# Chemistry Workshop Handout

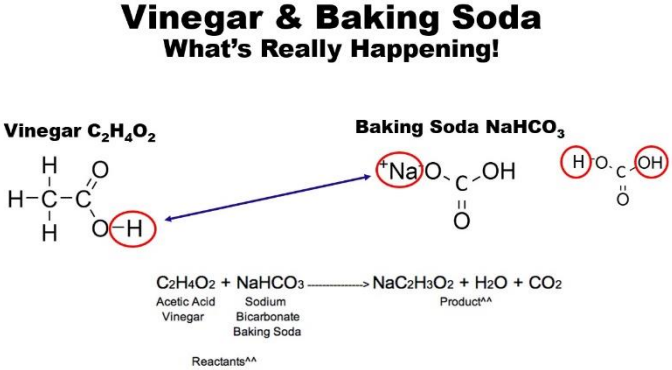
Hi Everyone,

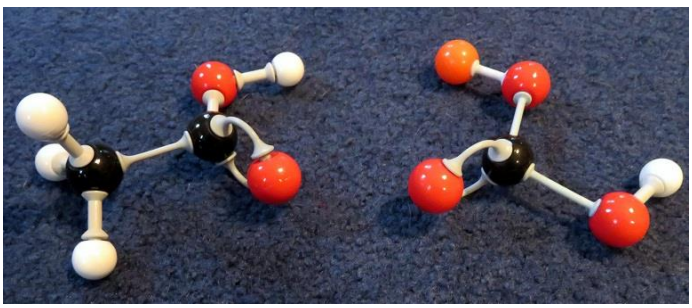
This is the hand-out I made to accompany my homeschool conference session. (You'll find that on pages 3 and 4). It gives an overview of the topics I covered in the slides. These are the chemistry topics that we covered in our homeschool over the years (grades 2-8 or so).

In the early years, we did a lot of hands-on activities. Plus, I purchased a chemistry set pretty early on that we have used for years. We have the Molymod set you see below right. We also have a Molecular Model Kit Biochemistry (240 Pieces) by Atomic Architect that works well too. What to look for in a kit: a minimum of 6 oxygens (10 or 12 is better) red; 15-20 hydrogens (white) and at least 6 carbons (black). The Molymod set we got has 12 oxygens (red) and 30 or 40 hydrogens. That has worked out really well for us since I have 3 kids and we make molecules at the same time.

We would build molecules at least once or twice a year (from the time the kids were little). Any time we talked about water or carbon dioxide, I would drag our Molymod chemistry set out and the kids would practice building molecules. I would talk about the fact that hydrogen, oxygen and carbon have different numbers of bonds (though didn't really explain why unless they asked).


As I mentioned in the workshop we'd even build the vinegar & baking soda molecules and show what happened on a molecular level when the two are put together. We'd trade the hydrogen and sodium atoms (I used an orange molecule below for sodium)… and break apart the (transformed) baking soda into carbon dioxide & water to show what was happening on a molecular level. Sorry I can't show you with a video at the moment. Hopefully the diagram helps!



It wasn't until years later that we went over valence electrons and Bohr (and Lewis Diagrams). We looked closely at the periodic table and how things are grouped. (That was when we did our chemistry unit last year… the kids were 10, 12, and 14).


Anyway, I wanted to share the hand-out here on the blog, but I hope to record the **Chemistry for Kids** session and share that with you. Everything will make much more sense then!

Hope this is helpful and of course, feel free to email me if you have any questions! 😊

~Liesl

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# Chemistry for Kids! ~with Liesl

1. Atoms and Molecules Matter! Why do we care about a world that is too small for us to see?
They make up matter, which makes up everything around us! Matter is anything that takes up space – and all matter is made up of atoms and molecules.

2. **Going from BIG to small:** Helping kids to understand the small world of atoms and molecules
http://htwins.net *What's Smaller than a Pygmy Shrew?* How many cuts activity.

3. What is an atom? the parts of an atom

4. Make your own atom project

5. What is an element? How are they organized? (periodic table). What is the most common element in the universe? Hydrogen What elements are found in our atmosphere? 78% nitrogen, 21% oxygen

6. Molecules – Building molecule models – Introducing bonds (on an elementary level or on a middle school level)

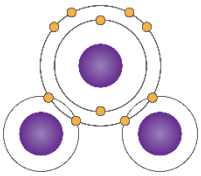
7. States of Matter solids, liquids gases

- Liquid activities – the special properties of water (cohesion)
- Solid activities – what is a solid… playing with polymers
- Gas activities – gas takes up space and has weight activities

8. Molecules can move at different rates (experiment)

9. Changes in states of matter (freezing/melting - evaporation/condensation – deposition/sublimation

10, Properties of Matter Pure substance vs. Mixtures



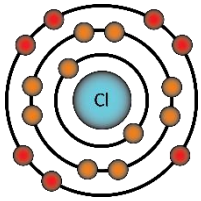
- Chromatography - Unmixing
- Cohesion
- Density Activities – Oil and Water
- Density Cubes
- Polar vs. Nonpolar Molecules – Water & Oil Experiments


11. Chemical Properties of Matter

12. Special Molecules – Acids and Bases

- pH activity – red cabbage activity
- Litmus paper
- Acids & Bases (vinegar & baking soda)
- Vinegar and Baking Soda - Showing the kids what's happening to the molecules

13 Periodic Table




- Organizational System (like sorting crayons of different shades)
- Periodic Table – organize your own chart
- Columns (valence electrons) and Rows (shells)
- Bohr Diagrams
- Lewis Diagrams

## Try This!

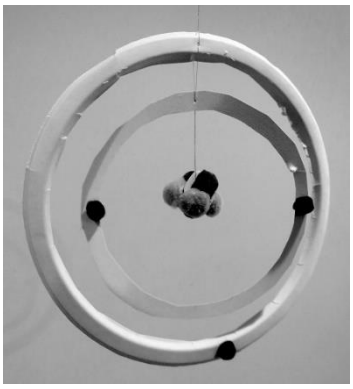
1. Take this strip of paper & cut it in half.
2. Now cut it in half again. Throw the rest away.
3. Now cut it in half again. Throw the rest away.
4. Now cut it in half again. Throw the rest away.
5. Now cut it in half again. Throw the rest away.
6. Now cut it in half again. Throw the rest away.
7. Now cut it in half again. Throw the rest away.
8. Now cut it in half again. Throw the rest away.
9. Now cut it in half again. Throw the rest away.
10. Now cut it in half again. Throw the rest away.
11. Now cut it in half again. Throw the rest away.
12. Now cut it in half again. Throw the rest away.
13. Now cut it in half again. Throw the rest away.
14. Now cut it in half again. Throw the rest away.
15. Now cut it in half again. Throw the rest away.
16. Now cut it in half again. Throw the rest away.

Remember how many cuts you were able to make!!

## How many cuts? Activity

- in the microscopic range (12 cuts)
- the width of paper (14 cuts)
- the size of bacteria (18 cuts)
- the size of visible light waves (19 cuts)
- electron microscope range/membranes (24 cuts)
- the size of an atom (31 cuts)

## Build your own atom



## Try This!

Pointillism is a style of painting using lots small, painted dots to create a picture.

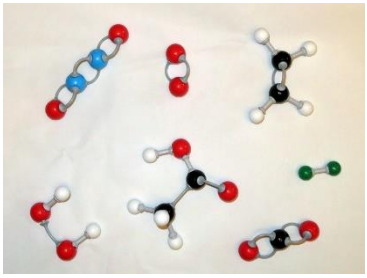
Use markers to create your own pointillism picture on an index card.

Ideas: create a tree, a mouse, or a car out of lots of tiny dots.

