



# Key Stage 4

## Penguin populations

### Student worksheet

Who doesn't love penguins? The sight of this much loved bird waddling along is guaranteed to bring out the nature lover in anyone. The bad news is that research shows that in some regions, penguin populations are in decline, meaning that 10 of the 18 penguin species are threatened with extinction.

Researchers at the University of Oxford are trying to figure out why some Antarctic populations are in decline, so we can help save them.

#### Penguin Watch

Penguin Watch is a project, led by penguinologist Dr Tom Hart, that has established a network of time-lapse cameras in Antarctica. The cameras take photos of penguins all year round. This means much more information about the penguins can be gathered than methods used in the past, where scientists would travel large distances in extreme conditions to study the penguins. Because of the vast amount of information collected, the team use help from the public to count the penguins - so you can join in!

#### Why are they doing it?

Penguins spend the majority of their life at sea and are near the top of the food chain. Therefore, changes in their populations are likely to reflect the changes occurring in the wider ecosystem, making them excellent indicators of the health of the marine environment.

By examining these changes, and identifying key threats, Penguin Watch can help policy makers in governments make useful changes to protect these important environments and organisms.

[www.oxfordsparks.ox.ac.uk/content/seabird-monitoring-witnesses-wild](http://www.oxfordsparks.ox.ac.uk/content/seabird-monitoring-witnesses-wild)

#### Your task:

You are going to act like a penguinologist and study the populations of two penguin species: chinstrap and gentoo. You will invent possible hypotheses for changes in their population.

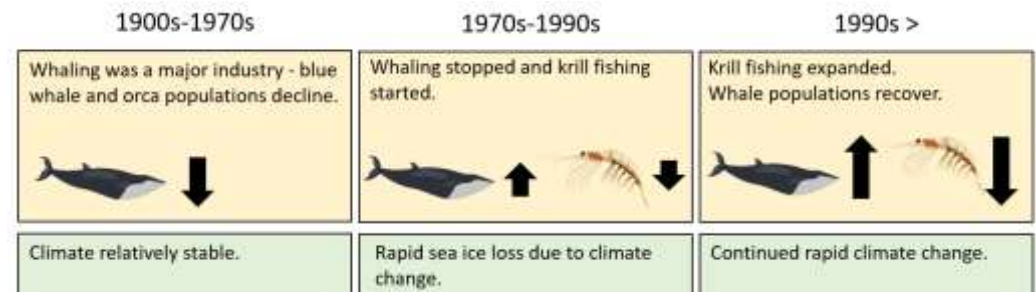
1. Use the 'penguin population data' to plot a line graph to show the changes in population of the two species on Ardely Island, Antarctica over time. Describe what the graph shows.
2. Read through the information below and use the Antarctic food web to explain possible reasons for the population change to each species.
3. Write advice to policy makers saying what changes they should make and why.

#### Useful information



##### Krill

Krill has adapted to low, stable temperatures and is unlikely to tolerate large temperature changes. The life-cycle of Antarctic krill is highly dependent upon sea ice. Larval krill feed on ice algae and other sea ice associated organisms to survive the winter. Sea ice also offers a suitable habitat to protect krill from predators.



#### Changes in the Antarctic





Penguin population data

Year	Number of nests	
	Chinstrap 	Gentoo 
1977	4100	2000
1979	5000	1800
1981	4150	1700
1982	3750	1650
1984	3800	2000
1986	2900	2100
1988	3900	2100
1990	2250	2000
1992	3000	2000
1994	2800	1800
1996	2100	1200
1998	2200	1200
2000	2000	2000
2002	1800	2100
2004	1200	2700
2006	1100	3000
2008	1050	4000
2010	1000	4900

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### Antarctic food web

