Cambridge Assessment International Education

Cambridge Lower Secondary Checkpoint

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

2555223880

SCIENCE **0893/01**

Paper 1 **October 2024**

45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

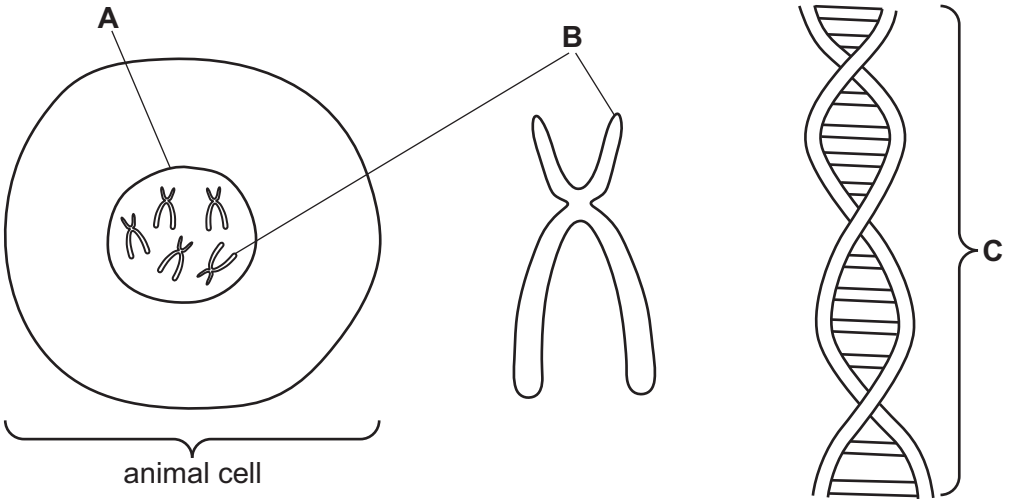
- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should show all your working in the booklet.
- You may use a calculator.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages.

1 Look at the diagram of some structures in an animal cell.



NOT TO SCALE

(a) Write down the name of structure **A**.

.....

[1]

(b) Write down the name of structure **B**.

.....

[1]

(c) Structure **C** is an enlarged part of structure **B**.

Write down the name of structure **C**.

.....

[1]

2 Look at the data about some elements.

element	mass in g	volume in cm^3	density in g/cm^3
A	10	2.22	4.5
B	10	7143	0.0014
C	10	3.70	2.7
D	10	0.88	

(a) Calculate the density of element **D**.

Include the equation you use.

density = ... g/cm^3

[2]

(b) Which element, **A**, **B**, **C** or **D**, is a gas?

.....

Explain your answer using information from the table.

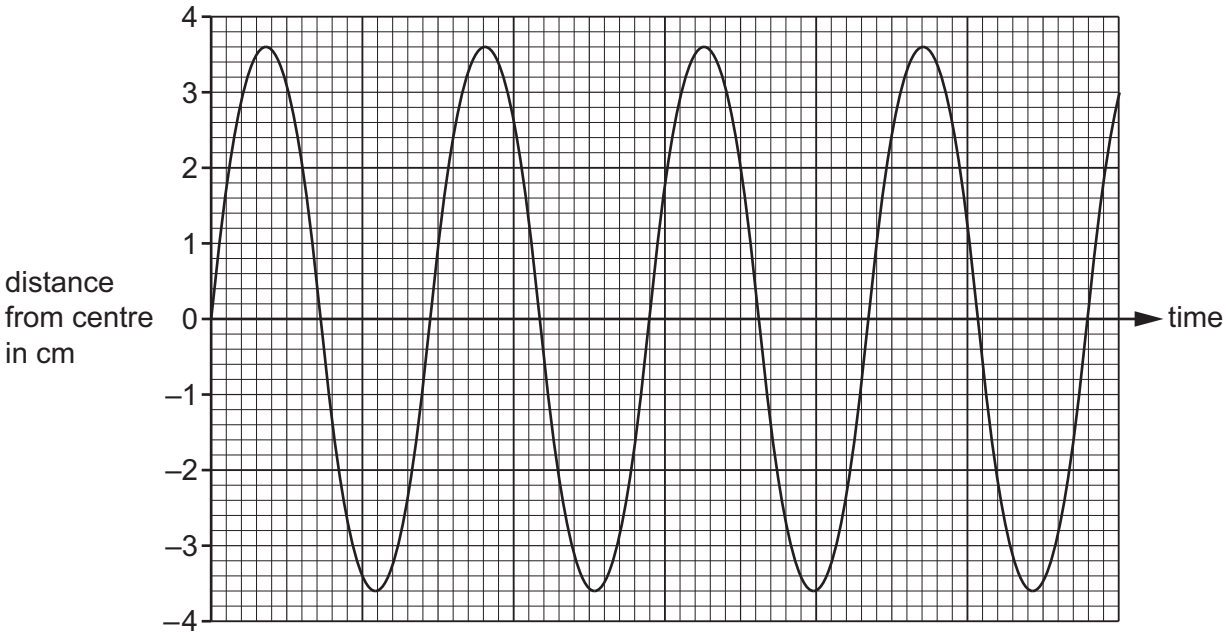
.....

