How to do a Peer Review

This is just a few notes on how to perform a peer review. They are not exhaustive by any means by just some tips that you may find handy for the assessment.

This is where you read through the manuscript at least twice. There are different things to look for on each reading.

First Read Through
This is really a quick skim through the manuscript.

Keep the following questions in your mind as you do this:
- What is the main question addressed by the research? Is it relevant and interesting?
- How original is the topic? What does it add to the subject area compared with other published material?
- Is the paper well written? Is the text clear and easy to read?
- Are the conclusions consistent with the evidence and arguments presented? Do they address the main question posed?
- If the author is disagreeing significantly with the current academic consensus, do they have a substantial case? If not, what would be required to make their case credible?
- If the paper includes tables or figures, what do they add to the paper? Do they aid understanding or are they superfluous?

During the first read through you should look for any major flaws in the manuscript. You may notice the following:

- Drawing a conclusion that is contradicted by the author's own statistical or qualitative evidence
- The use of a discredited method
- Ignoring a process that is known to have a strong influence on the area under study

Now that you have performed the first read through you should start to write your first couple of paragraphs of the review.

In the first paragraph you should summarise the goals, approaches and conclusions of the paper.

In the second paragraph you should conceptual overview of the contribution to the research. There are a couple of things that will pint you in the right direction hear:

- Is the paper's premise interesting and important?

- Are the methods used appropriate?
- Do the data support the conclusions?

Second Read Through

This is where you comment on each of the sections in the manuscript. The paper will be split into sections. It is your task to comment and voice your opinion on each section in the paper. I've put some headings below but papers can vary based on the publisher or paper type.

Introduction/Abstract
 A well-written introduction:

- Sets out the argument
- Summarizes recent research related to the topic
- Highlights gaps in current understanding or conflicts in current knowledge
- Establishes the originality of the research aims by demonstrating the need for investigations in the topic area
- Gives a clear idea of the target readership, why the research was carried out and the novelty and topicality of the manuscript

Previous Work/Literature Review

- Ensure papers are correctly cited
- Papers cited are relevant to the argument or aim of the paper
- Ethical standards are maintained

Methodology

- Are the methods applied best practice?
- Are the methods applied the most appropriate?
- Has the author/s correctly highlighted any pre-processing steps in data preparation?

Results/Findings/Discussion
This section should tell a coherent story - What happened? What was discovered or confirmed?

Certain patterns of good reporting need to be followed by the author

- They should start by describing in simple terms what the data show
- They should make reference to statistical analyses, such as significance or goodness of fit
- Once described, they should evaluate the trends observed and explain the significance of the results to wider understanding. This can only be done by referencing published research

- The outcome should be a critical analysis of the data collected

Discussion should always, at some point, gather all the information together into a single whole. Authors should describe and discuss the overall story formed. If there are gaps or inconsistencies in the story, they should address these and suggest ways future research might confirm the findings or take the research forward.

Conclusions

This section is usually no more than a few paragraphs and may be presented as part of the results and discussion, or in a separate section. The conclusions should reflect upon the aims - whether they were achieved or not - and, just like the aims, should not be surprising. If the conclusions are not evidence-based, it's appropriate to ask for them to be re-written.