

Time 1 hour

Mr. A. Goodison 1st year Science GCS

Name _____

Answer all questions in the spaces provided.





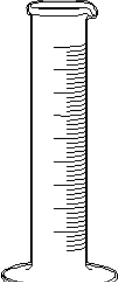
Good luck!



An image taken by the international space station of a solar eclipse. The moon has passed in front of the sun and the shadow of the moon may be seen on the earth.

Question	Marks	Awarded
1	16	
2	20	
3	20	
4	24	
5	12	
6	20	
7	20	
8	40	
9	30	
10	15	
Total	217	
Grade descriptor		

Question 1. (16 marks)

Picture	Name	Use
		
		
	eg. Vernier callipers	eg. measuring the diameter of a coin
		
		

Question 2 (20 marks)

Using the following list of words, complete the following sentences:

Solar system satellite galaxy planet star moon comet

- A _____ is a large round space object that circles a star in its own orbit. (2 marks)
- A _____ is made up of a star and all of the objects that move around it. (2 marks)
- A _____ is a natural satellite that makes an orbit around a planet. (2 marks)
- A _____ is a very large ball of gas that gives off light and heat. (2 marks)
- A _____ is a collection of many millions of stars. (4 marks)
- A _____ is any object that orbits a larger object or planet. (4 marks)
- A _____ is a small object composed of frozen gasses, ice, rock and dust that can glow and produce a 'tail'. (4 marks)

Question 3 (20 marks)

Use the planet data table below to answer the following questions.

Planet	Distance from the sun (Astronomical Units)	Relative volume compared to Earth	Surface Gravity (m/s ²)	Number of Moons
Mercury	0.4	0.056	0.37	0
Venus	0.7	0.87	8.9	0
Earth	1	1	9.8	1
Mars	1.5	0.15	3.7	2
Jupiter	5.2	1300	2.5	67
Saturn	9.5	760	10.4	62
Uranus	19	63	8.9	27
Neptune	30	58	11.2	13

- Which planet is closest to the Sun _____ (2)
- Which planet is farthest from the Sun _____ (2)
- Which planet is the biggest in volume _____ (2)
- Which planet is the smallest in volume _____ (2)
- Which planet is the closest in volume to Earth _____ (2)
- Which planet has the weakest surface gravity _____ (2)
- Which planet has the strongest surface gravity _____ (2)
- On which planet would you weigh the most? _____ (2)
- Is Mars bigger or smaller than Earth? _____ (2)
- Which planets have no Moons? _____ (2)

Question 4 (24) Match the correct word to the explanation (6)

Matter		The amount of matter in an object
Mass		The amount of space an object takes up
Volume		Anything that occupies space and has mass

Imagine in 15 years' time you have achieved your dream of becoming an astronaut.

(i) Will you have mass in outer space? (**yes** or **no**) _____ (3)

(ii) Will you have weight in outer space? (**yes** or **no**) _____ (3)

Give the SI unit of mass _____ (3)



If your teacher has a mass of **72 kg** what is his **weight** on **Earth** and on **Mercury**? **Hint, use the planet data table above. (9)**

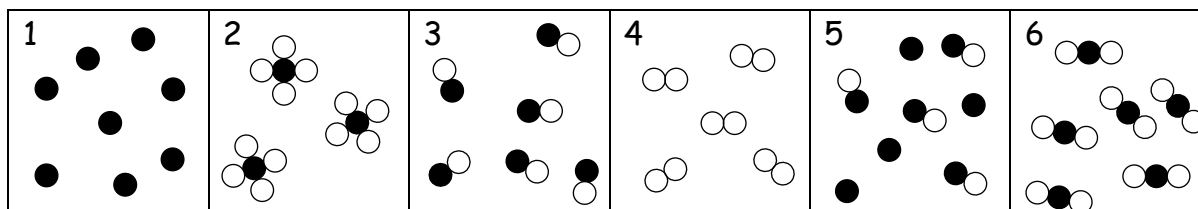
Use the following formula: $Weight = mass \times surface\ gravity$

Weight on Earth _____

Weight on Mercury _____

Question 5 (12 marks)

Look at the diagrams below and decide whether each one represents the particles in **an element**, **compound** or **mixture**. Different colours represent atoms of different elements.



1	4
2	5
3	6

Question 6 (20 marks)

All biological organisms are made up of cells.

- (a) Name the instrument shown in the picture on the right, which is used to examine cells.

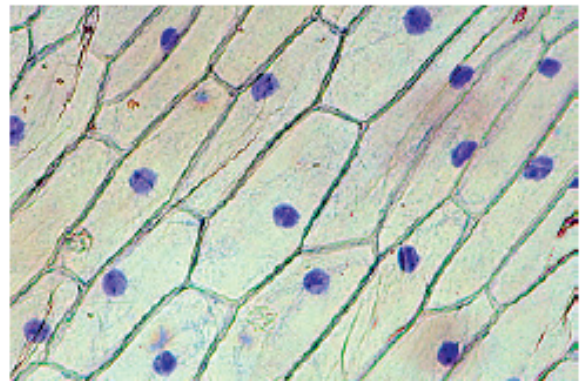
- (b) Name the labelled part of the instrument, which makes the cells look bigger.



- (c) The picture below shows cells from an onion, which are typical plant cells.

In the box, write the name of any one part of the cell.

Draw an arrow from the box to the part of the cell you have named.



