

# EVIDENCE OF EVOLUTION

## Science Reading

# Scroll Through

## To take a peek inside!

Help students learn about the various evidences of evolution and test their comprehension with these easy to read science reading passages.

**Embryology**

Embryology studies how organisms develop from fertilized eggs to fully formed individuals. It provides valuable insights into evolutionary relationships by examining the early stages of growth and development. Understanding embryology helps us learn about evolution and how different species are related.

Embryo development starts with fertilization, where a sperm cell joins an egg cell. The resulting zygote contains the genetic instructions for the entire organism. These cells multiply and divide, forming a ball of cells known as the embryo. As development progresses, organs like the heart, brain, and lungs form. The process is guided by genetic signals and environmental factors.

Embryology provides crucial insights into evolutionary relationships by examining the early stages of development. Similarities in early development among different species, such as the presence of a notochord in vertebrates, suggest a shared evolutionary ancestry. These similarities are often referred to as embryonic homologies. Additionally, the study of embryology has revealed that diverse species may have evolved from common ancestors. Embryonic development highlights evolutionary adaptations, as species develop characteristics tailored to their specific environments. For example, the presence of gill slits in the embryos of aquatic and terrestrial animals suggests a link between aquatic and terrestrial evolutionary patterns, revealing how organisms have adapted and diversified over time.

Embryology has several applications in science. It informs us about the development of various species, including humans. By studying embryonic development, scientists can identify genetic defects and understand the causes of developmental disorders. Additionally, embryology is used in the study of evolution, providing valuable insights into the relationships between different species and how they have evolved over time.

Embryology is a fascinating field of science that helps us understand the processes of life and evolution. It provides a detailed picture of the evolutionary process that shapes the diversity of life on Earth.

	Calf	Chicken	Fish	Human
Stage 1				
Stage 2				
Stage 3				

**Fossils**

Fossils are like Earth's time capsules, preserving the remains or traces of ancient plants, animals, and other organisms. They give us valuable insights into life forms that existed long before humans, helping scientists reconstruct Earth's history. Fossil evidence supports evolution, the process by which different kinds of living organisms develop and diversify from earlier forms.

Fossils form through a process called fossilization (diagram 1). When an organism dies, its remains may be buried in mud, sand, or volcanic ash. Over time, more sediment layers pile on top, pressing down on the remains. Minerals from the sediment seep into the organic material, gradually turning it into rock, a process that can take thousands or even millions of years.

There are several types of fossils (diagram 2). Body fossils are the preserved physical parts of an organism, such as bones, teeth, shells, or even impressions of skin or feathers. These give us direct evidence of what ancient creatures looked like. Trace fossils are signs left behind by ancient life, such as tracks, burrows, nests, and even droppings. These provide clues about the behavior and movement of organisms. Petrified fossils occur when organic material in the remains gets replaced by minerals, turning the remains into stone-like structures and preserving intricate details of plants and animals. Mold and cast fossils are formed when the complex parts of an organism leave an impression in sediment that hardens over time. The mold is the impression, while the cast is created if the mold gets filled with other hardened materials. Amber fossils occur when organisms, usually insects, become trapped in tree resin that hardens into amber. These fossils can preserve incredibly detailed and delicate features.

Fossils are crucial for understanding Earth's past and the process of evolution. They help scientists study changes in life forms over time, reconstruct ancient ecosystems, and identify extinct species. For instance, fossils show how whales evolved from land-dwelling mammals to the ocean giants we know today. They also provide climate clues, such as finding palm tree fossils in regions where they no longer grow, indicating a warmer climate in the past. Additionally, fossils reveal information about mass extinctions and how life diversified afterward.

Fossils are like Earth's history books, helping us piece together the story of life from ancient times to the present. By studying fossils, scientists can understand how organisms have changed and how new species have emerged. This gives us a clear picture of how life has evolved and continues to change.

