



# COOL PENGUINS

## KEEPING WARM UNDERWATER part 1

1. Over the four minute time period, predict which plastic bag will show the lowest temperature: the bag containing vegetable shortening, or the bag without?

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2. What does vegetable shortening represent in this activity?

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3. In the table below enter temperatures collected from both plastic bags, during the activity.

**Table 1: temperatures in insulated plastic bag and empty plastic bag over a four minute time period.**

TIME (MINUTES)	GLOVE 1 (INSULATION) TEMPERATURE (°C)	GLOVE 2 (NO INSULATION) TEMPERATURE (°C)
2		
4		

4. Was your prediction about which temperature was lowest correct?

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## KEEPING WARM UNDERWATER part 2

5. Did you notice a difference in temperature when you submerged both hands in cold water? Describe any differences you noticed.

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6. What advantage would a thick layer of fat provide the emperor penguin in the Antarctic environment?

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# STUDENT SHEET 7: COOL PENGUINS

## STAYING WARM ON ICE

1. Predict which test tube, filled with hot water, will cool down fastest: the test tube in the centre of the group, or the single test tube.  
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2. In the table below enter temperatures collected from both the group of test tubes and single test tube.

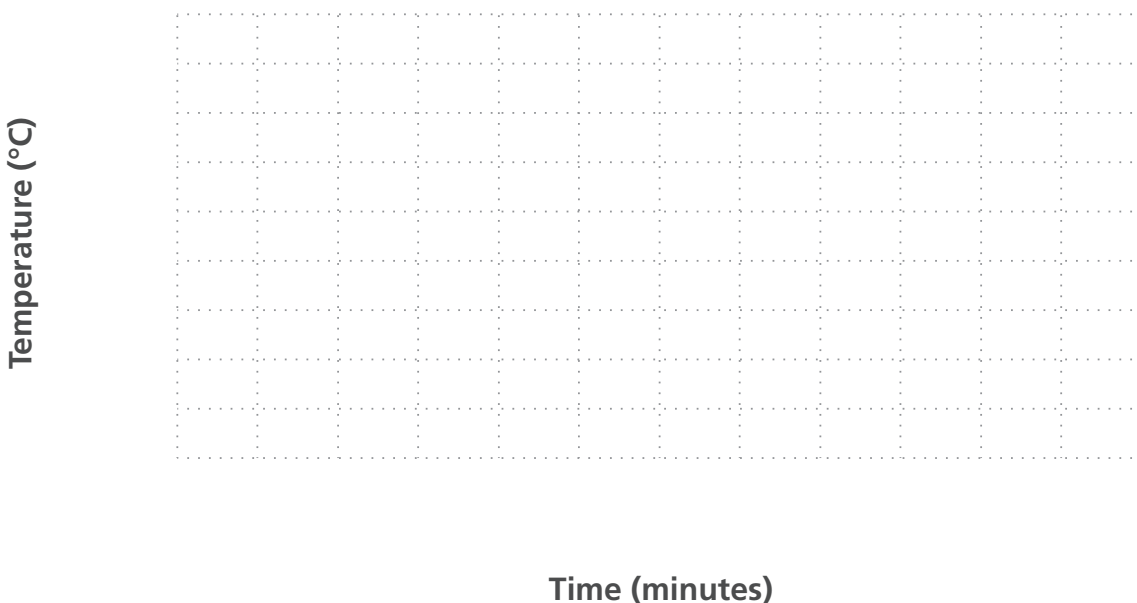
**Table 2: temperature of grouped test tubes and single test tube.**

TIME (MINUTES)	SINGLE TEST TUBE TEMPERATURE (°C)	GROUPED TEST TUBES TEMPERATURE (°C)
0		
2		
4		
6		
8		
10		
total change in temperature		

3. Calculate, using subtraction, the total change in temperature from 0 minutes to 10 minutes for both single test tube and grouped test tubes.  
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4. Present results from the table in a column graph using the grid below. Display both the single test tube and grouped test tube results in your graph.

**Graph title:**.....



## STUDENT SHEET 7: COOL PENGUINS

5. Was your prediction about which test tube would cool down quickest correct?

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6. How does huddling together help emperor penguins stay warm?

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7. Fill in the missing words.

Huddling behaviour and insulating fat are both .....of the emperor penguin that help it ..... in the Antarctic.

8. Write down any other information you might know or research about emperor penguins and their adaptations for life in Antarctica.

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