



## Study Evaluation Guide

Category	Low Score (1-2)	Medium Score (3-5)	High Score (6-7)
<b>1. Access</b>	<b>Impossible:</b> Behind a paywall (\$30+), no link provided, or "Contact author" with no reply.	<b>Difficult:</b> Requires University login, searching through specific databases, or requesting via forums.	<b>Open:</b> One-click access to the full PDF. Free for everyone (Open Access).
<b>2. Headline</b>	<b>Clickbait:</b> Uses words like "Miracle," "Proven," "Cure." Scarier or better than the actual data.	<b>Modest:</b> Describes the finding but might leave out limitations to sound more interesting.	<b>Accurate:</b> Boring but true. Describes exactly what happened (e.g., "Correlation observed in mice").
<b>3. Does it Make Sense? (Theory)</b>	<b>Nonsense:</b> Ignores all previous science. Invents new laws of physics/biology without proof.	<b>Standard:</b> Repeats what we already know without adding much new value.	<b>Robust:</b> Fills a clear gap in knowledge. Uses past research responsibly to build a new argument.
<b>4. Quality of the Test (Methods &amp; Data)</b>	<b>Flawed &amp; Closed:</b> Tiny sample size. No control group. Data is secret/hidden.	<b>Acceptable:</b> Decent sample size. Standard methods. Data available upon request.	<b>Rigorous &amp; Open:</b> Large sample size. Gold-standard controls. Raw data and statistics are fully open/downloadable.
<b>5. Verdict (Conclusion)</b>	<b>Overblown:</b> Claims a fact based on a guess. Confuses correlation with causation.	<b>Logical:</b> Conclusion mostly fits the results but ignores some alternative explanations.	<b>Nuanced:</b> Very careful. Admits what they don't know. Claims only what the data proves.
<b>6. Source Reputation</b>	<b>Suspicious:</b> Marketing blogs, "Predatory" journals (pay-to-publish), or corporate white papers.	<b>Unverified / Variable:</b> Preprints (not yet reviewed), or mid-tier journals that sometimes favour hype.	<b>Trusted:</b> Top-tier peer-reviewed journals, reputable independent research institutes, or government bodies.



## The Science Detective's Glossary

**Abstract:** The short summary paragraph at the very start of a scientific paper. It tells you what they did and what they found. *Warning: Sometimes the abstract promises more than the paper actually proves.*

**Conflict of Interest:** When researchers (or their funders) stand to gain—financially or professionally—if the results turn out a certain way. Examples:

- The pressure researchers feel to find ‘positive’ or ‘exciting’ results, because publishing in top journals leads to career advancement and future grants.
- A study on the benefits of a specific product that is funded by the business selling that product.

**Control Group:** The group in an experiment that does *not* get the treatment. They are used for comparison. If the ‘medicine group’ gets better, but the ‘control group’ gets better too, the medicine probably didn't work.

**Correlation vs. Causation:** Just because two things happen at the same time, it doesn't mean one caused the other. Example:

- Ice cream sales and shark attacks both go up in summer. Ice cream does not cause shark attacks (correlation). Summer heat causes both (causation).

**DOI (Digital Object Identifier):** A unique string of numbers and letters that acts as a permanent ID card for a scientific paper. If you have the DOI, you can always find the paper, even if the website moves.

**Open Access:** A publishing model where the scientific paper is free for anyone to read immediately. No credit card required.

**Open Data:** When scientists upload their raw spreadsheets, code and notes to a public website so others can check their maths. This is a sign of high trustworthiness.

**OSF (Open Science Framework):** A popular online platform where scientists upload their Open Data and pre-register their experiments. If a paper links to an OSF page, that's a good sign!

**Paywall:** A system that prevents you from reading a paper unless you pay a fee or have a subscription (usually via a university).



**Peer Review:** The ‘marking’ system of science. Before a paper is published in a journal, it is sent to 2 or 3 other experts (peers) who check it for mistakes.

**Predatory Journal:** A fake or low-quality scientific magazine that exists only to make money. They will publish anything (even nonsense) if the author pays a fee, without doing any Peer Review.

**Preprint:** A version of a scientific paper that has been shared publicly (often on a server like arXiv or bioRxiv) *before* it has been peer-reviewed. It allows science to move fast, but it hasn't been checked for errors yet.

**Replication:** When a different group of scientists tries to do the exact same experiment to see if they get the same result. If they do, the finding is ‘replicable’ (and likely true).

**Sample Size ( $N$ ):** The number of people, animals, or things tested in a study. Generally, a higher number ( $N = 1000$ ) is better than a low number ( $N = 10$ ).

**Sci-Hub:** A controversial ‘pirate’ website that bypasses paywalls to provide free access to millions of research papers. While legally challenged by publishers, it is widely used by researchers worldwide to access knowledge.