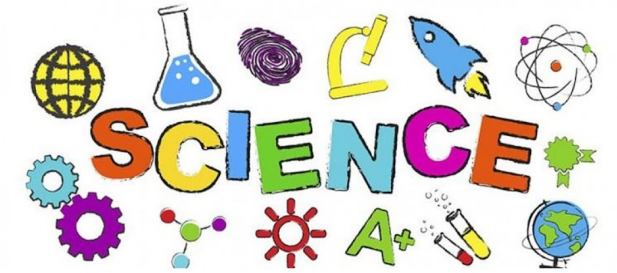
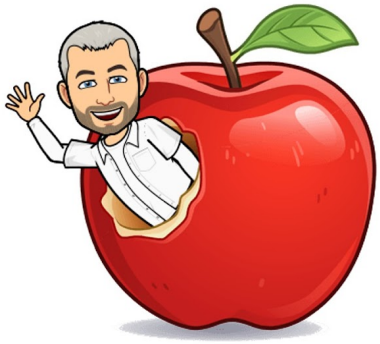




Physical & Chemical Changes

What I Will Be Learning In This Mastery Badge:
In this mastery badge we will learn to distinguish between physical changes and chemical changes.

What This Packet Includes:
It is important that you complete all aspects of this packet so that you gain the knowledge and skills that we are working on.

I. **Discovering Lab**
A discovering lab is a fun, introductory lab, where we discover the knowledge on our own.

II. **Video Instruction**
You will watch a video presented by Mr. Bertoch, and answer questions about it.

III. **Literacy Practice**
Reading and writing are critical life skills, and also very important to science. You will read the assigned article and complete a writing prompt.

IV. **Applying Lab**
An applying lab is how you pass off the Mastery Badge. It serves as the quiz. It is a hands on demonstration that you have mastered the skills and content of this badge.

Key Things We Will Learn In This Mastery Badge

Some of the most important things we will learn in this mastery badge:

- Substances can be changed
- Some changes are only physical. The substances remain the same.
- Other changes are chemical. New substances are created.
- How to distinguish between physical and chemical changes.

Name:_____ Date:_____

Discovering Lab

Learning Through Hands On Activities

Activity: Discovering Chemical & Physical Changes

Directions: Follow the directions below.

Video Instructions Available For This Assignment. Watch this video to learn how to do this assignment, and why it is important.

Scan This QR Code To Watch Mr. Bertoch Give You Directions For This Assignment

Goal: To learn as much as you can about chemical and physical changes.

Experiment 1: Changing Substances To Create Carbon Dioxide Gas

A chemical reaction occurs whenever two or more substances are combined to form a new substance.

For this experiment, you will mix two substances to make a new substance (Carbon Dioxide Gas).

- Fill a soda bottle with a small amount of vinegar.
- Using a funnel add two or three spoonfuls of baking soda to the inside of a balloon.
- Place the balloon over the mouth of the bottle, being careful not to spill out the baking soda.
- Once the balloon covers the entire mouth of the bottle, lift up the end of the balloon so that all of the baking soda spills out into the vinegar.
- Observe and record what happens.

What happened to the baking soda and vinegar when you mixed them together?

What happened to the balloon?

Your balloon should fill up with carbon dioxide gas.
When you put the balloon over the top of your bottle, there was no (or very little) carbon dioxide inside the bottle. Now there is a lot of it. Where did this gas come from?

Experiment 2: Observing A Physical Change
A physical change occurs when a substance changes its shape, texture, size, or state of matter, without changing the substance itself (without changing the molecules).
For this experiment, you will be changing the shape and state of matter of water.

- Fill a glass with water.
- Place the water into the freezer.
- Check on your water after several hours.
- Observe how it has changed.
- Leave the glass (of ice) on the counter for several hours.
- Once again, observe how it changes.

What happened to the water after being in the freezer for several hours?

What happened to the ice after being left on the counter for several hours?

At any point did the water ever stop being water?

Remember: A chemical change occurs when we change substances into new substances. Such as when we combine baking soda and vinegar to create carbon dioxide. Carbon dioxide is a new substance. A physical change occurs when we alter the shape, size, color, or other physical attributes, but we do not change the substance itself. Such as when we freeze water and the water continues t remain as water.

Final Questions:

Answer these questions using complete sentences.

1. In your own words explain what a chemical change is.

2. In your own words, explain what a physical change is.

3. Is chopping up wood into smaller pieces a chemical change or a physical change? Explain why you selected the answer that you did.

4. Do you think burning wood in a fire would be a chemical change or a physical change?
   This is a tough one, and it is okay if you get the wrong answer. Later on, we will talk more about fire. For now, just do the best you can. Give a thoughtful answer based on your understanding of chemical and physical changes. Explain why you picked the answer that you did.

