1st Year Science, Christmas 2021
Time allowed: Double class

Mr. A. Goodison

Student Name _____

Answer all questions in the spaces provided.

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

Good luck!

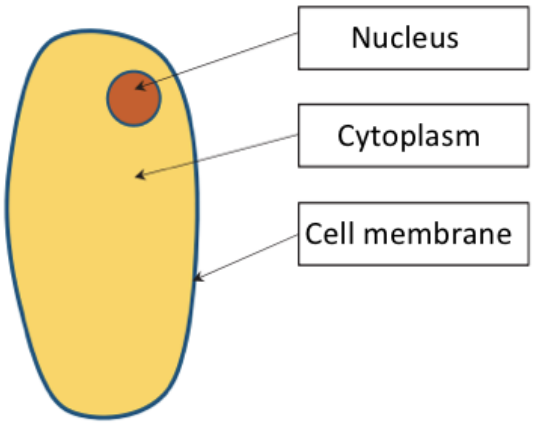
Question	Marks	Awarded
Total	**51**	
Grade descriptor		

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

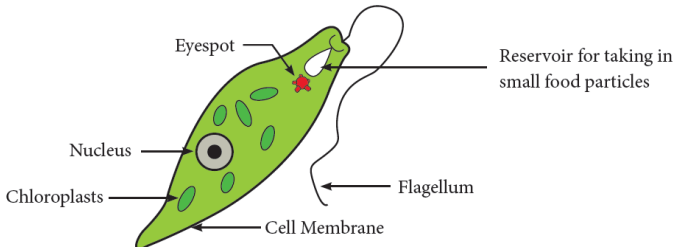
(a) The diagram below shows a cell. Use the words provided to label the parts of the cell (3)

Cytoplasm **Cell membrane** **Nucleus**



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)

It has no cell wall, it has an eye spot, it has a flagellum for movement
Any one

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

It has chloroplasts which plant cells do have

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

Cell structure	**Function**
Cell membrane	Controls what substances can enter and leave the cell
Nucleus	Stores DNA, and controls the activities of the cell

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)

Algae

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

Golden jellyfish need this light to survive.

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

Chloroplasts

(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)

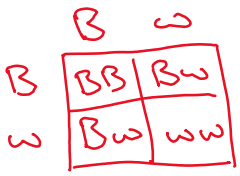
Mitochondria

Question 3

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

Sexual reproduction involves two parents while asexual involves only one.
OR compares fertilisation, gametes, offspring being identical, mixing of DNA (any one)

(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?____75%___ (1)

(d) What is the chance that each puppy will be **carry** the gene for white fur?____75%____(1)

(e) What is the chance that each puppy will be white? _____25%__ (1)

Question 4

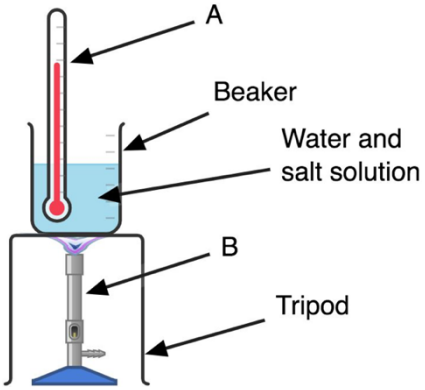
- Table salt is a white solid
- Water is a liquid that will boil at 100°C

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? The mass of salt _____(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.

Thermometer _____ (1)

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

Bunsen burner _____ (1)

Monika collected the following data for the boiling point of water when different amounts of salt were added to 200 cm^3 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)

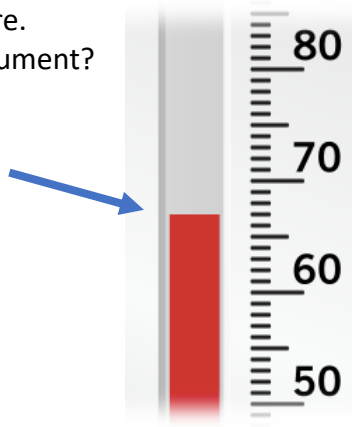
No, Monika's hypothesis is not supported because from the data in the table as more salt is added the boiling point increases from 100 to 109°C

