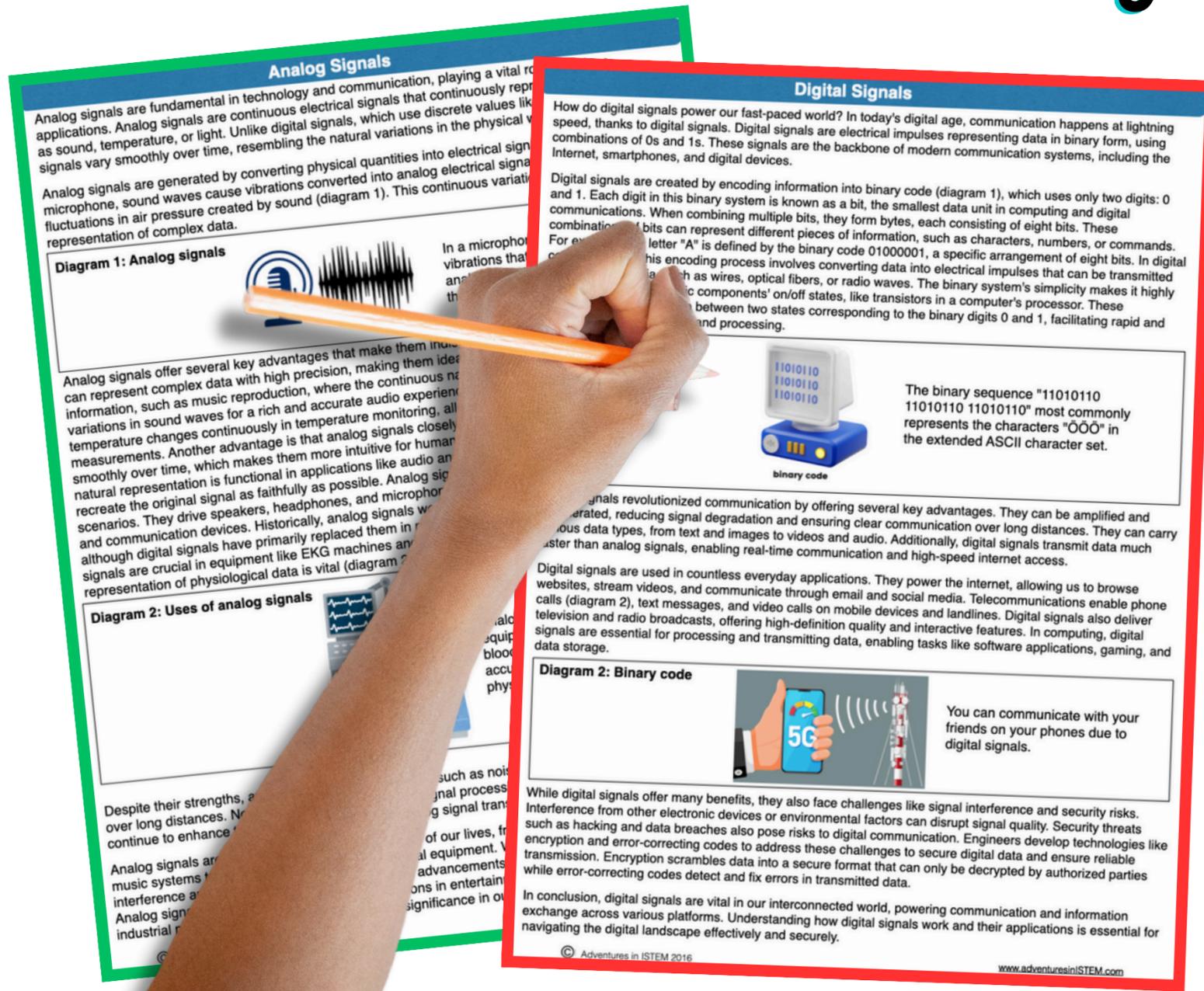


DIGITAL AND ANALOG SIGNALS

Science Reading



Scroll Through

To take a peek inside!

Help students learn about Digital and Analog Signals and test their comprehension with these easy to read science reading passages.

Why? SCIENCE READING PASSAGES?