Handsome Science Teacher One Take Videos

Now that you have completed the Discovering Lab let's watch the video that goes with it. In this video Mr. Bertoch will help connect the discoveries that you made during the lab to the broader concepts covered under this badge, and will also introduce the vocabulary that goes with these concept.

Take Your Time, Pause And Rewind As needed

You are not in a hurry! It is more important that you understand the concepts in this video than that you finish it quickly. Take your time. If you don't understand something, pause the video and use the Internet or other resources to look up the concept that has you confused.

When you finish this video, you should have a good understanding of the concepts that have been taught. If you find yourself confused, rewind, and rewatch.

The Video For This Mastery Badge Can Be Opened Using This QR Code

This Mastery Badge includes one video:

Watch The Assigned Science Video

Scan This QR Code To Open And Watch The Assigned Video For This Mastery Badge

Check Point

Let's make sure that you really did take your time and watch the video carefully! Remember that it is important to hold yourself accountable to a high standard and to take pride in your own success as a learner.

I watched the video carefully, and paused to look up anything I didn't understand.

Recording Your Learning

On the next page, you will record your learning and connect it to things you already know.

Ten Things I Learned From This Video

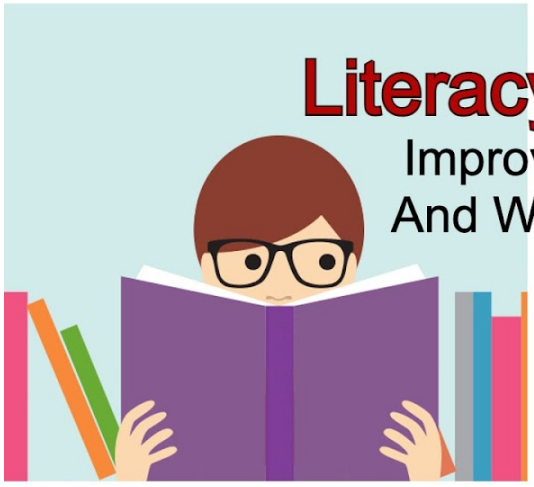
A powerful tool to help you retain what you learn is to take notes. Notes give you something that you can look back at later, to quickly remind your brain reinforcing the memories for the concepts you have learned. Record ten things that you learned or that you perhaps already knew that were discussed in this video.

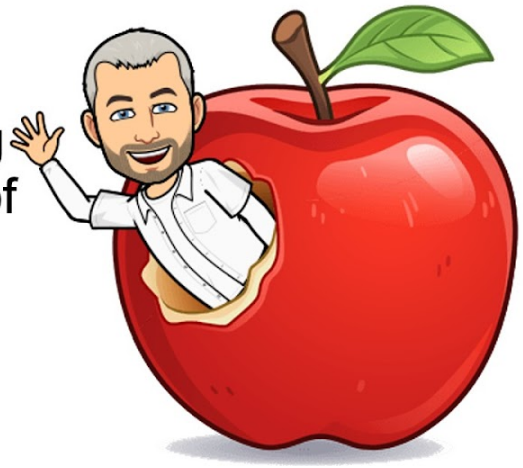
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Now, Let's Connect These New Concepts To Things You Already Knew

Another great way to help your brain retain new things is to connect these new concepts to other things that you already know. This gives your mind a place to store the new knowledge. Imagine that you are placing the new knowledge on a shelf in your brain next to facts that are already in there.

Write a paragraph explaining how the concepts taught in this video relate to things you already knew. There are no wrong answers. What are some things that you already knew that this video reminded you of?





Activity: Reading And Writing About Atoms

Directions: Reading and writing are very important life skills. Good scientists must be able to learn through reading and communicate their own discoveries through writing.

Video Instructions Available For This Assignment. Watch this video to learn how to do this assignment, and why it is important.

Scan This QR Code To Watch Mr. Bertoch Give You Directions For This Assignment

1. **Practice Reading For Understanding**
   Read the article below **for understanding**. Reading for understanding means that you take your time and monitor your own learning. If you get to the end of a sentence and you do not remember or understand what you read, **re-read it.**

2. **Practice Writing To Communicate**
   Complete the writing prompt below. Do your very best to write clearly so that others will understand what you are saying. This means using correct spelling, grammar, and writing, taking your time to think about the best ways to clearly communicate to others the main ideas that you are trying to get across to them.

