





## TERM 3 – QUIZ 2

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SETTINGS  
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QUIT





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## TERM 3 – QUIZ 2

EASY

HARD

EXPERT

LEGENDARY





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1) What is an electrolyte? An electrolyte is ...

... any substance that conducts electricity in solution due to the presence of ions.

*(Acids, Bases, Salts)*



2) J. J. Thomson, working with chocolate chip cookies in the late 1800s,

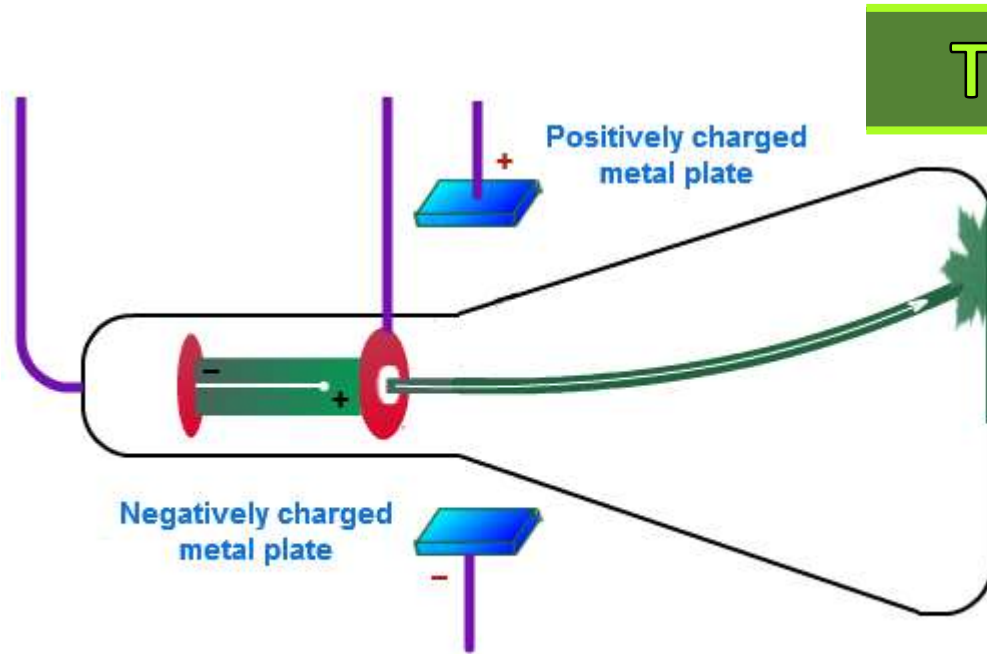


2) J. J. Thomson, working with chocolate chip cookies in the late 1800s,





- 2) J. J. Thomson, working with cathode ray tubes in the late 1800s, is credited with the discovery of what subatomic particle?



The ELECTRON



3) The chemical reaction between sodium carbonate and hydrochloric acid ...

EASY  
EXPERT

$$318 \text{ g} + 219 \text{ g} = 351 \text{ g} + 54 \text{ g} + 132 \text{ g}$$



HARD  
LEGENDARY

$$212 \text{ g} + 146 \text{ g} = 234 \text{ g} + 36 \text{ g} + 88 \text{ g}$$

4) Which of the following elements has atoms that normally have 2 valence electrons located in the 6<sup>th</sup> energy level?

Group→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
↓Period																			
1	1 H																		2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne	
3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar	
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr	
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe	
6	55 Cs	56 Ba	* 71 Lu	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn	
7	87 Fr	88 Ra	* 103 Lr	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Fl	115 Uup	116 Lv	117 Uus	118 Uuo	
			* 57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb			
			* 89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No			



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5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
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7	87 Fr	88 Ra	* Lr	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Fl	115 Uup	116 Lv	117 Uus	118 Uuo
				58 La	59 Ce	60 Pr	61 Nd	62 Pm	63 Sm	64 Eu	65 Gd	66 Tb	67 Dy	68 Ho	69 Er	70 Tm	71 Yb	
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**Barium**

# 5) ... two elements that are metalloids

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2	<del>3 Li</del>	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
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4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	<del>31 Ga</del>	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	<del>38 Sr</del>	<del>39 Y</del>	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
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6) What is the proper chemical symbol for the ion that contains 50 protons and 54 electrons?

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1	1 H																		2 He
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**50**  
**Sn<sup>4-</sup>**



7) A static charge can be obtained by friction, conduction, or induction.

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<b>Method of static charging</b>	<b>Materials at start...</b>	<b>Procedure</b>	<b>Materials after...</b>

7) A static charge can be obtained by friction, conduction, or induction.

Method of static charging	Materials at start...	Procedure	Materials after...
✓ One material has a charge at the start; they both have the same charge in the end.			
Conduction	1 charged, 1 neutral	Materials touch each other	Both charged (same charge)



8)

EASY  
EXPERT

A solution that has a pH of 10 could be neutralized by which of the following?

$pH > 7 \Rightarrow$  base

Neutralize with an acid



- (A) H<sub>2</sub>O    (B) H<sub>2</sub>CO<sub>3</sub>    (C) NaNO<sub>3</sub>    (D) KOH

HARD  
LEGENDARY

A solution that has a pH of 4 could be neutralized by which of the following?

$pH < 7 \Rightarrow$  acid

Neutralize with a base



9) The following are material requirements to make a frame for a technical object.

- The material must be lightweight.
- The material must be shock resistant (*resilient*).
- The material must act as an electrical insulator.
- The material must be fairly easy to melt, in order to be recyclable.

Which of the following materials is best suited to meet all of the above requirements?

**Glass**

**Thermoplastic**

**Aluminium**

**Thermosetting plastic**

9) The following are material requirements to make a frame for a technical object.

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Which of the following materials is best suited to meet all of the above requirements?

~~Glass~~

Thermoplastic

~~Aluminium~~

~~Thermosetting plastic~~

- 10) Which mechanical property describes the ability of a material to be flattened or bent without breaking?

Malleability



11) Refer to the following diagram of indicator colours to answer the question below.