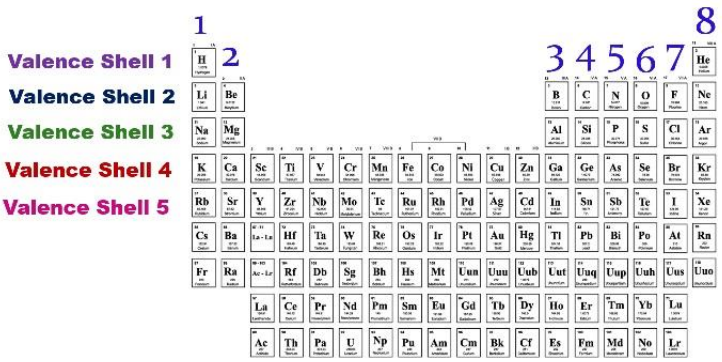
How does this relate to chemistry? From far away molecules appear to be one object, but if you could zoom in closely you would see that the object is made up of molecules.

## Building a Molecule

_____ water: $H_2O$
_____ hydrogen peroxide: $H_2O_2$
_____ carbon dioxide: $CO_2$
_____ chlorine: $Cl_2$
_____ ammonia: $NH_3$
_____ acetylene gas (used for blow torches): $C_2H_2$
_____ methane gas: $CH_4$
_____ ethylene gas (which ripens fruit): $C_2H_4$
_____ methanol (wood alcohol): $CH_3OH$
_____ propane gas (for grilling food): $C_3H_8$
_____ nitrous oxide (laughing gas): $N_20$
_____ hydrogen cyanide: HCN
_____ Vinegar: $CH_3COOH$
_____ Glycerol: $C_3H_5(OH)_3$
_____ $C_6H_{12}O_6$




## Learning about the Periodic Table



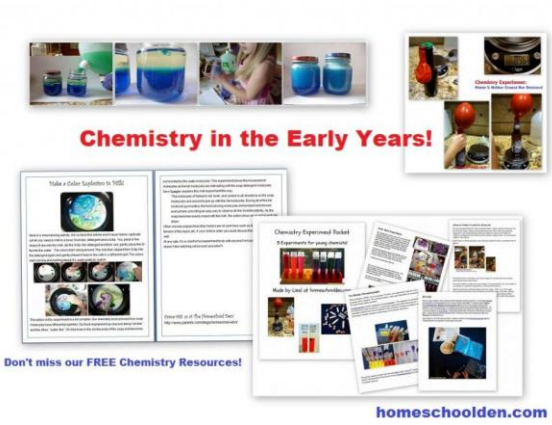

### By Middle School My Kids Knew (or are working on!) These chemistry terms:

1. alkaline earth metals
2. anion
3. valence electron
4. electron
5. transition metals
6. hydrogen
7. ionic bond
8. halogen
9. noble gases
10. neutron
11. atom
12. atomic mass
13. metalloids
14. isotope
15. ion
16. cation
17. proton
18. atomic number
19. covalent bond
20. alkali metals

Questions? You can reach me at Liesl@homeschoolden.com
Come check out lots of hands-on activities and various printables at homeschoolden.com

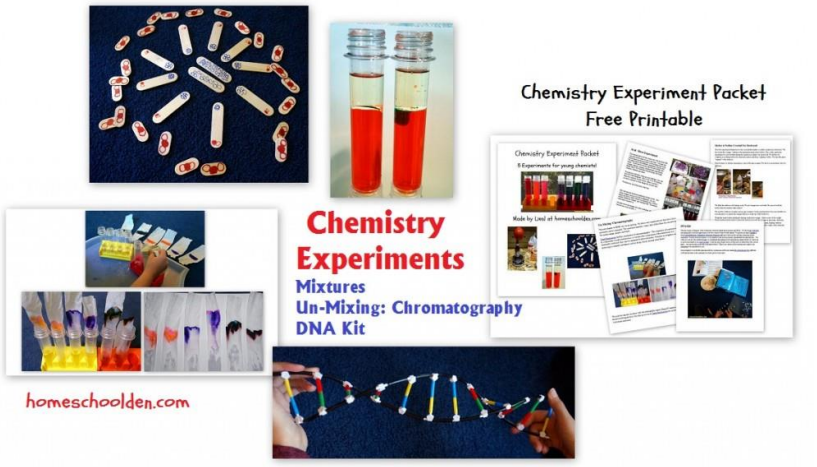
**Chemistry Posts that might be of interest:**

[Chemistry in the Early Years: Fun, Simple Science Experiments for Younger Kids]




Chemistry Experiments for Kids (Acids & Bases, Mixtures, Chromatography and More) with a free pdf packet available at either of the links below.

