



The Law of Gravity

What I Will Be Learning In This Mastery Badge:

In this mastery badge we will learn about The Law of Gravity

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:

- Issac Newton
- The Law of Gravity
- What is gravity?
- How does gravity affect objects?
- What causes gravity?
- How does distance affect gravity?

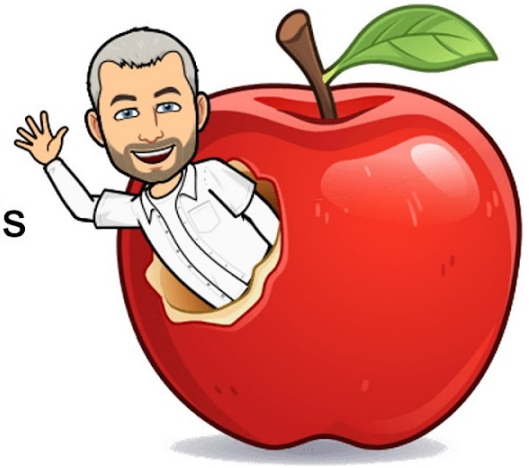
Name: _____

Date: _____



Discovering Lab

Learning Through Hands On Activities



Activity: Discovering Gravity

Directions: Follow the directions below to learn about gravity.



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 gravity

Using Computer Simulations

In science sometimes it is very difficult or even impossible to study phenomena directly. This might be because the phenomenon is too large such as a planet. It might be because it is too complex, such as the weather. Or, it might be because it spans too much time, such as plate tectonics.

Scientists use computer simulations to help them understand these complex problems. Using a computer they can track many complex factors, adjust the scale, and alter the time so that they can obtain results more quickly.

Studying Gravity With Computer Simulations

Gravity is an example of a phenomenon that is difficult to study. However, we can use computer simulations to try and understand it better.

For this lab, you will need to go online and find a simulation of gravity. There are many good simulations available. We cannot suggest one, because the links change too quickly and this book would become outdated. However, you can find one by using a search engine.

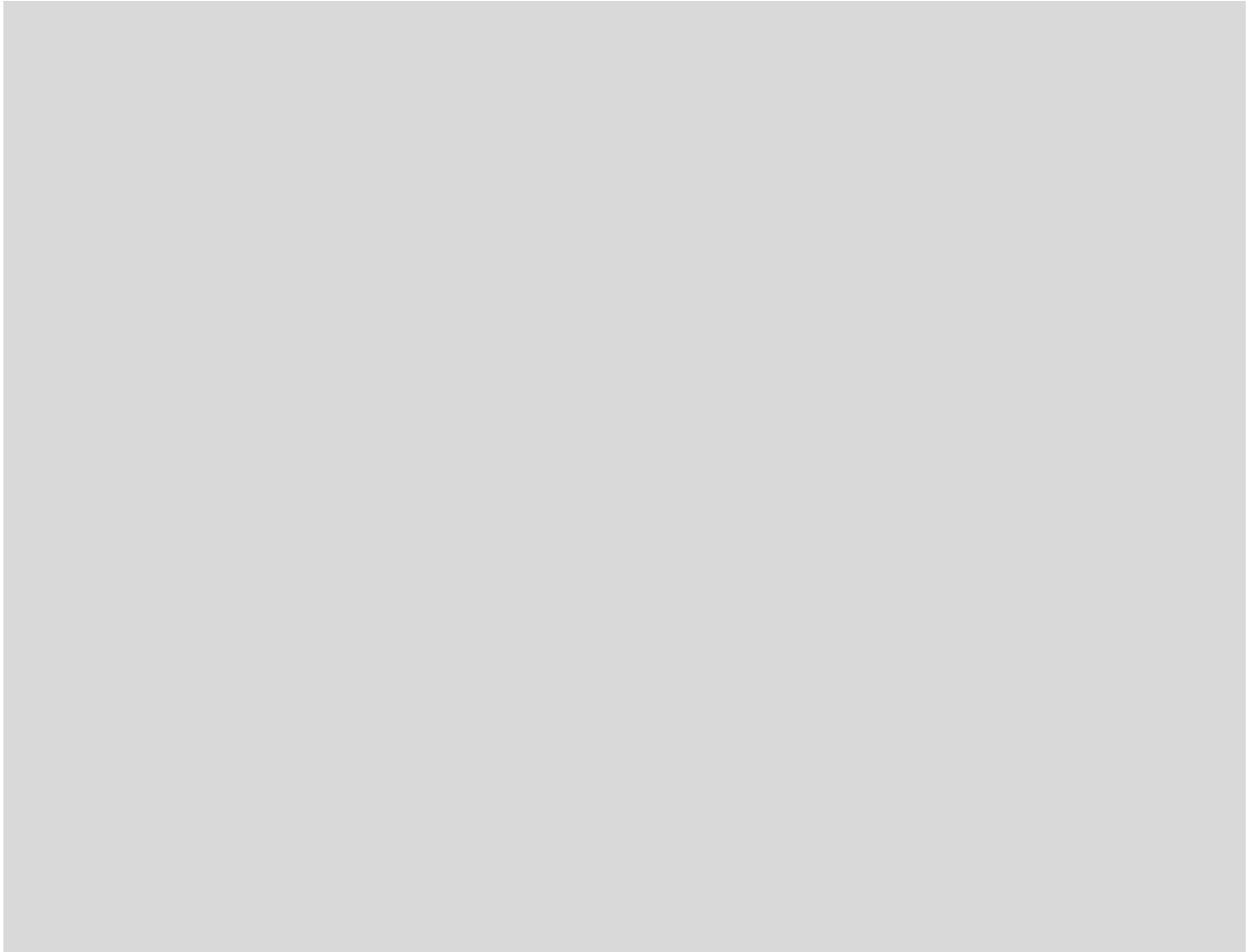
Spend a minimum of 30 minutes using the simulation. Then return and answer the questions on the next page.

