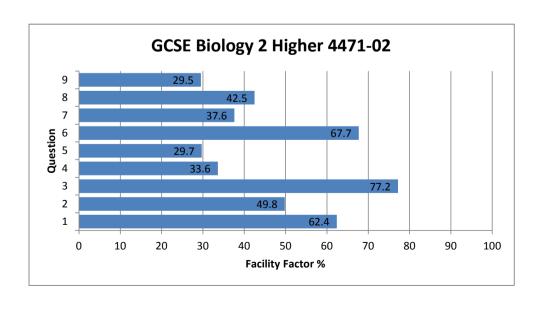


WJEC 2014 Online Exam Review

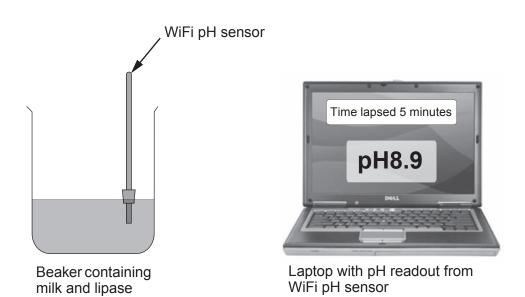
GCSE Biology 2 Higher 4471-02

All Candidates' performance across questions

?	?	?	?	?	?	?	
Question Title	N	Mean	S D	Max Mark	F F	Attempt %	
1	5240	4.4	1.6	7	62.4	100	
2	5241	3	1.3	6	49.8	100	
3	5241	3.9	0.9	5	77.2	100	
4	5195	2	1.5	6	33.6	99.1	
5	5231	1.8	1.6	6	29.7	99.8	\leftarrow
6	5241	6.1	2.1	9	67.7	100	
7	5237	2.6	1.3	7	37.6	99.9	\leftarrow
8	5238	3.4	1.7	8	42.5	99.9	
9	5210	1.8	2.1	6	29.5	99.4	\leftarrow



5. An experiment was set up to investigate the digestion of fat in milk by lipase. The following apparatus was used.



The beaker containing milk and lipase was kept at a constant temperature in a water bath. The pH readout on the laptop was recorded every 5 minutes for 40 minutes. The results are shown below.

time (minutes)	рН
0	9.1
5	8.9
10	8.8
15	8.7
20	8.6
25	7.5
30	7.0
35	6.4
40	5.9

(a)	Explain why the pH changed during the experiment.	[2]

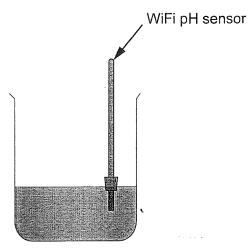
,	

6

Examiner only	The average rate of fall in pH in the first 20 minutes is 0.025 pH units per minute. After 20 minutes bile was added to the beaker. Calculate the average rate of fall in pH units per minute in the 20 minutes after the bile was added. [1]	(i)	(b)
	pH units per minute		
	Explain why the rate of fall in pH increased when bile was added. [3]	(ii)	
		•••••	
		•	
		•••••	
		•••••	

Turn over. (4471-02) © WJEC CBAC Ltd.

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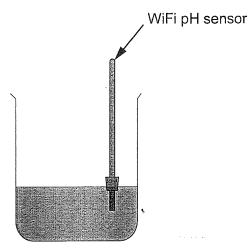
(a) Explain why the pH changed during the experiment. [2]

The PH Changed during the experiment due to lipase
breaking down the fat contained in the milli.