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# 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

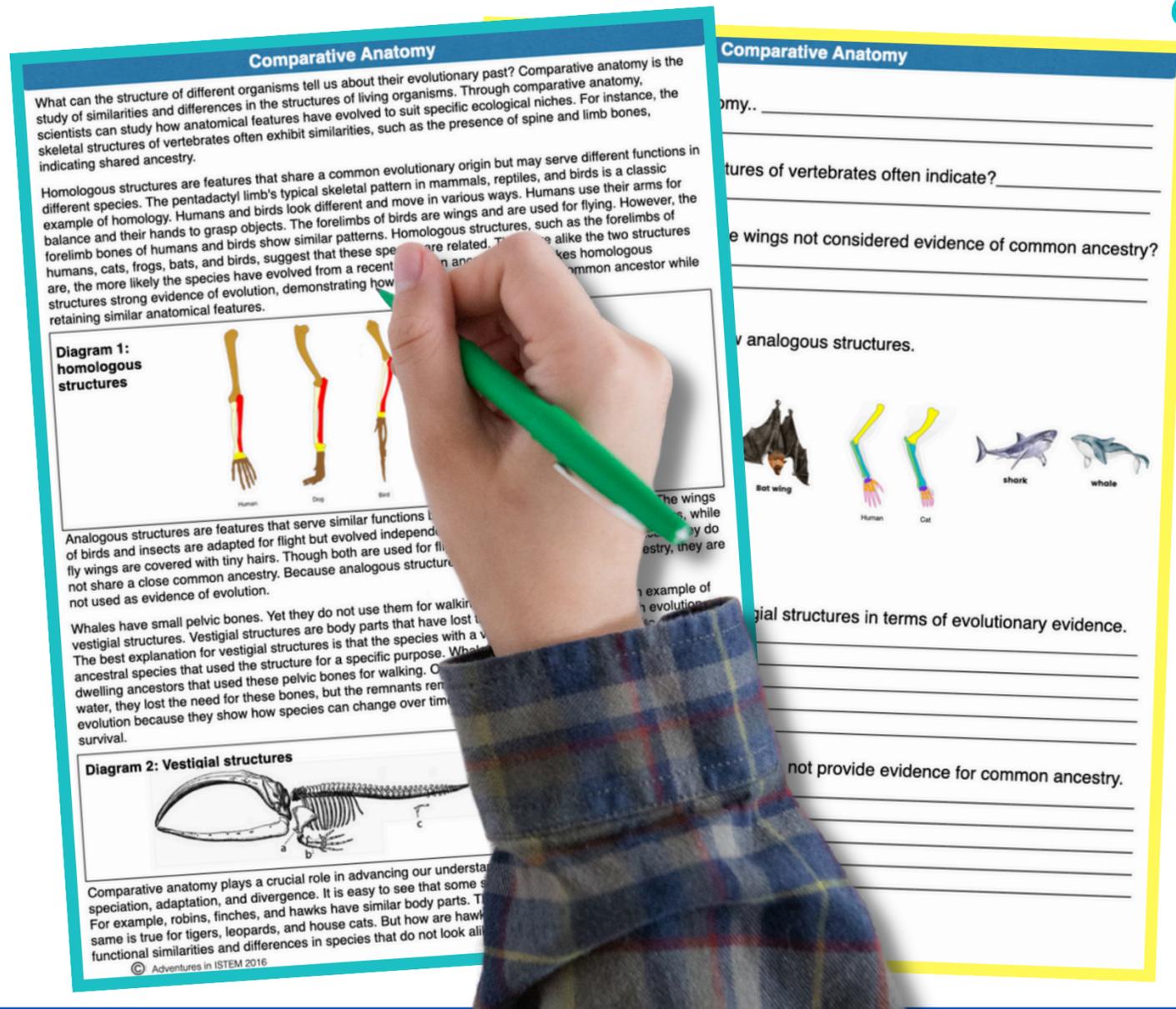


“This resource was absolutely perfect for when I was out sick with covid for multiple days. The content is exactly what I wanted to cover with my students, easy for a substitute to implement, and I was happy knowing my students’ time was being used productively!

Thank you! “- Emily

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## Science Reading



# What Are *students* Doing?

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

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## Science Reading

**Embryology**

**Define and Describe:**

1. Define embryology.
2. Describe the process that starts embryo development.
3. What do vertebrate embryos often exhibit during early development?

**Identify:**

Use the diagram to answer the questions

	Chicken	Fish
Stage 1		
Stage 2		
Stage 3		

3. Which organism(s) is most closely related to the chicken based on its early development?

4. Compare the embryonic development of the chicken and fish. What links do you see?

**Explain:**

5. How do the similarities in early development support the theory of evolution?

**Embryology**

Embryology studies how organisms develop from fertilized eggs to fully formed individuals. It explores the processes that shape life, from the earliest stages of growth to the emergence of complex structures. Understanding embryology helps us learn about evolution and how different species are related.

