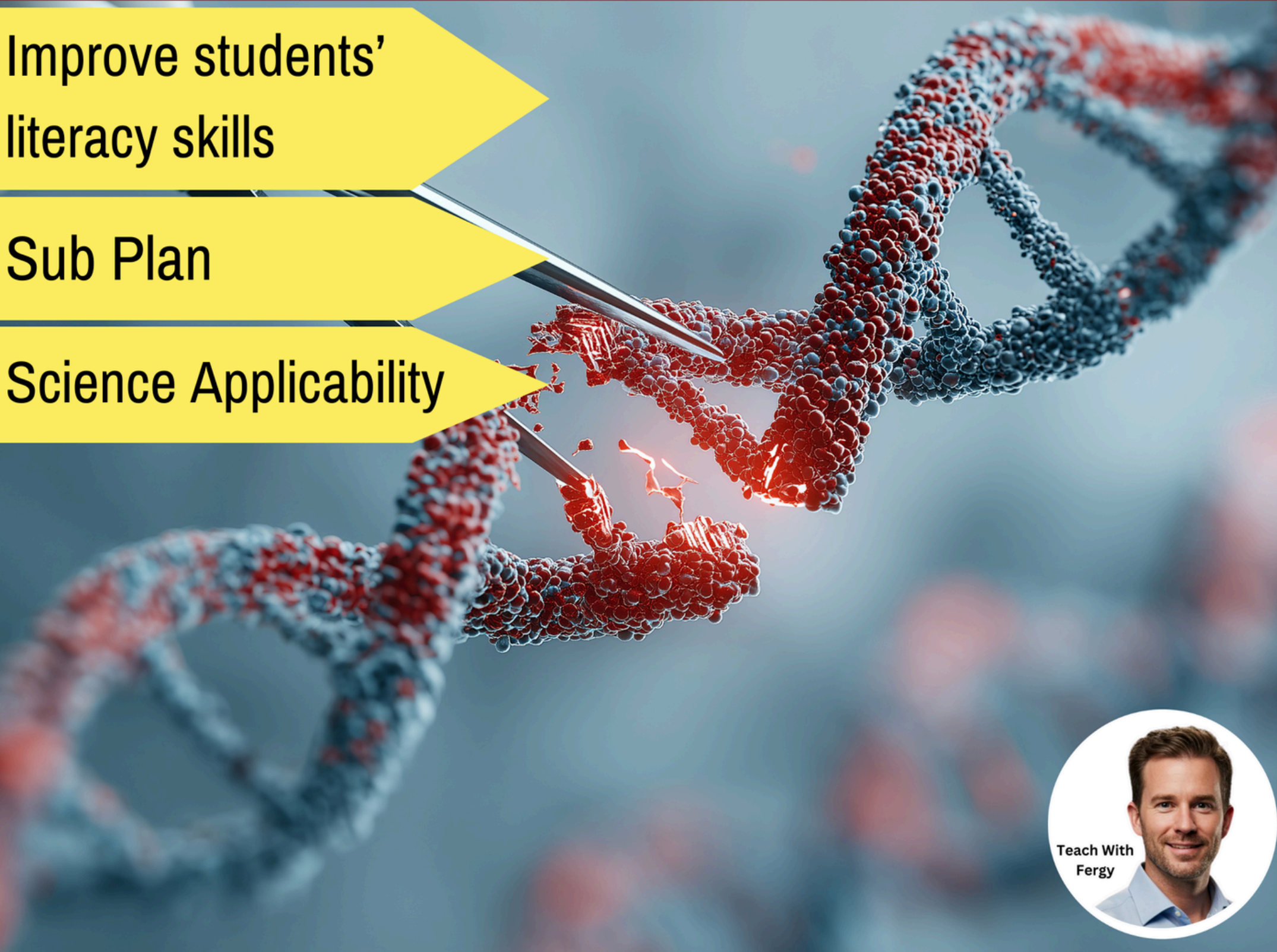


# CRISPR GENE EDITING: CHANGING DNA TO HELP PEOPLE 6TH, 7TH, 8TH GRADE READING

Improve students'  
literacy skills

Sub Plan

Science Applicability



## Reading Comment



★★★★★ Extremely satisfied - Great resource to work on student reading comprehension and it tied into the topic I was teaching. My students have been struggling with reading and I've been incorporating more reading into my lessons. Thank you for the resource.



