

Survival of the Fittest

Name: _____

1. Find definitions and examples to complete the vocabulary table below.

Term	Definition	Example
Adaptation	A physical or behavioural trait that improves an organism's ability to survive and reproduce in its environment. Adaptations are the result of evolution.	
Evolution		
Natural Selection		
Biomimicry		

2. Complete the table by stating which of the pictured organisms inspired the product design and outlining the feature of the organism that is being 'mimicked'.

Which organism do you think inspired the design?



Duck



Burdock plant seed (burr)



Flying Squirrel

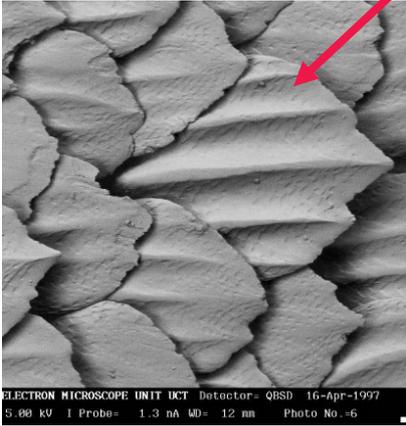
Product	Inspired by	Mimicked Adaptation
 <p>Swimming Fins</p>		
 <p>Wingsuit</p>		
 <p>Velcro</p>		

Biomimetic Design

In the field of biomimetic design, biomimicry is used to enhance sports equipment design in order to improve participant safety and comfort or to enhance performance. Some examples include running shoes for greater grip designed on cheetah claws and utilising the design of a pine cone to develop fabrics that allow better ventilation and sweat evaporation.

You will need to read the information about “Biomimetics in Sport” at this [web link](#) to complete the following questions. If you are unable to access the website all of the information can be found in accompanying “Biometrics in Sport Web Article” word document. You may also like to watch this short you tube [video](#) on biomimicry and this [video](#) about gecko grip.

1. Read about LZR speedo swimsuits and fill in the gaps to complete the biomimicry design brief below.

Project name: LZR speedo swimsuits	Target sport(s): Swimming
Biomimicry summary: Speedo LZR designed swimsuits to improve performance by _____. The swimsuit fabric incorporated the same structures as seen in _____. Shark skin contains tiny scale like structures called _____ which reduce both _____ and turbulence, allowing sharks to move through the water efficiently.	
Design diagram:	
 <p>ELECTRON MICROSCOPE UNIT UCT Detector= QBSD 16-Apr-1997 5.00 kV I Probe= 1.3 nA WD= 12 mm Photo No.=6</p>	

Denticle pattern of shark skin incorporated into panels of swimsuit to reduce drag.

2. Using the previous design brief as a guide, complete a design brief for an existing sports biomimetic design of your choice. You can use the information provided or do your own research.

Project name:	Target sport(s):
Biomimicry summary:	
<p>Design diagram:</p> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 30%; text-align: center; color: gray;"> <p><i>Add organism adaptation here</i></p> </div> <div style="width: 35%; border: 2px solid red; padding: 10px; text-align: center;"> <p>.....</p> <p>incorporated into</p> <p>.....</p> <p>to</p> <p>.....</p> </div> <div style="width: 30%; text-align: center; color: gray;"> <p><i>Add sports design application idea here</i></p> </div> </div>	

3. Come up with other possible applications of the adaptations used in the biomimetic designs above.

Adaptation	Target Sport	Biomimetic Sport Design Idea
Shark skin denticles		
Gecko Grip		

Is it fair?

The Speedo LZR Elite swimsuit was marketed as “the fastest swimming suit in the world” and was launched at the 2008 Olympic Games.



1. Some, but not all swimmers competed in the suit. Outline some reasons why not all swimmers would have used the swimsuit, even though it was “the fastest swimsuit in the world”.

2. Do you think it’s fair that some swimmers were able to utilise biomimetic design to gain a performance advantage? Explain why/why not.