To some extent your ability to review articles is something that requires practice and experience. However, the process can be aided by following a checklist of things to look out for and comparing the paper under review to the criteria. In its simplest form Bradford Hill (1965) cited by Hawkins (1985) suggested the following key questions should be asked about each section of a paper:

Introduction ....................... Why did they start the research?
Methods ............................ What did they do?
Results .............................. What did they find?
Discussion ........................ What do the results mean?

A more detailed checklist of points to look out for is now given section by section below. NB Do bear in mind that the type of research (quantitative or qualitative) will effect the information you are evaluating. Some of the issues mentioned below may not be applicable to all research studies but the general principles will apply.

<table>
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<tr>
<th>Title</th>
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<td>A minor issue this one, but it is helpful if the title is succinct but descriptive of the article content. Gimmicky or catchy titles are all very well but do they enable you to tell what the article is about? Of course a poor title does not necessarily indicate a poor paper and certainly isn't a key criterion in assessing the quality of a paper.</td>
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<th>Author</th>
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<td>Some idea of the author(s) academic background can be gained by looking at their job title, qualifications, and where they work. Articles normally provide this basic information and it may give you an indication of the ability of the writers to carry out valid research. If you know them to be acknowledged experts in the subject area covered then there is good chance the research work will be of high standard (though it would be dangerous to assume this without further critical review of the paper!)</td>
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| Abstract |
This should provide a handy summary of the content with indications of the aims, methods, results and importance of the study. Muir Gray (2001, p.107-8) suggests reading abstracts is an excellent way to "identify junk" but he also makes the valid point that abstracts are often written with a bias towards highlighting the positive aspects of the research. If the findings are noted as positive then carefully check the methods used (negative findings may perhaps give an indication of lack of bias but you still need to be check). The abstract can, therefore, give an indication of how well the study was conducted and whether it is worth reading.

**Source**

An assessment of where the article was published should give some clues as to its potential value. The key issue is whether it is a peer reviewed journal. In other words do articles submitted to the journal go through a rigorous review process before they are accepted for publication. Some journals are undoubtedly less fastidious about having articles assessed before publication.

**Introduction**

This section is where the research problem/clinical question should be defined clearly. You should expect to find here clear descriptions of the research aims, an outline of theoretical issues and the hypothesis should be introduced. Information should include the current state of knowledge about the research topic and an indication of the gaps in knowledge which the current study will hope to fill. Overall you should get an answer to the question "why was the research done?"

**Literature Review**

Here you will find a survey of current knowledge highlighted by a thorough review of the existing literature. The review should indicate any theoretical implications of the research in relation to previous work. The review should include up to date references and be based on as wide and thorough a search of sources as possible. A key issue is whether researchers have been unbiased and have presented any evidence which actually contradicts their own ideas.

**Methodology**

This section should provide a clear and concise account of methods used. Such detail should be sufficient to allow the research to be replicated by other researchers. The study design and data collection methods should be clearly outlined. Overall you should be able to assess how the research was done. The methods sections may be divided as follows:

- **a) subjects/population (n)**

The participants, the test conditions and procedures for experimental and control groups should be described in detail. This should enable you to assess whether the sample
selection method was valid. You would expect information on the number of subjects and who took part. A small sample may be fine as long as it is representative and numbers will generally be smaller for qualitative studies. However, it may be that a large sample size is needed to provide a representative group size and small numbers may have an impact on the power of statistical analysis (Polgar & Thomas, 2000, p.278). The type of research will obviously impact greatly on the information you should be looking for. For example, in the case of a study using a randomised controlled trial, there should be information on the method for randomising the allocation of subjects to experimental and control groups.

Any ethical issues should be clearly stated and explained. You would expect to learn that the study had been through ethical committee clearance and that the confidentiality and anonymity of subjects has been assured.

b) Apparatus or Instruments

Any special equipment or instruments (e.g. questionnaires, standardised assessments) should be described. The validity and reliability of apparatus or instruments needs to be indicated. In other words the adequacy and appropriateness of the methods used for collecting data should be made clear.

c) Procedures

What happened in the experiment and the steps executed should be described here. The treatments and settings should be outlined and a reputable researcher should detail any flaws in the procedures or any other factors adversely affecting the research work. In simple terms, what was done and how it was done should be recorded here.

Results

The results section reports what has been discovered as a result of the research undertaken. The normal format is for the results of the research to be reported factually and formally without discussion and then for a prose summary to be given of the statistics etc. Other results including summary statistics may usefully be presented in tables or figures which, if they are well constructed, should aid understanding of the findings. Any statistical tests and measures used should be described allowing the reader to evaluate whether the appropriate tests were applied. A good researcher should mention all the relevant results, even those that actually go against the hypothesis.

Discussion

The issues raised by the findings should be discussed and resolved in this section. A good discussion section will relate the findings back to the literature and to the aims of the research as outlined in the introduction. The author is expected to examine, interpret and qualify the results and draw any inferences from them. It should be possible to assess the contribution made by the study and decide how far it has helped to resolve
the original problem.

**Conclusion and recommendations**

The paper should end with some conclusions about the importance (or otherwise) of the findings. The author should not make any statements here which are not supported by the facts found. Some speculation is acceptable but only if it is described as such and does relate logically to the data or theoretical basis of the study. Recommendations on the basis of the findings are often stated here and may include comments on possible improvements to the research or future areas for more study.

**References and bibliography**

Consistent citing of references is a sign of good practice here. The list should be appropriately extensive and up-to-date. The separation of citations into References (ie papers actually referred to in the text) and Bibliography (other material read to support the research but not directly cited or quoted) is normal practice.

http://www2.plymouth.ac.uk/millbrook/rsources/sealit/critical.htm