**SCROLL**  
to take a look inside!

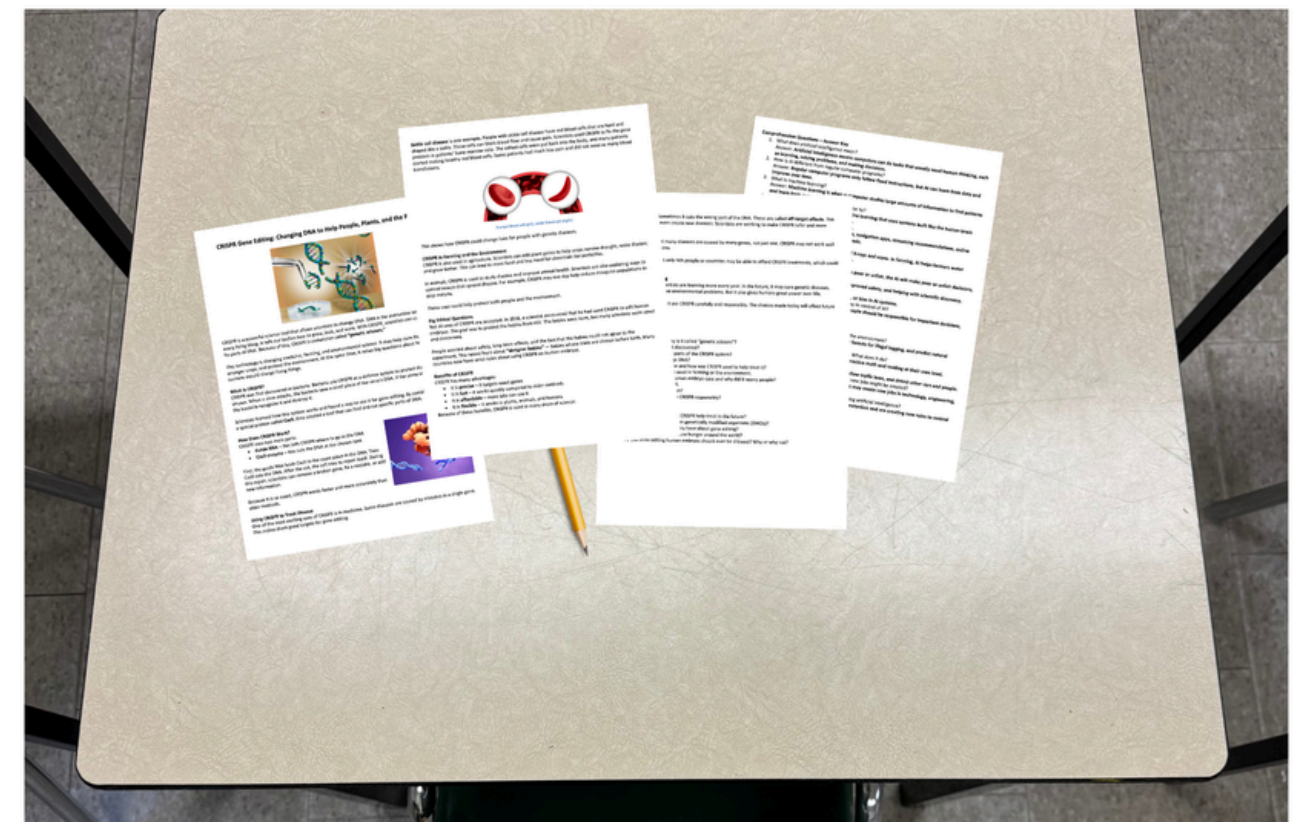


# THE PROBLEMS YOU FACE

- Limited time to teach scientific literacy and strengthen students' reading and analysis skills.
- Need meaningful extension activities to engage fast-moving learners.
- Difficulty creating effective last-minute sub plans that still support student learning.

## NO-PREP - PRINT/UPLOAD

- Questions and Answer Key
- **No Prep, Ready-to-Use:** Print or assign digitally with Google Docs, Microsoft Word, and PDF formats for flexible classroom use
- **Includes Varied Question Types:** Knowledge, thinking, connecting, application, and open-ended questions.



