

Marking Scheme

1st Year Science, Summer 2021

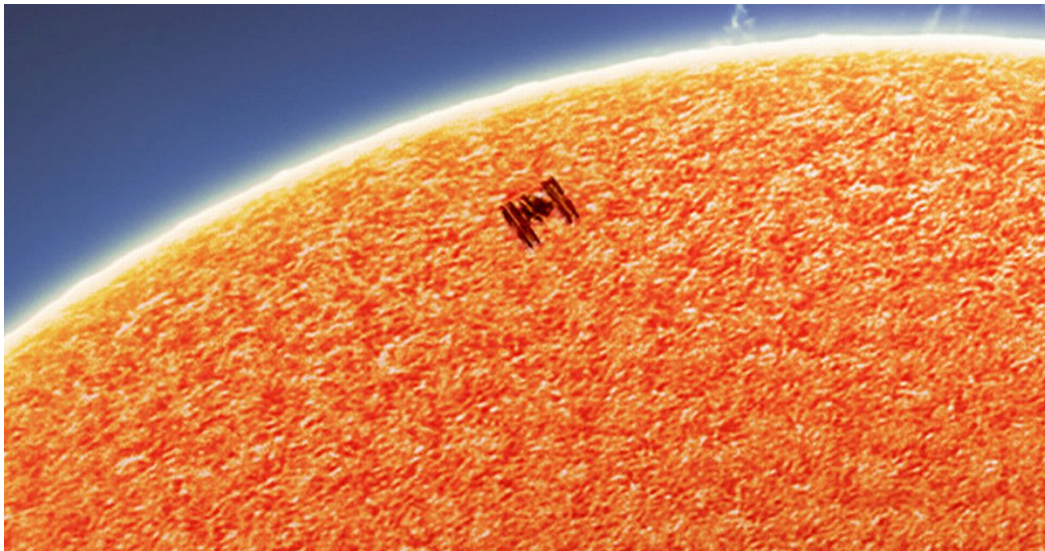
Time allowed: Double class

Mr. A. Goodison

Student Name _____

Answer all questions in the spaces provided.

Good luck!



An image of the international space station passing in front of the Sun.

Question	Marks	Awarded
1	10	
2	9	
3	7	
4	3	
5	10	
6	8	
Total	47	
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

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) (10 marks)



Instrument	Quantity measured	Unit
Metre stick	Length or distance	m or cm or mm
Stopwatch	Time	s or minutes
Graduated cylinder	Volume	cm ³ or ml
Thermometer	Temperature	°C
Trundle wheel	length	m
Mass balance	mass	kg or g

1 mark each
 ∴ 10 marks total

Question 2

Using the following list of celestial bodies, complete the following definitions. (7 marks)

Solar system, satellite, galaxy, star, planet, moon, comet.

- A planet is a large round space object that orbits a star (1)
- A solar system is made up of a star and all of the objects that orbit around it. (1)
- A moon is a naturally occurring satellite (1)
- A star is a large ball of gas that gives off heat and light. (1)
- A galaxy is a collection of many millions of stars. (1)
- A satellite is any object that orbits a larger object or planet. (1)
- A comet is a small object composed of frozen gases, ice, rock and dust (1)
that can glow and produce a tail

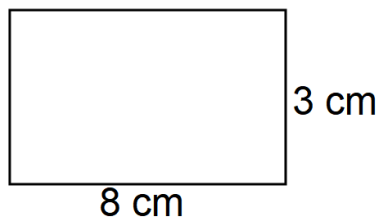
What is an asteroid?

A rock in space (1)

What does an asteroid orbit around? a star (1)

Question 3

Calculate the area of a rectangle of length 8 cm and width 3 cm. Include the units.



$$\begin{aligned} \text{Area} &= \text{length} \times \text{width} \\ &= (8 \text{ cm}) \times (3 \text{ cm}) \end{aligned}$$

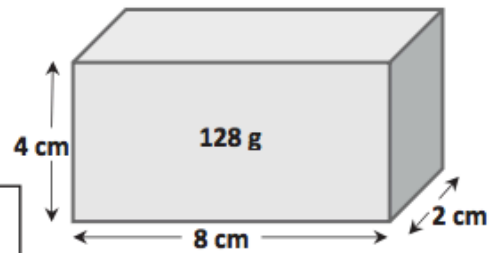
$$= 24 \text{ cm}^2$$

1 mark

1 mark

Answer _____ (2)

A student was asked to measure the density of a block.
 The dimensions of the block are shown in the diagram.
 The mass of the block is 128 g.



