POTCHEFSTROOM HIGH SCHOOL FOR BOYS

PRATICAL 1 LIFE SCIENCE

GRADE 11

Name: _____

Date: _____

Total: 35

Duration: 60 Minutes

Learners mark out of 35	Learner's percentage	Weighting of SBA task

SKILL ASSESSED

Skills for practical work	Description	Question number
Follow Instructions	Give Instructions	
	Adhere to safety rules	
Handle Apparatus	Knowledge of apparatus	
	Improvising apparatus	
	Handling chemicals/apparatus correctly	
	Work safely and take precautions	
Make observations	Make drawings	
	Measuring (proportions/ratios, scale)	
	Describing objects/processes	
	Grouping/Classifying materials	
	Observing results/features	
	Comparisons	
Record Data	Tables	
	Graphs	
	Drawings	
	Descriptions	
Measure	Reading scales	
	Scaling	
	Measuring out quantities	
	Estimations	
	Making valid measurements	
	Supply correct Units	
Interpret	Converting information	
	Apply knowledge	
	Analyse data	
	Make deductions	
Design/plan investigation		

KNOWLEDGE AREA

Tissues, Cells and Molecular Studies	Structure, Control and Processes	Environmental Studies	Diversity change and continuity

SPECIFIC OUTCOMES

	Knowledge	Practical skills	Society and Science
Required percentage :	20 %	60 %	20 %
Actual percentage:	%	%	%

TOPIC: MICRO-ORGANISMS AND BIOTECHNOLOGY

INSTRUCTIONS

1. Use black/blue ink or black ball-point pen. No pencil answers except for drawings.
2. Answer ALL the questions.
3. Write neatly and legibly
4. All drawings should be done in pencil and labelled in blue or black ink.
5. Draw diagrams or flow charts only when requested to do so.
6. The diagrams in this question paper may not necessarily be drawn to scale.
7. Non-programmable calculators, protractors and compasses may be used.

LEARNER DECLARATION

I confirm that this work was conducted under supervision in class by myself. I confirm that this work is my own.

Signature of learner: Date:

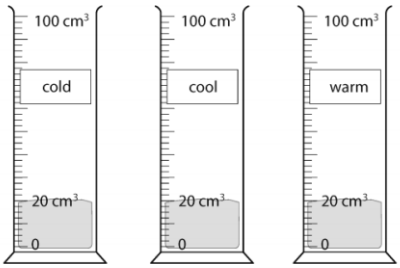
QUESTION 1.1:

Study the following experiment and answer the questions that follow:

Apparatus

- three measuring cylinders – you can use small plastic drinks bottles instead
- bread flour
- dried yeast
- large beaker or bowl
- stirring rod
- sugar
- tablespoon and teaspoon
- thermometer (optional)
- water

Do not eat any dough.



Method

A Measure out 5g of sugar, 3.5g of yeast and 100g of bread flour. Add them all to a large beaker.

B Now measure out 65cm^3 (65ml) of water.

C Pour the water, a little bit at a time, into the beaker. Each time you have added some water, stir the mixture using the spoon.

D Keep stirring until the mixture is a smooth paste. Now very slowly pour or spoon 20ml (that's 5 level teaspoons) of the mixture into a measuring cylinder. Put another 20ml of mixture into each of the other two measuring cylinders. Push any bits that get stuck to the side down to the bottom with the stirring rod. Use a ruler to measure the height of the dough in the cylinder.

E Label the cylinders to show the different temperatures they will be placed at – 'cold', 'cool' and 'warm'.

F Record the volume of dough in each cylinder.

G Put the cylinders in the different places for the different temperatures. If you have one use a thermometer to measure the exact temperature in each area. You could place the cylinders in cold, cool and warm water.

H Leave them for 1 hour.

I Now measure the new volume of the dough in each cylinder.

