

BASICS

- ◆ The key areas you'll be assessed on in this topic are:
 - ◆ Movements and growth responses
 - ◆ Biological rhythms
 - ◆ Relationships between species
 - ◆ Relationships between members of the same species
- ◆ Everything basically comes back to a **survival or reproductive advantage**. You should be specific about exactly how this advantage comes about. The main ways a species can gain a survival or reproductive advantage are:
 - ◆ Increasing genetic diversity, like having a pollinator for a tree species.
 - ◆ Getting energy or nutrients, like by growing towards the sun.
 - ◆ Decreasing competition for resources, for example by killing other species.
 - ◆ Gaining protection from predators, like by moving in large groups.
 - ◆ Exploiting a resource other organisms can't, like being resistant to a toxin.
 - ◆ Saving energy, such as by hibernating.
 - ◆ Getting guaranteed access to a mate, like by mating for life.
 - ◆ Or by passing on their genes as many times as possible, like in polygamous species.

TRICKY CONCEPTS

- ◆ There's heaps of vocabulary in this standard and it can be pretty hard to remember all of it. There's no shortcut to this in general, but there are some little tricks to help you remember some specific differences.
 - ◆ To remember the difference between taxis and kinesis, think of getting in a taxi – you tell the driver where to go, so taxis is a directional response.
 - ◆ To remember what a nastic response is, think of the plant going 'ewwww, nasty' when you touch it and shrivelling up – so nastic responses are the fast plant responses.
- ◆ One part of this topic that a lot of people have trouble with is actograms. Make sure you brush up on how to find a free running period from an actogram – this can feel tricky but it's really just about figuring out how much earlier and later the activity starts every day.
 - ◆ free running period = 24 hours + or – change in start time each day
- ◆ Another tricky concept to wrap your head around is photoperiodism and how the two kinds of phytochrome control it. Let's run through it briefly:
 - ◆ Plants flower at different times of year depending on how long the days are. This is controlled by the concentrations of the two different kinds of phytochrome.
 - ◆ Phytochrome red catches red light, which it absorbs really fast during the day because there's heaps of light. When it catches red light it gets turned into phytochrome far red. This is a quick process!
 - ◆ As you probably know, there's not quite so much light during the nighttime. There's still a little bit of what's called far red light though, and the phytochrome far red bit by bit absorbs this light, which turns

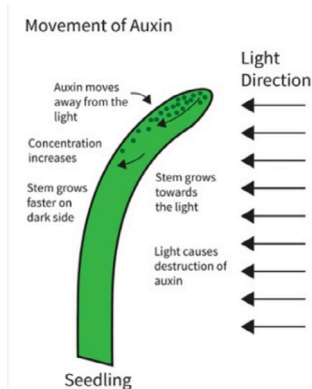
it back into phytochrome red, gradually.

- ◆ Because this happens so slowly, the important thing for the plant is how long the night time is, not how long the daytime is. If there's lots of phytochrome red, that tells the plant that the nights are long and the days are short. If there's not much red and heaps of far red, then that tells the plant that the days are long.



WRITING ANSWERS

- ◆ Diagrams are a useful tool to help make your answers more efficient! You'll want to be confident with drawing a diagram explaining how plant growth responses are controlled by auxins, because this is a lot easier than trying to explain it in just words.



- ◆ A good tip for getting high marks in this exam that has come up in markers reports in the past is to think about the benefits of both aspects of an organism's response.
 - ◆ If an animal only comes out during the night, then talk about how it benefits the animal to be out during the night as well as how it benefits it to be hidden during the day.
 - ◆ If you're talking about hierarchies, talk about how both the individuals at the top AND the bottom of the hierarchy are advantaged.
- ◆ One more quick tip: try not to talk about animals or plants like they're human, because this can bring a good explanation down. Instead of saying something like "the plant wants to grow towards the sunlight" say something more like "the plant gains a survival advantage by growing towards the sunlight".
- ◆ In general, your answers should follow the basic structure of:
 - ◆ First, naming and defining the response from the resource material and describing why it fits the situation you're given
 - ◆ Explaining why this response comes about, first in general and then relating it to the specific context
 - ◆ Describing both the pros and cons of the response
 - ◆ Summing up by stating how the benefits outweigh the costs