- (d) State the function of the part of the cell you have chosen.

Question 7 (20 marks)

Draw diagrams showing how the particles are **arranged** and **move** in a solid and in a gas (6):

Solid:

Gas:

Eoin finds two plastic bottles on the path on his way home from school. Both have lids screwed on tightly. One is empty (except for the air inside) and the other is full of water. He decides to stand on both. He notices that he can squash the empty one, but not the full one.

Explain, in terms of the particles in the liquid and gas diagrams you have drawn above, and your knowledge of the states of matter, why Eoin can only squash the empty one.



(5)

Write the **name** of the change of state which happens in the following cases:

Tiny water drops form on the inside of a cold window when you breathe on it: **eg. condensation**

Wet clothes drying on a washing line: _____ (3)

Wax turns into a liquid as a candle burns: _____ (3)

In a glass factory, molten (liquid) glass cools and turns into a solid: _____ (3)

You find the **volume** of the bolt to be **30 cm³**.

Your science teacher then asks you to figure out **what type of metal** the bolt is made from by determining its **density**.

You measure the **mass** of the bolt to be: **273 g**

Use the formula below to calculate the density of the bolt

$$Density = \frac{Mass}{Volume}$$

Density of the bolt _____ (6)

Use the density of the bolt and the table below to identify which type of metal the bolt is made from.

Metal	Density (g/cm³)
Copper	8.94
Gold	19.32
Iron	7.85
Lead	11.34
Mercury	13.59
Platinum	21.4
Silver	10.49
Sodium	0.97
Steel	7.90
Tin	7.28

Type of metal the bolt is made from _____ (3)

Mercury is a liquid metal. Using the table above name one metal that will float on mercury and one that will sink.

Metal that will float in mercury _____ (3)

Metal that will sink in mercury _____ (3)

Explain why the metal you have chosen will float on mercury

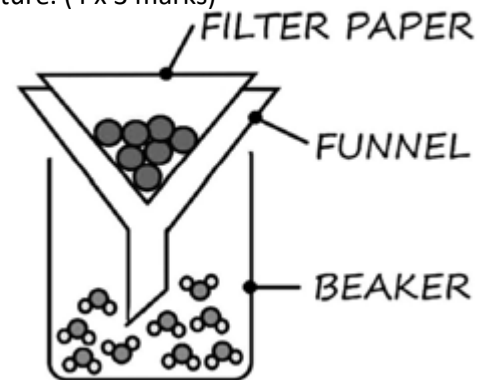
 _____ (7)

Question 9. (30 marks)

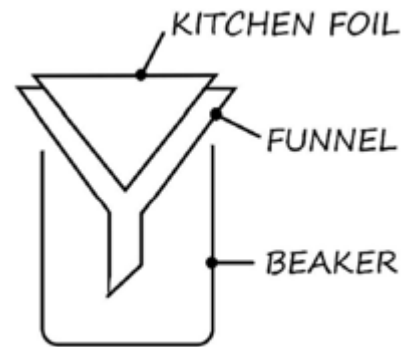
Some mixtures can be separated with a filter. The table below shows some different mixtures.

Complete the table to show is a filter can be used to separate each mixture. (4 x 3 marks)

Mixture	Can be separated using filtration (yes or no)
Sand and water	
Sand and Sugar	
Mud and water	
Salt and water	



Dervla and John have a mixture of sand, sugar and water. They try to filter the mixture using kitchen foil. The foil does not separate the mixture. Explain why the foil does not separate the mixture of sand, sugar and water. (6 marks)



John and Dervla make a new filter using a paper towel. The sand stays on the paper towel but the water and sugar go into the beaker. Name a separation method they could have then use to separate the **water** and **sugar**.

Name of method _____ (3 marks)

Describe how they could use this method (9 marks)

Question 10 (15 marks)

Read the following article, taken from an online newspaper, and answer the following question that follow

<p>Grey squirrels pushing out the reds</p> <p>The arrival of the grey squirrel in an area spells doom for the local red squirrels. In an infamous act of environmental vandalism, a 'scurry' of American grey squirrels was presented to a bride during a 1911 wedding celebration in Castleforbes, Co. Longford.</p> <p>Released into the countryside, the invaders thrived. Slowly, but surely, they have extended their range. All eastern and northern counties are colonised and the River Shannon, which blocked their westward march for decades, has been breached.</p> <p>The red squirrel is usually described as a 'native' but it was probably introduced; Ireland was already an island before suitable coniferous woods became available 9,000 years ago. Exploited for its pelt, this high-wire acrobat became virtually extinct here in the 18th century. Today's red squirrels are descended from Scottish ones brought in to restore the population.</p> <p>Their recent history in the Phoenix Park is typical. Grey squirrels were seen there for the first time in 1978. The last sighting of a red squirrel was on St. Patrick's Day, 1987. Why do reds lose out to the invader? Having lived here for millennia, reds should be perfectly adapted to local conditions, whereas the invader, used to broadleaved habitats in North America, had to change its ways to survive.</p>	 <p style="text-align: right;">irishexaminer.com</p>
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- (a) Name one invasive or 'non-native' species found in Ireland.

- (b) Describe one way the invasive species referred to in the article got to the island of Ireland.

- (c) For a long time, what blocked the arrival of the grey squirrel in the west of Ireland?

- (d) Describe an adaptation that, in your opinion, allows the red squirrel to survive Irish environmental conditions.
