



The Earth Has Cycles

What I Will Be Learning In This Mastery Badge:

In this mastery badge we will learn about the cycles of the Earth. Including The Water Cycle, The Carbon Cycle, and the Nitrogen Cycle. We will explore what causes these cycles to occur, and the major reservoirs of each one.

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 are cycles?
- What is a reservoir?
- What is a flux?
- The Water Cycle
- The Carbon Cycle
- The Nitrogen Cycle

Name: _____

Date: _____



Discovering Lab

Learning Through Hands On Activities



Activity: Discovering The Water Cycle

Directions: Follow the directions below to recreate different parts of the water cycle.



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 how water moves from one part of the water cycle to another.

Step 1. Let's Make Water Evaporate:

DO NOT DO THIS ALONE. MAKE SURE YOU HAVE ADULT SUPERVISION!

- Using a measuring cup, measure out exactly one cup of water.
- Place the water into a saucepan, and boil it.
- Once it begins to boil observe what you see, both in the pan and also above it.
- When the water starts to boil, set a timer for five minutes. After five minutes turn off the stove, and allow your water to cool for several minutes.
- Carefully pour the water back into the same measuring cup.

Did you observe any steam? Why do you think there was steam? What is steam?

Now that you have poured the water back into the measuring cup, do you still have the same amount of water that you started with? Is there still 1 cup of water? Explain your answer.

Where do you think the water went?

How does this relate to what we see in nature?

Step 2. Make Water Appear From Thin Air

This experiment works best in a humid environment. If you live in a dry climate, your results may not be as good, but try anyway and see what happens.

- Fill a glass jar to the top with ice and cold water. Be very careful not to get any water on the outside of the jar. If you do, dry the outside of the jar. It is important that you start this experiment with the outside of the jar being totally dry.
- Observe the jar for several minutes.

After several minutes of observation, you should begin to see water droplets forming on the outside of the glass jar. Why do you think this is happening?

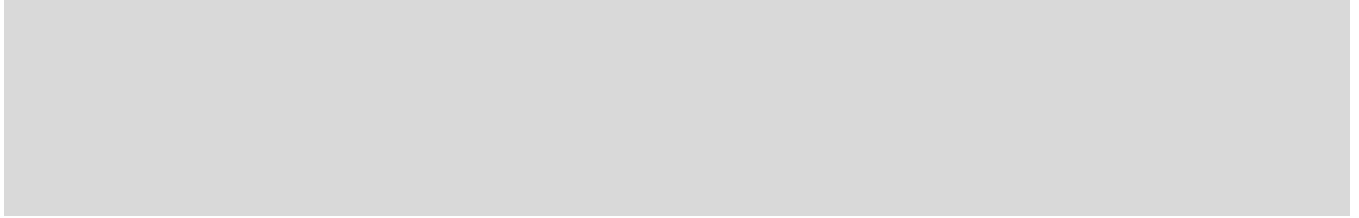
It is tempting to think that the water on the outside of the glass is coming from inside the glass, but notice that all the water inside the glass is still there. Where do you think the water on the outside of the jar is coming from?

How does this relate to what we see in nature?

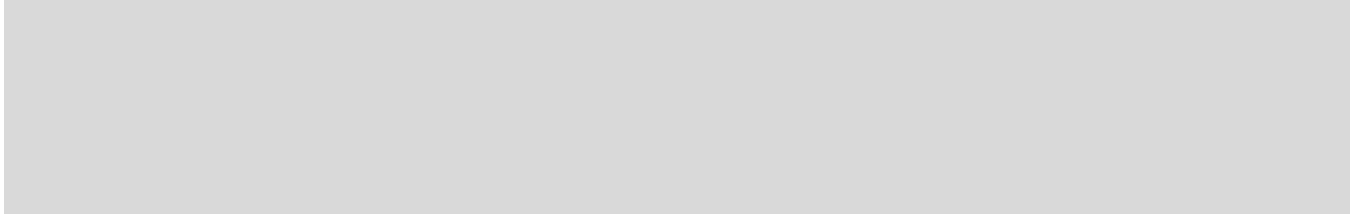
Final Questions:

Remember that your answers should ALWAYS be written using complete sentences.

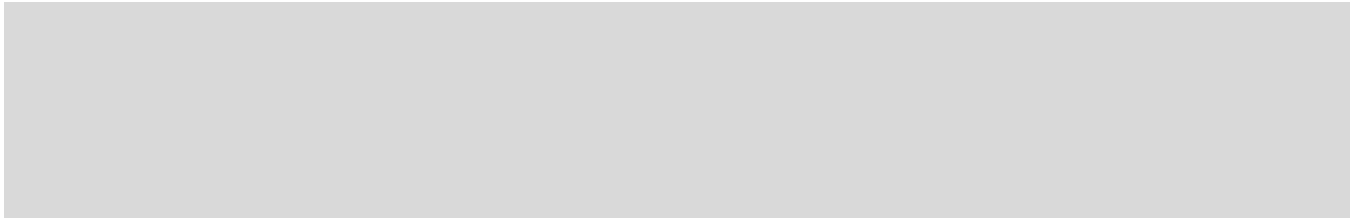
1. Where does water go when it evaporates?