- ✓ Increase science literacy in the classroom
- ✓ Simple passages to help students comprehend the information
- ✓ Note-taking template to help students interact with the reading
- ✓ Worksheets to review and apply their knowledge
- ✓ Reinforcement task cards to continue their understanding

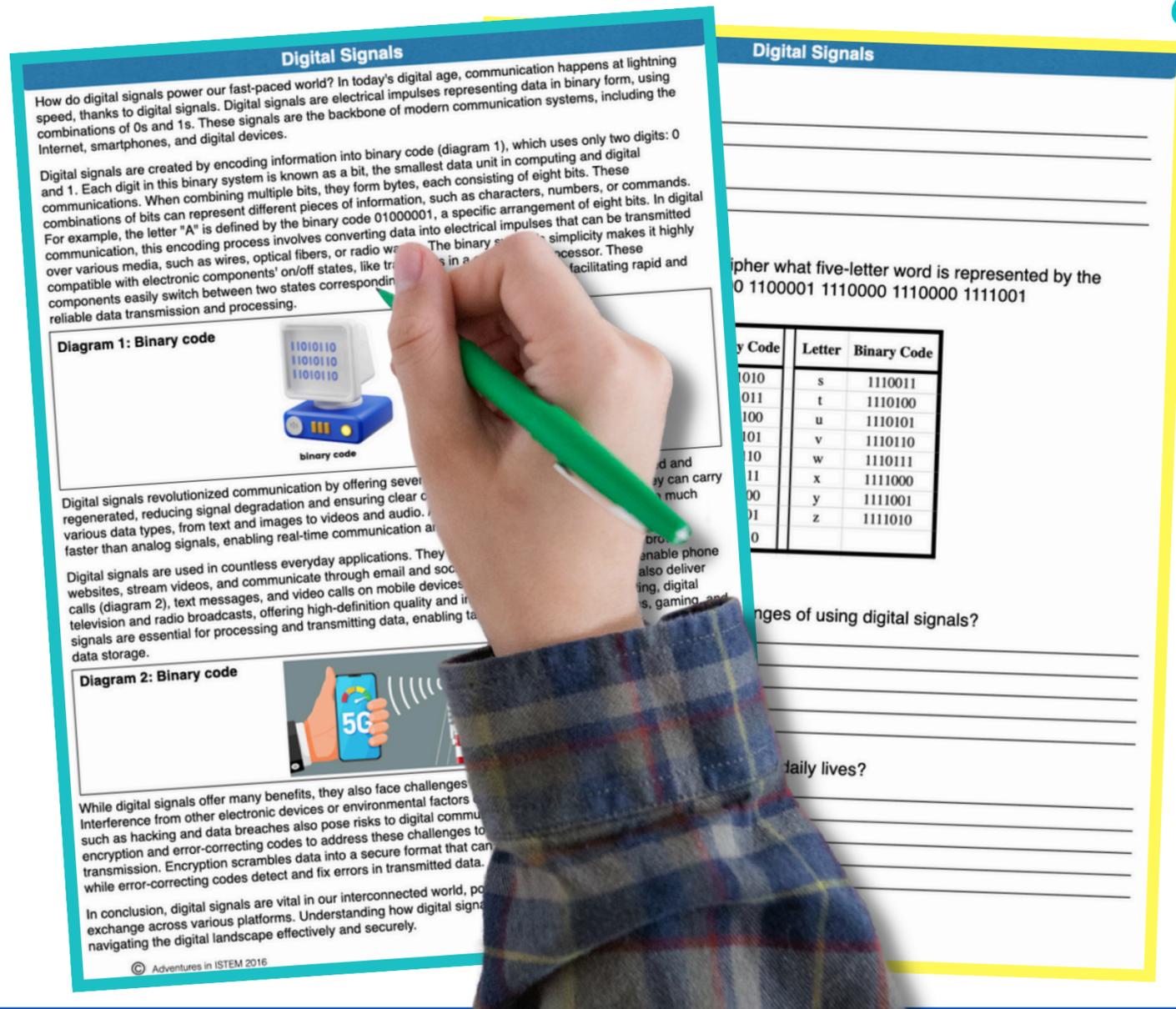


“This resource was absolutely perfect for when I was out sick with covid for multiple days. The content is exactly what I wanted to cover with my students, easy for a substitute to implement, and I was happy knowing my students’ time was being used productively!

Thank you! “- Emily

DIGITAL AND ANALOG SIGNALS

Science Reading



What Are *students* Doing?