.....

[1]

3 This question is about sound waves.

Look at the graph that shows the waveform of a sound wave.



(a) What is the amplitude of the sound wave?

amplitude = ... cm [1]

(b) (i) Describe the effect of **increasing the amplitude** of the sound wave.

..... [1]

(ii) Describe the effect of **decreasing the frequency** of the sound wave.

..... [1]

4 Nebulae are found in space.

(a) What are nebulae made from?

..... and ..... [2]

(b) Nebulae act as stellar nurseries.

Write down what happens in stellar nurseries.

.....

..... [1]

5 Water is essential for plant growth.

Complete these sentences about the pathway of water in flowering plants.

Water from the soil enters plants through cells called .....

This process is called .....

Water moves up a plant stem inside the .....

Water vapour is lost from the surface of leaves by the process of .....

[4]

6 Look at the table showing some properties of Group 1 elements.

element	melting point in °C	boiling point in °C	density in g / cm^3	radius of an atom in pm
lithium	181	1342	0.53	152
sodium	98	883	0.97	186
potassium	64	759	0.89	231
rubidium	39	688	1.53	244

There are trends in the properties of Group 1 elements from lithium to rubidium.

Write about **three** trends in the properties of the Group 1 elements shown in the table.

1 .....

.....

2 .....

.....

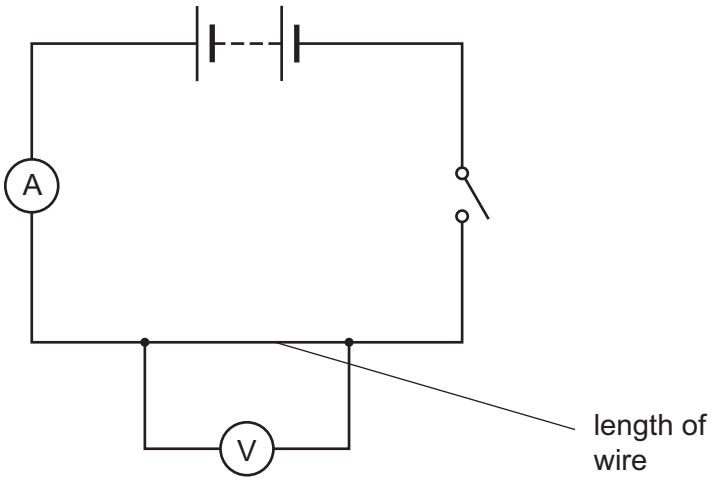
3 .....

.....

[3]

7 Yuri investigates the resistance of six different lengths of wire.

Look at the electrical circuit Yuri makes.



(a) Write down the name of the equipment Yuri uses to measure the voltage across the length of wire.

..... [1]

(b) Look at Yuri's results.

