

# Science at home: **Moldy bread project**

**Blurb:** In order to grow all organisms need energy. They get this energy from the chemical reaction of respiration. All chemical reactions are affected by temperature. When the temperature is warm the reactants can move faster and are more likely to react together. When the temperature is colder the reactants move slower and are less likely to react together.

## **Task 1**

Read through the method given for this investigation and complete the project booklet using your scientific enquiry knowledge. If you are unsure you can go back to the scientific enquiry skills power point or contact your teacher.

## **Task 2**

If possible, watch the video of a President Kennedy teacher completing the practical.

## **Task 3**

If you want to you can do this experiment at home.

## **Task 4**

Send your completed work to your teacher and if you want a picture of yourself having completed the project. You can find all the email address below.

## **Teacher contact information**

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## Hypothesis

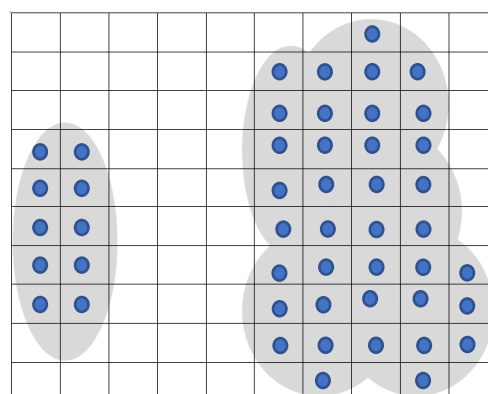
Changing the temperature of the bread affects the percentage of the bread that grows mould.

## Method

1. Using the sticky labels and the marker pen label the bags. Mark 3 bags as 'A', 3 as 'B' and 3 as 'C'. You also need to label each set of bags 1 to 3.
2. Cut the bread into 10cm x 10cm squares using the chopping board and knife.
3. Put one slice of this bread into each bag and seal the bags tightly.
4. Put the 3 'A' bags into the freezer, the 3 'B' bags into the refrigerator and the 3 'C' bags somewhere safe in a warm room. Because the bags in the freezer and fridge will not be getting much light it is best to cover the 'C' bags to make sure that light is a constant.
5. Every 24 hours, preferably at exactly the same time every day, using the plastic grid, count the number of square centimetres of mould on each slice of bread. If the mould covers more than half a square, count it as 1cm, if less than half a square, count as 0 cm. You must never open the bags.
6. You should repeat these counting processes for 10 days or until there are significant measurable results.
7. Keep a careful note of your results for each slice of bread for the entire duration of the experiment. You can even take pictures or draw the slices if you want to be really scientific!
8. Average the results for sample types A, B and C.
9. Once you have finished, throw out all of the bags without opening them.

## **Results**

Because each square of bread is 100cm<sup>2</sup>, you can express your results as a percentage. For the example on the right the percentage cover would be 48cm<sup>2</sup>. The dots represent the squares that are at least 50% covered with mould. For each of the bread types, A, B or C average the amount of mould grown over the ten days and write these figures into a table.



## Prediction

Write your prediction for this experiment

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**Variables**

What was the independent variable?

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What was the dependent variable during the investigation?

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State 2 things the scientists should **control** in order to produce a valid experiment.  
**Suggest** how you would control these variables.

<u>Control variable</u>	<u>How can this be controlled</u>

**Risk assessment**

Complete this risk assessment for the suggested experiment

Hazard	Risk	Prevention	Remedial action

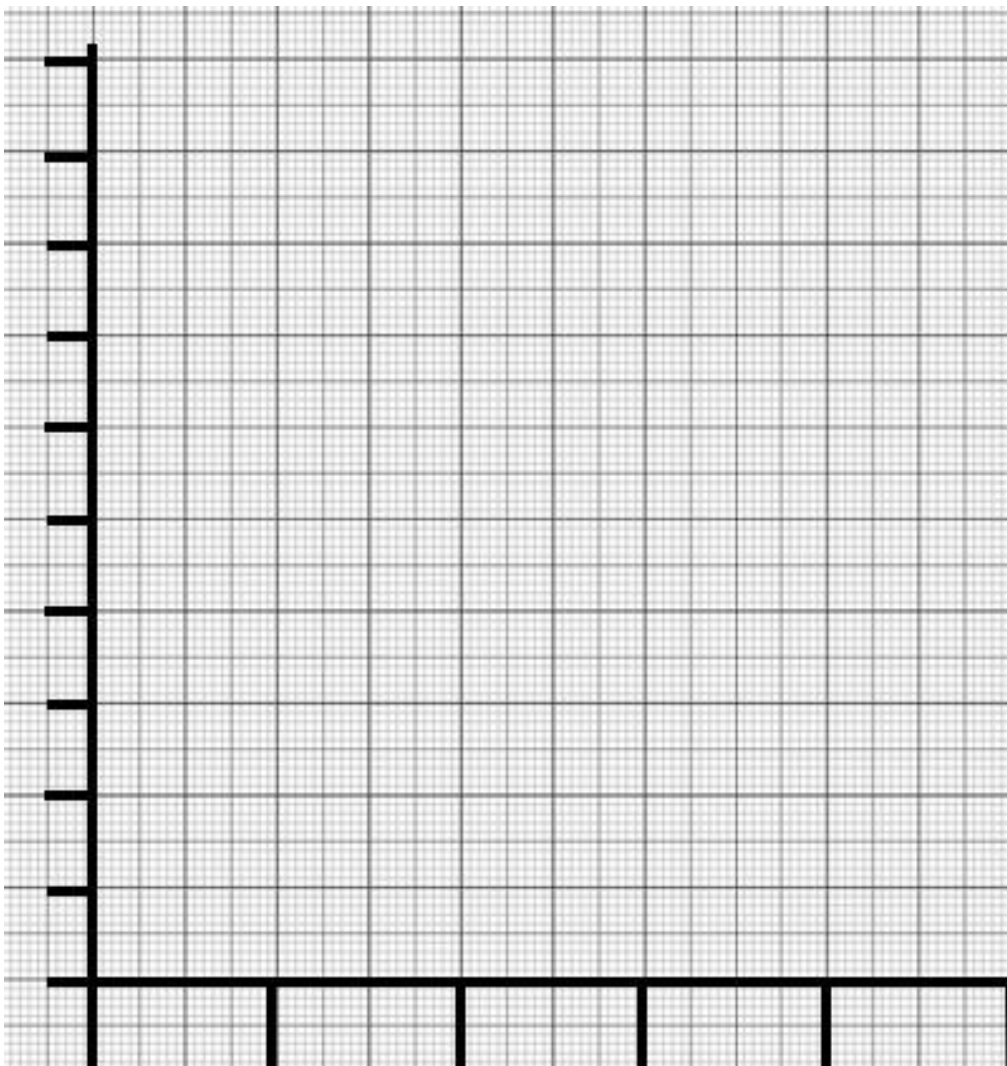
## Results table

Calculate the average

Temperature	Percentage of the bread covered by mold on day 10			
	Repeat 1	Repeat 2	Repeat 3	Average
<b>A</b> Warm room	76	80	78	
<b>B</b> Fridge	24	32	28	
<b>C</b> Freezer	0	0	0	

## Graph

Plot a graph of the average percentage of the bread covered by the mould on day 10 in each of the different temperatures.



**Conclusion**

Describe and explain the patterns shown in the graph. Remember to use data in your answer.

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**Evaluation**

1. How could the scientist improve the accuracy of his results?

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2. How could the scientist improve the reliability of his results?

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