(b)	(i)	The average rate of fall in pH in the first 20 minutes is 0.025 pH units per minute. After 20 minutes bile was added to the beaker.
	,	Calculate the average rate of fall in pH units per minute in the 20 minutes after the bile was added. [1]
		1-1 0.5
		0.6
		0.5
		0-675 pH units per minute
	(ii)	Explain why the rate of fall in pH increased when bile was added. [3]
		It increased because bile emubifies the fats
	•	in a fill william in a same of the sundance

work faster causing the Ph to Cather of Faster

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y-1 0.5

0.5

0 - 675 pH units per minute

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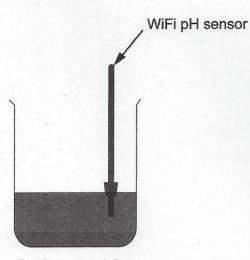
It increased because bile emuloifies the fats
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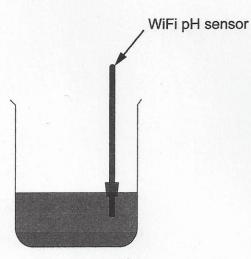
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25	7.5
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35	6.4
40	5.9

(a) Ex	xplain	why the pH char	nged during th	e experime	nt.			[2]
The	e (lipase	would	l has	re	digest	ed	
Μí	lk	(fat)	to pro	duc	gl	ycero	l and	
Fa.	tty	acids	ito	caus	e	the	Solution	du
		become			# 3.01			
		© WJEC CBAC Ltd	1. (447	71-02)				

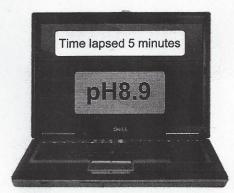
Only		(i) The average rate of fall in pH in the first 20 minutes is 0.025 pH ur After 20 minutes bile was added to the beaker. Calculate the average rate of fall in pH units per minute in the 20 minute was added.	(b)
	nits per minute	101015 0.625 pH u	
	[3] (arge	(ii) Explain why the rate of fall in pH increased when bile was added. Rile emulsifies Fat; breaks	

(II) Explain why the rate of fair in pri increased when bile was added.
Bile emulsifier Fat; breaks large
droplets of fat into smaller
droplets. This increases their
surface area for lipase to
work on, and increasing their
rake of digestion.
50 HOLE SECTION 1 1 HOLE (2017) HOLE HELD (2017) HOLE HELD HELD HELD HELD HELD HELD HELD HE

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40	5.9

(a) Explain why the pH changed during the experiment.	[2]
The lipase would have digested	
milk (fat) to produce glycerol an	d 2
Fatty acids i to cause the solut	ion
to become acidic.	

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(4471-02)

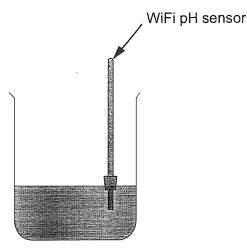
(b) (i) The average rate of fall in pH in the first 20 minutes is 0.025 pH units per minute.
 After 20 minutes bile was added to the beaker.
 Calculate the average rate of fall in pH units per minute in the 20 minutes after the bile was added.
 [1]



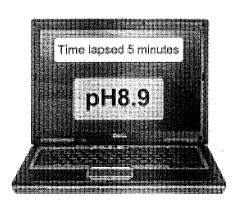
10/10/15 0 625 pH units per minute

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(a) Explain why the pH changed during the experiment.

The pH is decreasing as the time increases. This is because the lipase is breaking the fat in the milk into fatty acids and glyceral. The fatty acids that are being produced are lowering the pH & and making it more acidic.

(b) The average rate of fall in pH in the first 20 minutes is 0.025 pH units per minute. After 20 minutes bile was added to the beaker. Calculate the average rate of fall in pH units per minute in the 20 minutes after the

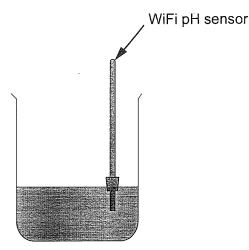
bile was added.

8.6-5.9=2.7 2.7-20=0.135

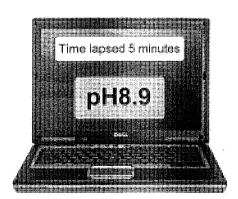
0.135 pH units per minute

Explain why the rate of fall in pH increased when bile was added. Bile emulsifies fats therefore it source breaks large globules into smaller globules, increasing the surface area and making it easier for lipase to work on fatty acids are therefore being produced at a faster rate because of the increased Surface area so the rate of fall in pH increased when bile was added

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$$8.6-5.9=2.7$$
 $2.7+20=0.135$

bile was added.

$$2.7 + 20 = 0.135$$

0 · 135 pH units per minute

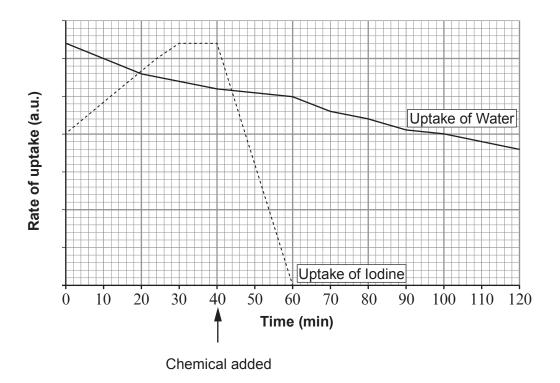
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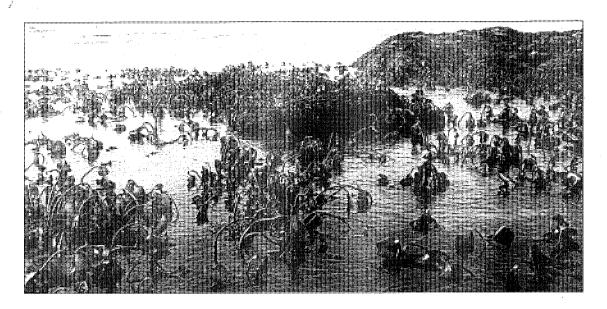


The graph below shows the rate of uptake of water and iodine from sea water into kelp in a laboratory.

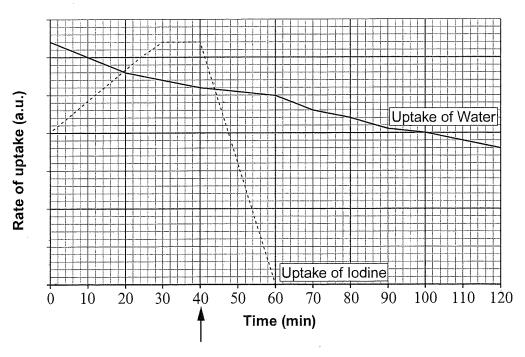


At forty minutes, a chemical was	added to the sea	water which stoppe	ed respiration	taking plac	се
in the cells of the kelp.					

(a)	(i)	Use the graph opposite to describe the effect of adding the chemical on of iodine and water.	the uptake [3]
	(ii)	Explain the effect of adding the chemical on the uptake of iodine.	[3]
b)	Wha	t process is responsible for the uptake of the water?	[1]
•			



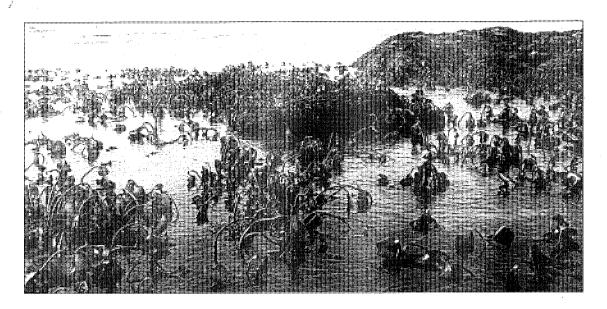
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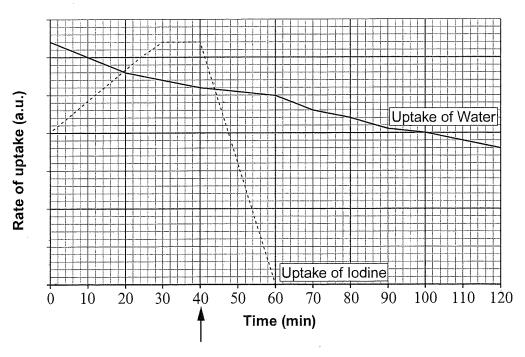
Chemical added

At forty minutes, a chemical was added to the sea water which stopped respiration taking place in the cells of the kelp.