Exploring Science HSW edition 114 © Pearson Education Limited 2008

1.1.1 Formulate a **hypothesis** for this investigation.

_____ (2)

1.1.2 Name THREE **fixed**/controlled **variables** for this investigation

_____

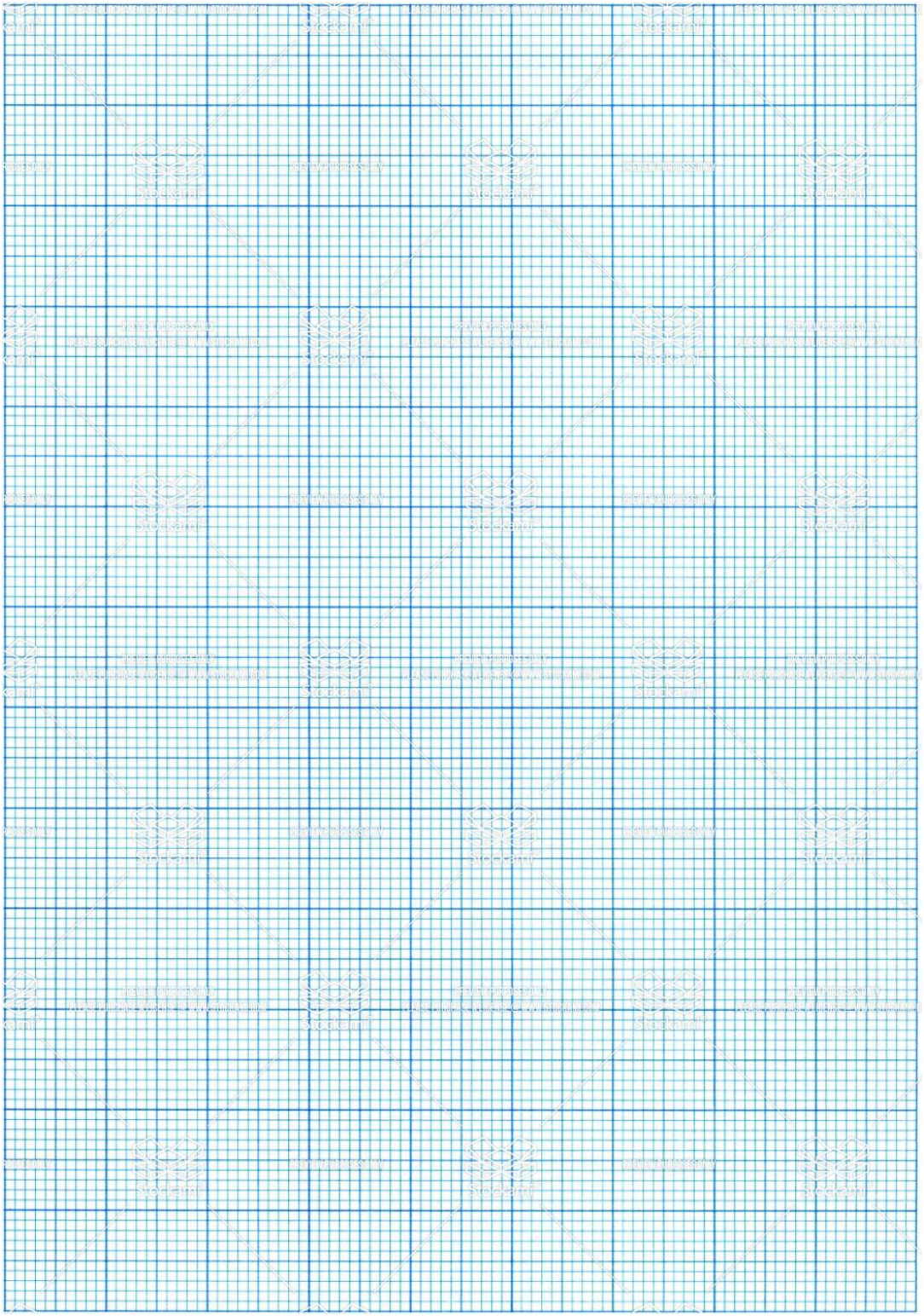
_____

_____ (3)

1.1.3 Complete the information in the table below and use the results to draw a **graph** of the percentage increase of the dough (4) +(6)

TABLE 1: THE EFFECT OF TEMPERATURE ON THE INCREASE IN THE VOLUME OF DOUGH

Temperature of the area the dough was left in (°C)	**Volume of the dough at the start of the experiment (cm3)**	**Volume of the dough at the end of the experiment (cm3)**	**Percentage Increase in the volume of the dough (cm3)**
Cold (5°C)		22	
Cool (20°C)		30	
Warm (40°C)		48	



1.1.4 Describe the results of the investigation

_____

_____

_____(3)

1.1.5 Explain how you can make this investigation more **reliable**

_____

_____(2)

[20]

QUESTION 1.2:

Read the information on sourdough production and answer the questions that follow:

Sourdough

Bread-baking, or the preparation of cakes from flour or parched grain, is an ancient human art. In Hebrew Bethlehem means "House of Bread". *Oxford English Dictionary* records twelfth-century usage of sourdough (*Sauerteig*), the common denomination in

Sourdough is a mixture of flour and water with Lactic acid bacteria (LAB) like *Lactobacillus* and yeast species like *Saccharomyces* and *Candida*. Over time, the culture will tend to become a mixture of one of a dozen or so wild yeast strains, and one of about 20 or so different lactobacilli. The yeast and LAB for a symbiosis that is interesting, and makes the culture quite stable. Due to the variations in niche and regions – each countries sourdough will have unique flavours and textures. Yeast does not eat maltose while the bacteria do, the lactobacilli also eat the dead yeast cells.

