

1-2-3 CHEMISTRY!

Have fun with these simple experiments and introduce your students to the amazing world of chemistry!

The World of Chemistry

The world of chemistry is absolutely remarkable. Through the use of chemistry we have been able to make fabric from soda bottles, fuel from garbage, basketball shoes from plastic, and aspirin from powdered starch. Someday, using chemistry, we may discover a cure for cancer or a way to conquer heart disease. Invite your class into a classroom laboratory setting where they can investigate with safe and simple chemistry experiments of their own. Employ cooperative learning techniques which are sure to get kids thinking, discussing, and working together.

Chemistry For Kids

The American Chemical Society sponsors National Chemistry Week each year during the first week in November. People across the country will be using chemical demonstrations, experiments, and other activities to teach and help others learn about chemistry. The society also creates *WONDERSCIENCE*, a newsletter which provides hands-on science activities for

elementary school teachers and students. For further information about curriculum resources, check www.chemistry.org/portal/a/c/s/1/acdisplay.html?DOC=education\curriculum\index.html.

Chemistry and Cooperation

Introduce your students to some chemistry basics and procedures for following a step-by-step lab. It's as easy as 1-2-3! Kids will quickly learn to:

1. State the problem.
2. Predict a solution.
3. Test and observe.
4. Draw a conclusion.

Duplicate lab worksheets and divide students into small groups. Having kids work in groups reduces the amount of materials needed and increases student interaction time. Instruct each group to carry out their investigation by following the instructions listed for the lab. When finished, plan some time for "chalkboard sharing." Ask one person from each group to go to the chalkboard and write the group's lab results. Then have the entire class compare

and discuss their own group's observations and conclusions.

Safety is Number One

Talk about important safety rules which must be followed in carrying out any chemistry labs in the classroom, and instill a "safety first" mentality in each student. Ask kids to read all the steps of a lab before beginning so that they will understand exactly what they are going to be doing. Explain that no substances are to be tasted (unless specifically instructed to do so by the teacher) and warn students not to rub their eyes or put their hands near their mouth while working on labs. Children should take special precautions around any liquids or chemicals so as not to spill them. Safety is number one!

Books for Further Exploration

- Fun With Mixing and Chemistry**
by Dr. Heidi Gold-Dworkin
(McGraw-Hill)
- Chemicals & Reactions**
by Jon Richards
(Copper Beech)

PENNY LAB 1

YOU'LL NEED:

3 dull copper pennies
3 clear plastic cups
salt, vinegar, tablespoon

PROBLEM

Can you clean a penny with salt and vinegar?

PREDICT

What do you think will happen?

TEST AND OBSERVE

Follow these steps and write down your observations.

1. Label one cup SALT and add 1 tablespoon of salt to this cup.
Put a penny in the cup and stir. Observe in 5, 10, and 15 minutes.
2. Label the second cup VINEGAR. Add 3 tablespoons of vinegar to this cup.
Put a penny in the cup and stir. Observe in 5, 10, and 15 minutes.
3. Label the third cup SALT & VINEGAR. Add 1/4 cup vinegar and 1 tablespoon of salt to the cup.
Stir to dissolve. Place a penny in the cup and stir. Observe in 5, 10, and 15 minutes.

CONCLUSION

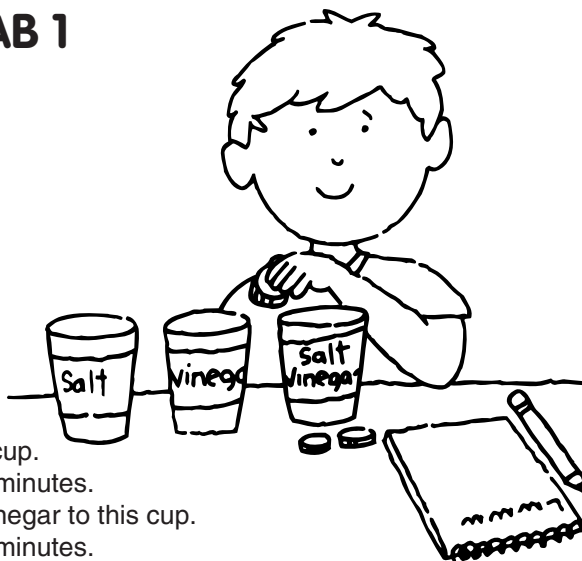
What did you learn? _____

CHALLENGE

Use lemon juice instead of vinegar. How many cleaning supplies in your home have lemon in them?

What happened? The oxygen in the air combined with the copper penny to form a dull coating called copper oxide. The vinegar is a mild acid. The vinegar and salt solution dissolves the coating on the penny.

Note: Save the vinegar and salt solution for use in Penny Lab 2.



PENNY LAB 2

YOU'LL NEED:

15 dull copper pennies
vinegar
large, shiny steel nail
pie plate

PROBLEM

Can you transfer copper from a penny to a nail?

PREDICT

What do you think will happen?

TEST AND OBSERVE

Follow these steps and write down your observations.

1. Pour the vinegar and salt solution from Penny Lab 1 into a pie plate.
Put pennies in plate and add vinegar until the plate is about 1/2 full.
2. Put the nail into the solution. Observe in 30, 60, and 90 minutes.
3. Remove the nail and observe.

CONCLUSION

What did you learn? _____

CHALLENGE

Try to rub the copper off the nail. Can you think of a way to get it off?

What happened? The copper from the pennies coats or plates the nail with a thin layer of copper.



SILVER LAB

YOU'LL NEED:

tarnished silver (silverware or jewelry)
aluminum foil
cooking pan
baking soda
salt, hot water

PROBLEM

Can you clean silver with the help of aluminum foil?

PREDICT

What do you think will happen?

TEST AND OBSERVE

Follow these steps and write down your observations.

1. Line the cooking pan with aluminum foil.
Have an adult pour 2 cups of hot water into the pan.
2. Add 1 tablespoon of baking soda and stir. Put the tarnished silver into the pan. Observe in 5, 10, and 15 minutes.
3. Carefully pour out the water. Observe silver and aluminum foil.

CONCLUSION:

What did you learn? _____

CHALLENGE: Compare the used foil with a new sheet of foil.

What happened? Oxygen in the air combined with the silver to form a dull coating called sulfur dioxide. The hot baking soda solution breaks the bond between the silver and the sulfur coating. The coating lays on the aluminum foil, forming a new coating called aluminum sulfide.



INVISIBLE INK LAB

YOU'LL NEED:

lemon juice
cotton swabs
lamp
pencil
blank paper

PROBLEM

Can you write a message with invisible ink?

PREDICT

What do you think will happen?

TEST AND OBSERVE

Follow these steps and write down your observations.

1. Dip a swab into the lemon juice. Use the swab like a pencil to write a secret word or message on a sheet of paper. Let it dry.
2. Give the message to a friend. Ask your friend to hold the paper near a light bulb to make the message appear.

CONCLUSION

What did you learn? _____

CHALLENGE

Dissolve 2 heaping spoonfuls of salt in hot water and experiment with this formula for invisible ink.

What happened? The lemon juice has carbon compounds in it. The carbon compounds are nearly invisible when dissolved in water. When heated by the light, they break down and produce carbon which is black.