Embryo development starts with fertilization, where a sperm cell joins an egg cell to form a zygote. This single cell contains the genetic instructions for the entire organism. The zygote then undergoes rapid cell division, forming a ball of cells known as the embryo. These cells multiply and differentiate into various tissues and organs. As development progresses, organs like the heart, brain, and limbs start to take shape. This process is influenced by genetic signals and environmental factors.

Studying embryos provides crucial insights into evolutionary relationships by examining the development stages of different species. Similarities in early development among different species suggest a common ancestor. For example, vertebrate embryos that often exhibit comparable features such as gill slits or tail-like structures. These characteristics reflect a shared evolutionary history and indicate that these species evolved from common ancestors. Additionally, variations in embryonic development reveal evolutionary adaptations, as species with different lifestyles exhibit distinct features. For example, pharyngeal pouches in fish embryos suggest a link between aquatic and terrestrial life. Studying embryos helps trace the evolutionary process that shapes the diversity of life we see today.

**Embryo Similarities**

	Calf	Chicken	Fish	Human	Pig	Salamander
Stage 1						
Stage 2						
Stage 3						

Embryology has several important applications in science. It informs medical research, aiding in understanding human development and potential birth defects. By studying embryos of endangered species, scientists can devise conservation and habitat preservation strategies. Additionally, embryology contributes to understanding evolutionary mechanisms, including speciation and adaptation.

Embryology is a field that unveils the interconnectedness of life and provides a window into evolutionary processes. It bridges the past with the present, offering valuable insights for medical, conservation, and evolutionary studies. By exploring how organisms develop and change from embryos to adults, we can better understand the story of life on Earth and how it continues to evolve.

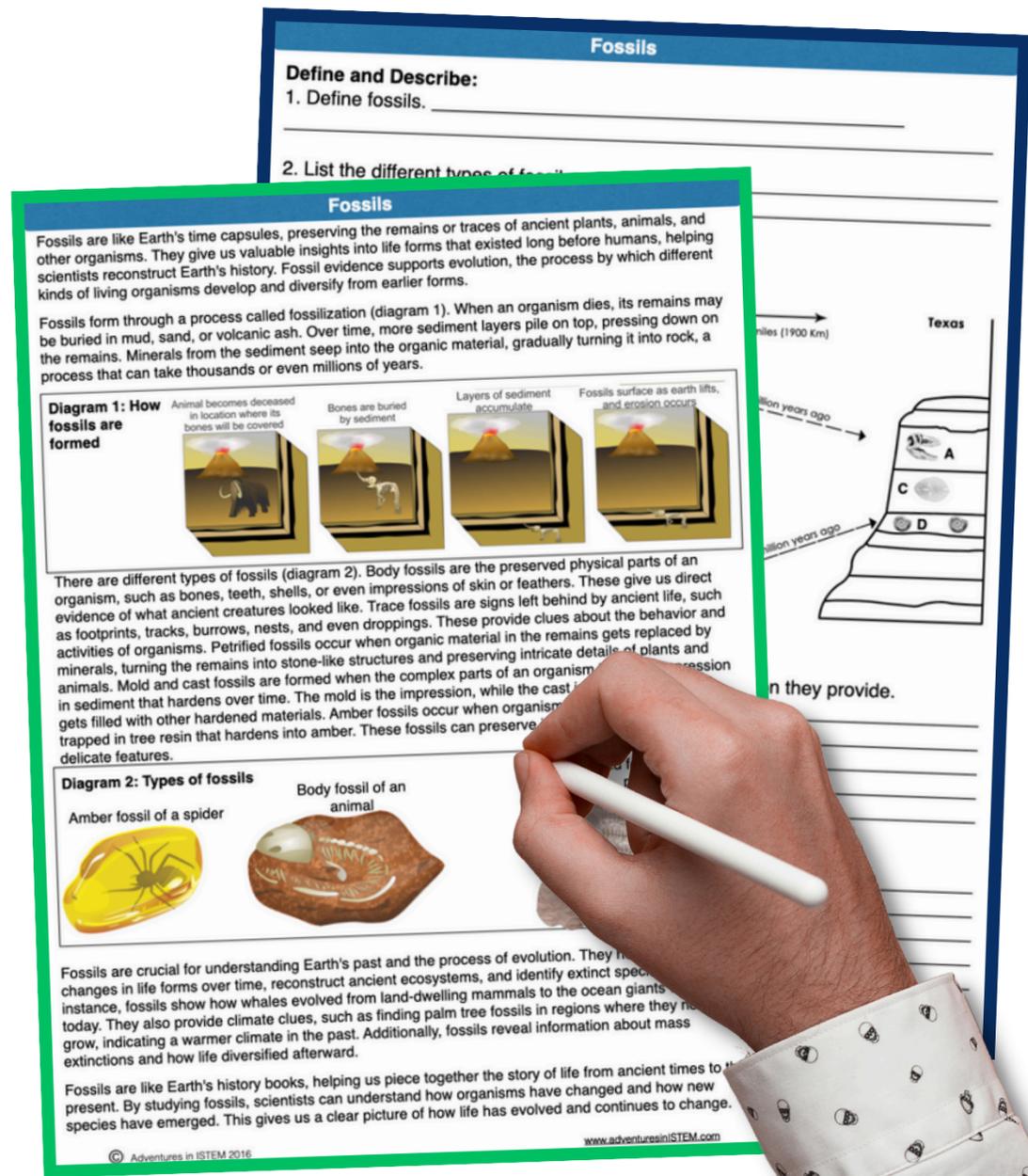
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## Different ways to use the science readings