- ✓ **Marking the text**
- ✓ **Filling in the guided note-taking template**
- ✓ **Reviewing and applying their knowledge**
- ✓ **Reinforcing their understanding**

DIGITAL AND ANALOG SIGNALS

Science Reading

Analog Signals

Define and Describe:

1. Define analog signals.
2. How do analog signals vary over time?
3. How are analog signals generated?

Identify:

4. Circle the pictures that use analog signals.



acoustic guitar clock clock thermom

Explain:

5. What are the benefits and challenges

6. How do we use digit

Analog Signals

Analog signals are fundamental in technology and communication, playing a vital role in various applications. Analog signals are continuous electrical signals that continuously represent information such as sound, temperature, or light. Unlike digital signals, which use discrete values like 0s and 1s, analog signals vary smoothly over time, resembling the natural variations in the physical world.

Analog signals are generated by converting physical quantities into electrical signals. For instance, in a microphone, sound waves cause vibrations that are converted into analog electrical signals, replicating the fluctuations in air pressure created by sound (diagram 1). This continuous variation allows for the precise representation of complex data.

Diagram 1: Uses of analog signals



In a microphone, sound waves cause vibrations that are converted into analog electrical signals, replicating the in air pressure created by sound.

Key advantages that make them indispensable in various applications. They provide data with high precision, making them ideal for tasks requiring detailed music reproduction, where the continuous nature of analog signals captures subtle changes continuously in temperature monitoring, allowing for precise and real-time data. Another advantage is that analog signals closely mimic real-world phenomena, varying over time, which makes them more intuitive for humans to understand and work with. This representation is functional in applications like audio and video transmission, where the goal is to reproduce the original signal as faithfully as possible. Analog signals find application in various everyday scenarios. They drive speakers, headphones, and microphones, delivering high-quality sound in music and communication devices. Historically, analog signals were used for broadcasting television signals, although digital signals have primarily replaced them in modern broadcasting. In medical devices, analog signals are crucial in equipment like EKG machines and blood pressure monitors, where accurate representation of physiological data is vital (diagram 2).

Diagram 2: Uses of analog signals



Analog signals are crucial in equipment like EKG machines and blood pressure monitors, where accurate representation of physiological data is vital.

Despite their strengths, analog signals face challenges such as noise interference and signal degradation over long distances. Nonetheless, advancements in signal processing and amplification technologies continue to enhance the reliability and quality of analog signal transmission.

Analog signals are indispensable in various aspects of our lives, from delivering high-quality sound in music systems to providing accurate data in medical equipment. While they face challenges like noise interference and signal degradation, technological advancements continue to improve their reliability. Analog signals help us see their needed applications in entertainment, communication, healthcare, and industrial processes, highlighting their enduring significance in our modern world.

© Adventures in ISTEM 2016
www.adventuresinistem.com

Different ways to use the science readings

- Substitute plan on days you will be out
- Introduction of the material at the beginning of the unit
- During the explain phase of the 5E model
- As part of a science station
- For reteach to reinforcing their understanding
- During the review at the end of the unit

DIGITAL AND ANALOG SIGNALS

Science Reading

Define and Describe:

1. Define digital signals. _____

2. What is binary code? _____

Identify:

3. Use the table below to decipher what five-letter word is represented by the following binary code: 1101000 1100001 1110000 1110000 1111001

Letter	Binary Code	Letter	Binary Code	Letter	Binary Code
a	1100001	j	1101010	s	1110011
b	1100010	k	1101011	t	1110100
c	1100011	l	1101100	u	1110101
d	1100100	m	1101101	v	1110110
e	1100101	n	1101110	w	1110111
f	1100110	o	1101111	x	1111000
g	1100111	p	1110000	y	1111001
h	1101000	q	1110001	z	1111010
i	1101001	r	1110010		

Explain:

5. What are the benefits and challenges of using digital signals? _____

6. How do we use digital signals in our daily lives? _____

© Adventures in STEM, LLC

Check out what teachers just like you have said about these product:



“I have incorporated these into my regular lessons and could not be more pleased. They are thorough, engaging and fun. I am very pleased with this purchase.” Rahim



“Perfect sub activities! Bought the bundle so I would have something for every unit. If there was nuclear section that would be icing on the cake! :) Maybe in the future?” Karis