Article:

Read The Assigned Article Carefully For Understanding.
https://handsomescienceteacher.com/Online-science-classes-kids/physical-and-chemical-changes/

Scan This QR Code To Open And Read The Article That Goes With This Mastery Badge

Writing Prompt:

Check Point

Let's make sure that you really did read for understanding! Remember that it is important to hold yourself accountable to a high standard and to take pride in your own success as a learner.

I Read For Understanding. I did not skim the article. I understood the material that the article discussed.

Quiz Time

Complete the quiz at the end of the article and post your score in the box below. Your goal is to get at least 75% on the quiz. Did you accomplish this goal?

%

Now Let's Write To Communicate

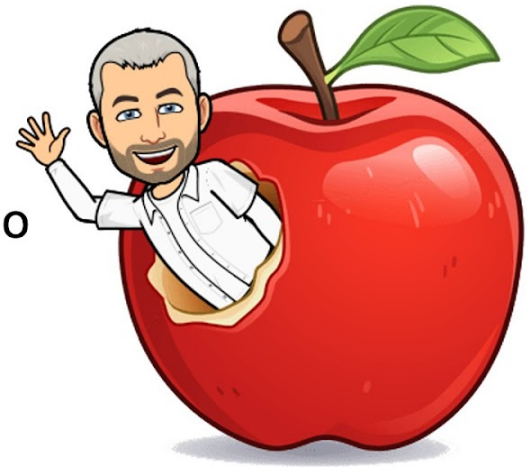
Remember that when you write to communicate you are taking your time, and explaining the topic in a detailed and concise way. Don't rush! You are not in a hurry. Think about what you are going to say, and plan how you will say it. So that someone else who reads your paragraphs will understand them easily.

Writing Prompt: Write two paragraphs describing the difference between chemical and physical changes.

Name:_____ Date:_____

Applying Lab

Proving That We Can Do It Ourselves



Activity: Identifying Chemical And Physical Changes Around Me

Directions: Follow the instructions below to identify chemical and physical changes in your neighborhood.

Video Instructions Available For This Assignment. Watch this video to learn how to do this assignment, and why it is important.

Scan This QR Code To Watch Mr. Bertoch Give You Directions For This Assignment

Goal: To distinguish between chemical and physical changes.

Chemical & Physical Changes Are Happening All Around Me

There are changes occurring all around you every single day. Some of them are physical and some of them are chemical. For example, your food is changed when it is cooked. A piece of paper is changed when you crumple it up and throw it away. The leaves on a tree change when they turn from green to brown. Look around your home and neighborhood. Find ten physical changes and ten chemical changes. Record them on the chart below.

Continued on the next page

Type of Change	What Happened?	Explain why this change is either chemical or physical.
Physical Change		
Physical Change		
Physical Change		
Physical Change		
Physical Change		
Physical Change		
Physical Change		
Physical Change		
Physical Change		
Physical Change		
Chemical Change		
Chemical Change		
Chemical Change		
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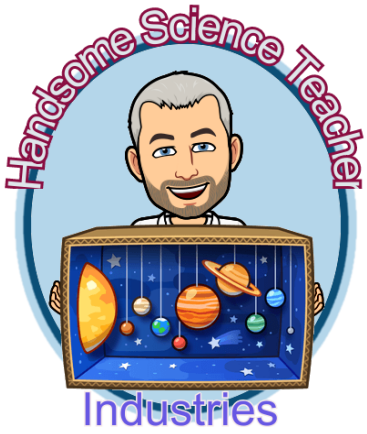

Congratulations! You Have Completed The Entire Mastery Badge
You have worked really hard to earn this mastery badge. More importantly, you have worked hard to earn your knowledge!

Time To Evaluate Your Work
Check each of the following to evaluate your work:

1. Did you do every assignment?
2. Did you read the assigned article?
3. Did you watch the assigned video?
4. Did you answer all the questions using complete sentences?
5. Are your answers accurate?

My Self-Evaluation:
Based on the criteria listed above, I believe I have passed off this Mastery Badge because… (Be detailed ans specific)

Mastery Badge Counselor Evaluation:
I have reviewed this student's work. Based on the criteria listed above I hereby certify that they have passed off the Mastery Badge because… (Be detailed and specific) Note: Any adult may serve as a Mastery Badge Counselor, so long as they are committed to ensuring the highest standards of excellence.

Student's Signature	**Date**	**Signature of Mastery Badge Counselor**	**Date**

Certificate For Your Homeschool Records

The following certificate which has been awarded through self-evaluation by the student, and also certified by a mastery badge counselor proves that the student listed thereon has completed all the work and has mastered all the concepts for the specified topic.

Keep this on file as evidence of your successful completion of this topic.
If audited by the State, these certificates stand as evidence that you have worked on and successfully completed a rigorous science curriculum.