What do microorganisms need to live?

Preparation:

Number each person in your group 1, 2, 3 or 4. You are each responsible for setting up your own bottle.

Extra responsibilities:

1. Organise practical equipment and collect any extra equipment needed (e.g. glue)
2. Make sure 1, 3 and 4 add the sugar cubes at the same time
3. Make sure that everyone has a title, diagram and results table in their jotter
4. Make sure everyone has completed the questions in sentences

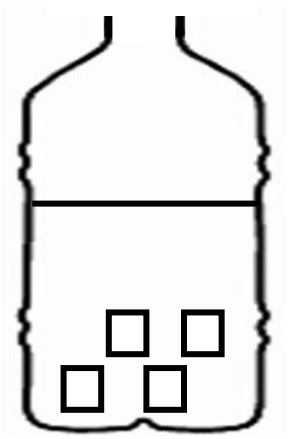
Equipment:

- 4 bottles
- 4 balloons
- oil
- 12 sugar cubes
- warm yeast solution (*water boiled first*)
- warm yeast solution
- cold yeast solution

Method:

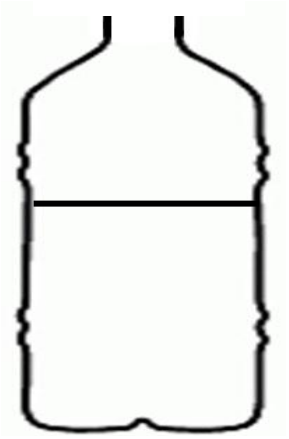
1. To bottles 1 and 2 add 200ml of <u>warm</u> yeast solution
2. To bottle 3 add 200ml of <u>cold</u> yeast solution
3. To bottle 4 add 200ml of <u>warm</u> yeast solution (*water boiled first*)
4. To bottle 4 carefully add a 3cm layer of oil
5. Add 4 sugar cubes to bottles 1, 3 and 4
6. Carefully stretch a balloon over the neck of each bottle

Bottle 1



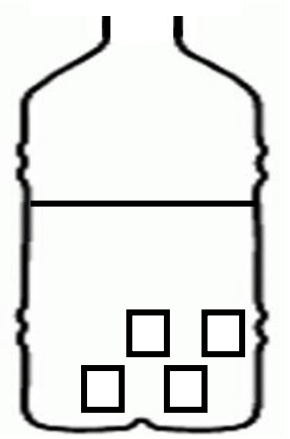
200ml warm yeast
4 sugar cubes
1 balloon

Bottle 2



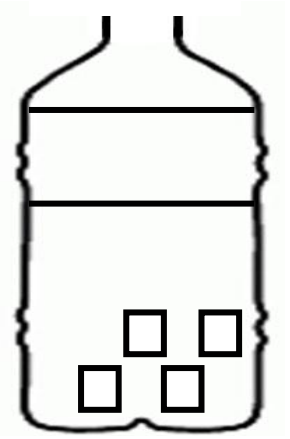
200ml warm yeast
1 balloon

Bottle 3



200ml **<u>cold</u>** yeast
4 sugar cubes
1 balloon

Bottle 4



200ml warm yeast
(*water boiled first*)
3cm oil
4 sugar cubes
1 balloon

Results:

Copy the results table below into your jotter

Bottle	Appearance of Balloon
1	
2	
3	
4	

When you have completed your results table complete the questions below in your jotter.

Remember to answer in sentences.

1. Why was the water in bottle 4 boiled first?
2. Why was a layer of oil added to bottle 4?
3. Does yeast need sugar to live? How do you know this?
4. Does yeast need warm conditions to live? How do you know this?
5. Does yeast need oxygen to live? How do you know this?
6. Which gas is produced by living yeast?

Conclusion:

Copy and complete the conclusion of the investigation in your jotter.

In conclusion the results of this experiment show that yeast need _____, _____ and _____ to live.