Sourdough is often considered to be superior to other dough for a variety of reasons. Commercial baker's yeast cannot survive the acidity in sourdough starters, nor can it be used more than twice, while sourdough starters are renewable. Although sourdough takes a longer time to rise, it breaks down the proteins (gluten in wheat) into amino acids, making it easier to digest. In addition the simple sugars are much lower and nutrients like vitamin B is higher. The acetic acid helps the bread to store longer by inhibiting growth of moulds.

Some historians speculate that the Egyptians were the first to discover the value of fermented dough.

(Source: Sourdough from Cultures for Health)

1.2.1 Complete the following table comparing the characteristic of *Lactobacilli* and *Saccharomyces*

	Lactobacillus	**Saccharomyces**
Kingdom		
Genetic material		

(4)

1.2.2 Name three advantages of using sourdough

_____

_____

_____(3)

1.2.3 Explain what a symbiotic relationship is and how the sourdough cultures are symbiotic

_____

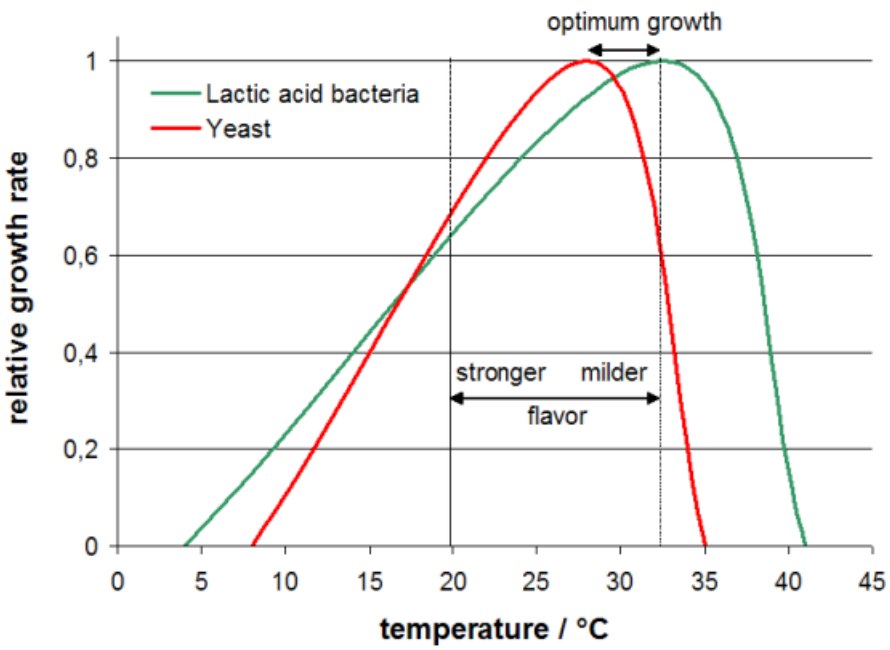
_____

_____(3)

[10]

QUESTION 1.3:

Study the graph on the effect of temperature on the relative growth rate of yeast and lactic acid bacteria and answer the questions that follow:



1.3.1

1.3.2 What is the optimum growth temperature range for the LAB and yeas cultures combined?

_____ (1)

1.3.2 What happens to the cultures above 40°C?

_____ (2)

1.3.3 At which two temperatures is the relative growth rates for LAB and yeast cultures the same?

_____ (2)

[5]

Question Analysis Grid

Life Sciences Gr 11

Task Type : Practical 1 Date: 15 March 2016

Educator: Mrs t De Vos

Question	Cognitive Levels				SA1	SA2	SA3	Knowledge Area			Total
	A	B	C	D							
								Micro organisms	and	biotechnology	
1.1.1		2				2			2		2
1.1.2	3					3			3		3
1.1.3	6		4			10			10		10
1.1.4				3			3		3		3
1.1.5	2					2			2		2
											0
1.2.1	4				4				4		4
1.2.2		3					3		3		3
1.2.3		3			3				3		3
											0
1.3.1			1			1			1		1
1.3.2		2				2			2		2
1.3.3			2			2			2		2
1.3.4											0
											0
Total Section A:	15	10	7	3	7	22	6		35		35
Grand Totals:											
Actual Marks	15	10	7	3	7	22	6		35		35
Actual Percentage	43	29	20	9	20	63	17		100		300
Recommended Weighting:											
Percentage	40%	25%	20%	5%	20%	60%	20%		100%		100%
Marks	14	9	7	2	7	21	7		35		35