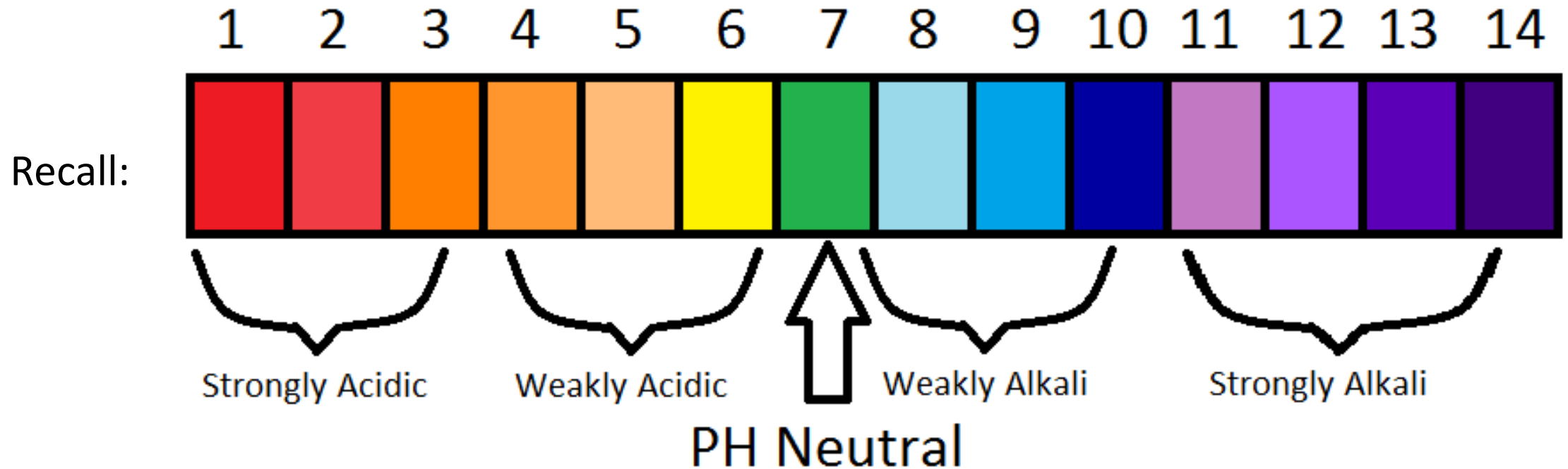
pH: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Phenolphthalein:

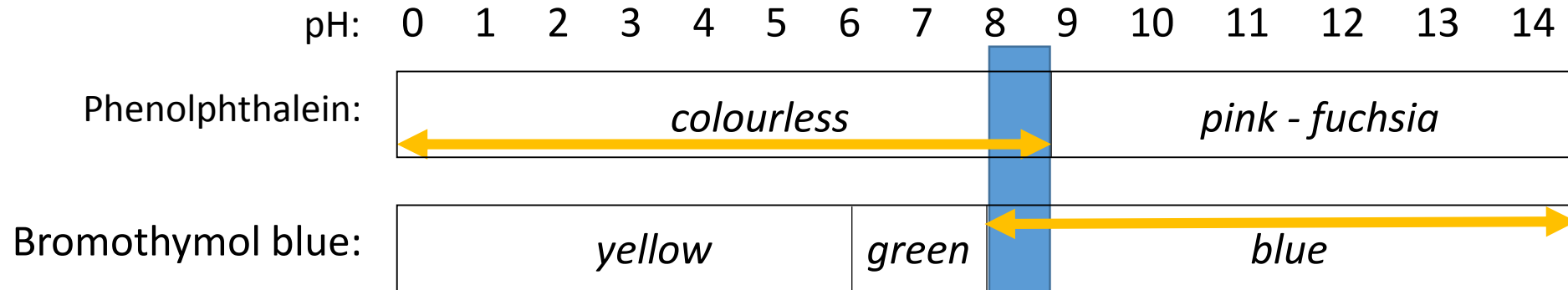
<i>colourless</i>	<i>pink - fuchsia</i>
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Bromothymol blue:

<i>yellow</i>	<i>green</i>	<i>blue</i>
---------------	--------------	-------------



11) Refer to the following diagram of indicator colours to answer the question below.



Phenolphthalein: Colourless

Bromothymol blue: Blue

Weak Base

12) Which of the following is ...

**EASY  
EXPERT**

... an alkaline earth metal?

**Magnesium, Mg**

**HARD  
LEGENDARY**

... an alkali metal?

**Lithium, Li**

(A) Magnesium      (B) Chlorine      (C) Neon      (D) Lithium

13) From the following choice of four elements, which is the least reactive?

Group→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
↓Period																		
1	1 H																	2 He
2	3 Li	4 Be											6 C	7 N	8 O	9 F	10 Ne	
3	11 Na	12 Mg											14 Si	15 P	16 S	17 Cl	18 Ar	
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr							32 Ge	33 As	34 Se	35 Br	36 Kr	
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			* 89 Ac	90 Th	91 Pa	92 U							100 Fm	101 Md	102 No			

2

# He

Helium  
(A Noble Gas)



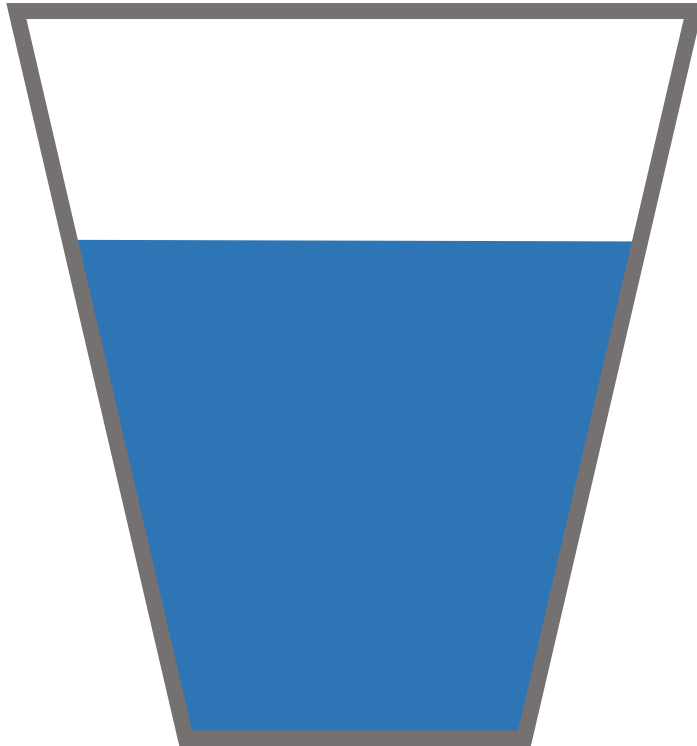
14) The following is a list of four compounds, all of which end with OH:



