READING SCIENTIFIC RESEARCH
CHEAT SHEET

Read the abstract and then head to the discussion

Of course, reading the entire research article is going to give you the best understanding, but this cheat sheet is more about learning quickly and increasing confidence in tackling scientific articles.

The first paragraph in the discussion will give you an overview of the most important findings of the research.

Once you have read the abstract and first paragraph of the discussion you should have a really good idea of what the research was all about and what the main findings are.

What are they trying to understand and why?

Skip to the end of the article and read the conclusion paragraph.

This will often be highlighted by words such as 'conclusion' or 'summary'. It's where they summarise their findings but also explain what the next step would be and what research questions remain. This can help you to search for other articles discussing those questions.

THE ABSTRACT GIVES A SUMMARY OF THE ENTIRE PAPER

Check the study design

01 Sample size
The methods section (and often the abstract) will tell you how many subjects were tested. Humans, cells, animals, whatever it is, there should be a number. It depends on the study, but 10-20 animals per group, and 50-100 humans, should give good data. Although with humans, the greater the number, the better.

02 Control
A control group is one in which a comparison can be made, and one that has had little or no influence from any intervention. They are used to compare what would happen just by chance, and account for biases and other influences from researchers. A control group is very important. We want to see it in the study.

03 Statistics
You might not be used to statistical analysis, but that's OK. Take a look over the graphs and figures that seem to make sense. Are there actually big differences or do the groups look the same but the authors claim there is a difference? This is a common trick. Claiming 'statistical significance' with almost no tangible change.

Diving deeper - tips and tricks

It's OK to skip parts
Pretty much most papers are going to present information and data in a confusing and dry manner. That's because it's written with the assumption that the audience is already very familair with, well, everything. Often, authors don't explain terms (and occasionally they don't even bother explaining initialisms) and they write in long confusing sentences. The writing style is designed to be (scientifically) precise and objectively correct, but this doesn't make it easy to read. It's OK to miss parts, skip to another section, or even just hit pause on that paper and try another one for now. Nobody can be an expert in everything, all the time. Life's too short to whip out the dictionary every time you want to read some science.

Make notes
Even experienced researchers read papers with unfamiliar methods. Experiments that did this or tested that, can be a headache to understand. Try making notes on the side of the paper (if you print it out). Then head to ChatGPT and type in the name of the experiment. Ask the AI to simplify the steps so that you can get a clearer idea of what the study tested and why. You can also log those entries into a document and build up your own research reading kit, filled with definitions and explanations for any time you come across those experiments in the future.

Read what you enjoy
If you want to start reading around a scientific topic, begin by searching for something that is exciting and engaging to you. Google is not the search engine it used to be and PubMed searches have the IQ of a chair leg. Instead, head to SciSpace (typeset.io). It's a great resource because you can type in questions you have and the AI will find the most relevant papers and even provide a summary and co-pilot, to help you read them. This way, you don't need to search for scientific keywords, just type in natural language for what you are interested in, and away you go. Maybe start with a review, rather than original research, so that you get a good overview of your favourite topics.

Bonus 01
Check for conflict of interest.
This is written at the end of the article. It's important because the authors state whether or not they have ties to anything that might introduce bias into the results of the study. Occasional conflicts occur, that's just the nature of having a long career, but too many, and be careful about any strong conclusions the authors make from their data.

Bonus 02
Limitations
A good paper will address their study limitations. One study can't answer everything, and that's fine. Being open about that and leaving room for future studies to address the missing parts is a sign of a well-rounded and transparent author. Be cautious when reading about data where they don't tell you the gaps in the knowledge, or claim to have created the perfect data set. That's just not realistic.