AS Biology bridging work

Introduction
You have studied cells at GCSE to a certain degree of detail. At A level you are expected to know far more about the internal structure (ultrastructure) of cells. You have already learnt that cells contain structures (organelles) such as mitochondria, chloroplasts and ribosomes and these organelles all have particular jobs (functions) which enable a cell to work efficiently within the tissue, organ and organ system it belongs to.

There are many more organelles than the three mentioned above and you will be researching and writing up your findings about each organelle, for your bridging work.

The list of organelles you will research and study is below.

- nucleus
- nucleolus
- nuclear envelope
- rough endoplasmic reticulum
- smooth endoplasmic reticulum
- golgi apparatus and golgi vesicles
- ribosomes
- mitochondria
- lysosomes
- chloroplasts
- plasma (cell surface) membrane
- centrioles
- flagella and cilia
- vacuole

Detail to include:
Include in your research the following:

The structure and function of the cell organelles above (the structure includes what the organelle consists of, the function is the role or job it performs within the cell)

What is a Eukaryotic cell (with named examples)?
What is a Prokaryotic cell (with named examples)?

You should include diagrams (either drawn by yourself or referenced diagrams from the internet) which help you explain your research

You should include electron microscope images of each organelle (often these are blurry, but you will need to be able to recognise these and label these in your A level exam).

Higher level students (aspiring A/A* students) will demonstrate their dedication by researching additional websites and information about current research areas involving the cell organelles. For example scientists have found that Parkinson’s disease exerts its effects by damaging mitochondria in brain cells:
http://news.bbc.co.uk/1/hi/health/4967892.stm

Report
Your report can be submitted in many different forms, either a poster (minimum size A3), series of fact sheets or extended essay with diagrams, images and tables accordingly. It may be printed or hand written with images stuck onto the paper.
Work should be in your own words, not plagiarised (cut and pasted) from an internet site. The understanding you will gain from producing this piece of work is needed for your A level qualification and will directly help you make a positive start to A / AS level Biology.

**Graded**

Your work will be submitted within the deadline and it will be marked and given a level 1-3. Level 1 students will be given one week to improve and resubmit their work.

**Further guidance:**

Level 1: basic information only provided, not referenced, limited use of diagrams or electron microscope images, bullet pointed information. Lack of clarity in written text. Lack of effort and presentation poor.

Level 2: Detail at good or high level indicated by the use of keywords and phrases about the cell organelles. All organelles researched with accurate and detailed summaries including most diagrams and images. Some references may be missing. Written work is accurate but presentation may be a little rushed.

Level 3: Presentation is excellent and information is arranged thoughtfully with a clear understanding of the structure and function of each organelle. Diagrams and images present for each organelle. Accurate referencing of each source of information (websites or book references listed clearly). Clear indication that student has processed the information and reworded it themselves, highlighting key words and phrases. Work appears original and student has actively sought additional / alternative references. Some students may provide information found from current research areas about some cell organelles, for example linking mitochondria to current research publications e.g. [http://news.bbc.co.uk/1/hi/health/4967892.stm](http://news.bbc.co.uk/1/hi/health/4967892.stm)

**Suggested websites**

[http://www.s-cool.co.uk/a-level/biology/cells-and-organelles/revise-it/organelles](http://www.s-cool.co.uk/a-level/biology/cells-and-organelles/revise-it/organelles)
[http://biology.clc.uc.edu/courses/bio104/cells.htm](http://biology.clc.uc.edu/courses/bio104/cells.htm)
[http://www.edu.pe.ca/gray/class_pages/rcfleming/cells/notes.htm](http://www.edu.pe.ca/gray/class_pages/rcfleming/cells/notes.htm)
[https://www.youtube.com/watch?v=RKmaq7JpNYM](https://www.youtube.com/watch?v=RKmaq7JpNYM)
Example Student work:

**Grade = Level 2**

**Fact sheet on “The nucleus”** (part of a booklet submitted)

**Nucleus diagram**

[Diagram showing nuclear envelope, nuclear pore, heterochromatin, euchromatin, nucleolus, and chromatin]

**Electron Microscope image of**

[Image of a nucleus structure]

**Nucleus structure**

The nucleus is the largest organelle (10-20µm diameter)
Roughly spherical
Surrounded by a double membrane called the nuclear envelope.
The nuclear envelope contains openings called nuclear pores.
Outer membrane joins up to the endoplasmic reticulum.

**Nucleus function**

Contains nearly all of a cell's genetic material
Contains instructions for making proteins
Controls protein synthesis (mRNA is made here)
The nuclear envelope controls the entry and exit of materials into the nucleus