- 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

# EVIDENCE OF EVOLUTION

## Science Reading



# 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



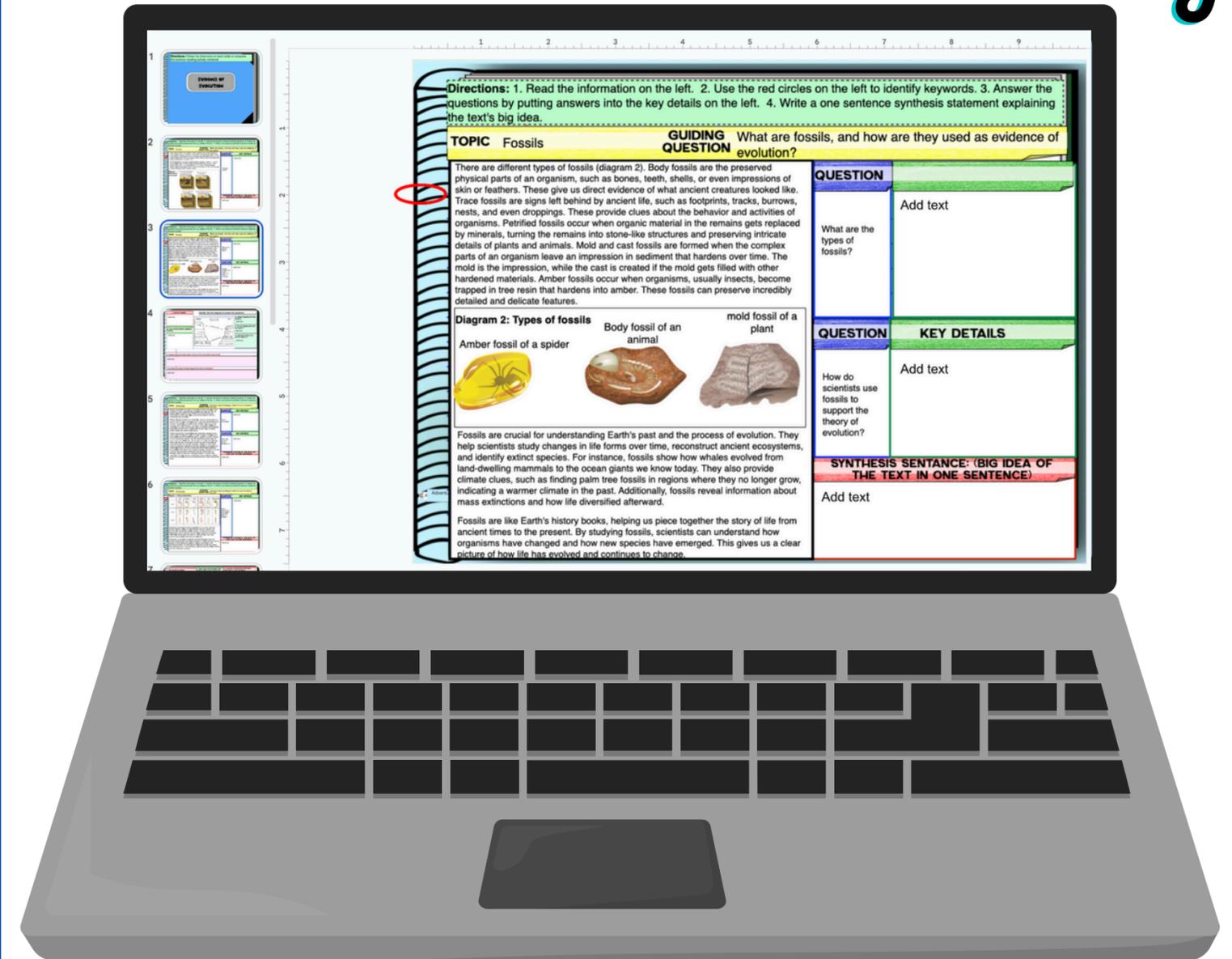
“This was a wonderful and engaging resource. My students were able to take a lot from it, and I loved how easy it was to prep it out.” – Christine