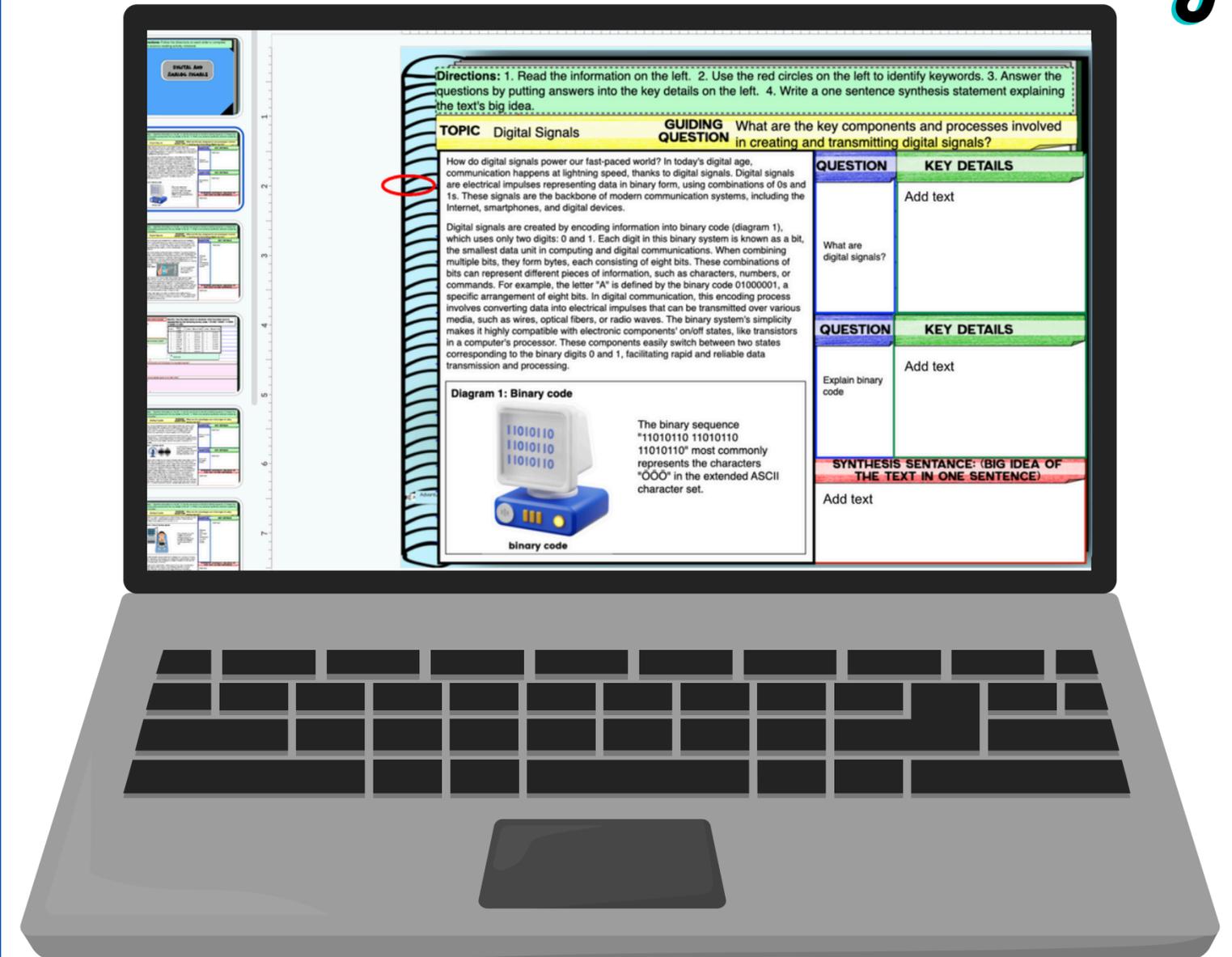
“This was a wonderful and engaging resource. My students were able to take a lot from it, and I loved how easy it was to prep it out.” – Christine

Resource *includes*

- ✓ 2 Reading Passages
- ✓ 2 Note-taking guides
- ✓ 2 Comprehension Worksheets
- ✓ 4 Task cards
- ✓ Answer key
- ✓ Digital version

DIGITAL AND ANALOG SIGNALS

Science Reading



DIGITAL AND ANALOG SIGNALS

Science Reading

Analog Signals

Define and Describe:

1. Define analog signals. _____
2. How do analog signals vary over time? _____
3. How are analog signals generated? _____

Identify:

4. Circle the pictures that use analog signals.

 acoustic guitar  clock  clock  thermom

Explain:

5. What are the benefits and challenges of using digital signals? _____

6. How do we use digital signals in our daily lives? _____

Class: _____
Date: _____
Advantages and challenges of using analog signals?
Notes

© Adventures in STEM, LLC www.adventuresinSTEM.com

Topics Included

Digital Signals

Analog Signals

HOW TO USE THE RESOURCE IN

3 simple steps

1

Print the PDF version, make copies, and hand out to students

2

Use the digital version by clicking the titles in the RED BOX to make your own copy (found at the end of the PDF)

3

Share the resource with your students using your favorite LMS (Google Classroom, Powerschool (schoolology), Canva...)

