

Guide to read scientific papers:

A scientific publication...

1. Peer-reviewed writing on novel contribution to research field
2. Accessible to the public through journals, websites, blogs
3. Provides results, techniques, and interpretations that are important to other researchers

Guide to read scientific papers:

1. Why are you reading article?
2. Three-pass guide:
 - a. The quick pass
 - b. The active read
 - c. The summary
3. How to search for and access papers
4. Keeping up with the literature

Why are you reading article?

1. Compare your results with published findings.
2. to get info about a topic you are stuck on.
3. background on research.
4. future directions / questions

}

Why are you reading article?

COMPETENCE

Build knowledge of field

CONTEXT

How research fits in field

CURRENT

What's new in field

COMPARISON

Your results to published findings

Search for & access journal articles

SEARCH –

1. Google scholar
2. journal feeds
3. arXiv
4. Web of Science

Some recommended journals:

Science

Physical Review Letters

PNAS

Soft Matter

Nature

Physics Today

Scientific American

Granular Matter

ACCESS – most articles via college library

The quick pass

1. Assess paper structure and writing style
 - a. Title and abstract – key words
 - b. Introduction – why authors performed study, research argument
 - c. Methods – what authors did
 - d. Results – what they found
 - e. Discussion – how they interpret what they found in context of field
2. Read title and abstract and identify most important figures
3. Read accompanying summary, if available.

The quick pass

Through quick pass, you should learn:

1. Type of paper – review, seminal paper, new technique, minor advancement,...
2. Paper's big picture
3. If paper meets your reading goals

What if there's a term or jargon you don't understand?

1. highlight words - search in Google - write definition next to word.
2. Use context from paragraph.
3. figures may help.

What if there's a term or jargon you don't understand?

Here are a few things you can do:

1. **Quick search** for term online on reputable sites, ex. Wikipedia, course sites
2. Scan **review article or textbook chapter** to get appropriate background
3. See the **citation** for additional info.

The active read

1. **Read carefully** – highlighting and commenting as you read
2. Interpret diagrams and **figures** then read captions
3. Mark **references** for further reading and background literature

The active read

Questions to consider while reading:

1. Main points?
2. Your research questions?
3. Why did authors conduct experiment or simulations in that way?
4. Sufficient data to support conclusions?
5. Which results are most compelling?
6. Reported quantities, parameters, and analysis methods?

The summary

Write **your own notes** about the article, including:

1. Summarize main points in your own words
 1. supporting evidence/methods
 2. important figures
2. Ideas or questions you have after reading article
3. Jargon you learned
4. Weak points or limitations

Save your notes with the article for future reference

Keeping up with the literature

MONITOR – journal feeds via email updates or Feedly and through social media

ORGANIZE - Use chosen platform to organize articles by topic



References

<https://www.sciencemag.org/careers/2016/03/how-seriously-read-scientific-paper>

<https://www.sciencemag.org/careers/2016/11/how-keep-scientific-literature>

<https://web.stanford.edu/class/ee384m/Handouts/HowtoReadPaper.pdf>

<https://pages.ucsd.edu/~mboyle/COGS163/pdf-files/scientificarticlereview.original.pdf>

<https://www.owl.net.rice.edu/~cainproj/courses/HowToReadSciArticle.pdf>

<https://www.elsevier.com/connect/infographic-how-to-read-a-scientific-paper>

<https://www.geneseo.edu/~mclean/Dept/JournalArticle.pdf>