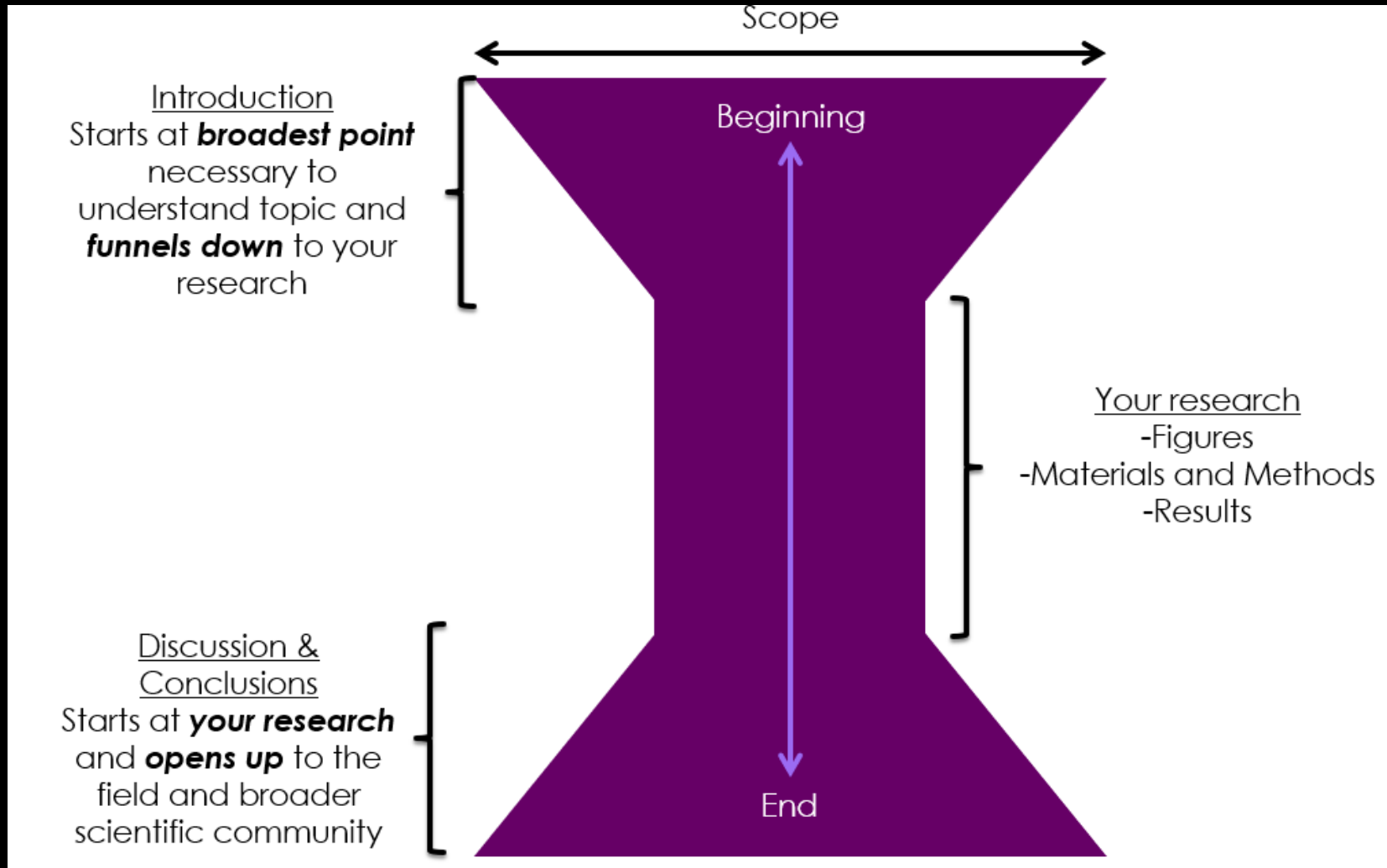




LECTURE 4.5

READING SCIENTIFIC PAPERS

PAPER STRUCTURE



WHAT IS AN ABSTRACT?