# What Will Your Students Learn?

## READING COMPREHENSION ARTICLE & QUESTIONS

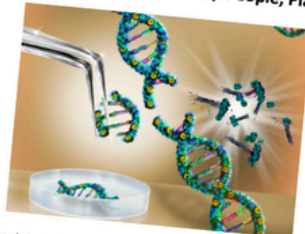
### Comprehension Questions

1. What is CRISPR and why is it called "genetic scissors"?
2. Where was CRISPR first discovered?
3. What are the two main parts of the CRISPR system?
4. How does CRISPR work?
5. What are the benefits of CRISPR?
6. Name one risk of CRISPR.
7. What are the ethical questions surrounding CRISPR?
8. List three applications of CRISPR.
9. What is the future of CRISPR?
10. Why is CRISPR important?

### Extension Questions

1. What are the ethical questions surrounding CRISPR?
2. How can we ensure that CRISPR is used responsibly?
3. What are the potential risks of CRISPR?
4. How can we address the ethical concerns of CRISPR?
5. Do you think CRISPR will be used in the future? Why or why not?

### CRISPR Gene Editing: Changing DNA to Help People, Plants, and the Planet



CRISPR is a powerful science tool that allows scientists to change DNA. DNA is the instruction book inside every living thing. It tells our bodies how to grow, look, and work. With CRISPR, scientists can cut, remove, or fix parts of DNA. Because of this, CRISPR is sometimes called "genetic scissors."

This technology is changing medicine, farming, and environmental science. It may help cure diseases, grow stronger crops, and protect the environment. At the same time, it raises big questions about how much humans should change living things.

**What Is CRISPR?**  
CRISPR was first discovered in bacteria. Bacteria use CRISPR as a defense system to protect themselves from viruses. When a virus attacks, the bacteria save a small piece of the virus's DNA. If the same virus comes back, the bacteria recognize it and destroy it.

Scientists learned how this system works and found a way to use it for gene editing. By combining CRISPR with a special protein called Cas9, they created a tool that can find and cut specific parts of DNA.

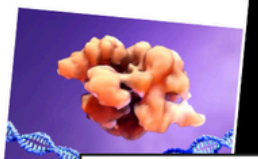
**How Does CRISPR Work?**  
CRISPR uses two main parts:

- **Guide RNA** – this tells CRISPR where to go in the DNA
- **Cas9 enzyme** – this cuts the DNA at the chosen spot

First, the guide RNA leads Cas9 to the exact place in the DNA. Then Cas9 cuts the DNA. After the cut, the cell tries to repair itself. During this repair, scientists can remove a broken gene, fix a mistake, or add new information.

Because it is so exact, CRISPR works faster and more accurately than older methods of gene editing.

**Using CRISPR**  
One of the first uses of CRISPR was to edit the DNA of a banana to make it last longer.



### Google Access

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Article with  
Comprehension  
Questions

6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup> Grade

Print & Digital

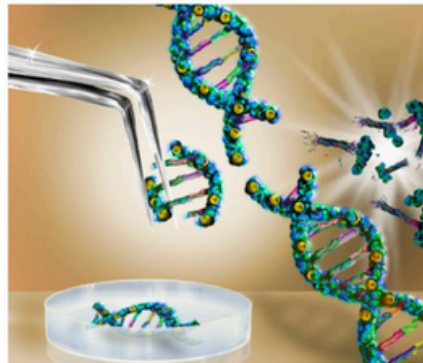
- What Is CRISPR?
- How CRISPR Works (Guide RNA & Cas9)
- DNA and Gene Editing Basics
- CRISPR in Medicine (Sickle Cell Case Study)
- CRISPR in Farming and the Environment
- Benefits of CRISPR Technology
- Risks and Limitations
- Ethical Questions and Responsibility
- The Future of Gene Editing

PDF



# Your Reading

## CRISPR Gene Editing: Changing DNA to Help People, Plants, and the Planet



CRISPR is a powerful science tool that allows scientists to change DNA. It can be used to edit the DNA of every living thing. It tells our bodies how to grow, look, and work. With CRISPR, scientists can fix parts of DNA. Because of this, CRISPR is sometimes called “genetic scissors.”