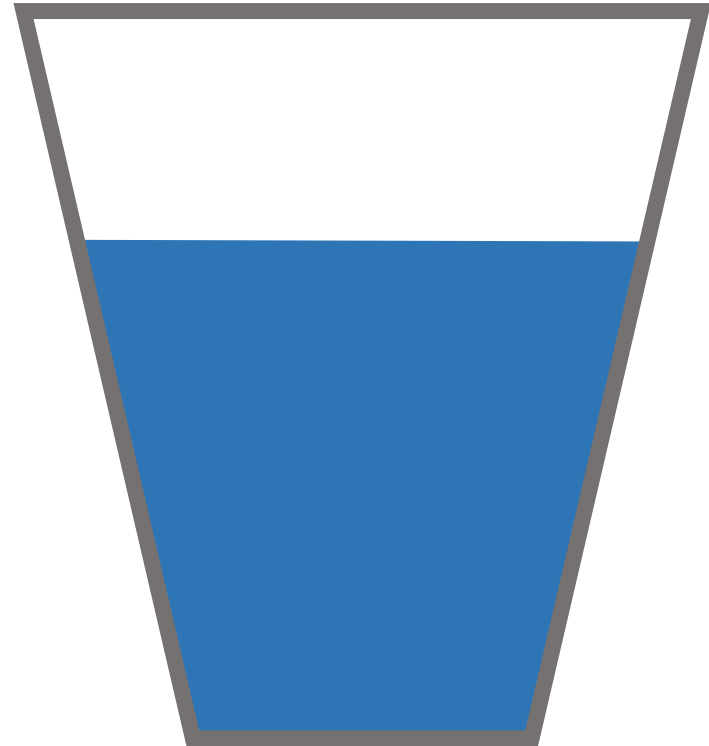
Which compound from this list is not a base, but would conduct electricity when dissolved in water?

15) You start with a bucket of salt water that has a salt concentration of 3.5 g/L.  
Which of the following statements is true?

- If you add more salt to the bucket, the concentration will decrease.



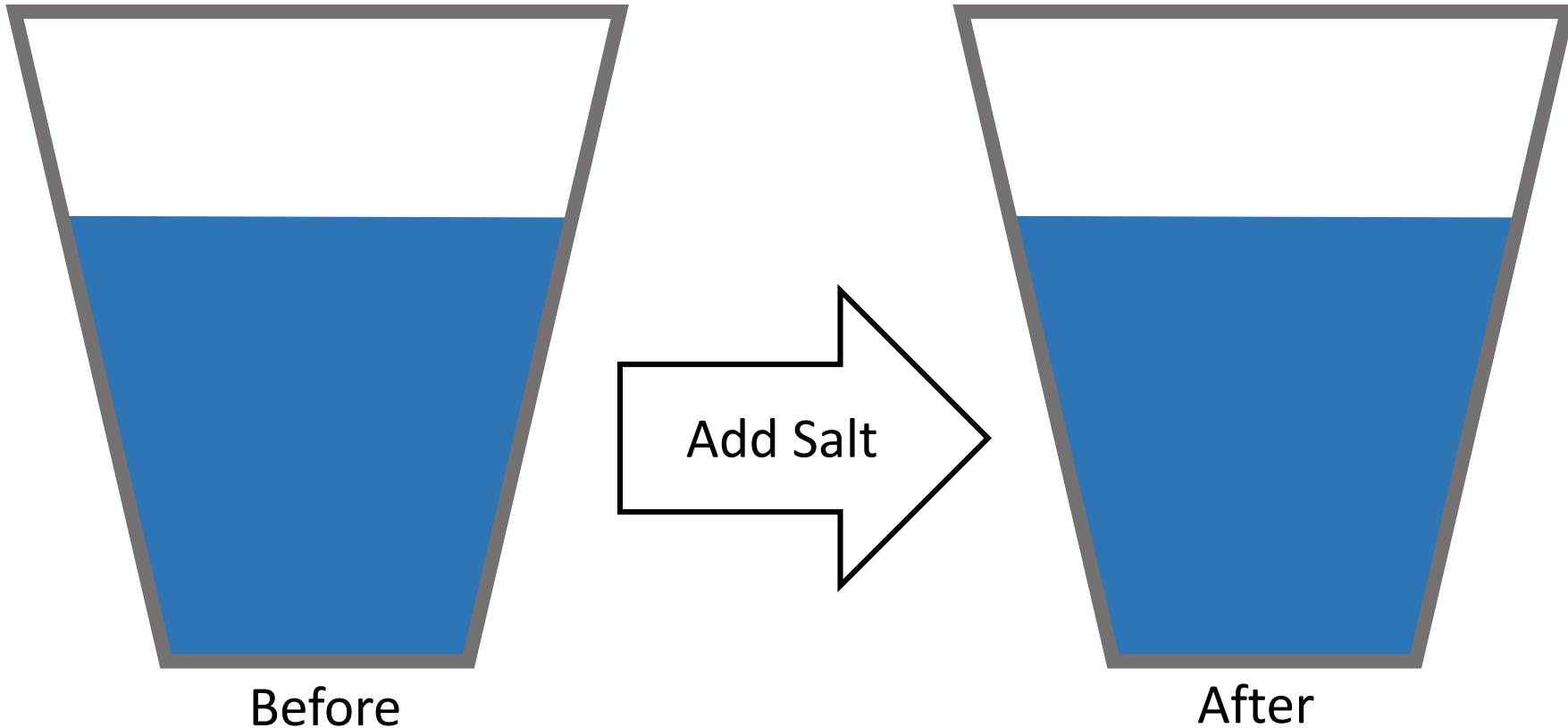
Before



After

15) You start with a bucket of salt water that has a salt concentration of 3.5 g/L.  
Which of the following statements is true?