Interactive Digital Flip Book

Teachers Guide

What You Will Need To Get Started:

1. Download link for the Google Resource by clicking on the titles in the red box

Cell Energy Digital Flip Book Student

Cell Energy Digital Flip Book Teacher

2. Access to the Internet and a Google Account (Free)
3. Google accounts or Microsoft OneDrive accounts for your students to save their work
4. Open the file on your Google Drive. The link will prompt you to make a copy

5. This new copy is now yours to edit and share with your students

6. Printer access if you choose to print the finished product as an actual flip book

© Adventures in ISTEM 2015 www.adventuresinSTEM.com

Get Instant Access

1. Add this resource to your cart

Add one to cart

2. Check out securely

3. Download right away

Download

4. Use with your class

5. Leave a review on your My Purchases page to get reward points to spend on new resources!

Leave a review



Physical Science Readings

Physical Science Reading Comprehension Passages Units Covered:

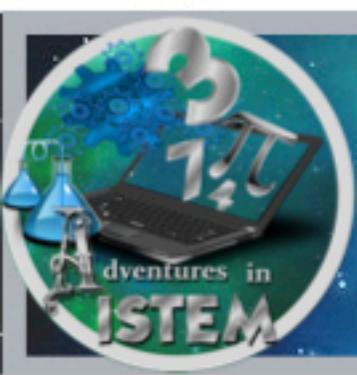
- Chemistry
- Matter
- Force
- Motion
- Energy
- Waves

I have incorporated these into my regular lessons and could not be more pleased. They are thorough, engaging and fun. I am very pleased with this purchase.- Rahim

Physical Science

The collage features several educational pages. On the left, a page titled 'Buoyancy' includes a diagram of a beach ball and text explaining buoyant force. The middle section shows a 'Friction' page with a diagram of a person pushing a cabinet and text about kinetic and static friction. On the right, a 'Radiation' page includes a diagram of a sun and text about electromagnetic waves. A yellow box with a checkmark lists 'Reading Passages', 'Notes', 'Worksheets', and 'Task Cards'. A blue arrow points to the text 'Digital and Print'.

Science Reading Comprehension Worksheets Bundle



Free Sample

You can print the following pages for a free sample of what a science reading looks like and how you could use it in your classroom. Click the title in the red box for the digital version of the reading.

What You Will Need To Get Started:

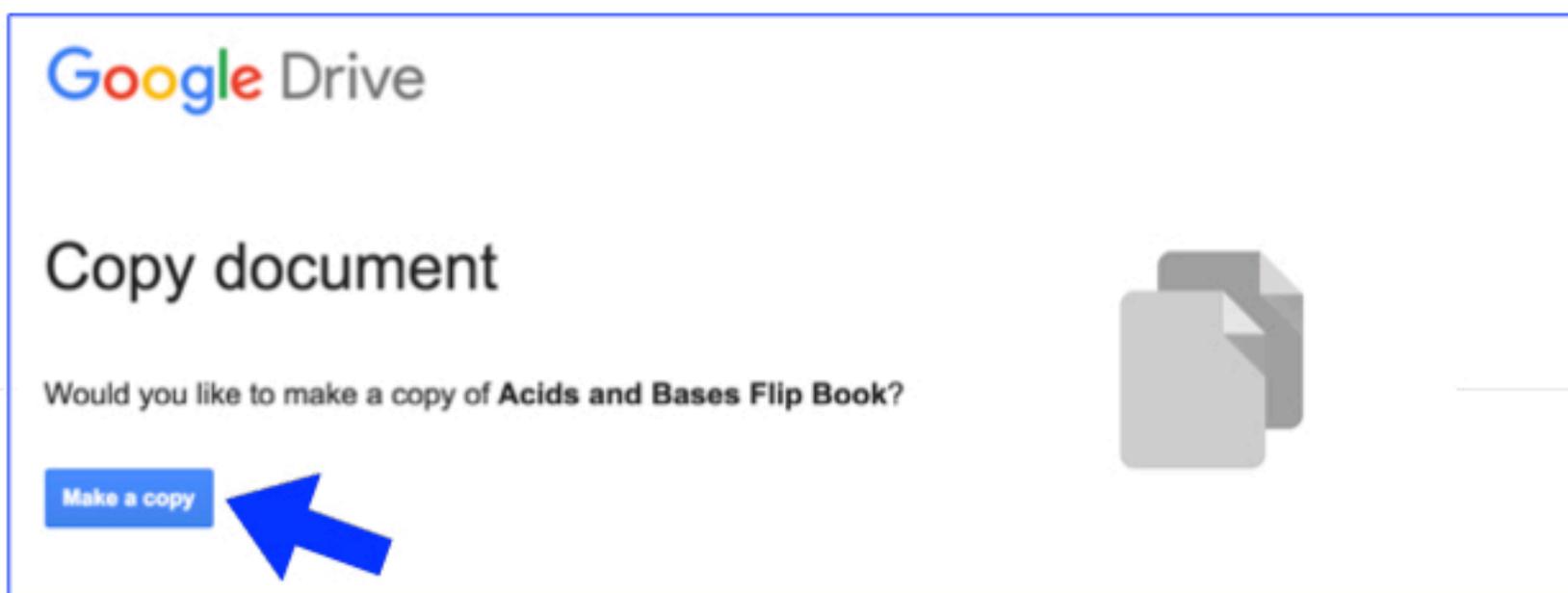
1. Download link for the Google Resource by clicking on the titles in the red box

Outer Planets Guided Reading Digital Notes

2. Access to the Internet and a Google Account (Free)

3. Google accounts or Microsoft OneDrive accounts for your students to save their work

4. Open the file on your Google Drive. The link will prompt you to make a copy



5. This new copy is now yours to edit and share with your students

6. Printer access if you choose to print the finished product as an actual flip book

Outer Planets

Big Idea Question: *Why are they called gas giants? What are some key characteristics?*

The outer solar system is made up of four gas giants. They are Jupiter, Saturn, Uranus, and Neptune. Since they are so far away from the Sun, they are able to hold onto their gas atmospheres and are made up mostly of gas but have solid rocky cores. Because they are so massive, they have a greater gravity than the terrestrial planets. They are also much colder than the terrestrial planets since they are so far away from the Sun. They also all have rings, and many planetary satellites.

Basic facts:

Jupiter: Largest planet in our solar system. Its mass is twice as much as the other seven planets combined. Now that's massive! It is made up mostly of hydrogen gas, and it is know for its massive storm—which is more like a hurricane that is the size of three Earths put together. Since it is made up of mostly gas, it is able to spin around pretty quickly. In one Earth day, Jupiter will have had three days. Now that's fast! It also has the most planetary satellites. To date, the number is at 67. It has the most gravity of all the planets.

Saturn: This planet is known for its many rings that circle it which are made of gas and ice. It is the least dense of all planets. In fact, if you put Saturn in a tub of water, it would actually float. It's amazing that something that massive could actually float. Crazy. Its atmosphere is mostly helium and hydrogen and its gravity pull could tear a comet apart if one got close enough.

Uranus: This planet does not reflect much light since it is so far from the sun. We know about it from our space probes that we sent out into space. The methane gas in its atmosphere is what gives it its greenish color. The rotation of Uranus is unique because it is so tilted it actually spins on its side. Its poles would be found in the same location as our equator, weird. This rotation causes one pole to be in complete darkness for half of its revolution. Could you imagine having night last half a year and a day lasting the other half?

Neptune: The outermost planet in the solar system. Its blue color is caused by its methane gas in its atmosphere. There is a hurricane-like storm that is the size of Earth. It has the fastest winds of any of the planets moving at more than 1,000 km/h (a high wind on Earth is considered 100km/hr).

