How to read a Scientific paper (and why)
Or the anatomy of a scientific paper exposed

WHY? There are many reasons to read primary source scholarly journal literature, to start CURRENCY. Textbooks can be dated by the time they are published. Textbooks are typically secondary sources that combine general information on a topic with specific examples or studies by citing primary sources and research that was happening during the years prior to publication. Journal articles tell you what is happening right now!

A second reason is the research presented is REPRODUCABLE to the extent that data included in the papers provides everything you need to know to replicate the experiment or studies if you want to verify the research or build upon prior studies exploring a new hypothesis.

Lastly the conclusion and discussion sections allow you to follow the logic of the study, assess any assumptions that were made and decide whether or not you are convinced of the significance of their findings.

HOW? Don’t try to read straight through, you’ll get bogged down and lost. Have a notebook for jotting down main ideas you identify and for any scientific terminology you might want to look up later. Sampling specific sections of the paper will be faster, more efficient and ideally lead to higher comprehension of the material.

Proceed through the paper reading these parts in this order:

1. **Abstract.** In brief, what was done and what was found.
2. **Discussion** (sometimes called Analysis, Conclusion). Summarizes important results that justify conclusions.
3. **Intro.** Provides background into the motivation for the study. And background info.
4. **Results.** In table or figure form the raw data is available for visual interpretation.

Adapted from:

Try **split-page note taking** as a strategy for organizing and internalizing new reading material.

On the left side of the page list facts from the text either as direct quotations or better yet, attempt to summarize information in your own words. Then on the right list your responses or any further questions you have.

<table>
<thead>
<tr>
<th><strong>Facts</strong></th>
<th><strong>Responses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>marine invert. larvae are induced to metamorph. by chemical cues</td>
<td>True for all larvae? How many species have been studied? The larvae are awfully tiny—what body parts &quot;smell&quot; the cues? What are the cues?</td>
</tr>
<tr>
<td>Different species respond to diff. chem. cues</td>
<td>Must be pretty widespread. Examples given incl. a variety of species from very different groups.</td>
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<tr>
<td><strong>Juvenile hormone (JH) regulates insect development, but also makes polychaete annelid larvae metamorphose.</strong></td>
<td>Why would juvenile hormone be floating around in seawater? Maybe it’s not—maybe it’s not the chem. cue discussed in first para. But rather something that acts inside the larva? Why would an insect chemical work on a worm? Are worms and insects closely related?</td>
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Figure 4. An example of split-page note taking, based on the first 2 paragraphs of material presented in Figure 2. The student has recorded factual information on the left side of the page and her response to that information on the right.

This split page note taking strategy is from: