

# 1<sup>st</sup> Year Science, Christmas 2021

## Time allowed: Double class

**Mr. A. Goodison**

Student Name \_\_\_\_\_

Answer all questions in the spaces provided.



Good luck!

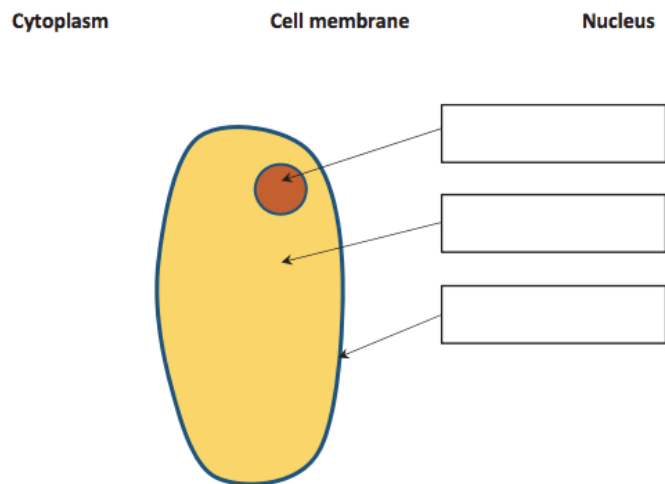
An image of comet Neowise captured over Dublin Bay taken by Antonio Martin Carrillo on the 12<sup>th</sup> of July 2020.

Question	Marks	Awarded
Total	51	
Grade descriptor		

Junior Cycle	
Percentage	Grade Descriptor
≥ 90 to 100	Distinction
≥ 75 and < 90	Higher Merit
≥ 55 and < 75	Merit
≥ 40 and < 55	Achieved
≥ 20 and < 40	Partially Achieved
≥ 0 and < 20	Not Graded (NG)

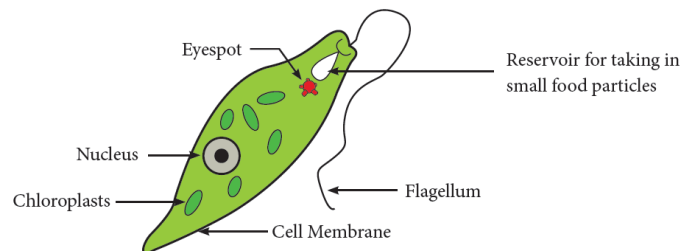
# Question 1

(a) The diagram below shows a cell. Use the words provided to label the parts of the cell (3)



The diagram on the right shows an organism called Euglena. It is made of only one cell. It lives in ponds and streams. Emma and Caoimhe were using a microscope to examine a specimen of Euglena.

This is a diagram of Euglena



b) Support Caoimhe’s hypothesis, that this organism is an animal. (1 mark)

--	--

c) Support Emma’s hypothesis that this organism is a plant. (1 mark)

--	--

d) Complete the table to give the function of the following cell structures. (2 marks)

Cell structure	Function
Cell membrane	
Nucleus	

## Question 2

Read the following passage and answer the questions

Jellyfish are known for drifting in ocean currents—but one type of jellyfish is very different.

Golden Jellyfish pack a remote island lake which is located in the Pacific Ocean. Golden Jellyfish spend much of their lives on the move during a daily journey that follows the Sun across the sky. Each morning at around 6 am, when the Sun rises, they begin to swim toward the light. They follow the sunlight until they nearly reach the shore—stopping just before the shadows caused by trees. They repeat this journey every day.



Golden jellyfish need this light to survive. The Sunlight is used by a special plant called algae which live inside the body of the jellyfish. The process of photosynthesis allows the algae to make food using sunlight, for itself and the jellyfish.

(i) What lives inside the Golden Jellyfish? (1)

(ii) Why does the golden jellyfish follow the light from the Sun? (1)

(iii) What is the cell structure that can be found in plant cells that allows photosynthesis to take place? (1)

(iv) In order for the jellyfish to swim, its cells must release energy from the food the algae provide. In what part of the cell does respiration happen so that the energy is released from the food? (1)

### Question 3

(a) Describe one difference between sexual and asexual reproduction. (4)


(b) The gene for a black dog (B) is dominant over the gene for a white dog (w). Complete a genetic cross (Punnett square) between a female dog with the genotype Bw and a male dog with the genotype (Bw). (2)

--

(c) What is the chance the offspring (each puppy) of the dogs will be Black? \_\_\_\_\_ (1)

(d) What is the chance that each puppy will be **carry** the gene for white fur? \_\_\_\_\_ (1)

(e) What is the chance that each puppy will be white? \_\_\_\_\_ (1)

### Question 4

- Table salt is a white solid
- Water is a liquid that will boil at 100°C

Monika was asked to investigate what effect adding salt has on the temperature water will boil at (the boiling point). She gave her hypothesis which is below:

**Hypothesis:** "If I add more salt to the water, then I think the temperature the water boils at will decrease."

(a) The independent variable is the variable Monika will change. What is the independent variable in this experiment? \_\_\_\_\_ (1)

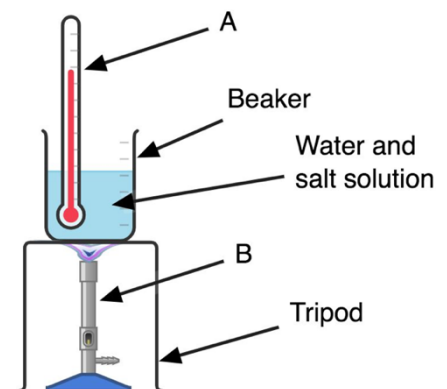
The diagram of the how Monika set up the equipment is shown.

(b) Name the instrument (A) in the diagram that is used to measure temperature.

\_\_\_\_\_ (1)

(c) Name the device (B) in the diagram used to heat the water

\_\_\_\_\_ (1)



Monika collected the following data for the boiling point of water when different amounts of salt were added to 200 cm<sup>3</sup> of water.

Mass of salt dissolved (g)	Boiling point (°C)
0	100
2	102
4	105
6	107
8	109

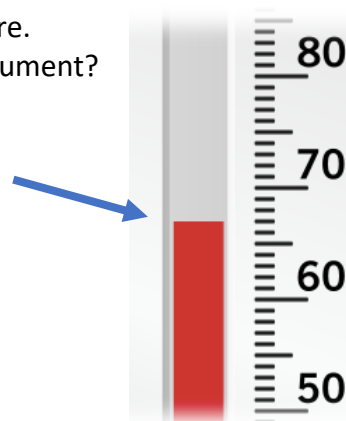
(d) Does the data in the table support Monika's hypothesis? Explain your answer. (2)


(e) Give a safety precaution when using a Bunsen burner in the lab. (1)

--

(f) During the experiment the student measured the temperature.  
What is the temperature reading shown on this measuring instrument?

Temperature \_\_\_\_\_ (1)



## Question 5

Complete the table below for the instruments shown.

(10 marks)

In each case, state what physical quantity the instrument measures. Also state the unit used for that measurement. (Some parts of the table are already completed for you)



Metre stick



Stopwatch



Graduated cylinder



Thermometer



Trundle Wheel

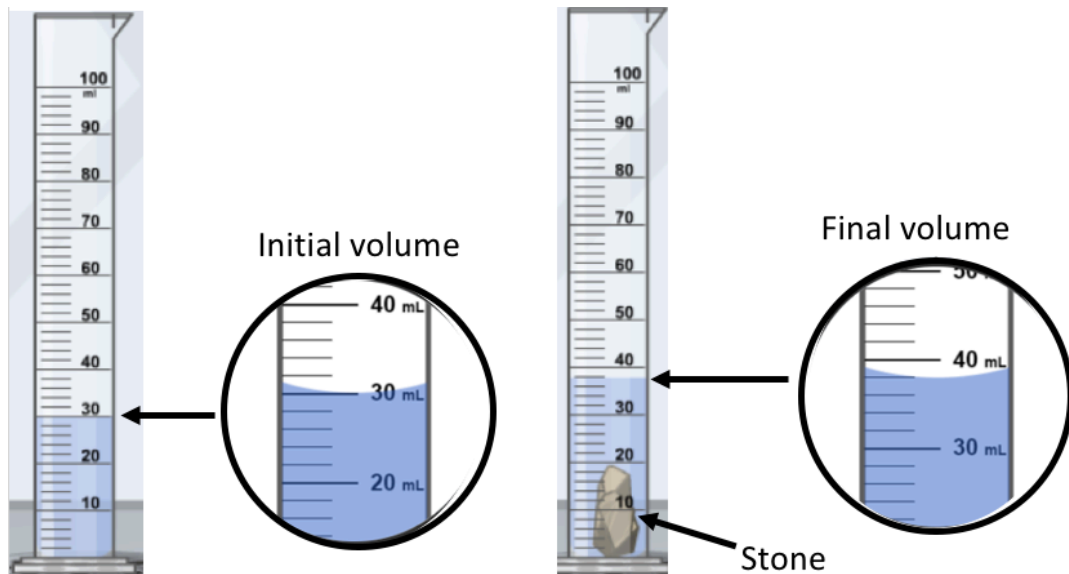


Mass balance

Instrument	Quantity measured	Unit
Metre stick		
Stopwatch		
Graduated cylinder		
Thermometer	Temperature	°C
Trundle wheel		
Mass balance		

### Question 6

Your science teacher has asked you to find the **volume** of a stone using a graduated cylinder. During the experiment you made the observations as seen in the diagram below.



Study the diagram above for measuring the volume of the stone carefully.

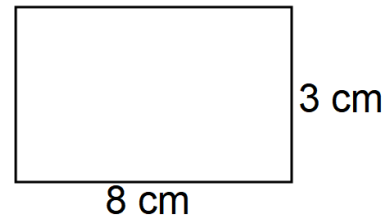
- a) What was the initial volume of water? \_\_\_\_\_ (1)
- b) After the stone was added, what was the final volume? \_\_\_\_\_ (1)
- c) Calculate the volume of the stone \_\_\_\_\_ (1)

### Question 7

(a) Convert 1.8 metres to millimetres (1)

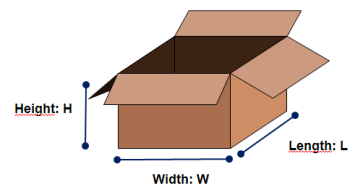
(b) Convert 14,000 grams to kilograms (1)

(c) Calculate the area of a rectangle of length 8 cm and width 3 cm. Include the unit in your answer.



Answer \_\_\_\_\_ (3)

(d) Calculate the volume of a box of length 2 m, width 5 m and height 3 m. Include the unit in your answer.



Answer \_\_\_\_\_ (3)

(e) Anna is a builder and wants to order concrete for the floor of an apartment she is building. She needs the depth of the floor to be 0.5 m, the width to be 15 m while the length will be 30 m. Calculate what volume of concrete is required for the floor.

Answer \_\_\_\_\_ (3)



Happy Christmas to the best students!