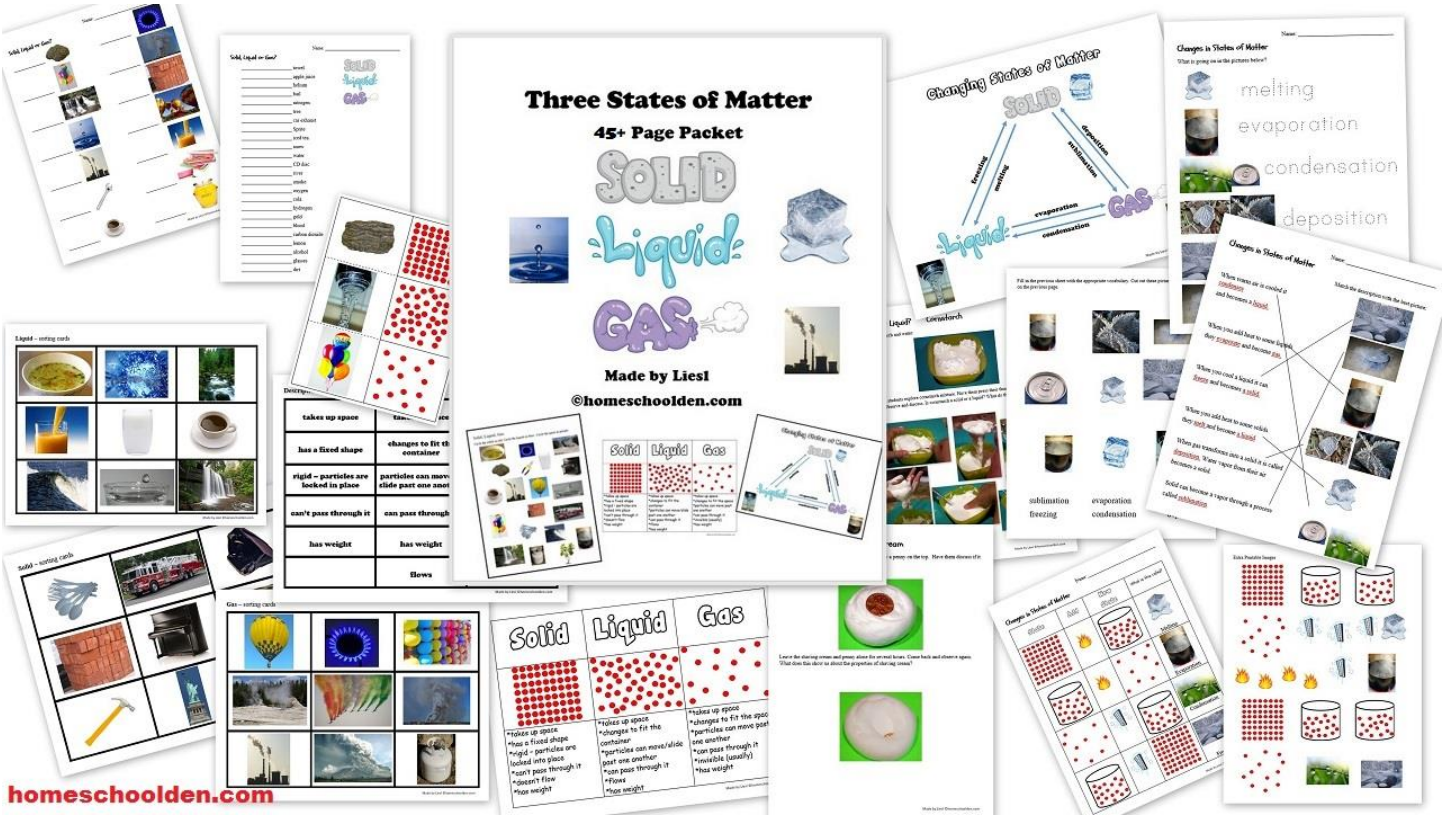
- [Chemistry for Kids Part I: Matter is Neither Created Nor Destroyed, Acids & Bases]
- [Chemistry for Kids Part II: Mixtures, Chromatography, Oil & Water]