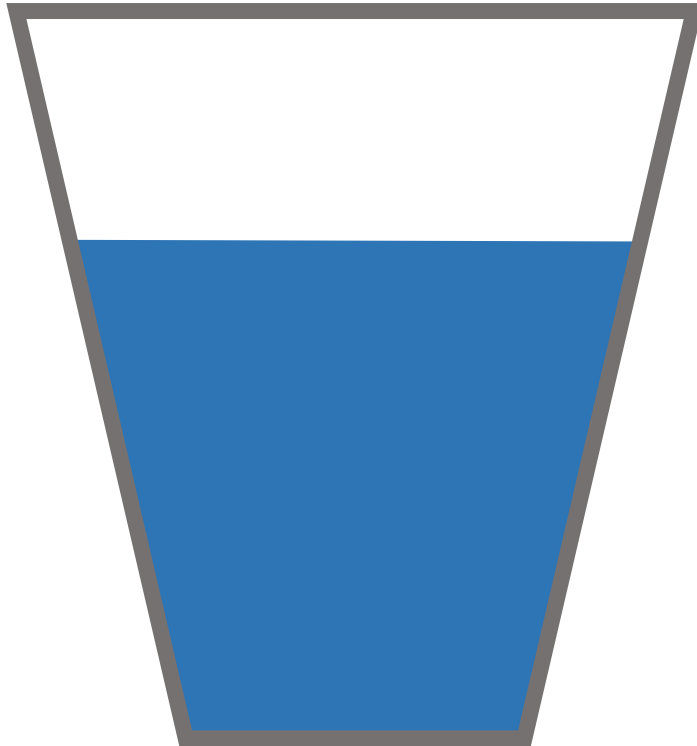
If you add more salt to the bucket, the concentration will decrease. ~~X~~



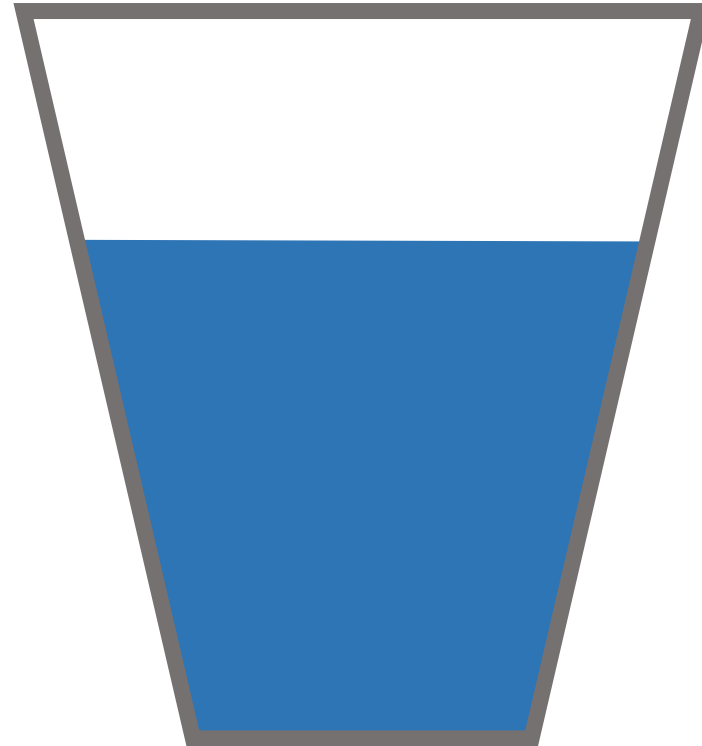
15) You start with a bucket of salt water that has a salt concentration of 3.5 g/L.

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Before

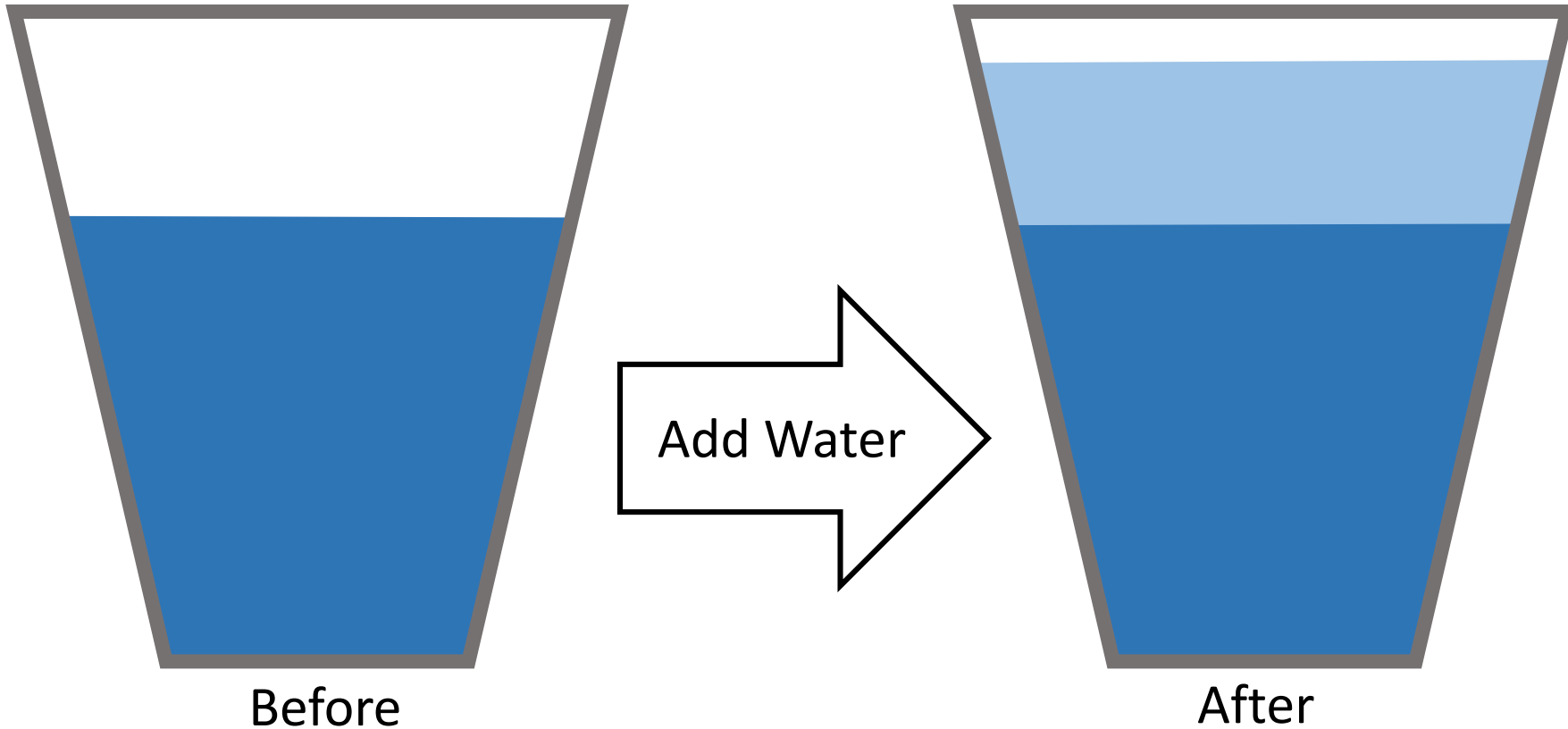


After

15) You start with a bucket of salt water that has a salt concentration of 3.5 g/L.