# Resource *includes*

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

# EVIDENCE OF EVOLUTION

## Science Reading



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## Science Reading

**Comparative Anatomy**

What can the structure of different organisms tell us about their evolutionary past? Comparative anatomy is the study of similarities and differences in the structures of living organisms. Through comparative anatomy, scientists can study how anatomical features have evolved to suit specific ecological niches. For instance, the skeletal structures of vertebrates often exhibit similarities, such as the presence of spine and limb bones, indicating shared ancestry.

Homologous structures are features that share a common evolutionary origin but may serve different functions in different species. The pentadactyl limb's typical skeletal pattern in mammals, reptiles, and birds is a classic example of homology. Humans and birds look different and move in various ways. Humans use their arms for balance and their hands to grasp objects. The forelimbs of birds are wings and are used for flying. However, the forelimb bones of humans and birds show similar patterns. Homologous structures, such as the forelimbs of humans, cats, frogs, bats, and birds, suggest that these species share a common ancestor. The more alike the two structures are, the more likely the species have evolved from a recent common ancestor while retaining similar anatomical features.

**Diagram 1: homologous structures**



Analogous structures are features that serve similar functions but evolved independently. The wings of birds and insects are adapted for flight but evolved independently. Bird wings are covered with tiny hairs. Though both are used for flying, they do not share a close common ancestry. Because analogous structures do not share a close common ancestry, they are not used as evidence of evolution.

Whales have small pelvic bones. Yet they do not use them for walking. Vestigial structures are body parts that have lost their original function. The best explanation for vestigial structures is that the species with a vestigial structure inherited it from an ancestral species that used the structure for a specific purpose. Whales' ancestors that used these pelvic bones for walking. Once they became aquatic, they lost the need for these bones, but the remnants remained. This is an example of evolution because they show how species can change over time for survival.

**Diagram 2: Vestigial structures**



Comparative anatomy plays a crucial role in advancing our understanding of speciation, adaptation, and divergence. It is easy to see that some species have similar body parts. For example, robins, finches, and hawks have similar body parts. The same is true for tigers, leopards, and house cats. But how are hawks and cats related? Comparative anatomy studies functional similarities and differences in species that do not look alike.

Class: \_\_\_\_\_  
Date: \_\_\_\_\_

Study of embryology, and how is it used as evidence of evolution?

