



Specific Heat Capacity

What I Will Be Learning In This Mastery Badge:

In this Mastery Badge we are going to learn about specific heat capacity, including how the temperatures of substances increase at varying rates depending on their specific heat capacity.

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:

- What does capacity refer to?
- What is heat capacity?
- How does the specific heat capacity of different objects influence their temperatures?
- Which substances have a high specific heat capacity?
- Which substances have a low specific heat capacity?

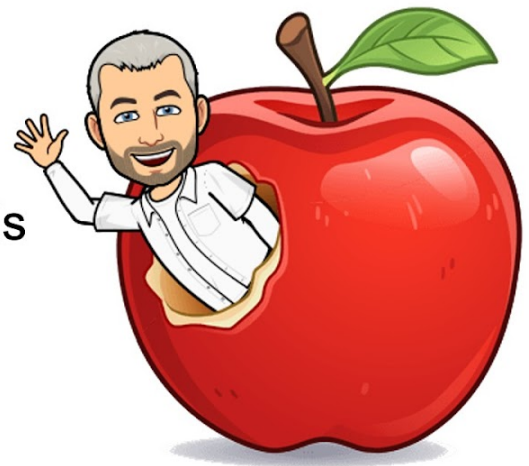
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Discovering Lab

Learning Through Hands On Activities



Activity: Discovering Specific Heat Capacity

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 the capacity for different substances to absorb and store heat.

Measuring The Specific Heat Capacity of Different Substances

For this lab you will need sand, water, three disposable cups, and a thermometer. If you do not have a thermometer one can be purchased on HandsomeScienceTeacher.com. Alternatively, you can use a thermometer from a pharmacy.

Step 1.

Fill one disposable cup with sand, a second with water, and a third with any substance of your choice. You can use rice, flour, oil, or any other substance you want to include in this experiment. Try to get all three substances to the same temperature. A good way to do this is to place them in a refrigerator for a few hours.

Step 2.

Place all three cups in a window that gets a lot of sunlight. Do this before the sun shines through the window. Take and record the temperature of each cup below.

Sand Temperature	Water Temperature	Other Substance Temperature

Step 3.

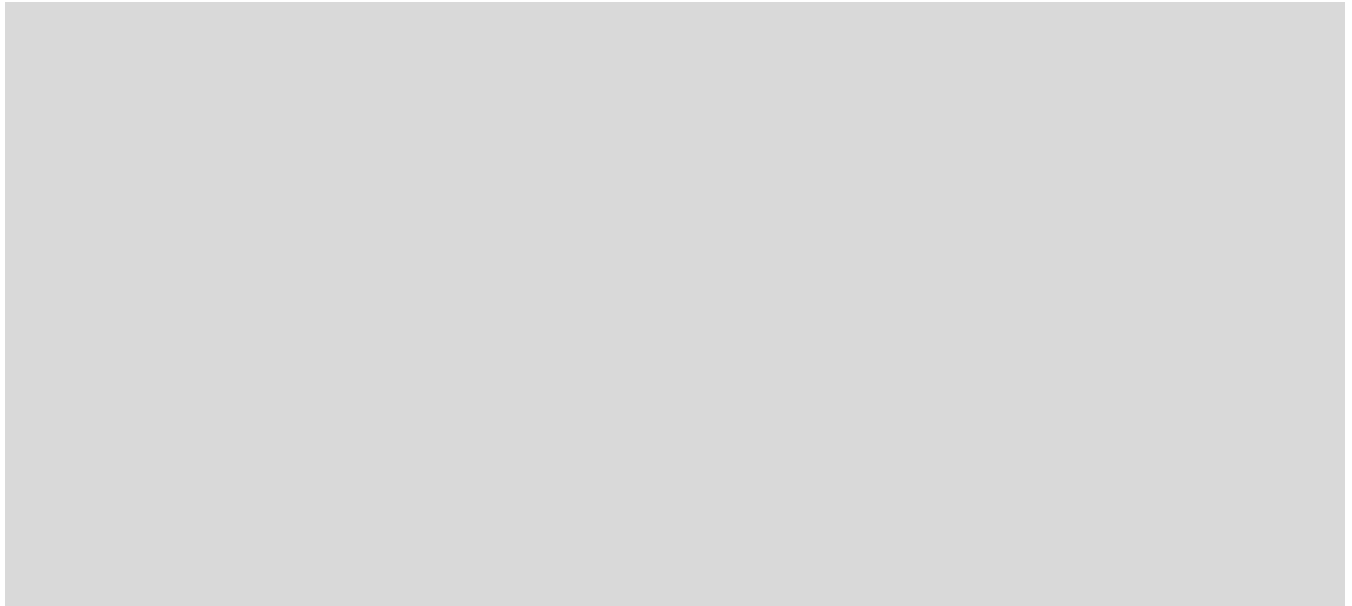
Leave the cups in the window for seven hours. Make sure that they get lots of direct sunlight. Measure and record the temperature of each substance once per hour.