This technology is changing medicine, farming, and environmental science. It can help create stronger crops, and protect the environment. At the same time, it raises questions about whether humans should change living things.

### What Is CRISPR?

CRISPR was first discovered in bacteria. Bacteria use CRISPR as a defense against viruses. When a virus attacks, the bacteria save a small piece of the virus’ DNA. Later, the bacteria recognize it and destroy it.

Scientists learned how this system works and found a way to use it for gene editing. They used a special protein called **Cas9**, they created a tool that can find and cut specific parts of DNA.

### How Does CRISPR Work?

CRISPR uses two main parts:

- **Guide RNA** – this tells CRISPR where to go in the DNA
- **Cas9 enzyme** – this cuts the DNA at the chosen spot

First, the guide RNA leads Cas9 to the exact place in the DNA. Then Cas9 cuts the DNA. After the cut, the cell tries to repair itself. During this repair, scientists can remove a broken gene, fix a mistake, or add new information.

Because it is so exact, CRISPR works faster and more accurately than older methods.

### Using CRISPR to Treat Disease

One of the most exciting uses of CRISPR is in medicine. Some diseases are caused by faulty genes. This makes them good targets for gene editing.

**Sickle cell disease** is one example. People with sickle cell disease have red blood cells that are shaped like a sickle. These cells can block blood flow and cause pain. Scientists used CRISPR to edit a problem in patients’ bone marrow cells. The edited cells were put back into the body, and the patients started making healthy red blood cells. Some patients had much less pain and did not need transfusions.



Normal blood cell (left), sickle blood cell (right)

This shows how CRISPR could change lives for people with genetic diseases.

### CRISPR in Farming and the Environment

CRISPR is also used in agriculture. Scientists can edit plant genes to help crops survive drought and grow better. This can lead to more food and less need for chemicals like pesticides.

In animals, CRISPR is used to study disease and improve animal health. Scientists are also using it to control insects that spread disease. For example, CRISPR may one day help reduce mosquito populations to stop malaria.

These uses could help protect both people and the environment.

### Big Ethical Questions

Not all uses of CRISPR are accepted. In 2018, a scientist announced that he had used CRISPR to edit human embryos. The goal was to protect the babies from HIV. The babies were born, but many people were concerned.

People worried about safety, long-term effects, and the fact that the babies could not be tested in an experiment. This raised fears about “**designer babies**” — babies whose traits are chosen by parents. Many countries now have strict rules about using CRISPR on human embryos.

### Benefits of CRISPR

CRISPR has many advantages:

- It is **precise** – it targets exact genes
- It is **fast** – it works quickly compared to older methods
- It is **affordable** – more labs can use it
- It is **flexible** – it works in plants, animals, and humans

Because of these benefits, CRISPR is used in many areas of science.

### Risks and Limits

CRISPR is not perfect. Sometimes it cuts the wrong part of the DNA. These are called **off-target effects**. This can cause problems or even create new diseases. Scientists are working to make CRISPR safer and more accurate.

Another challenge is that many diseases are caused by many genes, not just one. CRISPR may not work well for these complex problems.

There is also concern that only rich people or countries may be able to afford CRISPR treatments, which could increase unfairness.

### The Future of Gene Editing

CRISPR is still new, and scientists are learning more every year. In the future, it may cure genetic diseases, protect crops, and help solve environmental problems. But it also gives humans great power over life.

Because of this, people must use CRISPR carefully and responsibly. The choices made today will affect future generations.

### Comprehension Questions

1. What is CRISPR and why is it called “genetic scissors”?
2. Where was CRISPR first discovered?
3. What are the two main parts of the CRISPR system?
4. How does CRISPR change DNA?
5. What is sickle cell disease and how was CRISPR used to help treat it?
6. Name one way CRISPR is used in farming or the environment.
7. What happened in the human embryo case and why did it worry people?
8. List one benefit of CRISPR.
9. What is an off-target effect?
10. Why is it important to use CRISPR responsibly?

### Extension Questions

1. What other diseases might CRISPR help treat in the future?
2. How is CRISPR different from genetically modified organisms (GMOs)?
3. What rules does your country have about gene editing?
4. How could CRISPR help reduce hunger around the world?
5. Do you think editing human embryos should ever be allowed? Why or why not?