Which of the following statements is true?

If you add more water to the bucket, the concentration will increase.

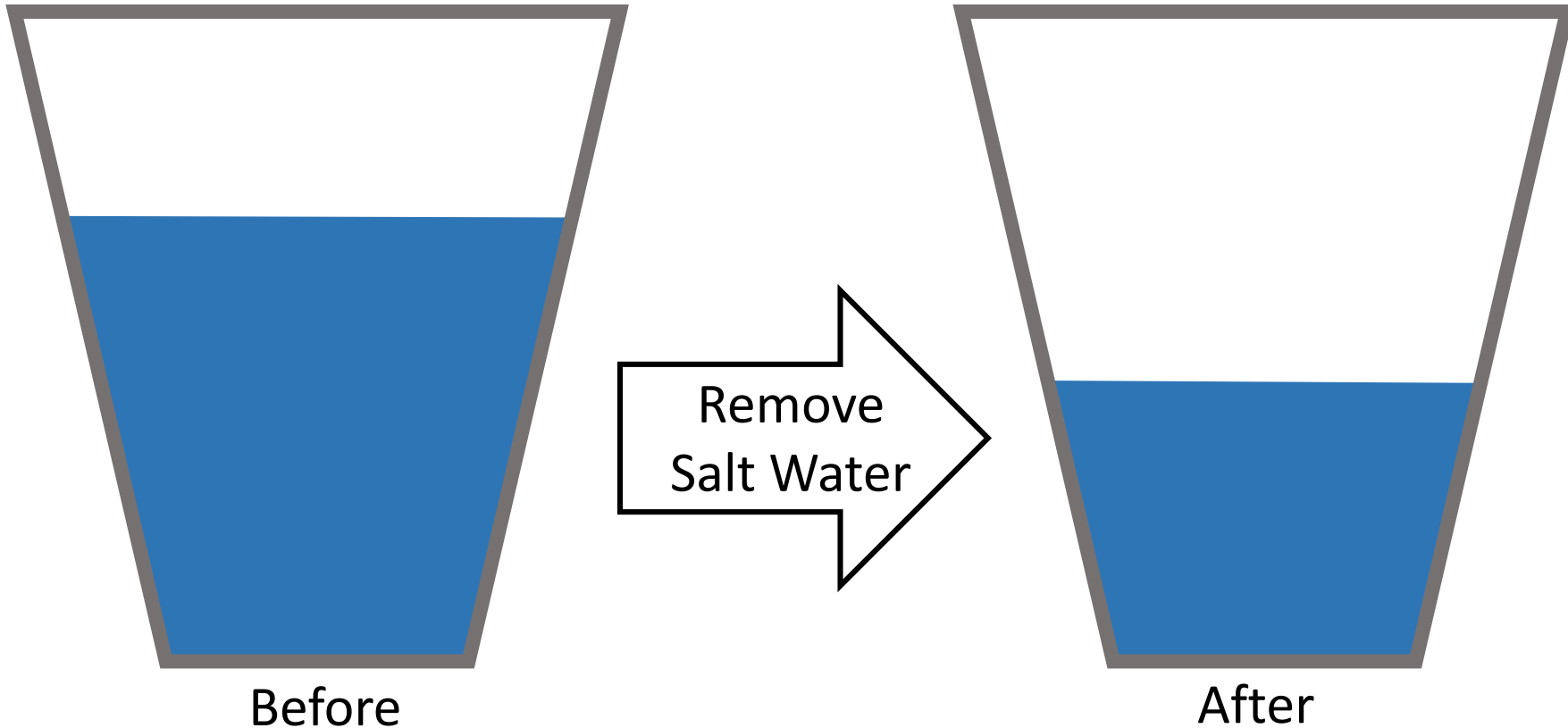




15) You start with a bucket of salt water that has a salt concentration of 3.5 g/L.

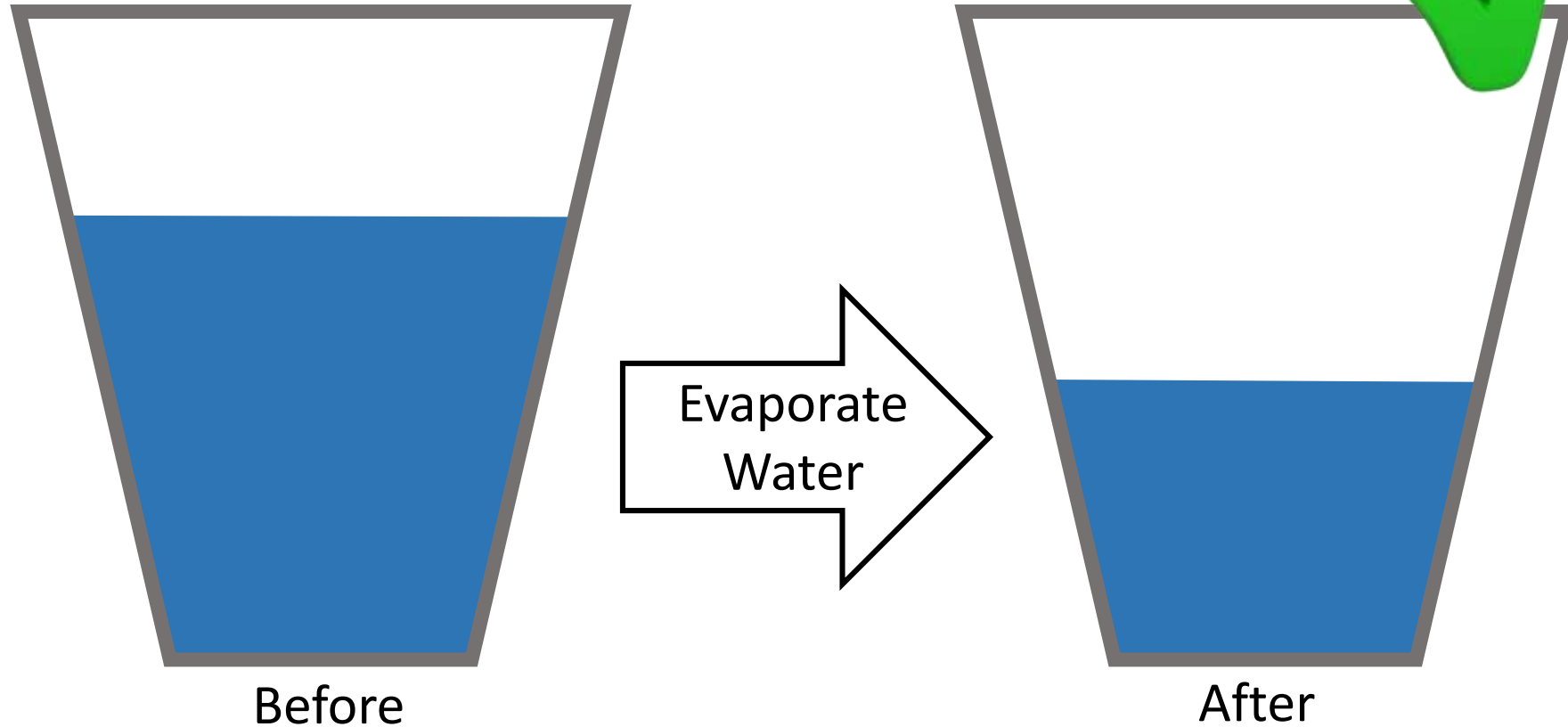
Which of the following statements is true?