Notes

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## Topics Included

**Fossils**

**Embryology**

**Comparative Anatomy**

# 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

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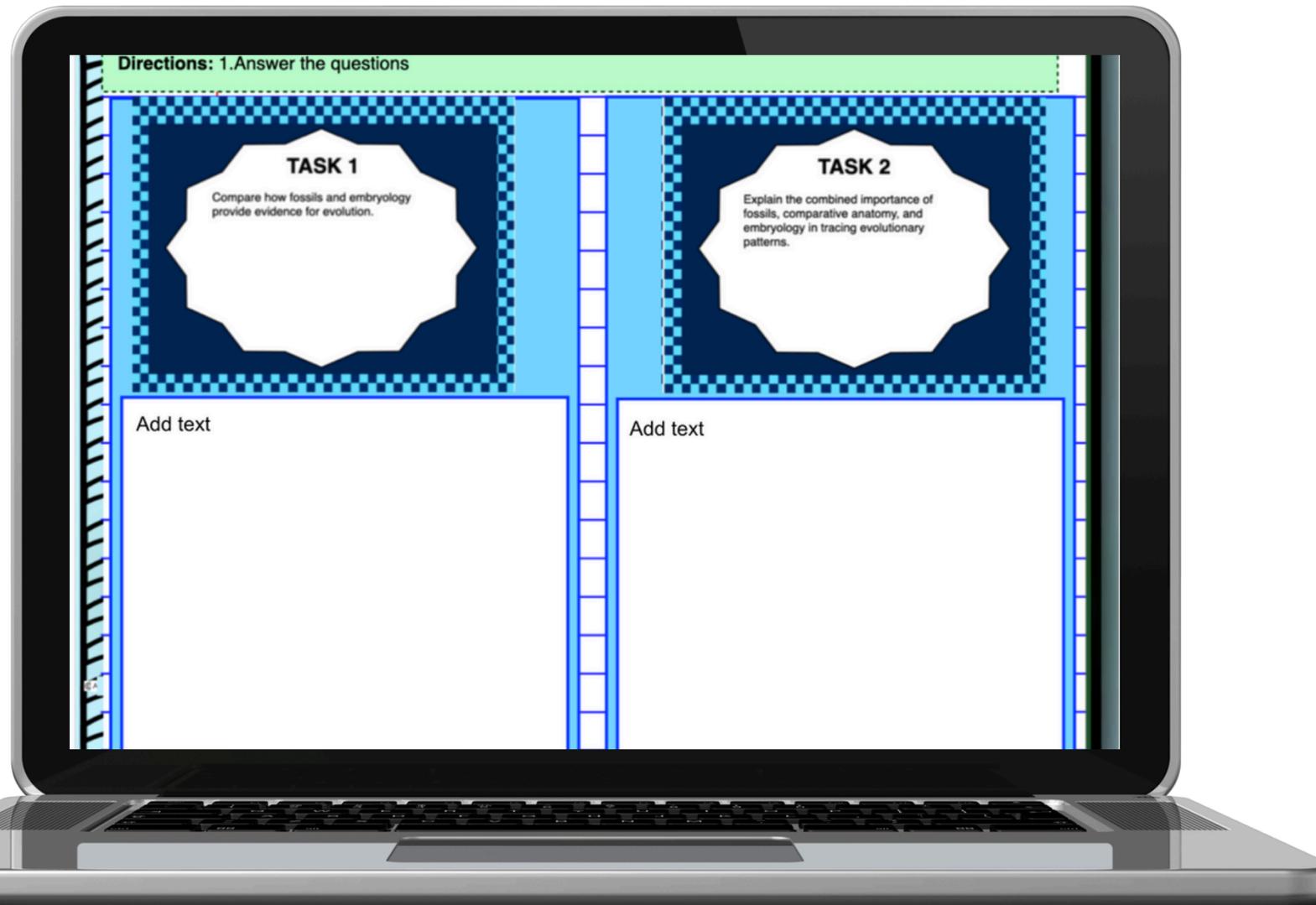
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# Life Science Bundle

## Units

- ✓ Cells
- ✓ Genetics
- ✓ Evolution
- ✓ Ecosystems

### Life Science

**Big Idea Question:** How can Punnett squares be used to predict the probable outcomes of offspring?

**Diagram 1:** When mice reproduce, there is a 50% chance of having a boy and a 50% chance of having a girl. Mice are known to have six to eight babies per litter and can have multiple litters in a year. Each time they have a baby, there is a 50% chance of having a boy and a 50% chance of having a girl. This does not mean that if they have six babies that will be boys and five girls and that will be girls. They could have five boys and one girl or five girls and one boy. The more babies they have, the closer the actual results will be to the predicted outcome. You can predict the possible results of two parents by using a tool called a Punnett Square.

**Diagram 2:** A Punnett square is a tool that can show possible allele combinations of a genetic trait. A cross of a brown (BB) mouse with a white (bb) mouse will result in 100% brown offspring (Bb). A cross of two brown (Bb) mice will result in 75% brown (BB or Bb) and 25% white (bb) offspring.

**Labels:** Digital and Print

- ✓ Reading Passages
- ✓ Notes
- ✓ Worksheets
- ✓ Task Cards

Science Reading Comprehension questions and Worksheets

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### Basic Types of Cells

**Big Idea Question:** What is the difference between prokaryotes and eukaryotes?

**Diagram 1:** Cells are the basic unit of living things. There are many different types of cells: blood cells, nerve cells, plant cells, bacteria, animal cells, just to name a few (diagram 1). All of the cells, however, fall into two main categories: prokaryote and eukaryote.