### Questions – Answer Key

1. CRISPR and why is it called “genetic scissors”?

CRISPR is a tool that can cut and change DNA, so it is called genetic scissors.

2. Where was CRISPR first discovered?

CRISPR was first discovered in bacteria.

3. What are the two main parts of the CRISPR system?

Guide RNA and the Cas9 enzyme.

4. How does CRISPR change DNA?

CRISPR cuts the DNA and allows scientists to remove, fix, or add genes during repair.

5. What is sickle cell disease and how was CRISPR used to help treat it?

Sickle cell disease is a blood disorder. CRISPR was used to fix the faulty gene so patients could make healthy blood cells.

6. Name one way CRISPR is used in farming or the environment.

CRISPR can be used to create crops that resist disease or to control mosquitoes.

7. What happened in the human embryo case and why did it worry people?

Scientists edited embryos to resist HIV, which worried people because of safety and ethical issues.

8. List one benefit of CRISPR.

CRISPR is precise, affordable, and flexible.

# Answer Key Included Office, Google, and PDF Versions

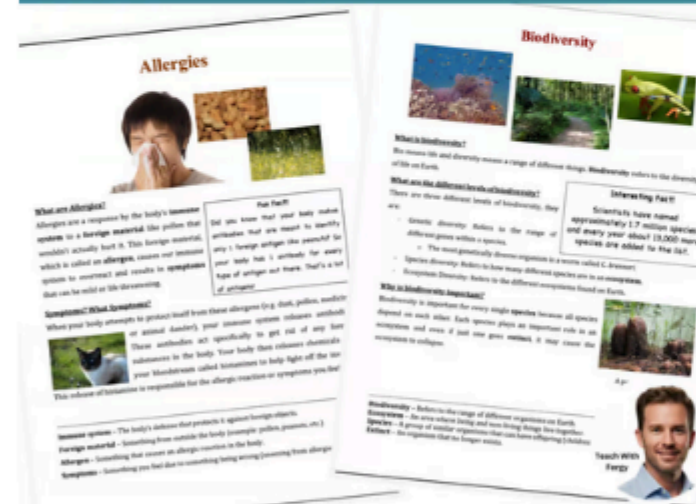


# Comprehension and Extension Questions

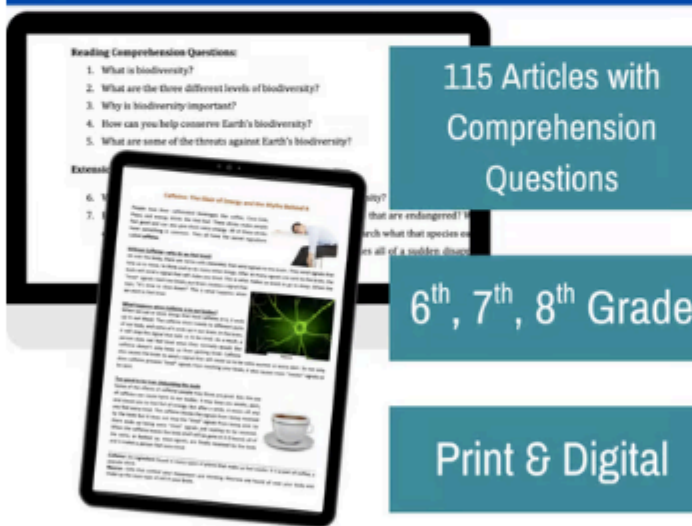
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## READING COMPREHENSION ARTICLE & QUESTION MEGA BUNDLE



## CLASSROOM READY

- Questions and Answer Key
- **No Prep, Ready-to-Use:** Print or assign digitally with Google Docs, Microsoft Word, and PDF formats for flexible classroom use
- **Includes Varied Question Types:** Knowledge, thinking, connecting, application, and open-ended questions.



115 Articles with  
Comprehension  
Questions

6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup> Grade

Print & Digital

★★★★★ Extremely satisfied - So many comprehensive readings for all science fields. PDF and DOCX versions included so they can be edited if needed. Each one includes short answer questions at the end, the first set are easy to find the answers to in the readings, the second set require a bit more critical thinking. Includes an answer key. Great to use to fill in time or for sub plans.

## 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup> Grade Reading Mega Bundle

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