1. What is already known about the subject, related to the paper in question?
2. What is not known about the subject and hence what the study intended to examine (or what the paper seeks to present)?



ABSTRACT STRUCTURE



One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline.

Two to three sentences of **more detailed background**, comprehensible to scientists in related disciplines.

One sentence clearly stating the **general problem** being addressed by this particular

study.

One sentence summarising the main result (with the words "**here we show**" or their equivalent).

Two or three sentences explaining what the **main result** reveals in direct comparison to what was thought to be the case previously, or how the main result adds to previous knowledge.

One or two sentences to put the results into a more **general context**.

Two or three sentences to provide a **broader perspective**, readily comprehensible to a scientist in any discipline, may be included in the first paragraph if the editor considers that the accessibility of the paper is significantly enhanced by their inclusion.

HOW TO USE AN ABSTRACT

“ ... most readers will acknowledge, with a chuckle, that when they leaf through the hard copy of a journal, they look at only the titles of the contained papers. **If a title interests them, they glance through the abstract of that paper. Only a dedicated reader will peruse the contents of the paper,** and then, most often only the introduction and discussion sections. Only a reader with a very specific interest in the subject of the paper, and a need to understand it thoroughly, will read the entire paper.”

READING STRATEGIES



HOW TO READ SCIENTIFIC PAPERS

Much of a scientist's work involves reading research papers. Because scientific articles are different from other texts, like novels or newspaper stories, they should be read differently. Here are some tips to be able to read and understand them.

1 SKIM



First get the "big picture" by reading the title, key words and abstract carefully; this will tell you the major findings and why they matter.

- Quickly scan the article without taking notes; focus on headings and subheadings.
- Note the publishing date; for many areas, current research is more relevant.
- Note any terms and parts you don't understand for further reading.

RE-READ 2

Read the article again, asking yourself questions such as:



- What problem is the study trying to solve?
- Are the findings well supported by evidence?
- Are the findings unique and supported by other work in the field?
- What was the sample size? Is it representative of the larger population?
- Is the study repeatable?
- What factors might affect the results?

If you are unfamiliar with key concepts, look for them in the literature.

3 INTERPRET



- Examine graphs and tables carefully.
- Try to interpret data first before looking at captions.

- When reading the discussion and results, look for key issues and new findings.
- Make sure you have distinguished the main points. If not, go over the text again.

SUMMARIZE 4



- Take notes; it improves reading comprehension and helps you remember key points.
- If you have a printed version, highlight key points and write on the article. If it's on screen, make use of markers and comments.

www.rodfiguerezmatalia.com

- Lenny Rhine, "How to Read a Scientific Paper," Research4Life Training Portal.
- Valerie Matarrese, PhD (Ed), "Using strategic, critical reading of research papers to teach scientific writing," *Supporting Research Writing: Roles and Challenges in Multilingual Settings*, Chandos Publishing, Elsevier (2012).
- Allen H. Berman, PhD, and Carole L. Palmer, PhD, "Strategic Reading, Ontologies, and the Future of Scientific Publishing," *Science* (2009).
- Angel Borja, PhD, "11 steps to structuring a science paper editors will take seriously," *Clever Connect* (June 28, 2014).
- Mary Panagagan, PhD, and Jan Hewitt, PhD, "How to Read a Scientific Article," *Cain Project in Engineering and Professional Communication*, Rice University.
- "How to Read and Review a Scientific Journal Article," *Writing Studio*, Duke University.
- Robert Siegel, PhD, "Reading Scientific Papers," Stanford University.