If you remove some of the salt water, the concentration will decrease. ~~X~~



15) You start with a bucket of salt water that has a salt concentration of 3.5 g/L.  
Which of the following statements is true?

- If some of the water evaporates, the concentration will increase.



16) What volume of a 5 % *m/v* solution would contain 2 g of solute?

$$C = \frac{m}{V}$$

$$\frac{5 \text{ g}}{100 \text{ mL}} = \frac{2 \text{ g}}{x}$$

$$5x = 200$$

$$x = 40 \text{ mL}$$

17) What will be the concentration if 40 mg of solute is dissolved in 800 mL of solution?

( Note: multiple choices are all in ppm )

$$C = \frac{40 \text{ mg}}{0.8 \text{ L}}$$

800 mL = \_\_\_\_\_L

$$C = 50 \text{ ppm}$$

End of Multiple choice  
section

4 marks each: /68

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The image features a pair of rich red theater curtains with gold tassels, partially drawn to reveal a dark stage. The word "Intermission" is written across the center in a white, elegant cursive font. The lighting is soft, highlighting the texture of the fabric and the contrast between the red and white.

*Intermission*

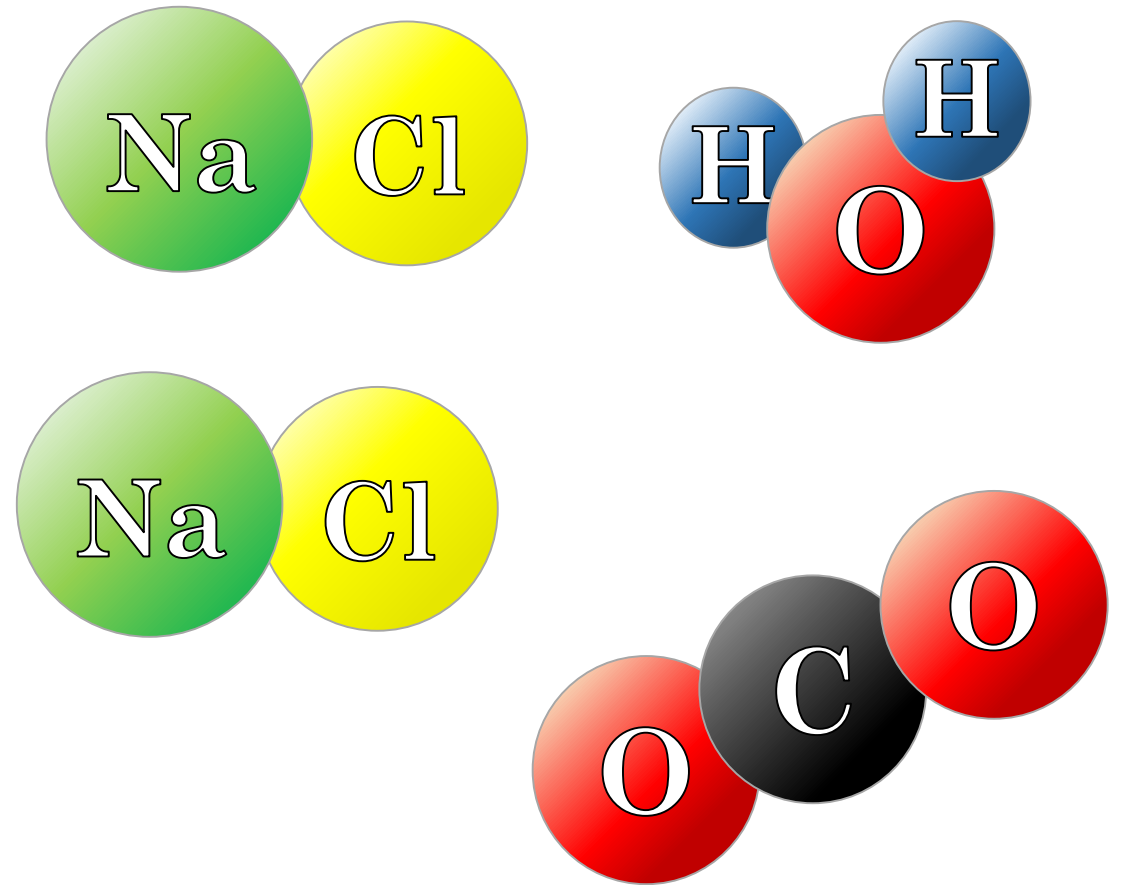
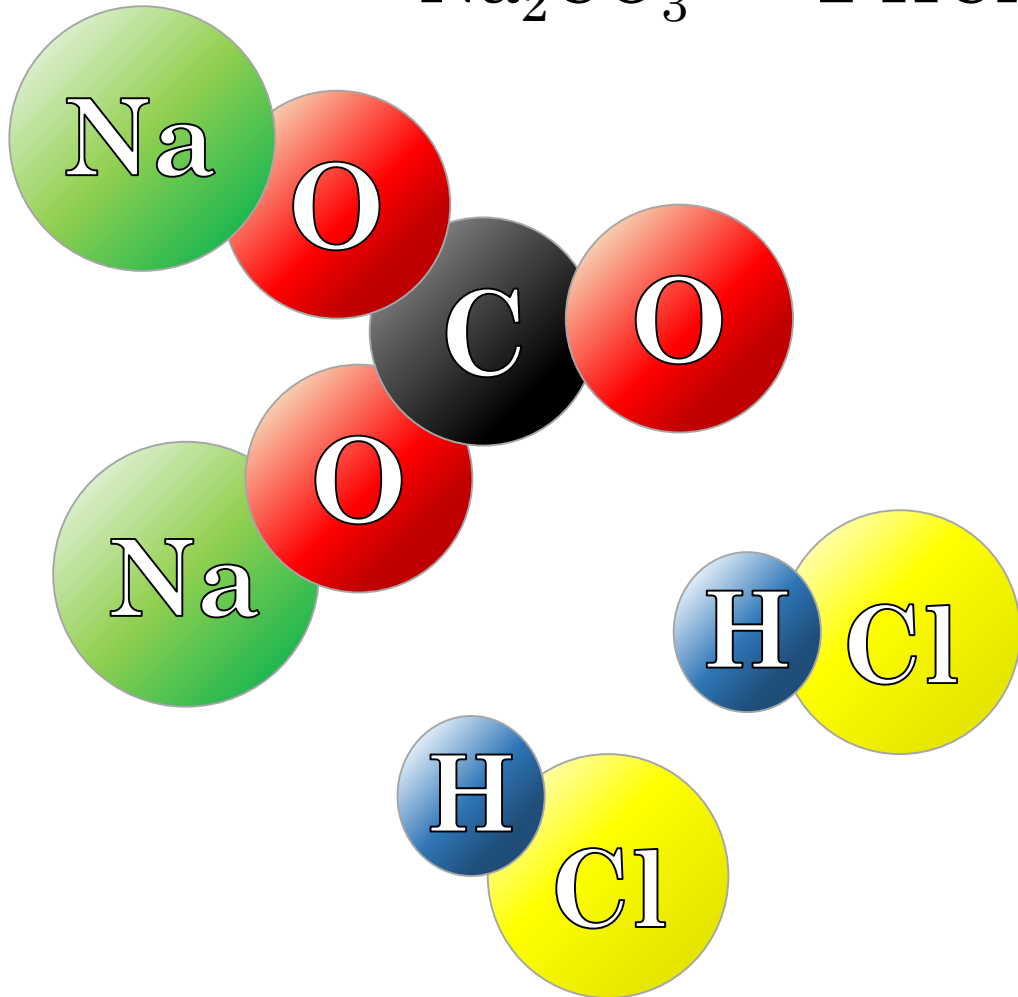
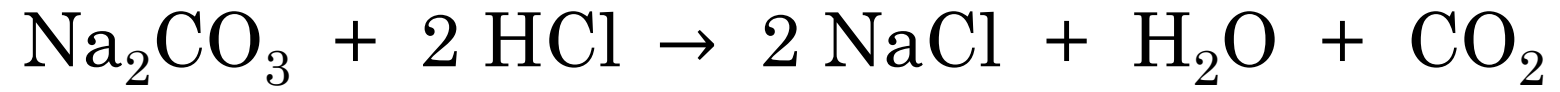
And now ...