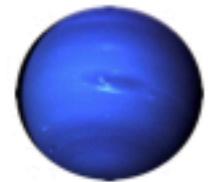
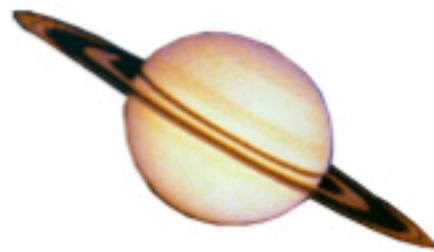
				
Distance from Sun	5 AU	9 AU	19 AU	30 AU
Rotation (day/night)	9 hours	10 hours	17 hours	16 hours
Revolution (year)	11 Earth years	29 Earth years	83 Earth years	163 Earth years
Diameter (size)	142,984 km	120,536 km	51,118 km	49,528 km
Density	1.33 g/cm ³	0.69 g/cm ³	1.27 g/cm ³	1.64 g/cm ³
Gravity	236% of Earth's	92% of Earth's	89% of Earth's	112% of Earth's
Planetary Satellites	67	62	27	14

The planet information is current as of April 2015

Outer Planets

1. Comparing the planets: Fill in the data table

	1	2	3	4
place the planets in order from closest to the Sun to furthest from the Sun				
place the planets in order from shortest day to longest day				
place the planets in order from shortest year to longest year				
place the planets in order from smallest size to largest size				
place the planets in order from least dense to most dense				
place the planets in order from least amount of planetary satellites to most amount of planetary satellites				



2. **Using Patterns:** Compare the number of planetary satellites to the diameter, location from the Sun, and the density. Which characteristic do you think has the most influence on how many planetary satellites an outer planet will have?

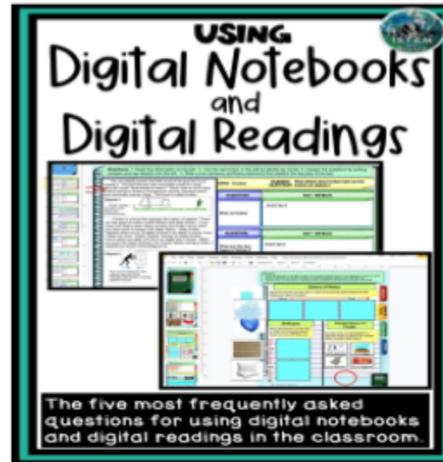
3. Why do you think the characteristic you choose in question 2 has more influence on the number of planetary satellites than the other characteristics? Explain.

4. Thinking beyond the table, what is another factor that could be influencing the number of planetary satellites the outer planets have? Explain.

Digital Resources

Using Digital Products?

If you are new to using digital lessons than I recommend to check out my blog post that contains the most frequently asked questions. Click the picture for the link.



I would also recommend checking out my Google Slide videos that demonstrate how to drag and drop pieces, write in the text boxes, add objects, and more. These are short videos that can easily be shared with students and parents. Click the picture for the link



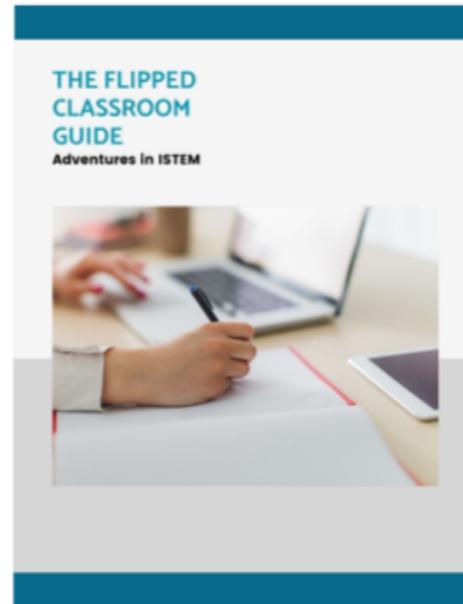
Thank You

Thank You for taking the time to visit my store and downloading one of my products. I hope you find this resource a useful tool for your classroom. I appreciate your support and look forward to your feedback.

Giving Back

Cancer affects not only the person but everyone they know. A portion of the proceeds of this product are going to the organization LLS which helps to fund treatments and find a cure.

Grab the free guides (flipped classroom guide / 5E model guide) to help empower students and then receive weekly tips, strategies, ideas, and freebies delivered right to your inbox.



Grab the FREE guides



Terms of Use

The purchase of this resource entitles the purchaser to share with students, print, photocopy for single classroom and personal use only and may not be put on the internet, sold, or distributed in any form. If you would like to share this with your colleagues, please purchase multiple licenses from the product page on Teachers Pay Teachers.

Copying any part of the product and / or placing it on the internet in an unsecured platform (school sharing site, school website, personal website...) is strictly forbidden and is a violation of the Digital Millennium Copyright Act (DMCA)

Special Thanks