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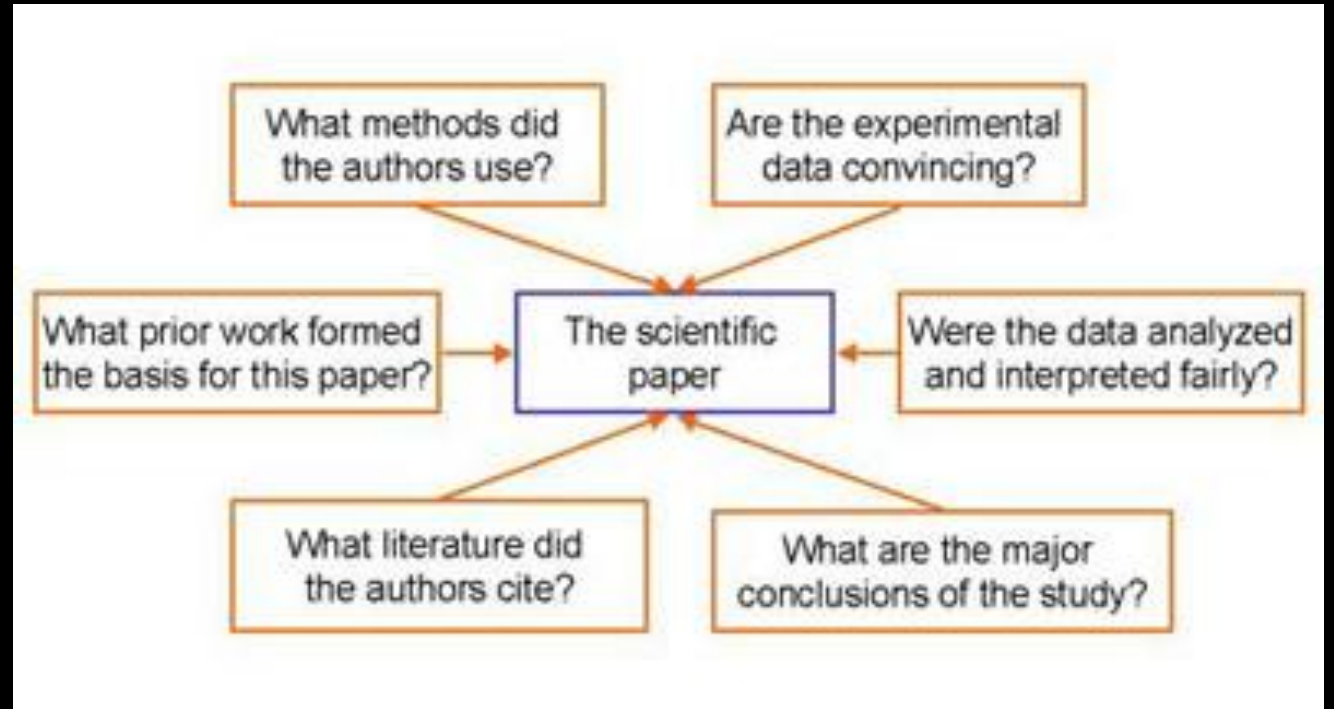
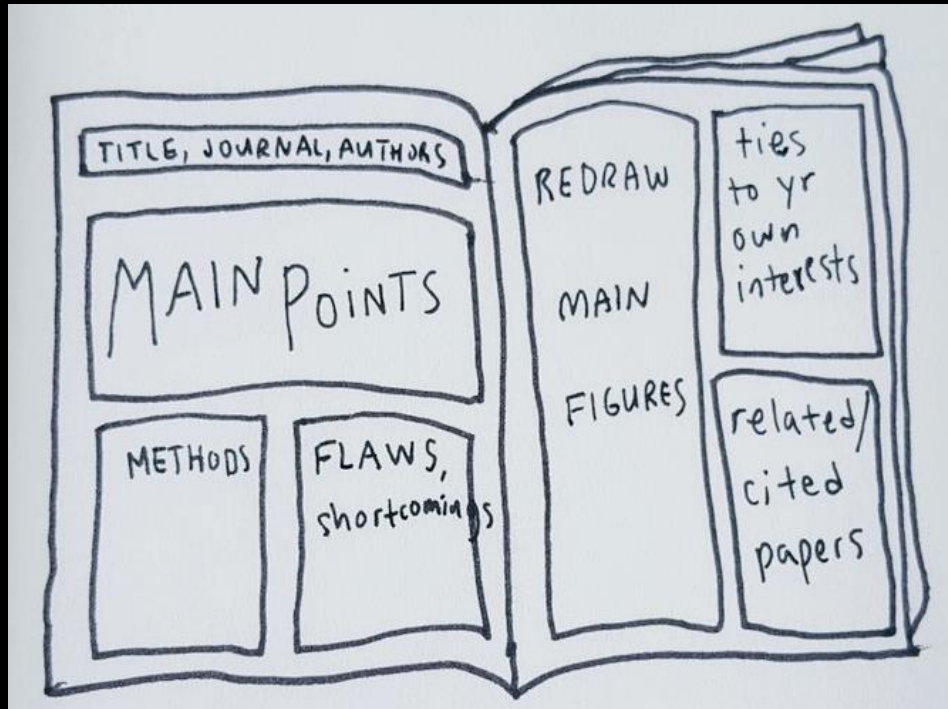
How to Read Scientific Papers Quickly & Efficiently