Short answer  
section

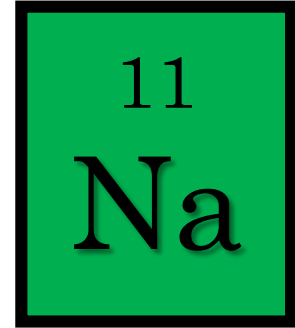
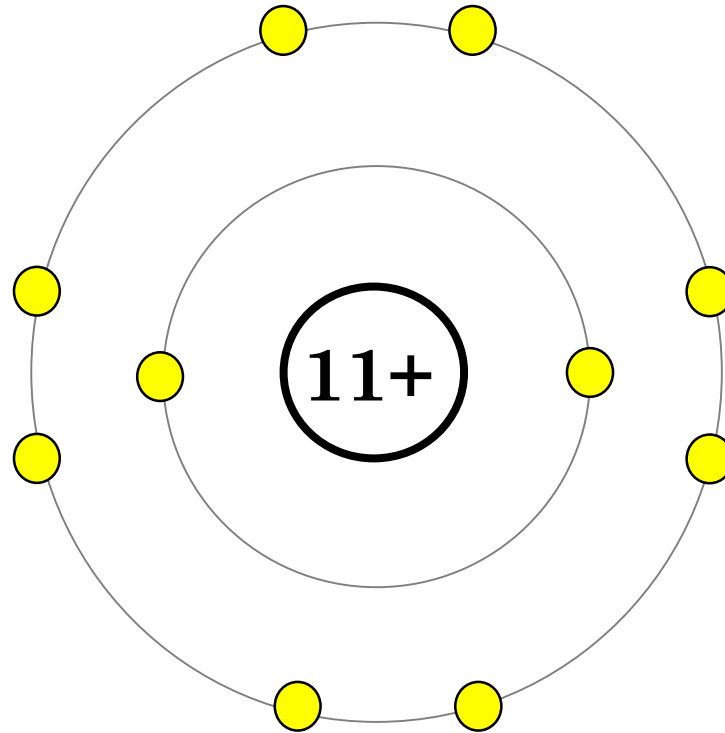
4 marks each:  
/32



18) Draw a particle model ...



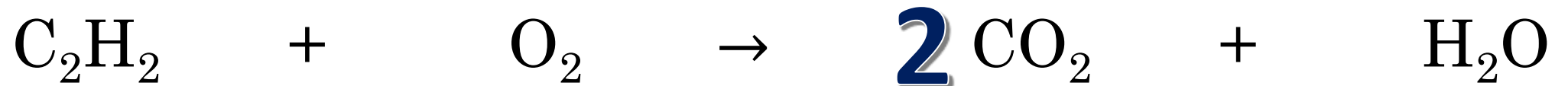
19) Complete a Bohr-Rutherford diagram to illustrate a **sodium ion, Na<sup>+</sup>**.



Na<sup>+</sup> ion

( Lost 1 electron;  
now has 10 e<sup>-</sup> )

20) Balance the following skeleton equations. (*Lowest integer coefficients for full marks*)





20) Balance the following skeleton equations. (*Lowest integer coefficients for full marks*)



21) Refer to the following triboelectric series to complete the statements below.



Step 1) A piece of **acetate** is rubbed with a piece of **fur**.

