Learning Activity:

# Tips and Tricks to Understanding Science Text

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| **Activity Type** | Reading and Interpreting Scientific Language |
| **Focus Area** | English Language Arts (Literacy in Science) |
| **Time Required** | 60–90 minutes |

## Overview

Understanding scientific text requires a unique skill set; readers are expected to skim, infer, analyze, and interpret information so they can explain and communicate findings to others. This process can often feel challenging and overwhelming to students. However, there are strategies for processing science text that make it less daunting. Using the *Living Planet Report 2022*, this activity will enhance those skills to help students more confidently approach advanced science-based articles.

## Objectives

**After completing this activity, students will able to**

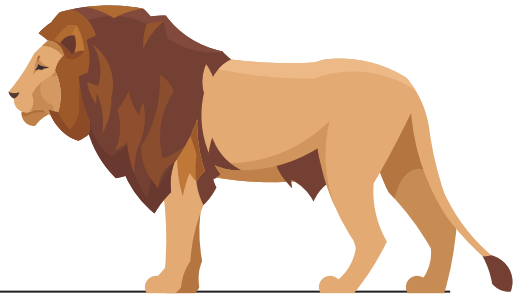
- extract information from scientific texts and visuals
- understand the way that scientists use evidence to form an argument and justify their claims in a report
- demonstrate comprehension of the *Living Planet Report 2022* by communicating its messages to others

*Female mountain gorilla carrying baby on its back, Virunga National Park, North Kivu, Democratic Republic of Congo*

## Standards

Common Core State Standards for English Language Arts: Reading for Literacy in Science and Technical Subjects

- RST.9-10.1: Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
- RST.9-10.2: Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
- RST.9-10.7: Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.



## Materials Needed

- Access to electronic copies or printed copies of ***Living Planet Report 2022***
- Printed copies of the student handout (included), one for each individual
- Pencils, pens, and highlighters

## Vocabulary

- **Analyze:** to study or determine the nature and relationship of the parts of something
- **Annotate:** to add notes to a text or diagram
- **Biodiversity:** all the different kinds of life found in one area, including animals, plants, fungi, bacteria, and genetic material
- **Data:** facts about something that can be used in calculating, reasoning, discussing, or planning
- **Evidence:** an outward sign; information that supports a claim
- **Infer:** to arrive at a conclusion
- **Methodology:** a set of rules, methods, or procedures
- **Predict:** to declare in advance on the basis of observation, experience, or reasoning
- **Primary argument:** the main concept that an author/scientist/person conveys
- **Reflect:** to think seriously and carefully; to bring as a result
- **Skim:** to glance through (e.g., a book) for the chief ideas or the plot

## Activity Procedure

### Teacher Preparation

- Reading is required throughout the activity, so determine whether you will have your students access the reading material online or use printed copies. One copy per student is ideal, but materials can be shared as needed.

- *Living Planet Report 2022* is broken into three chapters. Each chapter increases in length and complexity. Determine whether you wish to have every student read the same chapter or have students divided up and assigned different chapters.

### Part 1: Engage

- Reading scientific reports is different from reading other texts. Instead of reading from beginning to end, reading science material often leads readers to use skills seen throughout other scientific practices; skimming, predicting, analyzing, inferring, and reflecting are examples. Take a few minutes to discuss these terms, ensuring that students understand this approach.

- **Skim:** Scan to identify the question or problem that the author is trying to solve.
- **Predict:** Hypothesize what you think is the purpose.
- **Analyze:** Determine how the author approached answering the question or problem and the methods that were used.
- **Infer:** Summarize what the data and results mean.
- **Reflect:** Consider what readers should take away after reading the report and what remaining questions are left to answer.

*Seabed, coral reefs, Indian Ocean*

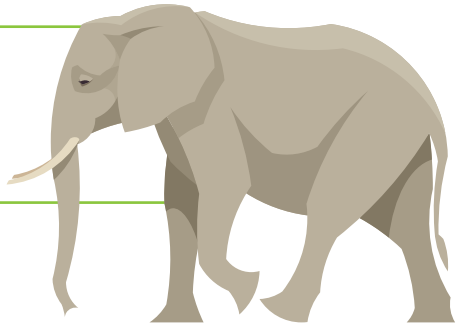
## Part 2: Explore

- Continue the discussion by posing the following questions to learners:
    - In what types of scenarios is scientific text typically used?
    - Where would you typically find scientific text?
    - What useful information would someone get from scientific text?
- Introduce students to *Living Planet Report 2022*.

This report is published by World Wildlife Fund every two years and uses the *Living Planet Index* and ecological footprint calculations to measure and show how biodiversity has changed around the world and the impact of human activity. In this activity, students will be using *Living Planet Report 2022* to practice their skills reading scientific text and comprehending the report's main idea and findings.

At the completion of the activity, learners should be able to answer the key question:

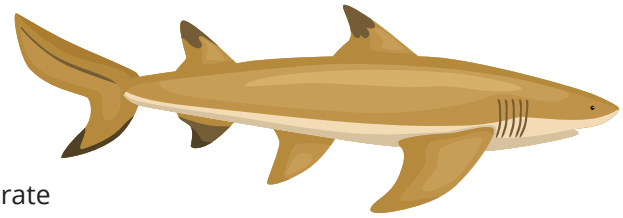
**Key Question:** ***What methods and tools are effective when reading, writing, and communicating about scientific text such as*** **Living Planet Report 2022*?***



## Part 3: Explain

- Distribute copies of *Living Planet Report 2022* (or ensure that each person has access to a digital copy) and assign the chapter(s) each student will read.
    - Chapter 1: The Global Double Emergency
    - Chapter 2: The Speed and Scale of Change
    - Chapter 3: Building a Nature-Positive Society
- As a class, read through the headings and graphics throughout the report.
    - Ask students, based on the report's headlines, format, and graphics, to predict what they think the report is about and to share how they feel about approaching the task of reading the report. Do they feel interested and confident? Overwhelmed and bored? Ask them to explain why.
- Distribute a copy of the student handout to each participant. This handout guides students through each step of reading a scientific report. Learners should complete the questions on the student handout in sequential order, beginning with the first set of guiding questions prior to reading their assigned chapter.

