

<b>CHAPTER 2</b>	<b>Thought Lab 2.3: Too Much of a Good Thing</b>	<b>BLM 2.3.3</b>
<b>HANDOUT</b>		

**Purpose:** To investigate the impact of increasing ultraviolet radiation on organisms.

### Procedure

Working in a group, use the information presented below to answer the Analysis questions.

Type of organism	Overall effect of increasing amounts of UVR	Adaptations for protection against UVR	Environmental features that protect against UVR
algae or phytoplankton	<ul style="list-style-type: none"> <li>can inhibit photosynthesis</li> </ul>	<ul style="list-style-type: none"> <li>UVR-absorbing compounds</li> </ul>	<ul style="list-style-type: none"> <li>dissolved material in water can act as a shield</li> </ul>
plants	<ul style="list-style-type: none"> <li>in general, inhibits photosynthesis</li> <li>reduces leaf size and decreases growth of many plants</li> </ul>	<ul style="list-style-type: none"> <li>pigmentation</li> <li>UVR-absorbing compounds</li> <li>DNA repair processes</li> </ul>	<ul style="list-style-type: none"> <li>shade can protect plants</li> </ul>
bacteria	<ul style="list-style-type: none"> <li>depending on species, may be killed or highly resistant</li> </ul>	<ul style="list-style-type: none"> <li>DNA repair processes</li> </ul>	<ul style="list-style-type: none"> <li>amount of Sun exposure is limited</li> </ul>
protozoa	<ul style="list-style-type: none"> <li>varies; damages cells in some species</li> </ul>	<ul style="list-style-type: none"> <li>DNA repair processes in some protozoa</li> </ul>	<ul style="list-style-type: none"> <li>protozoa living in deeper waters are shielded from UVR</li> </ul>
zooplankton	<ul style="list-style-type: none"> <li>can be damaging or kill depending on age and other factors</li> </ul>	<ul style="list-style-type: none"> <li>pigmentation</li> <li>UVR-absorbing compounds</li> <li>DNA repair</li> </ul>	<ul style="list-style-type: none"> <li>zooplankton are shielded from UVR when they swim to deeper waters</li> </ul>
fish	<ul style="list-style-type: none"> <li>damaging</li> <li>can kill fish</li> </ul>	<ul style="list-style-type: none"> <li>pigmentation</li> <li>DNA repair in fish eggs</li> </ul>	<ul style="list-style-type: none"> <li>deeper, cooler waters protect developing fish</li> </ul>
amphibians	<ul style="list-style-type: none"> <li>causes developmental damage</li> <li>can kill some amphibians</li> <li>possibly reduces amphibians' ability to fight disease</li> </ul>	<ul style="list-style-type: none"> <li>pigmentation</li> <li>DNA repair processes</li> </ul>	<ul style="list-style-type: none"> <li>dissolved materials in water can act as a shield</li> <li>some amphibians are nocturnal</li> </ul>
humans	<ul style="list-style-type: none"> <li>causes skin deterioration, skin cancer, and eye problems (cataracts)</li> </ul>	<ul style="list-style-type: none"> <li>pigmentation (melanin in skin)</li> <li>DNA repair processes</li> </ul>	<ul style="list-style-type: none"> <li>shade, clothing, and sunscreen can protect against UVR</li> </ul>

<b>CHAPTER 2</b>	<b>Thought Lab 2.3: Too Much of a Good Thing (cont'd)</b>	<b>BLM 2.3.3</b>
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### Analysis

1. What might be the effects of increasing amounts of UVR on productivity?
2. What direct effects does increasing UVR have on animals?
3. What indirect effects might increasing UVR have on animals?
4. Suggest an approach to counteract increased levels of UVR in ecosystems. What would you need to find out to ensure that your approach is a wise one?