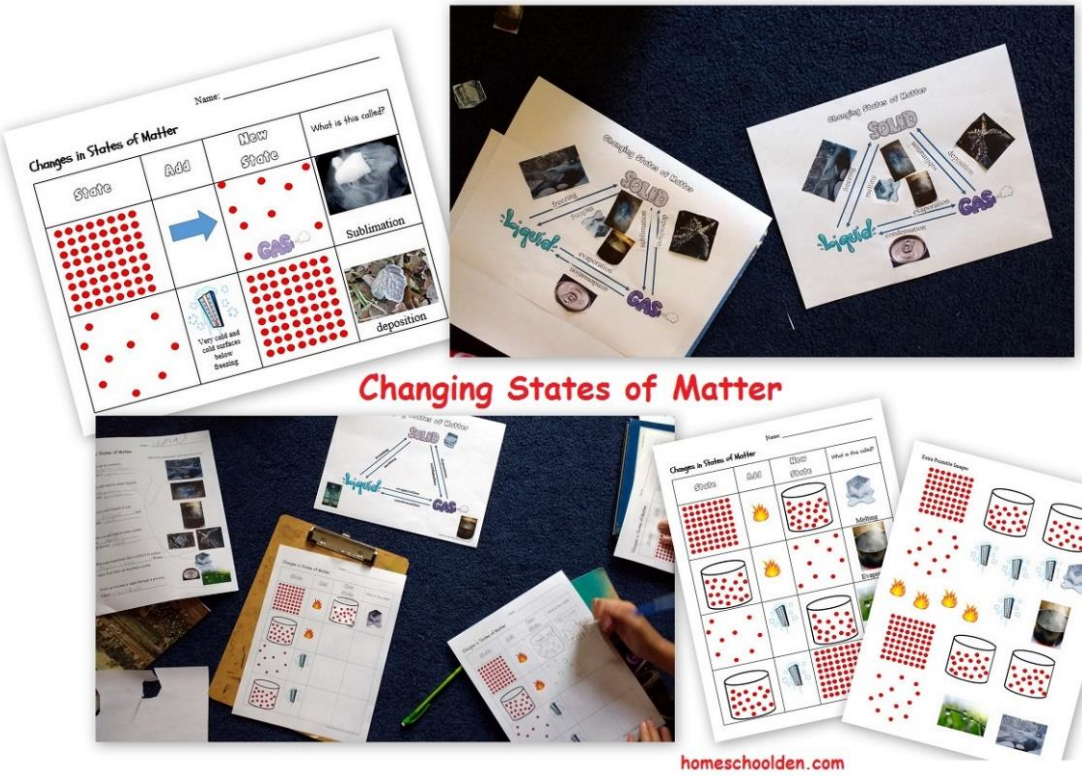



[Free Chemistry Experiment Packet for Kids]