Step 2) A piece of **rubber** is rubbed with a piece of **wool**.

The piece of **wool** and the piece of **rubber** will attract each other.

The piece of **fur** and the piece of **wool** will attract each other.

The piece of **rubber** and the piece of **fur** will repel each other.

The piece of **fur** will attract small neutral pieces of styrofoam.

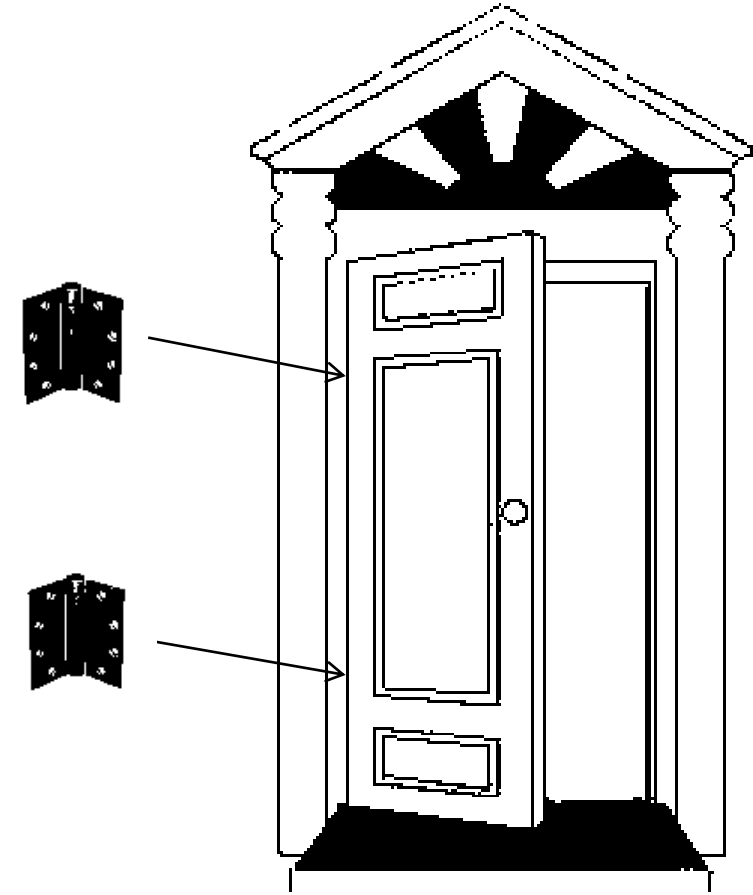
22) Steel hinges and screws are used to attach a door to its frame.

(i) Describe the link between the door and its frame.

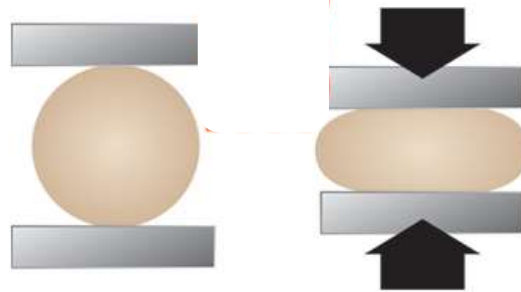
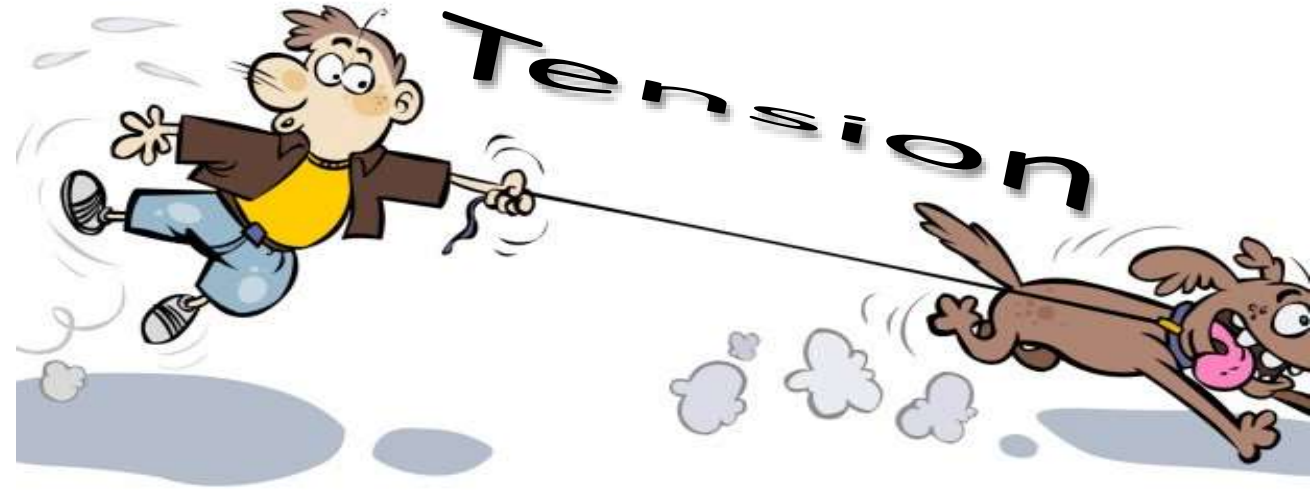
- Indirect
- Removable
- Partial
- Rigid

(ii) What type of guiding control is this?

Rotational



23) Constraints describe how forces act on an object.  
What constraint is shown?...



Compression

## 24) Types of deformation.

If, after being deformed due to a constraint, a material returns to its original shape, the deformation is said to be elastic.



If a material retains its new shape after being deformed, the deformation is said to be plastic.

25) What mass of solute is required in order to make 75 mL of a 60 g/L solution?

*Show all calculations clearly; don't forget units with the answer.*

$$\frac{60 \text{ g}}{1 \text{ L}} = \frac{x}{0.075 \text{ L}}$$

$$75 \text{ mL} = ? \text{ L}$$

$$x = 4.5 \text{ g}$$





## TERM 3 – QUIZ 2

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PLEASE STAND BY

The image shows a vintage television test pattern. At the center is a large circular dial with a vertical scale. The dial is divided into several segments with different shading patterns. The central vertical axis has markings for 30, 45, and 50. The dial is surrounded by a grid of horizontal and vertical lines. In the four corners, there are smaller circular crop marks, each containing the numbers 30 and 35. The text 'PLEASE STAND BY' is superimposed over the center of the dial.