(a)	(i) Use the graph opposite to describe the effect of adding the chemical on the uptake of iodine and water. [3]
()	ence the chemical was added the uptake of iodine
	decreased & dramatically only after 10 mins of
	the chemical had been added. The uptake of valer
	deeneased gradually when the chemical was
	added.
	(ii) Explain the effect of adding the chemical on the uptake of iodine. [3]
	the iodine moved from a high concentration
	to a low concentration as the chemical
	uas added It moved down a concentration
	gradient. Therefore the uptake of iodine decreased.
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	05M08/S



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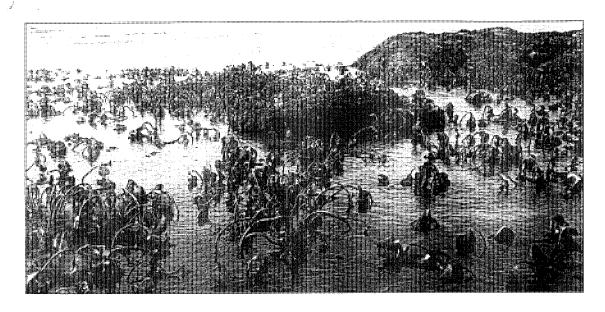


Chemical added

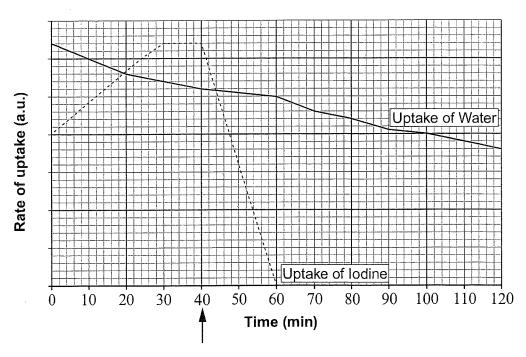
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	Osmæis D





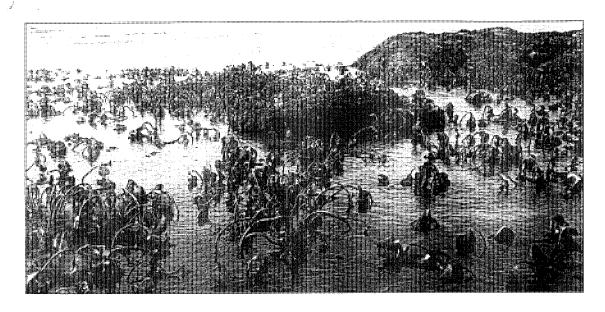
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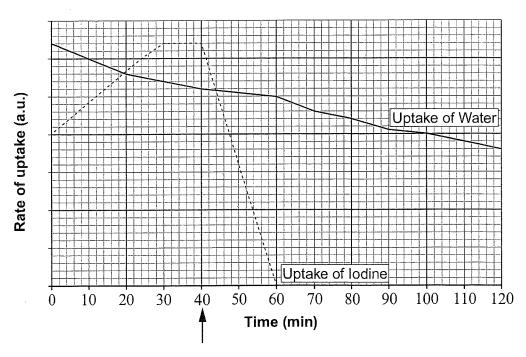
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When the chemical was was added at 40 minutes, the rate of the uptake of	
iodine dramatically decreased until there was no uptake of iodine after 60	ا
J	_
chemical was added and it continued to gradually decrease after the chemi	cal
was added so it had no effect on the uptake of water.	
(ii) Explain the effect of adding the chemical on the uptake of iodine.	[3]
The uptake of judine dramatically decreased when the chemical was adde	d
This is because indine is used to fest for starch therefore when the	
chamical was added, starch couldn't be made was so the level	<u>}</u>
'	
What process is responsible for the uptake of the water?	[1]
	of iodine and water. When the chemical was was added at 40 minutes, the rate of the uprake of iodine diamatically decreased until there was no uptake of iodine after 60 minutes. The uptake of water was already gradually decreasing before the chemical was added and it continued to gradually decrease after the chemical was added so it had no effect on the uptake of water. (ii) Explain the effect of adding the chemical on the uptake of iodine. The uptake of iodine dramatically decreased when the chemical was added. This is because iodine is used to test for struck therefore when the chemical was added of iodine dropped.



