BME/BIOL 178: Scientific research article reports

When reading scientific articles, answer the following questions (max one page):

1. What was the overall goal of the paper?
   What biological question was addressed?

2. Summarize the general approach/strategy.
   For example: Gene X was knocked out to study its role in mouse heart development

3. What specific techniques were used?
   For example: Western blotting was used to determine whether protein A is expressed in mouse cardiac cells

4. Are the data consistent with the conclusions?
   Consider this question for each experiment and for the overall conclusions; report only the overall

5. Can you think of alternative explanations?

6. Was the overall goal of the study accomplished? Why or why not?

7. What experiment would you do next?

Tips for reading and understanding scientific reports
It can sometimes be hard, even for experts, to understand scientific articles. Here are some tips that may help.

• A typical article is divided into these sections:

  Abstract: briefly summarizes the purpose, approach, results and significance of the findings
  Introduction: gives a brief overview of the field to provide context for the current study, explains the rationale and the hypothesis to be tested
  Methods: provides the details of how the experiments were performed
  Results: provides the primary (i.e., uninterpreted) data as text combined with figures, figure legends and tables; usually provides a brief conclusion for each experiment and a rationale for the next experiment.
  Discussion: discusses the overall conclusions based on all the data in the report; considers whether the data support the hypothesis; judges the potential limitations of the experimental design or system; explores the implications of the findings and may suggest future experiments.

• Read the whole article from beginning to end, even if you don’t understand everything.

• Go through the article a second time. Take notes on what you do understand, then deal with the parts that you don’t understand. Break the paper down in smaller sections (maybe by figure) and work on understanding each part. Use the questions above to help you.

• Rephrase important points using your own words.

• The figures are the “meat” of the paper. If you understand the results of the figures, you are doing well. Sometimes different scientists will draw different conclusions from the same data.

• Read the whole paper again.