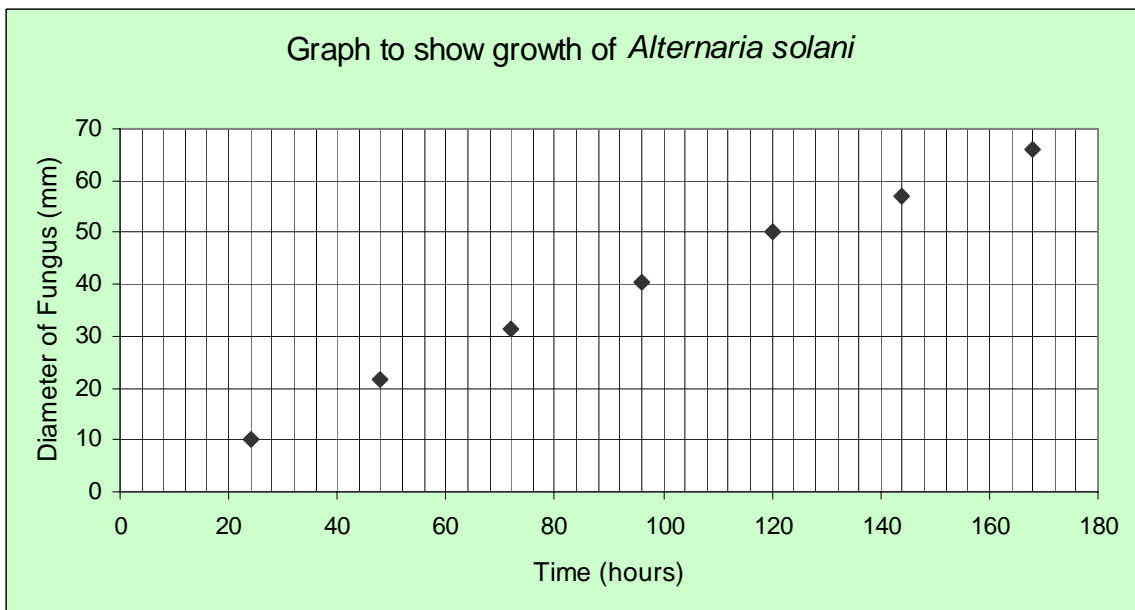
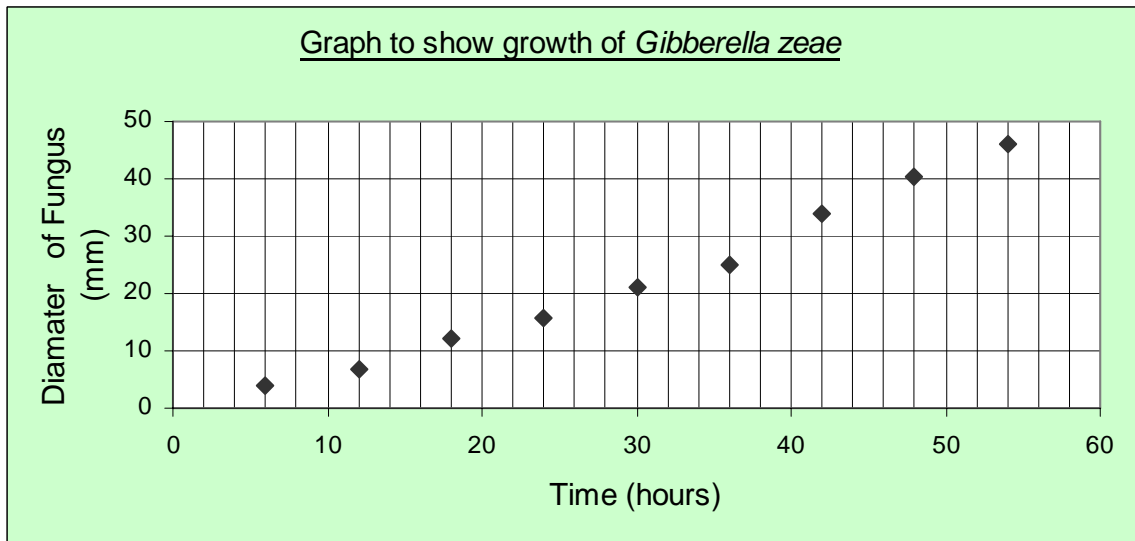




## Fungal Growth – Teaching Notes

### Microbial Growth

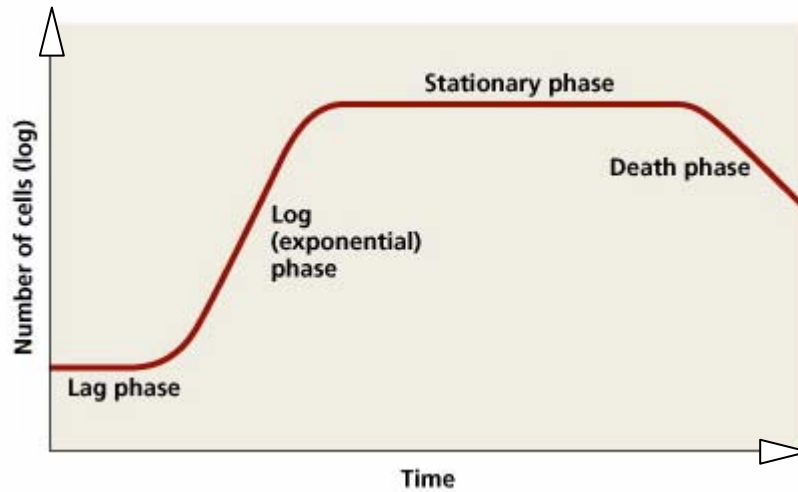
From following the instructions, students should get two graphs similar to this, showing a strong positive correlation for studies of both fungi.





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### Microbial Growth Curve



The microbial growth curve is plotted as the logarithm of cell numbers against the incubation time, the result showing four distinct phases. Though it is not necessary for students to understand how to use logarithms, or the reason for their use, it is still useful for them to understand these four phases of microbial growth.

#### Lag phase:

When micro organisms are first introduced into a fresh culture, there is usually no immediate microbial growth. This lag phase prior to the start of cell division can be due to a number of reasons. The cells may be damaged or weakened, or the medium may be different to what they are used to, necessitating the production of new enzymes before reproduction can begin in force.

#### Exponential growth phase:

During this phase, the microbes are growing and dividing at the maximum rate possible in the set conditions. During this phase the rate of growth is constant, the organisms dividing and doubling at regular intervals. The smooth curve is caused by the fact that each organisms divides at a slightly different moment, rather than at the same time which would lead to increase in discrete jumps.

#### Stationary phase:

In this phase the number of viable micro organisms remains constant, usually as a result of an equal balance between cell division and cell death. It must be remembered that this is not a decreasing number of organisms, but a constant number, due to various





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restrictions on the previously rapid growth. The stage can be realised for several different reasons:

- Nutritional limitation (for example as seen in the fungal growth experiment, the closed system of the petri dish meaning only limited nutrients was available).
- Oxygen limitation for aerobic organisms
- Accumulation of toxic waste products (eg. some organisms produce so much lactic acid from sugar fermentation that their medium can become too acidic to allow maximum growth potential)
- Space limitation

### Death phase:

The detrimental environmental factors listed above ultimately lead to the death phase of the microbial growth graph. As with the exponential phases, the decline in population in the death phase is again logarithmic.