2. Where does water come from when it condenses onto things like windows, grass, or other objects?



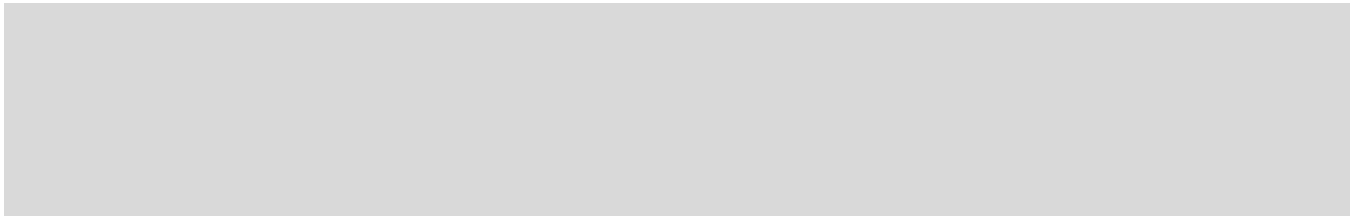
3. Where are some places on Earth that we often find water?



4. How did the water get to the places you described in the last question?

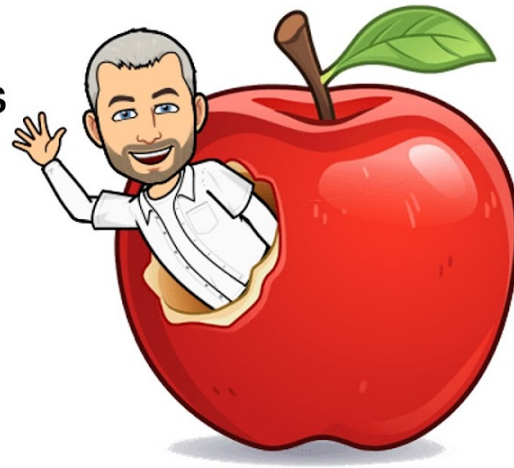


5. Where is the largest amount of water on Earth?



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.

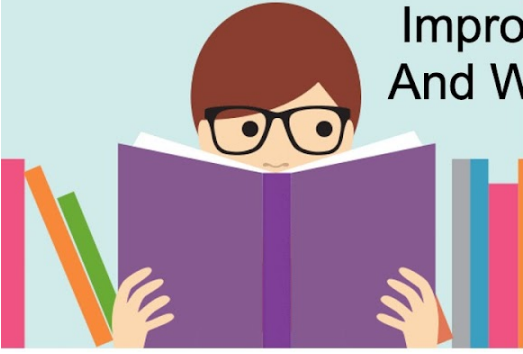
Now, Let's Connect These New Concepts To Things You Already Knew

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 Lunar Phases

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/the-earths-cycles/>

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 in your own words describing what a cycle is. Use examples from this article.

Name: _____

Date: _____



Applying Lab

Proving That We Can Do It Ourselves



Directions: Draw diagrams of the Earth's Cycles



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 that you understand the different cycles of the Earth.

Step 1. Drawing The Water Cycle

Draw and color a detailed picture of the water cycle.

Your picture must include evaporation, condensation, and precipitation, and must be in color. You can do this using crayons, colored pencils, or complete the drawing digitally.

Step 2. Drawing The Carbon Cycle

Draw and color a detailed picture of the carbon cycle. Your picture must include the atmosphere, the earth, and the biosphere. You can complete your drawing using crayons, colored pencils, or digitally.

Step 3. Drawing The Nitrogen Cycle

Draw and color a detailed picture of the Nitrogen Cycle. Your picture must include the atmosphere, the earth, plants, animals, and bacteria. You can complete your drawing using crayons, colored pencils, or digitally.

Final Questions:

Remember to write your answers using complete sentences.

1. What would happen if the water cycle stopped?

2. What would happen if too much carbon collected in one place, such as in the atmosphere?

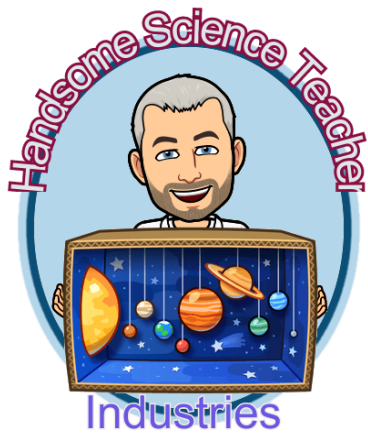
3. Why do you think it might be important for humans to balance their usage of renewable resources like water, carbon, and nitrogen?

4. What is a reservoir?

5. What is the biggest reservoir of water on Earth?

6. What is the biggest reservoir of carbon?

7. What is the biggest reservoir of nitrogen?



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.



The certificate is framed by a decorative, repeating pattern of stylized faces. On the left side, there is a circular logo featuring a cartoon man with a beard and glasses, wearing a white lab coat, holding a tablet that displays a solar system with various planets. The text "Handsome Science Teacher" is written in a pink, curved font above the man, and "Industries" is written in a blue, curved font below the tablet.

Mastery Badge Certificate

Topic: The Earth Has Cycles

Student Name: _____

This certificate certifies that the person named above has completed all of the requirements to earn this Mastery Badge.

MASTERY BADGE COUNSELOR SIGNATURE

DATE AWARDED



A smaller version of the logo is located in the bottom right corner of the certificate.