**Diagram 2:** Prokaryotes are the simplest and oldest of cells. The name prokaryote means no nucleus. Pro=before and kary=nucleus, so prokaryote means before nucleus. Even though they don't have a nucleus, they do have circular DNA, the genetic material that holds the blueprints for making more cells. Prokaryotes also have cell walls to protect them, ribosomes, and cytoplasm (diagram 2). Prokaryotic organisms are single-celled and extremely small. Examples of prokaryotes are bacteria and archaea.

**Diagram 3:** Eukaryotes are larger and more complex than prokaryotes. They have a nucleus that protects their DNA. In fact, the name eukaryote means after nucleus. Unlike prokaryotes, which have circular DNA, eukaryotes have linear DNA. Eukaryotes also have cell walls. However, eukaryotes also have organelles that perform specific functions. Examples of eukaryotes are plants, animals, and fungi.

### Fossils

Fossils are like Earth's time capsules, preserving the remains or traces of ancient plants, animals, and other organisms. They give us valuable insights into life forms that existed long before humans, helping scientists reconstruct Earth's history. Fossil evidence supports evolution, the process by which different kinds of living organisms develop and diversify from earlier forms.

Fossils form through a process called fossilization (diagram 1). When an organism dies, its remains may be buried in mud, sand, or volcanic ash. Over time, more sediment layers pile on top, pressing down on the remains. Minerals from the sediment seep into the organic material, gradually turning it into rock, a process that can take thousands or even millions of years.

**Diagram 1: How fossils are formed**

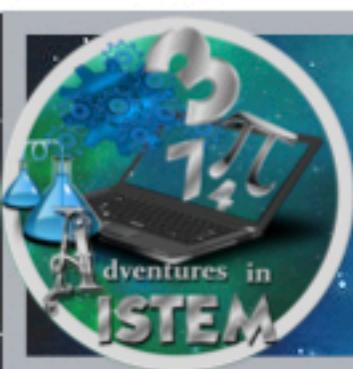
There are different types of fossils (diagram 2). Body fossils are the preserved physical parts of an organism, such as bones, teeth, shells, or even impressions of skin or feathers. These give us direct evidence of what ancient creatures looked like. Trace fossils are signs left behind by the behavior and activities of organisms. Petrified fossils occur when organic material in the remains gets replaced by minerals, turning the remains into stone-like structures and preserving intricate details of plants and animals. Mold and cast fossils are formed when the complex parts of an organism leave an impression in the surrounding material. Amber fossils occur when organisms are trapped in tree resin that hardens into amber. These fossils can preserve incredibly detailed and accurate features.

**Diagram 2: Types of fossils**

They help scientists study extinct species. For example, fossils of ocean giants we know no longer exist tell us about mass extinctions. From ancient times to the present, the Earth continues to change.

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“Our biology teacher and I share a lot of the same students this semester, so finding reading activities I can sprinkle into my English classes is a blessing! We discuss the passages together as a class and talk through any confusion students may have on the science concepts, as well as discussing the writing elements of the passage. Highly recommend!- Laura”