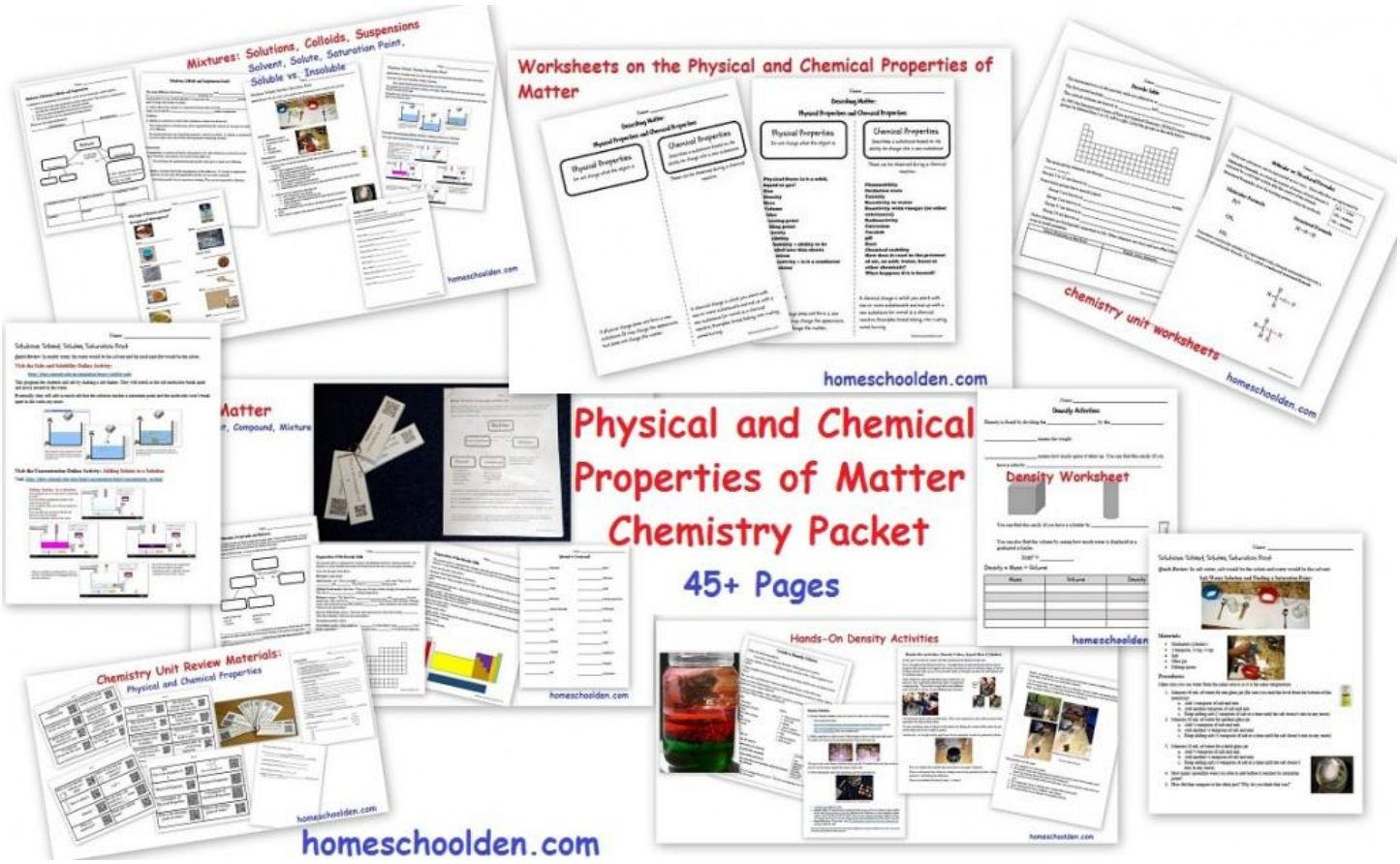
**We have a number of other packets that might be of interest:**

