SUMMER TASKS – GCSE to AS TRANSITION

Subject: Biology
Title: Key skills assessment
The following activities cover some of the key skills from GCSE science that will be relevant at AS and A-level. Complete all activities. **Understanding and using scientific vocabulary** Understanding and applying the correct terms are key for practical science. Much of the vocabulary you have used at GCSE for practical work will not change but some terms are dealt with in more detail at A-level so are more complex. **Activity 1:** Link each term on the left to the correct definition on the right. Copy or print out your answers. (Terms and definitions are on the next 2 pages).

Hypothesis	The maximum and minimum values of the independent or dependent variable
Dependent variable	A variable that is kept constant during an experiment
Independent variable	The quantity between readings, eg a set of 11 readings equally spaced over a distance of 1 metre would give an interval of 10 centimetres
Control variable	A proposal intended to explain certain facts or observations
Range	A variable that is measured as the outcome of an experiment
Interval	A variable selected by the investigator and whose values are changed during the investigation

True value	The range within which you would expect the true value to lie
Accurate	A measurement that is close to the true value
Resolution	Repeated measurements that are very similar to the calculated mean value
Precise	The value that would be obtained in an ideal measurement where there were no errors of any kind
Uncertainty	The smallest change that can be measured using the measuring instrument that gives a readable change in the reading

Practical skills

The practical skills you learnt at GCSE will be further developed through the practicals you undertake at A-level.

Activity 2: Investigating how temperature and pH affect enzymes

Read the following information and answer the questions below. Write down or print out your answers.

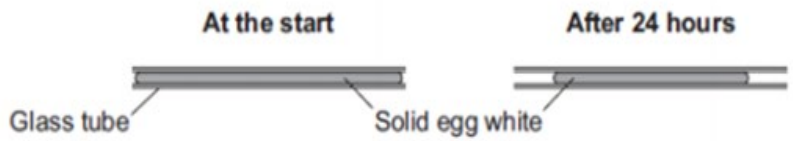
Egg white is made of protein. The students were investigating how temperature and pH affect the digestion of protein

The students carried out the following procedure:

- Filled six narrow glass tubes with fresh egg white
- Boiled the tubes so the egg white became solid

- Placed each tube into a different beaker containing human protease enzyme at different pH values at room temperature and 3 in neutral pH but at different temperatures for 24 hours
- Measured the length of solid egg white in each tube after 24 hours

The diagram shows the investigation.



The results were recorded in the tables below:

pH	Original length of solid egg white (cm)	Final length of solid egg white (cm)	% change
4	6.0	5.6	
7	6.0	3.8	
9	6.0	5.8	

Temperature (°C)	Original length of solid egg white (cm)	Final length of solid egg white (cm)	% change
15	6.0	5.7	
35	6.0	3.8	
55	6.0	5.3	

1. The students predicted that the enzyme would be most effective in conditions similar to those found in the human body. Was their prediction correct?

2. Identify the independent and dependent variables in this investigation.
3. Suggest the control variables for this investigation.
4. Describe the difference between repeatable and reproducible.
5. What would be the most likely resolution of the ruler you would use in this investigation.
6. Suggest how repeating the investigation would be an improvement.
7. Calculate the % change for each result in this investigation. Show your answers to 3 significant figures.

Questions requiring an extended response.

The ability to write coherently in a logical, well-structured way is an essential skill to develop. Your Tutor will work with you on this skill during the course.

Activity 3: Extended writing

This is an 'open book' activity, meaning you can use notes/ resources to help you.

Before attempting the question below, you might want to remind yourself of the work you did on the following topics at GCSE (using notes/ textbooks/ revision guides etc):

- the theory of evolution
- the role of mutation and natural selection

Lemurs are only found on the island of Madagascar. Madagascar is off the coast of Africa. Scientists think that ancestors of modern lemurs evolved in Africa and reached Madagascar about 50-60 million years ago.

Today there are many species of lemur living on Madagascar.

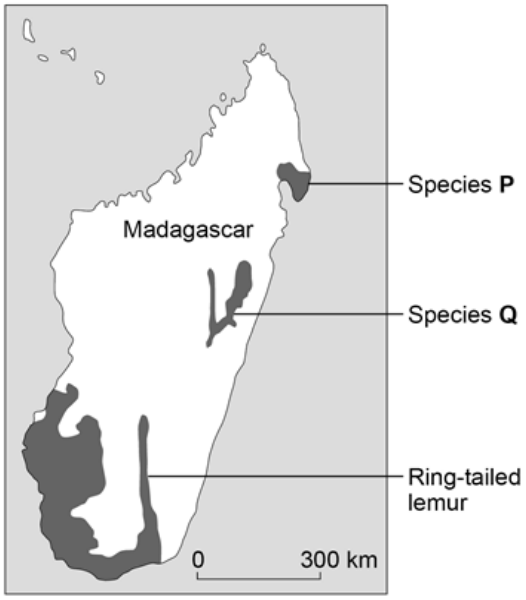


Figure 1 shows the distribution of three species of lemur on Madagascar.

In up to 300 words, describe how the ancestors of modern lemurs may have evolved into the three different species shown on the map (species P, species Q and ring tail lemurs)

How long should I spend on this? 60 minutes

How will I get feedback? In class from your Biology Tutor