Drew Dennis Sep 14, 2017 · 3 min read



KEY TAKEAWAYS



READ SANFORD 1999 (10 mins)

Regulation of Keystone Predation by Small Changes in Ocean Temperature


Eric Sanford

Key species interactions that are sensitive to temperature may act as leverage points through which small changes in climate could generate large changes in natural communities. Field and laboratory experiments showed that a slight decrease in water temperature dramatically reduced the effects of a keystone predator, the sea star *Pisaster ochraceus*, on its principal prey. Ongoing changes in patterns of cold water upwelling, associated with El Niño events and longer term geophysical changes, may thus have far-reaching impacts on the composition and diversity of these rocky intertidal communities.

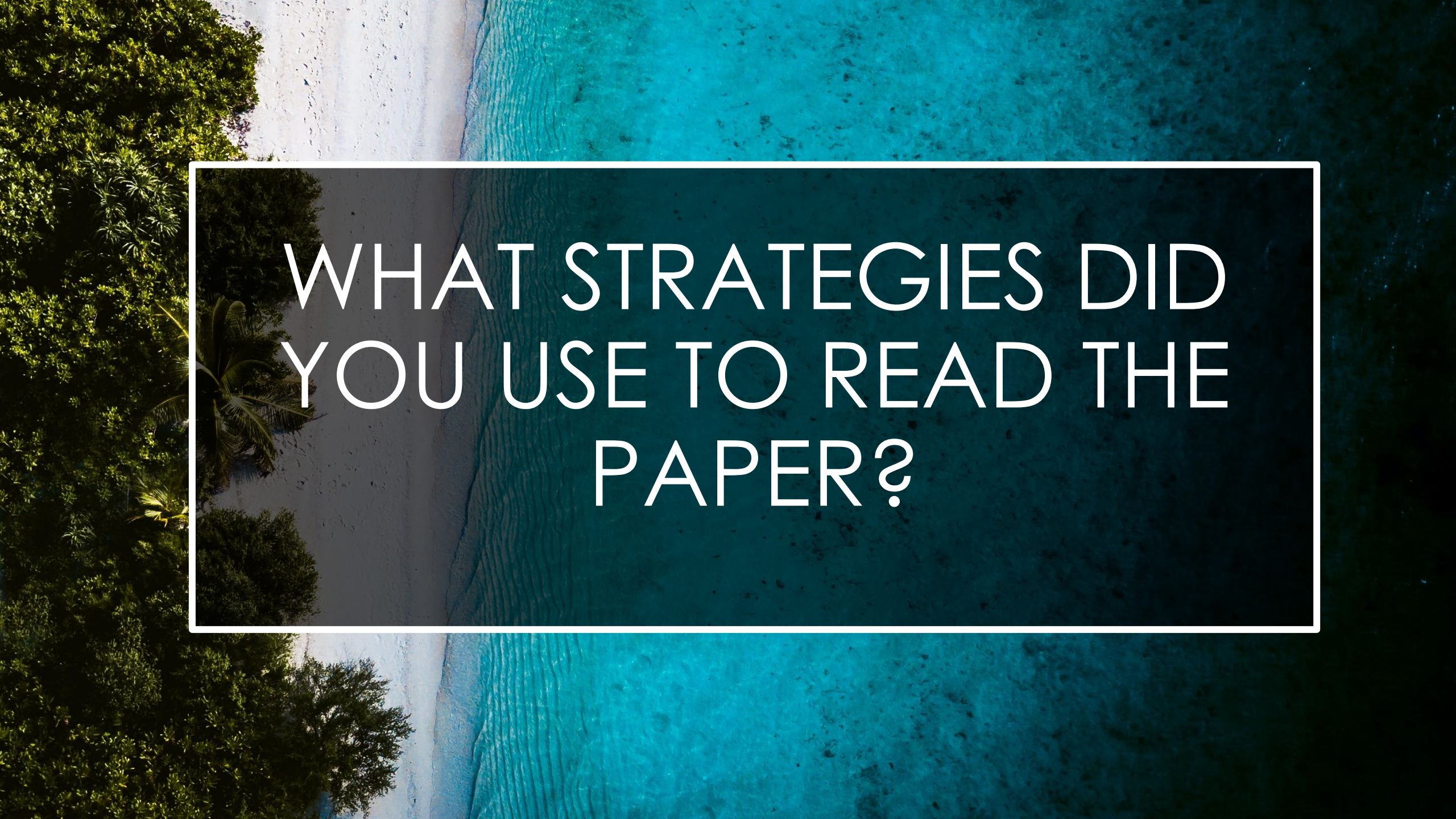
HINT:

While reading, demarcate the **Abstract, Intro, Methods, Results, Discussion**



An aerial photograph of a rugged coastline with dark, rocky terrain and turquoise water. A white rectangular box is centered over the image, containing the text "WHAT WERE KEY TAKEAWAYS FROM THIS PAPER?".

WHAT WERE KEY
TAKEAWAYS FROM THIS
PAPER?