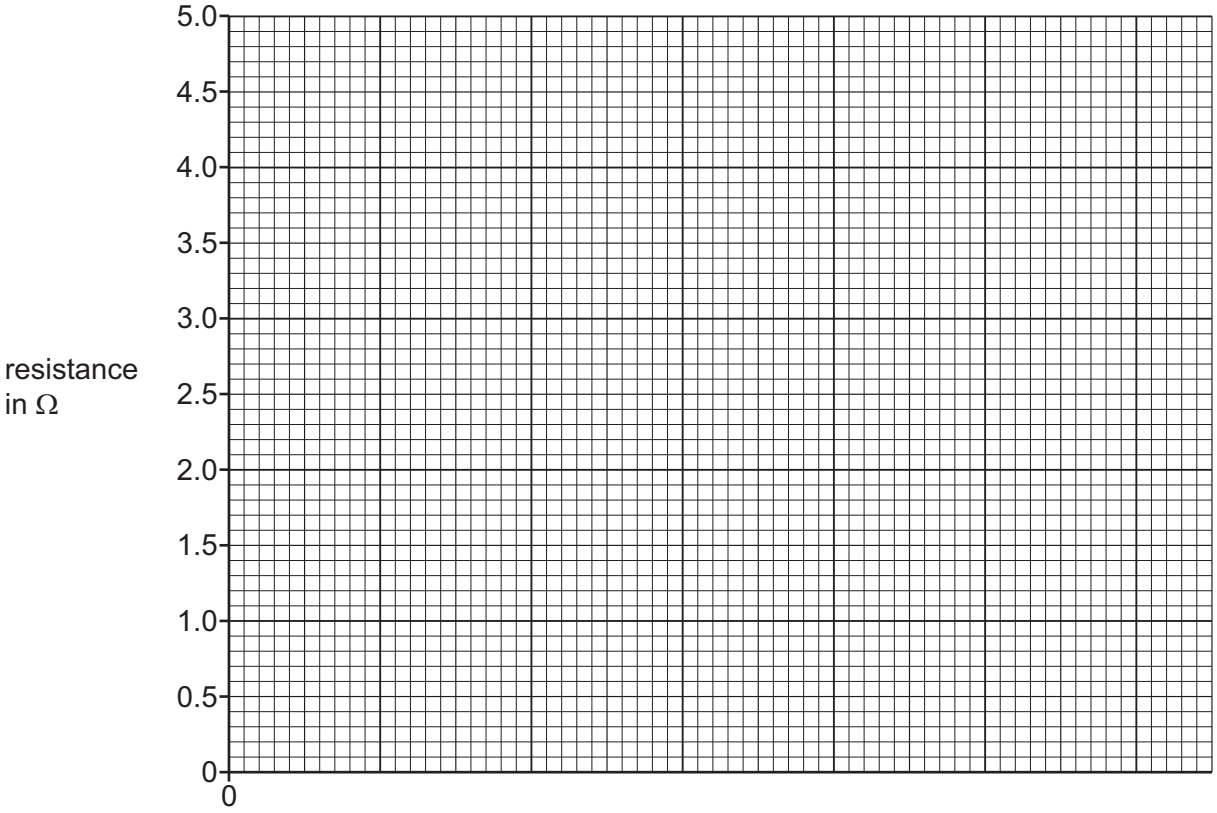
length of wire in cm	voltage in V	current in A	resistance of wire in Ω
10	0.45	0.64	0.7
20	0.63	0.47	.....
30	0.76	0.38	2.0
40	0.82	0.23	3.6
50	0.89	0.27	3.3
60	0.99	0.24	4.1

Calculate the resistance of the 20 cm length of wire.

Write your answer in the table. [2]

(c) Draw the graph of resistance in Ω against length of wire in cm by:

- labelling the *x*-axis
- writing the scale for the *x*-axis
- plotting the points.



.....

.....

[2]

(d) Yuri reads the ruler, ammeter and voltmeter correctly.

The result for the 40 cm length of wire is anomalous.

Suggest **one** reason for this anomalous result.

.....

..... [1]

8 Complete the sentences about the formation of the Moon.

The theory for how the Moon formed is called .....

One piece of evidence for this theory is that the composition of rocks on the Earth and on the Moon is .....

[2]

9 Look at the picture of a panda.

Pandas live in forests in the mountains of southwest China.

Pandas eat bamboo plants.

Bamboo is found in forests in some parts of southwest China.

Climate change is decreasing the amount of bamboo.

Pandas need to eat 11 kg to 38 kg of bamboo each day to survive.

(a) Suggest the impact of climate change on the panda population.

.....

[1]

(b) Write down **three** reasons for your answer in **(a)**.

1 .....

.....

2 .....

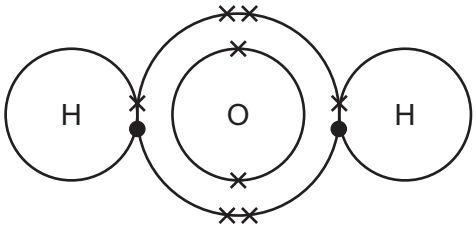
.....

3 .....

.....

[3]

10 Look at the model of a particle of water, H_2O.



(a) The chemical bonding in water is **covalent**.

Describe what is meant by a covalent bond.

.....

..... [1]

(b) Complete the sentence.

When two or more atoms are joined together by covalent bonding,

a ..... is made. [1]

(c) How many covalent bonds are shown in the model of a particle of water?

..... [1]

11 Priya investigates inheritance of sex in humans.

She analyses two human blood samples.

(a) Suggest **one** way Priya reduces the chance of getting a disease from the blood samples she analyses.

..... [1]

(b) Explain why it is a good idea that Priya analyses more than two samples.

.....

.....

.....