- Allow individuals at least 20–30 minutes to read their chapter and complete the handout.
    - Before they begin, remind students that they should be prepared to carry out the steps that were reviewed when discussing how to approach reading a scientific report (e.g., skim, infer).
    - Using the annotation guide on the student handout, have them identify the main question or problem expressed in the chapter, any methods being used to answer the question or problem, and results. They should also take note of important takeaways, such as the intended messages that the authors are attempting to convey to the reader and any other outstanding questions that the chapter did not address.



### Part 4: Elaborate

- Once students have completed reading their chapter and answering the questions on the handout, they will demonstrate their comprehension by discussing or sharing their chapter's information with their peers.
    - If you chose to have each student read the same chapter(s), form small groups of two to four students, at your discretion.
    - If you chose to assign students to the three different chapters, form groups that contain one individual who worked on chapter 1, one on chapter 2, and one on chapter 3.
    - As a group, have students discuss the following questions:
        - What is the primary argument that was posed in your chapter?
        - What methodology did scientists use?
        - What evidence or data was included in your chapter to help reinforce the primary argument?
        - What further questions do you have that the chapter did not address?

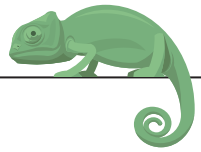
### Part 5: Evaluate

- To conclude the activity and further demonstrate their comprehension, have individuals submit answers to the following questions:
    - Recall how you felt, approaching the activity. Did the assignment align with those feelings? Did the reading strategies and guidance on the handout help you to understand your chapter?
    - Based on what you learned from the report and using the guiding questions and annotation strategies, what can you conclude about how the natural world has changed over time? What solutions are being suggested?
    - What writing tools or strategies did the writers use in the report to help convey these ideas and findings?

## Extended Learning Opportunities

- The peer-sharing portion of this activity can be a larger project in which participants deliver the information from their chapter visually in a presentation format.
- Not all scientific research papers are structured like the *Living Planet Report 2022*. Many traditional scientific reports include more extensive sections, including an abstract, hypothesis, methodology, results, and discussion/conclusion. Have students find another example of a scientific paper and compare it to *Living Planet Report 2022*. When comparing the differences, ask the students *Why do you think the authors of* Living Planet Report 2022 *chose to format the report this way?*
- Challenge learners to research other scientific studies focused on the biodiversity and climate crises. Using the strategies they've learned from this activity, have them collect the data and arguments from these studies to use as supporting evidence in letters to their local, regional, or state officials, stating the need for stronger environmental policies.

## Additional Resources



- Kahoot!: ***How has our planet changed? The Living Planet Report 2022***
- Recorded livestream: ***Earth's Report Card: The Status of Our Planet's Biodiversity***
- Video: ***Living Planet Report 2022***
- WWF webpage: ***Living Planet Report 2022***

**Student Handout:**

# Tips and Tricks to Understanding Science Text

**Before reading: IDENTIFY, PREDICT, & SKIM**

Briefly look through *Living Planet Report 2022* in its entirety to determine what pieces of information you are able to gather prior to reading your assigned chapter.

1. Review the title of the report and skim through the headlines, captions, and figures. What do you think the report is about?

2. Based on your answer to question 1, what do you already know about this topic?

3. Who are the authors of this report?

4. Who is the intended audience of this report?

5. Why did the authors write this report?

6. What do you think the authors' hypothesis is?

7. What do you hope to learn from this report after you are done reading it? What questions do you have about the topic that you hope will get answered?

**While reading: ANNOTATE**

Read and annotate your assigned chapter, remembering to look for important pieces of evidence and data that support or contradict the key messages that the report is trying to convey. Keep in mind that you will be tasked with sharing the information in your chapter with your peers, so marking the information that you feel will be useful in your discussion is recommended. Here are some additional annotation tips to use as you read:

- Highlight any main ideas that you come across while reading.
- Underline supporting details that help you understand main ideas.
- Add a **?** in the margins next to any sentences that you do not understand. Asking questions is a critical part of reading articles!
- Use a ★ in the margins when something connects back to the main idea.
- Next to any infographics or charts, indicate what trend(s) the graphic is displaying or what conclusion it's supporting.
- On each page, note any additional summaries, ideas, and questions in the margins to keep track of your thoughts while reading.

**After reading: INTERPRET & TRANSLATE**

1. What was the **main idea** of the chapter that you read?

2. Use three pieces of **evidence** (quotes or statistics) to support your answer to question 1.

3. Identify one visual or graphic in the section that you read.

   a. What is this visual showing you?

   b. What is it about the visual that aids in your understanding of the topic?

4. How did the scientists in the article find their information? What **methods** did they use?

5. How do these findings advance your understanding of the topic?

6. What parts did you not understand? What **questions** do you still have?

7. Use the remaining space below to note any additional information from your chapter that you will reference when explaining your section to others.