The graph below shows the rate of uptake of water and iodine from sea water into kelp in a laboratory.



Chemical added

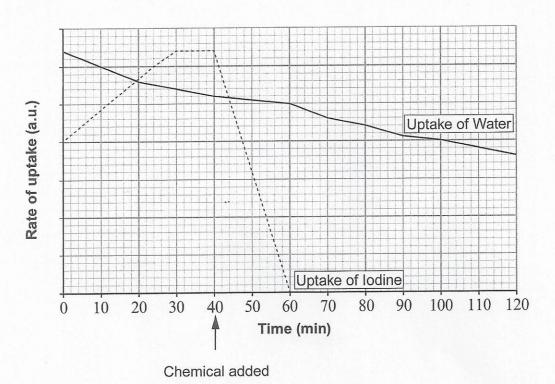
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(a)	(i) Use the graph opposite to describe the effect of adding the chemical on the use of iodine and water.	ıptake [3]
	When the chemical was was added at 40 minutes, the rate of the uptake of	
	iodine dramatically decreased until there was no uptake of iodine after 6	0
	minutes. The uptake of water was already gradually decreasing before	the
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	This is because is dire is used to fest for starch therefore when the	
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(b)	What process is responsible for the uptake of the water?	[1]





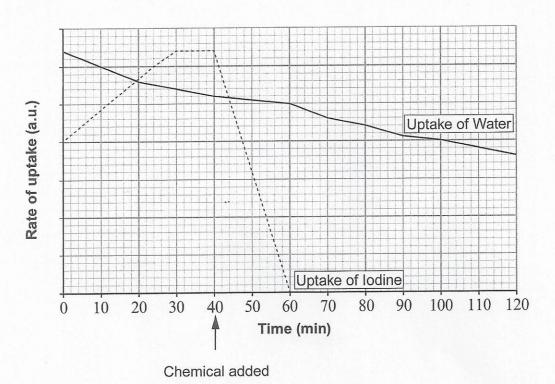
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		nutes, a chemical was added to the sea water which stopped respiration taking place of the kelp.	oni
(a)	(i)	Use the graph opposite to describe the effect of adding the chemical on the uptake of iodine and water. [3]	1
\$		Adding the chemical has little effect on the	
	и	place of water, it continues to reduce at the same	
		note. Adding the chemical courses the uptake of voction	
		to decreese rapidly, and within 20 min, the Kelp	- Set
		no longer takes in voeline	
	(ii)	Explain the effect of adding the chemical on the uptake of iodine. [3]	
		Adding the chemical stopped the Kelp from respining This	
		stopped the kelp from execting every. Without energy	2,4
		active transport can't take place to work take in	
		the iodine, which is why the uptake of iodina reclused	
(b)	What	process is responsible for the uptake of the water?	
		Osmosis	
			12



The graph below shows the rate of uptake of water and iodine from sea water into kelp in a laboratory.



the	cells of the kelp.	5
(a)	(i) Use the graph opposite to describe the effect of adding the chemical on the uptake of iodine and water. [3	- 1
	Adding the chamical has little effect on the	
	uptake of water, it continues to recluse at the same	
	note. Adding the chemical courses the uptake of voction	
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	stopped the kelp from creating energy. Without energy	
	active transport cont take place to possess take in	
	the incline, which is why the uptake of incline reclused	
b)	Vhat process is responsible for the uptake of the water? [1]	
	Osmosis D	
		7

9. A student used red blood cells to carry out an investigation into cell membranes. Red blood cells were placed in salt solutions at three different concentrations. A sample of red blood cells was then removed from each concentration and placed on a microscope slide. The cells were viewed using a microscope for a period of time. The observations were recorded in a table:

concentration of salt solution (%)	observation of red blood cells
0.0	swell and burst
0.9	remain the same size
3.0	smaller and shrivelled