An aerial photograph of a tropical beach. The top half of the image shows a white sandy beach bordered by dense, lush green vegetation, including palm trees. The bottom half shows clear, turquoise water with visible ripples and sandy seabed. A white rectangular border frames the central text.

WHAT STRATEGIES DID
YOU USE TO READ THE
PAPER?

An aerial photograph of a rocky coastline. The water is a vibrant turquoise color, with white foam from waves crashing against the shore. The rocks are dark and jagged, forming a barrier between the sea and a sandy beach. A white rectangular box is superimposed over the center of the image, containing the text "WHAT WAS HARD / EASY ABOUT READING THE PAPER?".

WHAT WAS HARD / EASY
ABOUT READING THE
PAPER?

JOURNAL ARTICLE NOTEBOOK





NEXT WEEK

**APPLYING TO
JOBS & INTERNSHIPS**

BEFORE CLASS NEXT WEEK

Complete Assignment 4

Watch Short ICC Video(s) in prep
for next week

Think about what kind of job you
might want after undergrad

Begin to winnow down topics for
our wild card class!



A sunset over the ocean with the word "QUESTIONS?" in a dashed white box. The sky is filled with vibrant orange and red clouds, and the sun is visible on the horizon. The water is dark and reflects the colors of the sky. The text "QUESTIONS?" is written in a bold, white, sans-serif font and is enclosed in a white dashed border with rounded corners.

QUESTIONS?