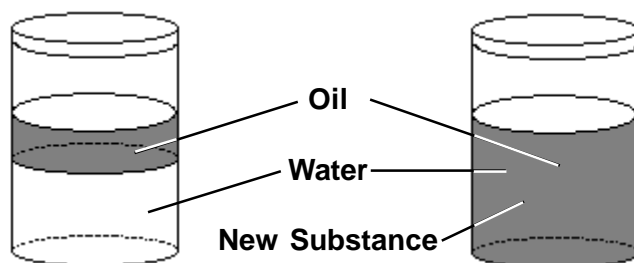
In a clear container, mix a half-cup of **water** with a tablespoon of **oil**.

Why do 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: _____

Explain how that substance worked to combine the oil and water: _____



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