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

Wear safety goggles, tie back long hair (Any one)

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

Temperature 67°C _____ (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

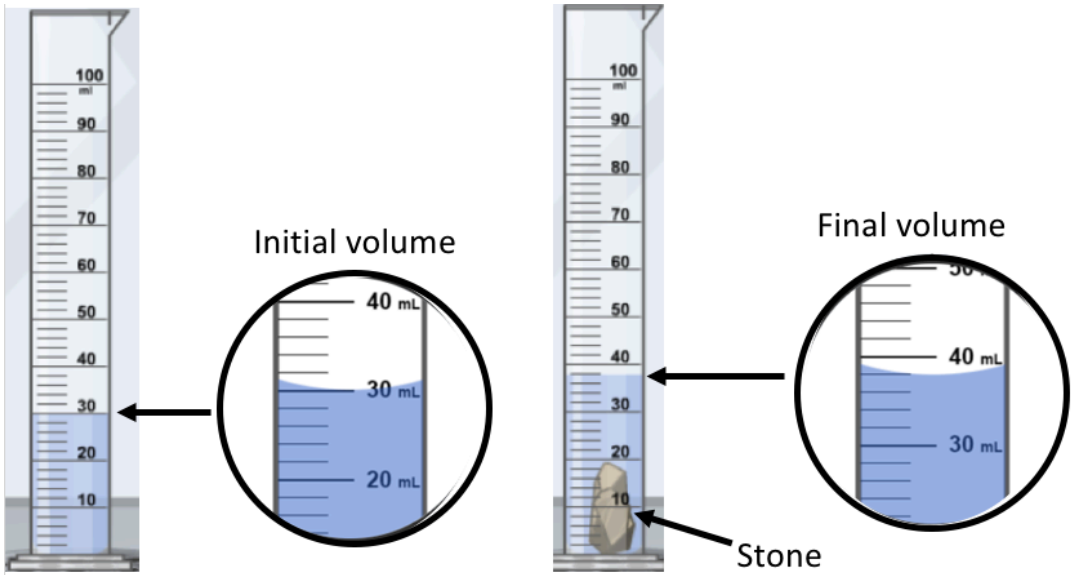
Trundle Wheel

Mass balance

Instrument	**Quantity measured**	**Unit**
Metre stick	Length	Metres (m) OR centimetres (cm)
Stopwatch	Time	Seconds (s) OR minutes (min)
Graduated cylinder	Volume	cm^3 OR ml OR m^3
Thermometer	Temperature	^oC
Trundle wheel	Length or Distance	Metres OR Kilometres
Mass balance	Mass	Grams (g) OR kilograms (kg)

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? 30 mL _____(1)

b) After the stone was added, what was the final volume? 38 mL NOT 39 mL _____(1)

c) Calculate the volume of the stone 8 mL _____(1)

Question 7

(a) Convert 1.8 metres to millimetres (1)

1 m – 1000 mm (×1000)

1.8 m × 1000

= 1800 mm

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

1000 g – 1 kg (÷1000)

14,000 ÷ 1000

= 14 kg

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

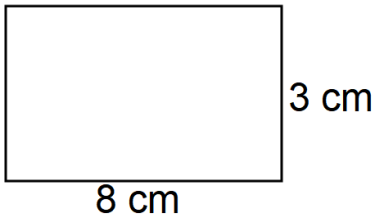
Area = length × width

= (8 cm) × (3 cm)

= 24 cm^2

L = 8 cm

w = 3 cm



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.

Volume = length × width × height

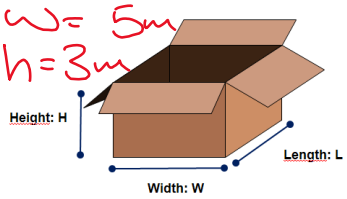
= (2 m) × (5 m) × (3 m)

= 30 m^3

L = 2 m

w = 5 m

h = 3 m



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.

Volume = length × width × depth

V = (30 m) × (15 m) × (0.5 m)

= 225 m^3

depth = 0.5 m

width = 15 m

length = 30 m

Answer _____ (3)

Happy Christmas to the best students!