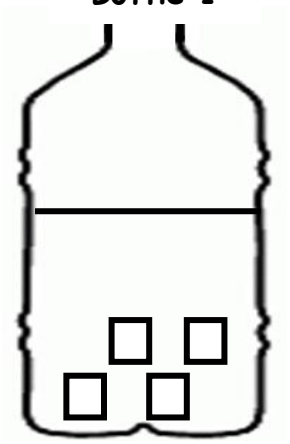
Bottle	Appearance of Balloon
1	
2	
3	
4	

Bottle	Appearance of Balloon
1	
2	
3	
4	

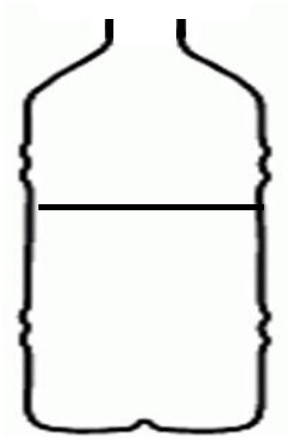
Bottle	Appearance of Balloon
1	
2	
3	
4	

Bottle	Appearance of Balloon
1	
2	
3	
4	

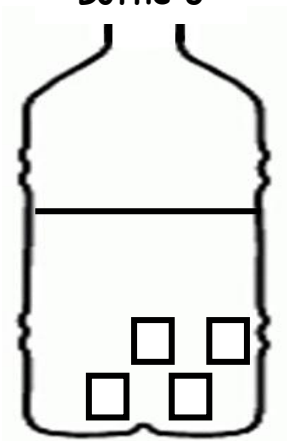
Bottle 1



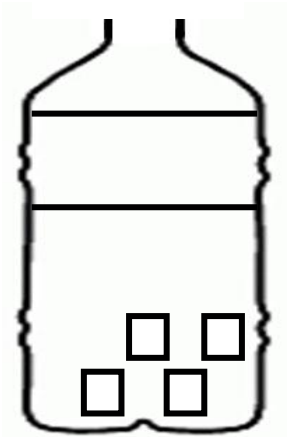
Bottle 2



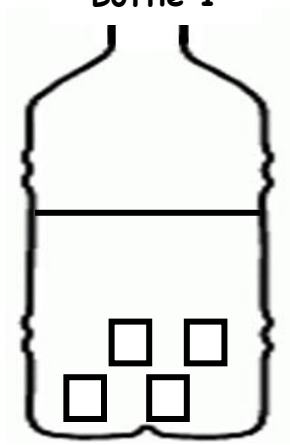
Bottle 3



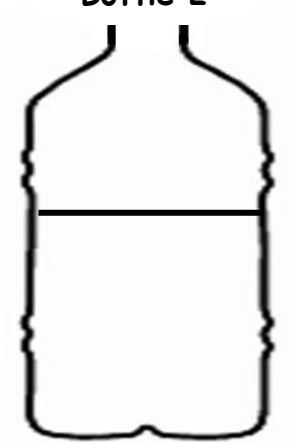
Bottle 4



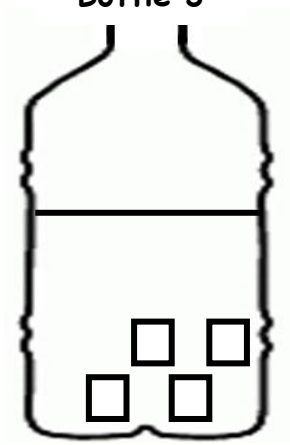
Bottle 1



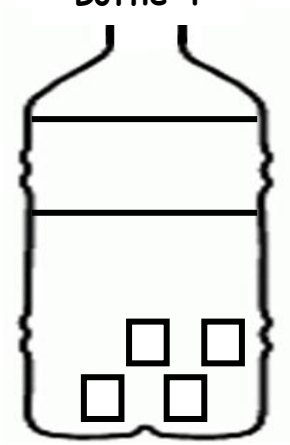
Bottle 2



Bottle 3



Bottle 4



1. The water in bottle 4 was boiled first to _____

_____

2. Oil was add to bottle 4 to _____

_____

3. Yeast _____ sugar to live.
4. Yeast _____ warm conditions to live.
5. Yeast _____ oxygen to live.
6. Living yeast produce the gas _____ _____

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In conclusion the results of this experiment show that yeast need _____, _____ and _____ to live.

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