..... [2]

12 This question is about energy.

(a) Tick (✓) the law which states that energy **cannot** be created or destroyed.

conduction of energy ☐

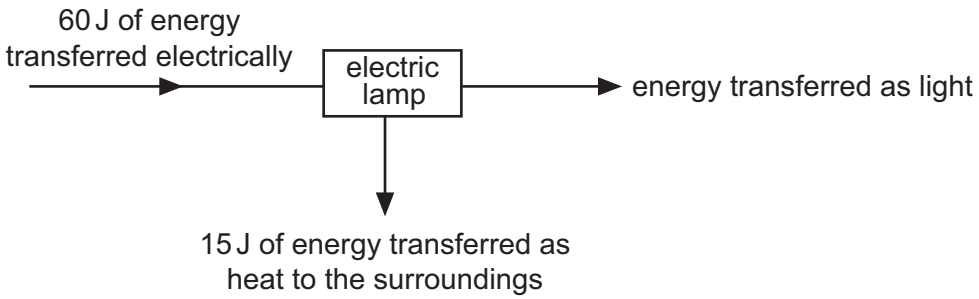
conservation of energy ☐

dissipation of energy ☐

transfer of energy ☐

[1]

(b) The diagram shows the energy transfers in an electric lamp.



Calculate the percentage of the energy transferred electrically to the lamp which is transferred as light.

percentage of energy transferred as light = ... %

[2]

13 Mia makes two salts.

She mixes 20 cm^3 of an acid with 1 g of a solid in a beaker.

She repeats this with a different solid and a different acid.

She notices that one reaction mixture warms up and the other cools down.

reaction mixture	**salt made**	**what happens**
zinc and sulfuric acid	zinc sulfate	warms up
sodium carbonate and ethanoic acid	sodium ethanoate	cools down

(a) Zinc reacts with sulfuric acid.

Zinc sulfate and hydrogen are made.

Write the **word** equation for this reaction.

.... [1]

(b) Mia wants to know which reaction has the largest energy change.

Suggest what Mia does to find out which reaction has the largest energy change.

....

.... [1]

14 Pierre investigates the amount of rainfall for 6 months near his school.

He does two experiments to measure the total rainfall for each month.

He uses the same method and the same location for both experiments.

Look at Pierre's results.

		January	February	March	April	May	June
rainfall in mm	**experiment 1**	310	235	205	260	330	300
	experiment 2	410	52	150	410	150	25

(a) Pierre concludes that his results are precise.

Tick (✓) to show if his conclusion is correct.

yes ☐ no ☐

Give a reason for your answer.

.....

.....

[1]

(b) A scientist does the same investigation as Pierre at the same location.

The results of the scientist are correct.

Look at the scientist's results.

	January	February	March	April	May	June
rainfall in mm	310	235	205	260	330	300

Pierre says,

'My results for experiment 1 are accurate.'

Tick (✓) to show if his conclusion is correct.

yes ☐ no ☐

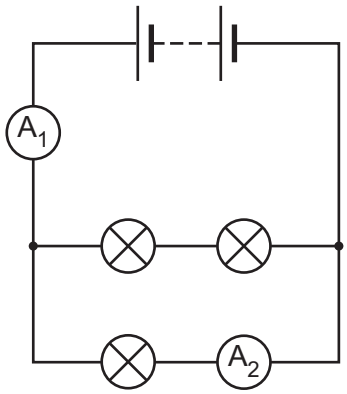
Give a reason for your answer.

.....

.....

[1]

15 Carlos makes an electrical circuit using three identical lamps.



(a) Name this **type** of electrical circuit.

.....

[1]

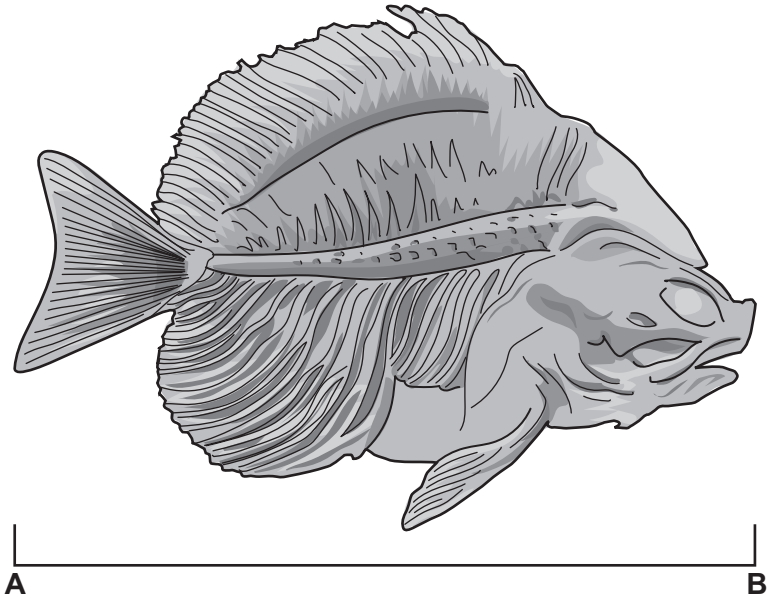
(b) The reading on ammeter A_1 is 1.2 A.