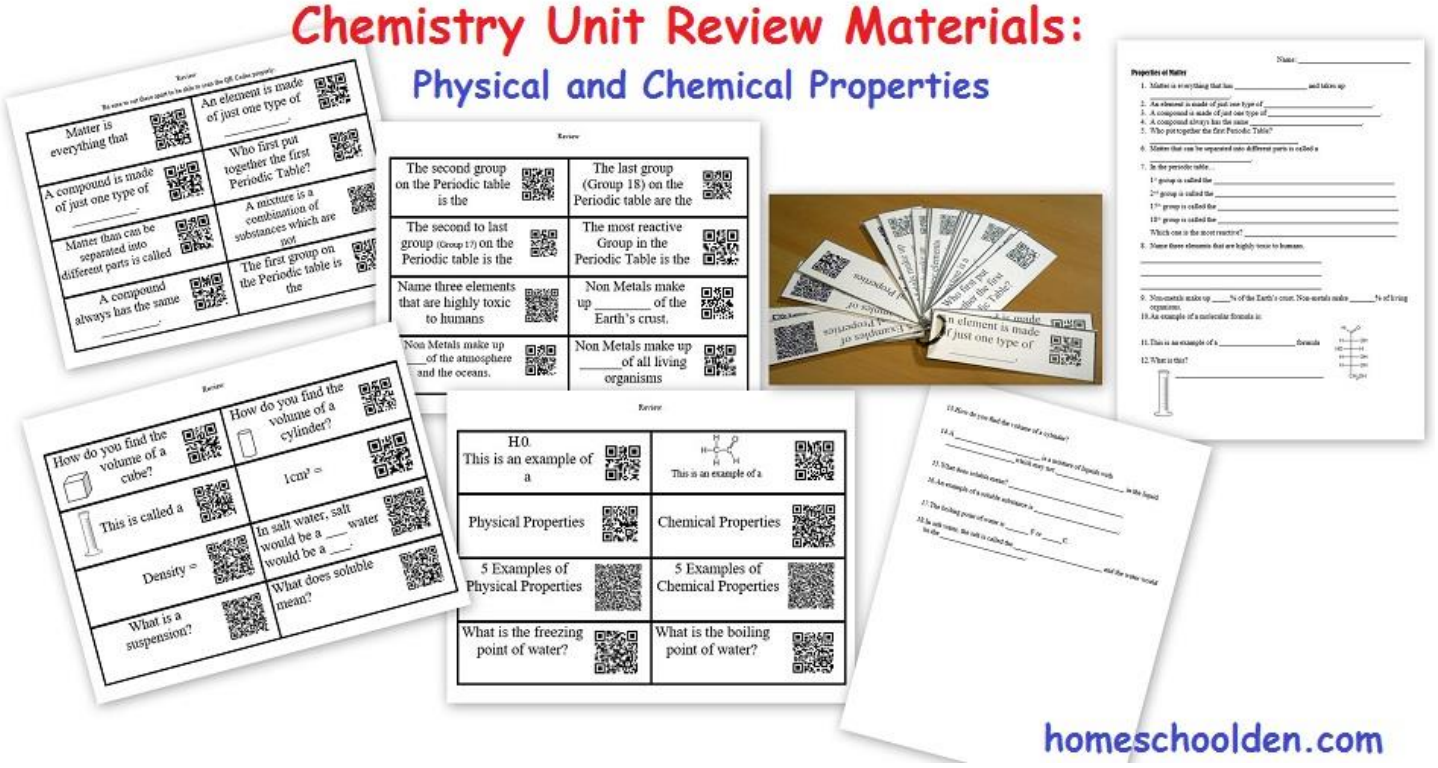
**[States of Matter Packet](#) – an introduction to the states of matter and changing states of matter**