Explain the observations shown in the table.	[6 QWC]

END OF PAPER

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The observations show that the red blood cells how	ea
salt concentration of 0.9% This is because at	10.9
the was no net movement of the solution and	the
red blad cell remained the same However at O,	6
because the red blood cell was more dilute than	lle
water around it asmosis occurred and water move	
at a greater not movement causing the swelling	919
eventual birsting of the cell Finally will the s	dulas
at 3% salt concestration, the solution outside the	e
cell was more dilyte and a greater net move	nent
caused water to move out of the cell via	ì a
sen permeable membrane gesent with assosis.	
	£ 9

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soft concentration of 0.9% This is because	at 0.9
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red blad cell consined the same However at	06
because the red blood cell was more dilute to	on the
water around it asmosis accused and water n	
at a greater not movement causing the swel	
eventual bursting of the cell finally will to	Le solution
at 3% salt concertigation the solution outside	Rie
cell was more dilute and a greater net in	ovenent
consed water to move out of the cell	via a
sen permeable membrane gresent with osno	5,5
	¥ 9



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Explain the observations shown in the table.

For the 0.0% concertation of Salt Solution, the closervations.

Show that water has mared into the cell, by osmosis, via a Selectively permeable membrane. This is due to the Concertation of water in the outside Salt Solution being more dilute and tage larger than the concertation of water inside the cell, which is more Solute. Water has mired into the red blood Cell causing it to burst as it cannot take anymore water. Secondly, for the 0.9% Salt Solution, nothing has occured via osmosis. This means the Concertation of water outside the cell is the same as the concertation inside the cell. Finally, the cell grow Smaller and Shrivelled in a 3.0% Salt Solution. This means the Concertation inside the cell is more Solute than the dilute solution inside the cell. This has resulted in laster being down out from the cell through a sone permeable.

END OF PAPER

6

1 VZQ OS

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Concertation of hate in the outside Salt Solution being

More delute and by large larger than the concertation of mate

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Explain the observations shown in the table.

[6 QWC]

It seems that when the red blood cells were placed in a 0.0% concentration of salt solution, the red blood cells protected and bust. This is because the it is a more dilute solution so there are so more water molecules in the salt solution than there are in the red blood cells. The water molecules then are not move from any high concentration in the salt solution to any low concentration in the cells they through a partially perneable membrane so by osmosis. This causes the cells to swell plurst because the contains a lot more water At a 0.9% concentration of salt solution, the sourced blood cells remained the same size because there is no net movement of water molecules due to their being roughly the same amount in both the salt solution and the red blood cells like the salt solution and the red blood cells like the cells were placed so in the 3.0% concentration of ralt rolution, the red blood cells became smaller and shrivelled. This is because the water molecules are moving are not in the salt solution.

9. A student used red blood cells to carry out an investigation into cell membranes. Red blood cells were placed in salt solutions at three different concentrations. A sample of red blood cells was then removed from each concentration and placed on a microscope slide. The cells were viewed using a microscope for a period of time. The observations were recorded in a table:

concentration of salt solution (%)	observation of red blood cells
0.0	swell and burst
0.9	remain the same size
3.0	smaller and shrivelled

Explain the observations shown in the table.

[6 QWC]

It seems that when the red blood cells were placed in a 0.0% concentration of salt solvhish, the red blood cells meet did swell and bust. This is because the it is a more dilute colution so there are the more water molecules in the call solvhish than them are in the red blood cells. The water molecules then move from any high concentration in the salt solvhish to any a low concentration in the cells the swell plurest because the container a lot more water At a 0.9% concentration of salt solvhish, the sale red blood cells remained the same fire because there is no net movement of water molecules due to their being roughly the same amount in both the salt solvhion and the red blood cells. When the cells were placed the in the 3.0% concentration of ralt rolution, the red blood cells became smaller and shrivelled. This is because the water molecules are moving from another that solvhish concentration in the cells to become smaller and shrivel