Calculate the reading on ammeter A_2.

.....

A [1]

16 Aiko investigates the fossil of a fish.



(a) Measure the length **AB** in mm of the fossil fish in the diagram.

length of fossil = ... mm [1]

(b) Aiko measures the mass of the fossil.

Look at the reading on the balance.

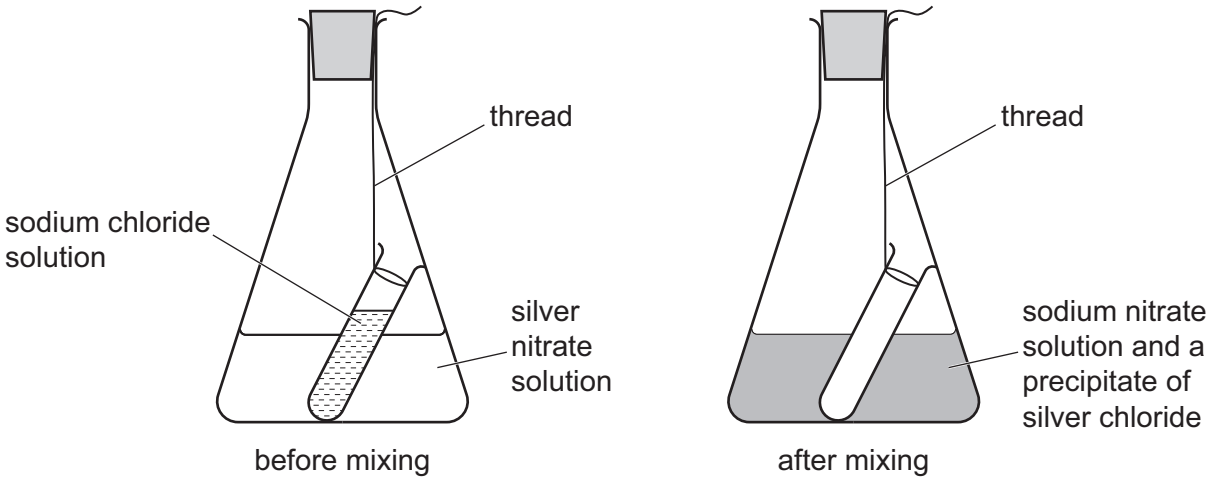
420.4 g

Write down the mass of the fossil to the nearest whole number.

mass = ... g [1]

17 Mike investigates the reaction between silver nitrate solution and sodium chloride solution.

Look at the diagram of the equipment he uses.



Mike:

- assembles the equipment as shown in the diagram before mixing
- records the total mass of the flask and its contents
- turns the flask and its contents upside down to let the solutions mix
- is careful not to let any liquid leak out of the flask
- records the mass of the flask and its contents again.

What happens to the mass of the flask and its contents during the reaction?

.....

Explain your answer.

.....

.....

.....

[2]

The Periodic Table of Elements

Group																	
1	2											3	4	5	6	7	8
							1 H hydrogen 1										2 He helium 4
3 Li lithium 7	4 Be beryllium 9											5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20
11 Na sodium 23	12 Mg magnesium 24											13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium –	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131
55 Cs caesium 133	56 Ba barium 137	57–71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium –	85 At astatine –	86 Rn radon –
87 Fr francium –	88 Ra radium –	89–103 actinoids	104 Rf rutherfordium –	105 Db dubnium –	106 Sg seaborgium –	107 Bh bohrium –	108 Hs hassium –	109 Mt meitnerium –	110 Ds darmstadtium –	111 Rg roentgenium –	112 Cn copernicium –	113 Nh nihonium –	114 Fl flerovium –	115 Mc moscovium –	116 Lv livermorium –	117 Ts tennessine –	118 Og oganesson –

Key

atomic number
atomic symbol
name
relative atomic mass

lanthanoids	57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium –	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
actinoids	89 Ac actinium –	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium –	94 Pu plutonium –	95 Am americium –	96 Cm curium –	97 Bk berkelium –	98 Cf californium –	99 Es einsteinium –	100 Fm fermium –	101 Md mendelevium –	102 No nobelium –	103 Lr lawrencium –