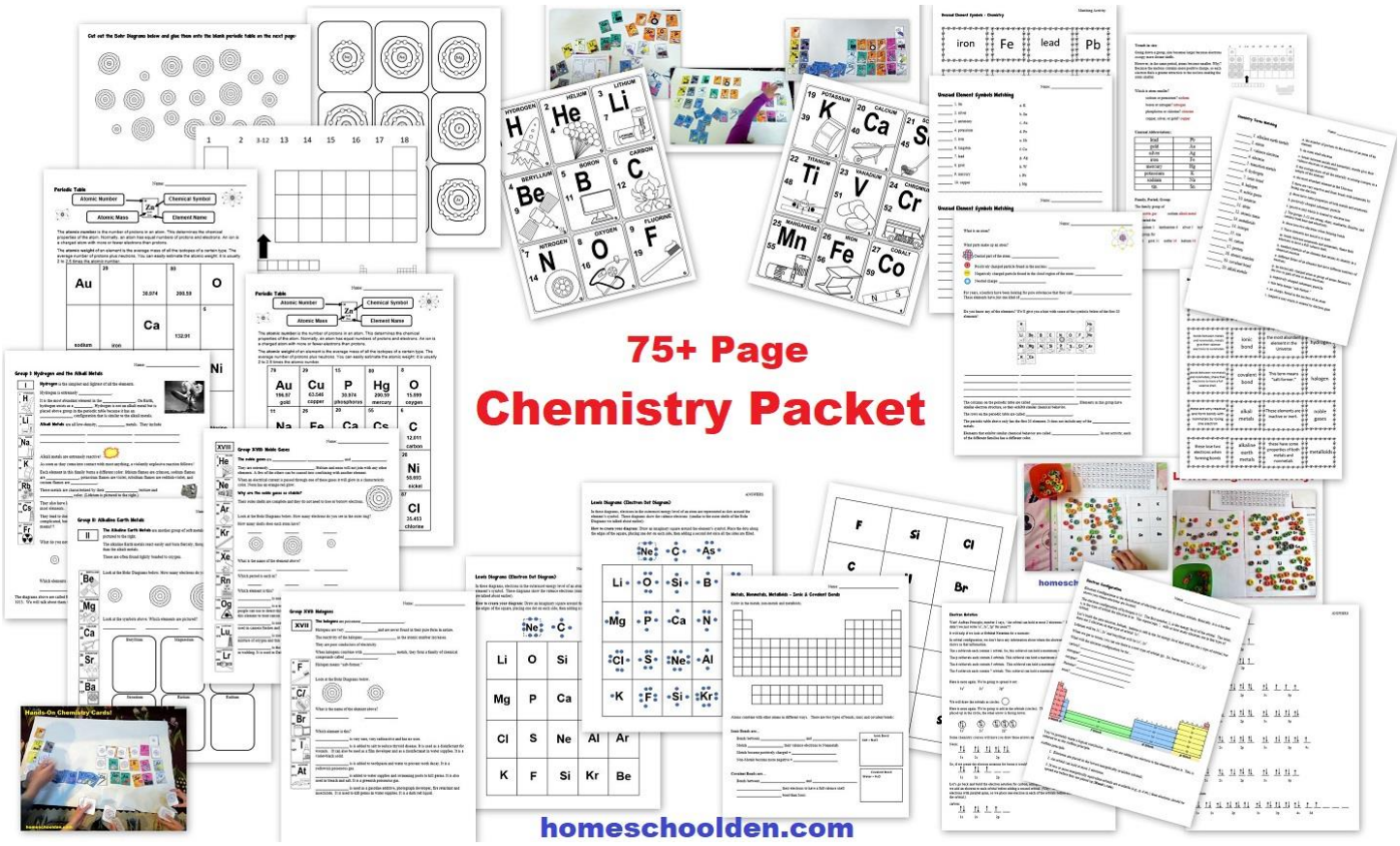



# Physical and Chemical Properties of Matter

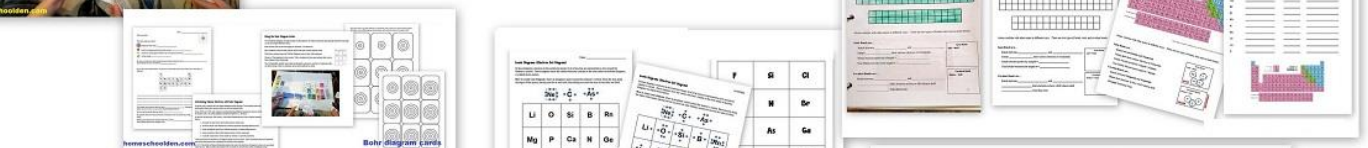


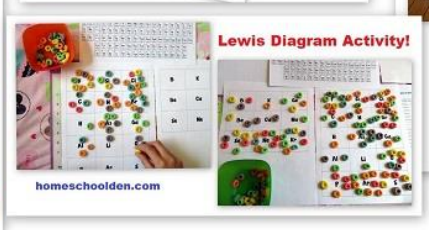
# Chemistry Packet










# Electricity and Circuits Packet