COMPLETE INTRODUCTION TO CHEMISTRY (GRADES 9+)

KT-CHEMHSC

SAMPLE

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Science Foundations Series

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ACTIVITY #2 – SOLUBILITY

FROM THE KIT: Safety glasses, safety gloves, lab apron, 250 mL beaker, copper II sulfate, epsom salt, silica packet, Superior Balance digital pocket scale, stirring rod, and weighing boat.
YOU PROVIDE: Water

SAFETY NOTE: Are you wearing your personal protective equipment (PPE)? If not, stop what you're doing and put on your safety glasses, gloves, and apron now.

1. Predict whether each chemical will be soluble in water in the table.
2. Fill the beaker with 150 milliliters (mL) of water.
3. Turn on the scale using the center button.
4. Press "MODE" to change to grams (g).
5. Set the weighing boat on the scale.
6. Press "TARE" to return the number on the screen to "0.0".
7. Measure out 5 g copper II sulfate. Transfer it to the beaker.
8. Using the stirring rod, attempt to mix the chemical with the water. Record if the chemical was soluble in the table.
9. Clean the weighing boat, beaker, and stirring rod.
10. Repeat Steps 2–9 with 10 g epsom salt.
11. Fill the beaker with 150 milliliters (mL) of water.
12. Empty one silica packet into the beaker.
13. Using the stirring rod, attempt to mix the chemical with the water. Record if the chemical was soluble in the table.
14. Clean the weighing boat, beaker, and stirring rod.

Chemical	Prediction (Yes/No)	Soluble (Yes/No)
Copper II Sulfate		
Epsom Salt		
Silica		

Based on your data, which chemicals do you think have covalent bonds? Which have ionic bonds?

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MOLARITY

Molarity is the number of moles of a solute in 1 liter (L) of solution. So, what is a mole? A **mole** is a set of 6.02×10^{23} particles of the same element or same compound. This is similar to saying two of the same type of thing is a pair, and twelve of the same type of item is a dozen. In chemistry, a mole refers to atoms or molecules.

Figure 6. A Pair of Socks.

Figure 7. A Dozen Eggs.

If 6.02×10^{23} is one mole of atoms, then what about two moles of atoms?
2 moles × (6.02×10^{23} atoms per mole) = 1.204×10^{23} atoms.

What about half (0.5) moles of atoms?
0.5 moles × (6.02×10^{23} atoms per mole) = 3.01×10^{23} atoms, OR
(6.02×10^{23} atoms per mole) ÷ 0.5 moles = 3.01×10^{23} atoms.

Understanding a mole can help in determining the amount of a solute to add to a solvent to make the desired solution. This can include the production of chemical solutions such as antifreeze and mouthwash but also used in pharmaceutical manufacturing. It can also be used in day-to-day activities like adding enough powdered drink mix to your water for it to taste the way you prefer it to.

ACTIVITY #7 – TASTE TESTING

FROM THE KIT: 3 16 oz cups, Superior Balance digital pocket scale, weighing boat, 250 mL graduated cylinder, stirring rod, and drink powder.
YOU PROVIDE: Water

SAFETY NOTE: Make sure to thoroughly wash all your equipment before starting this lab.

NOTE: After Step 11, you may want to put your solution in the refrigerator. They will taste better cool.

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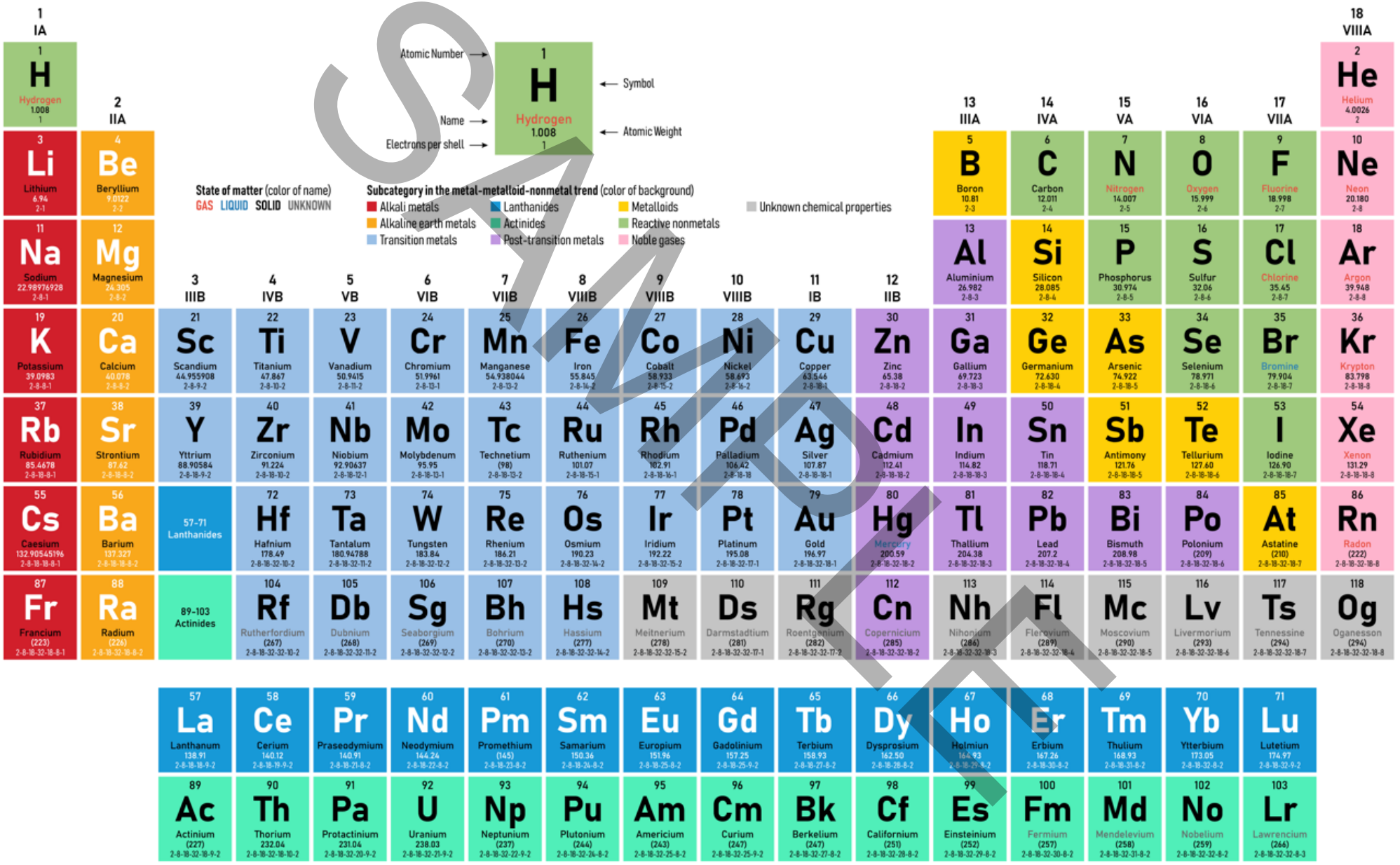
Periodic Table of the Elements



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