Note: It is a good idea to use more than one simulation. This will help you see how gravity is presented differently by different simulations.

What did you learn about gravity from the simulation you completed? Be detailed.

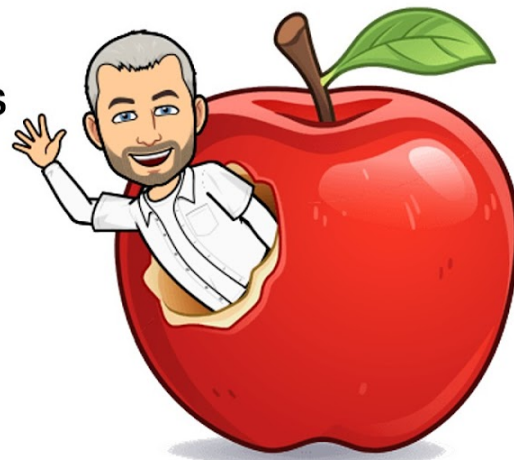


Based on what you learned, draw a picture of two objects in space. Label your diagram showing how the gravity of the objects affects each other.



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.

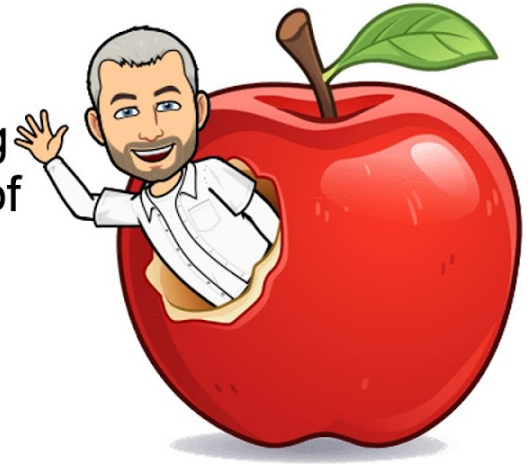
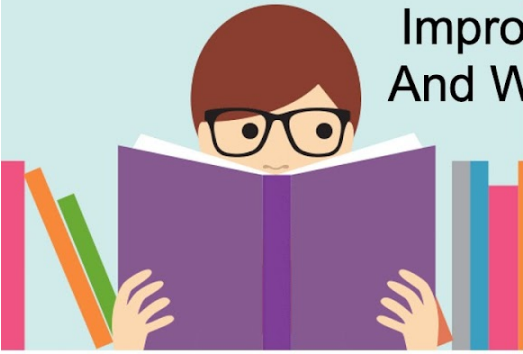
Now, Let's Connect These New Concepts To Things You Already Knew

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-law-of-gravity/>

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 explaining what gravity is and how it affects objects in the Universe.

Name: _____

Date: _____



Applying Lab

Proving That We Can Do It Ourselves



Directions: Follow the steps outlined below to create a diagram showing how gravity bends the fabric of spacetime.



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 what gravity is, and how it affects spacetime.

In the video, we learned that gravity works by creating a distortion or bend in the fabric of spacetime. Create a detailed diagram showing how this occurs. Make sure to include all of the following in your diagram:

- Diagram must be in color.
- Include at least three objects of various sizes and gravity.
- Show the relationship between mass and the size of the distortion in spacetime.
- Show how objects become trapped by the distortion created in spacetime.
- Show how objects that are moving fast enough can escape from this distortion.
- Label your diagram.



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. In the top-left corner, there is a circular logo with a cartoon man's face and the text "Handsome Science Teacher" in a pink arc. Below the logo is a rectangular image of a man holding a tablet displaying a solar system. The word "Industries" is written in blue below the image. In the center, the title "Mastery Badge Certificate" is written in large black font. Below the title, the topic "Topic: The Law of Gravity" is written in purple. Underneath, "Student Name:" is followed by a blank line. The main body of the certificate contains the text: "This certificate certifies that the person named above has completed all of the requirements to earn this Mastery Badge." At the bottom, there are two horizontal lines for signatures. The left line is labeled "MASTERY BADGE COUNSELOR SIGNATURE" and the right line is labeled "DATE AWARDED". In the bottom-right corner, there is a small circular logo with a cartoon man's face and a pink arc, similar to the top-left logo.

Handsome Science Teacher

Industries

Mastery Badge Certificate

Topic: The Law of Gravity

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