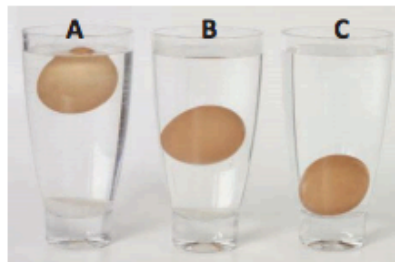
- (a) Calculate the volume of the block. (1)

Calculation $V = L \times w \times h$ $= (8 \text{ cm}) \times (2 \text{ cm}) \times (4 \text{ cm})$ $= 64 \text{ cm}^3$	①
--	---

- (b) Calculate the density of the block. Include the unit for your answer. (2)

Calculation $\text{Density} = \frac{\text{mass}}{\text{Volume}} = \frac{128 \text{ g}}{64 \text{ cm}^3} = 2 \text{ g/cm}^3$	① → For Answer ① → For unit
--	--------------------------------

- (c) The photograph below shows three glasses of water labelled A, B and C. An egg was placed into each glass. The photograph was taken when the eggs were stationary.

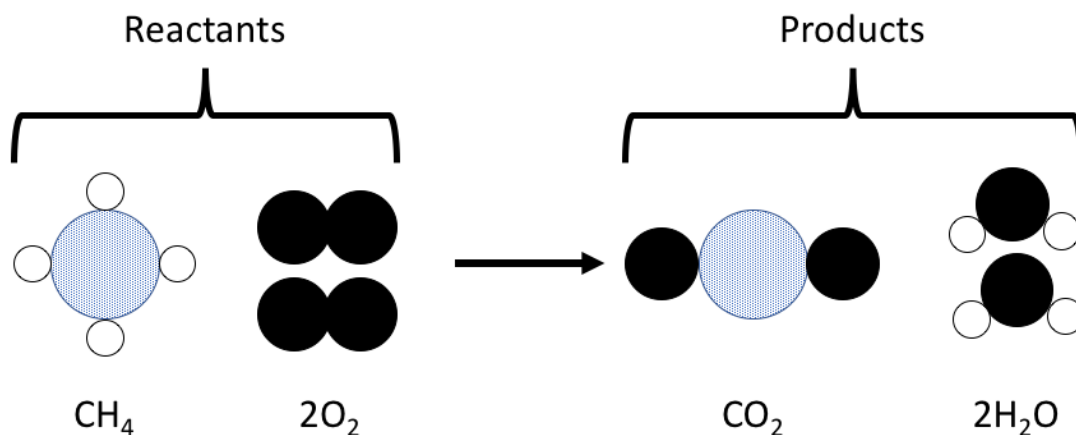


- Which glass (A, B or C) contains the egg with the greatest density? (2)
 Give a reason for your answer.

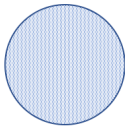


C ① mark
because it sank to the bottom ①

Question 4

Natural gas contains methane (CH₄). Methane is a fuel. Methane burns in oxygen to produce carbon dioxide and water. The diagram below represents the reaction.



(a) Count the number of each type of atom in the products to complete the table below (1)

Element	Type of atom	Number of atoms in reactants	Number of atoms in products
Carbon		1	1
Hydrogen		4	4
Oxygen		4	4

(b) Mass is conserved (the same) during this reaction. What evidence is there for this?

The amount of atoms in the products is the same as the reactants

(1)

(c) The burning of methane is an example of a chemical change. Describe one difference between a physical change and a chemical change.

*Physical change: • No new substance formed
• easy to reverse*

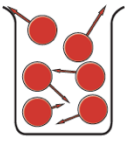
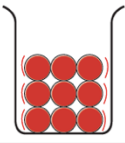
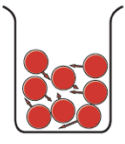
(1)

Chemical change -> new substance is formed

Question 5

The diagrams in the table represent models of the different states of matter; solid, liquid and gas.

a) Complete the table to show the state represented by each model. (3)

Model	State of matter
	gas ①
	solid ①
	liquid ①

Water is a substance that can exist as a solid, liquid and a gas.

b) Place the sentences (a – d) in the correct order below to help you write a paragraph to explain what happens when ice melts. The first one is completed for you. (1)

- A. The particles vibrate more
- B. The ice is heated
- C. The particles can now swap bonds and move past each other
- D. The ice is now liquid water