Time	Sand Temperature	Water Temperature	Other Substance Temperature
After 1 Hour			
After 2 Hours			
After 3 Hours			
After 4 Hours			
After 5 Hours			
After 6 Hours			
After 7 Hours			

Create a line graph showing how the temperature of each substance changed over time. You can do this by drawing or by using a program such as a spreadsheet or a word processor.

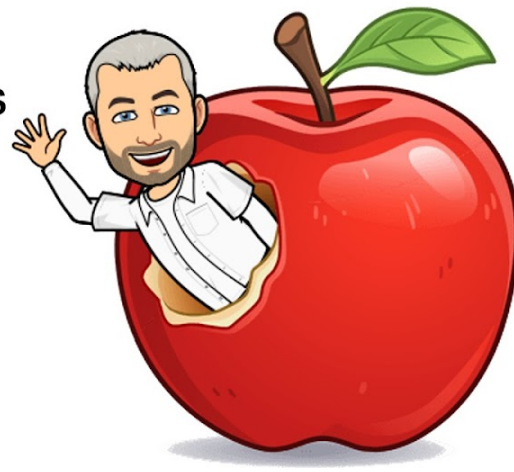
Analyze Your Data

Scientists support their conclusions with evidence and data. What conclusions can you draw about how heat affects different substances? For example, do all substances heat up at the same rate?



Video Instruction

Reviewing The Teacher's Instruction At My Own Pace



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.

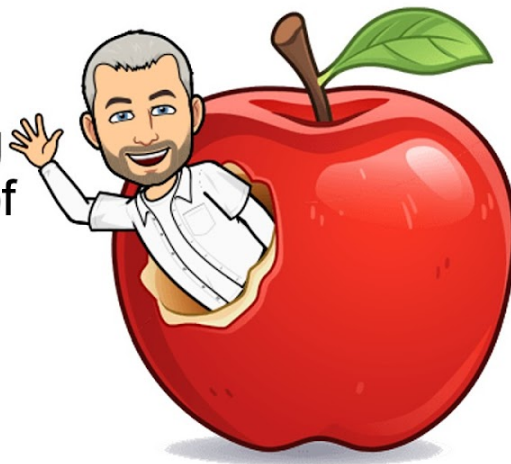
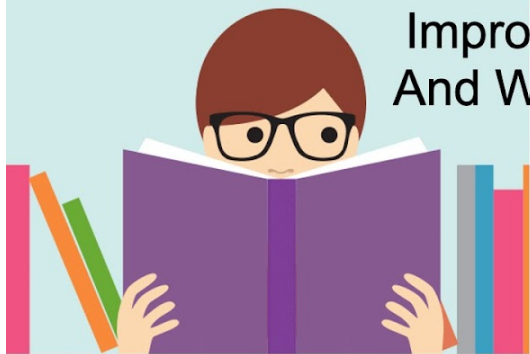
Now, Let's Connect These New Concepts To Things You Already Knew

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?

Literacy Practice

Improving Our Reading
And Writing In Search of
Knowledge



Activity: Reading And Writing About The Formation of The Earth

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/specific-heat-capacity/>

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

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 explaining what specific heat capacity is, and how it affects climate.

Name: _____

Date: _____



Applying Lab

Proving That We Can Do It Ourselves



Activity: Applying Specific Heat Capacity

Directions: Follow the instructions below to create a map of the atmospheric and oceanic currents.



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 demonstrate your understanding of sea breezes, land breezes, and monsoons

As a valued employee of Acme Toothpaste, we need your opinion. Our company is growing and will be opening a new plant. In order to ensure the highest quality toothpaste it is very important that our new plant be located in a place where there are no extreme temperature shifts between daytime and nighttime temperatures.

We are counting on you to find a city for us, where the temperature will be moderated by the presence of water. Once you locate a city, we need you to then create a presentation (PowerPoint, Google Slides, Etc) illustrating why you selected the location that you did, and how the presence of water will help to moderate the shift between day and night temperatures.

If you do a really good job, I will take all the credit with the board of directors. If you do a bad job, you will be fired. Because here at Acme Toothpaste, we value you... well, we value you helping me!

Make sure your presentation includes all of the following:

- It must be at least ten slides long.
- Must recommend a city for Acme Toothpaste.
- Must discuss how the presence of water helps moderate temperatures between day and night.
- Must give a definition and explanation of specific heat capacity.



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 and 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.