# 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:

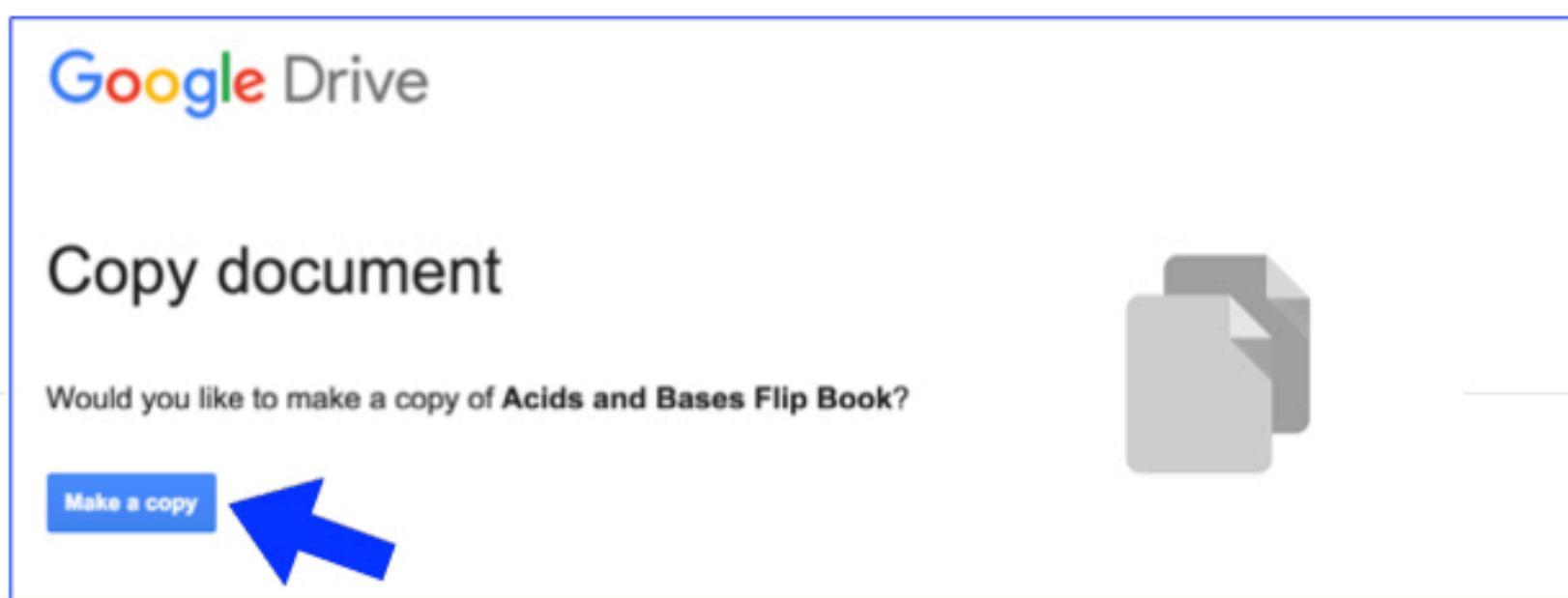
1. Download link for the Google Resource by clicking on the titles in the red box

### **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).

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

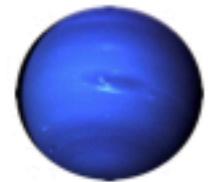
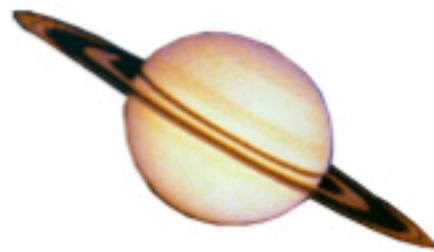
The planet information is current as of April 2015



# 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?

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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.

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

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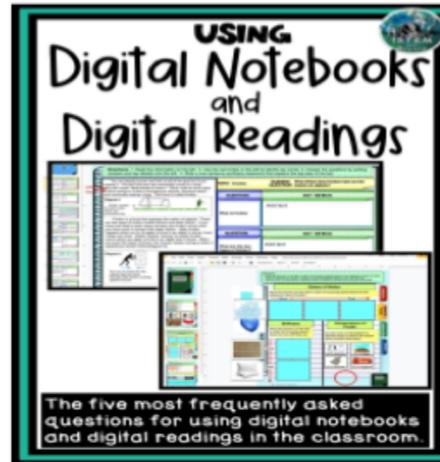
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## Digital Resources

### 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



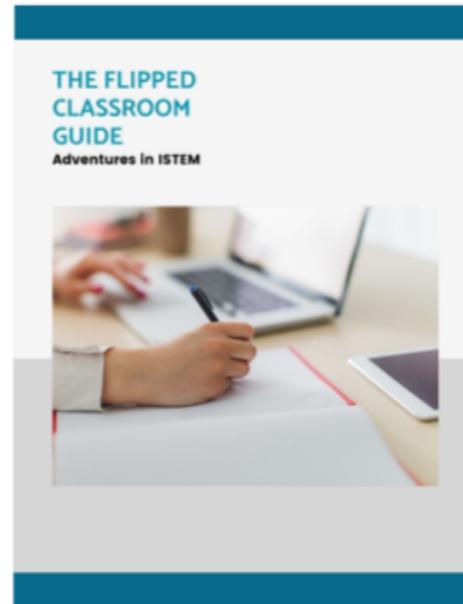
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