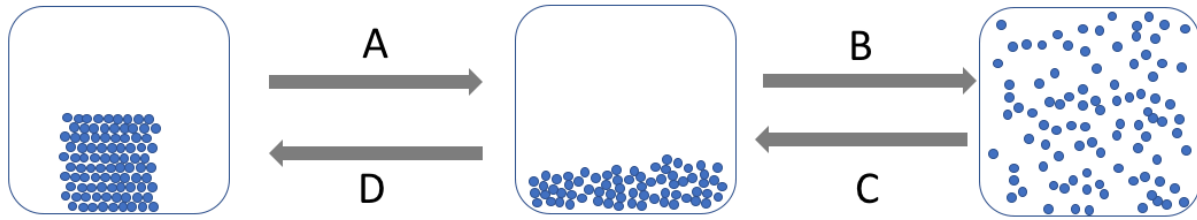
1. B) The ice is heated

2. A

3. C

4. D

IF A is first → ① mark



c) Using the above diagram, name the phase changes A – D and state if heat energy has been gained or lost. (6)

The first one has been completed for you.

Letter	Change of state	Heat gained or lost?
A	Melting	Gained
B	Evaporation ①	gained ①
C	condensation ①	lost ①
D	Freezing / Solidification ①	lost ①

Question 6

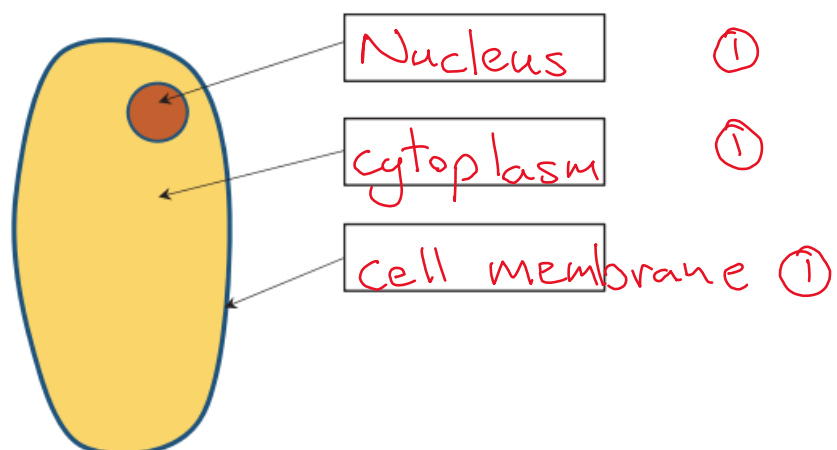
The diagram shows an animal cell.

a) Use the words listed below to label the parts of the cell. (3)

Cytoplasm

Cell membrane

Nucleus



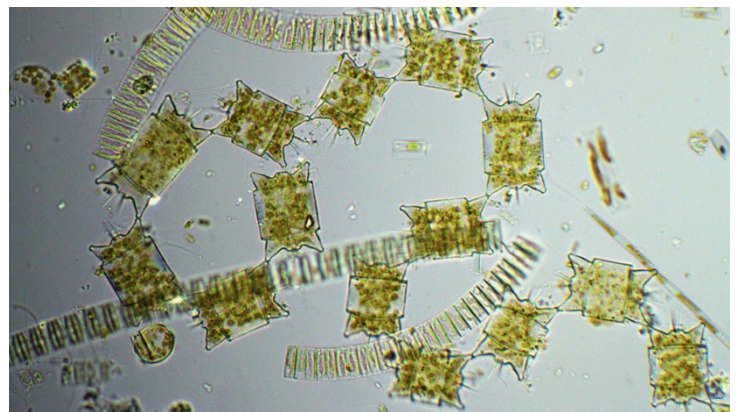
b) Which of the three named parts controls the activities of the cell?

Nucleus (1) (1)

c) A student was asked to examine animal cells in the laboratory. Which of the following instruments should the student use? Place a tick(✓) in the correct box. (1)

- Telescope
- Microscope (1)
- Periscope

Phytoplankton are microscopic organisms that live in the ocean. They obtain their energy through photosynthesis and must therefore live near the surface of the ocean. They take in carbon dioxide gas and produce about half of the Earth's oxygen.



d) What part of the cell contains chlorophyll which allows photosynthesis to take place?

chloroplast (1) (1)

e) From the information given about phytoplankton, do you think they are an animal cell or a plant cell? Justify your answer.

plant cell (1)
because plant cells gain their energy through photosynthesis (1) (2)