

<b>Subject:</b> Natural Sciences		
<b>Strand:</b> Matter and materials		
<b>Topic:</b> Atoms, sub-atomic particles, compounds, pure substances, mixtures of elements and compounds: CAPS p 41		
<b>Grade:</b> 8		
Low order questions	Middle order questions	High order questions
1 – 10		

### **Assessment task 1**

Choose the correct answer and write down only the symbol of the answer.

- The three basic components of an atom are \_\_\_\_\_
  - protons, neutrons and ions
  - protons, neutrons and electrons
  - protons, neutrinos and ions
  - protium, neutroninos and electrons
  
- An atom is determined by the number of \_\_\_\_\_
  - atoms
  - electrons
  - neutrons
  - protons
  
- The nucleus of an atom consists of \_\_\_\_\_
  - electrons
  - neutrons
  - protons and neutrons
  - protons, neutrons and electrons
  
- What is a charge of a proton?

- A. None
  - B. Positive
  - C. Negative
  - D. Either a positive or negative
5. Which particles have approximately the same size and mass as each other?
- A. Neutrons and electrons
  - B. Electrons and protons
  - C. Protons and neutrons
  - D. None – they are all very different in size and mass
6. Which two particles would be attracted to each other?
- A. Electrons and neutrons
  - B. Electrons and protons
  - C. Protons and neutrons
  - D. All particles are attracted to each other
7. The atomic number of an atom is \_\_\_\_\_
- A. the number of electrons
  - B. the number of neutrons
  - C. the number of protons
  - D. the number of protons plus the number of neutrons
8. The mass number of an atom is \_\_\_\_\_
- A. the number of electrons
  - B. the number of neutrons
  - C. the number of protons
  - D. the number of protons plus the number of neutrons
9. According to the atomic theory, electrons are usually found \_\_\_\_\_

- A. in the atomic nucleus
- B. outside the nucleus, yet very near it because they are attracted to the protons
- C. outside the nucleus and often far from it – most of an atom's volume is its electron cloud
- D. either in the nucleus or around it – electrons are readily found anywhere in an atom

10. Which particles carry opposite charges? :

- A. Protons and neutrons
- B. Neutrons and electrons
- C. Protons and electrons
- D. Neutrons and ions

(10)

### **Answers**

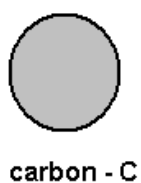
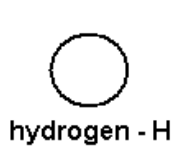
- 1. B
- 2. D
- 3. C
- 4. B
- 5. C
- 6. B
- 7. C
- 8. D
- 9. C
- 10. C

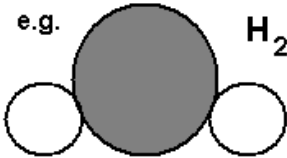
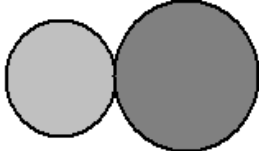
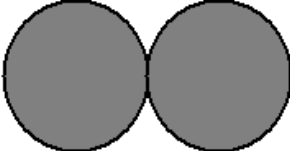


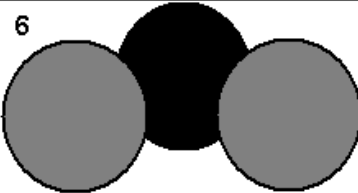
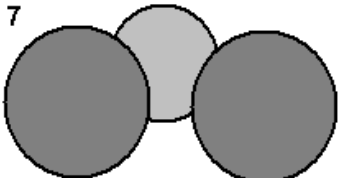


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### **Assessment Task 2**

## Molecule models

<b>Subject:</b> Natural Sciences		
<b>Strand:</b> Matter and materials		
<b>Topic:</b> Chemical formulae, molecules, atoms: CAPS pp40 - 41		
<b>Grade:</b> 8		
Low order questions	Middle order questions	High order questions
Part 1: 2-9	Part 2: 1-9 Part 3: 1-9 Part 4: 1-9	



1 e.g.  $H_2O$	2 	3 
4 	5 	6 
7 	8 	9 

### Part One: Write the chemical formulas

Use the model key for each element and write the chemical formula for each molecule.

[16 marks]

## Part Two: Draw the model for the molecules

Use the same model key and draw the model for each of the molecules given.

1	$\text{NH}_4$	2	$\text{NO}$	3	$\text{H}_2$
4	$\text{NH}_3$	5	$\text{H}_2\text{O}$	6	$\text{NO}_2$
7	$\text{O}_2$	8	$\text{CO}$	9	$\text{CO}_2$

## Part Three: Create 3D models of molecules

The above drawings are all 2dimensional (2D) models of the actual molecules.

Use different coloured jelly tots and toothpicks and create 3D models of the above molecules.

Your partner will assess your models and you will assess your partner's.

[20 marks]

## Checklist for assessing jelly tot models

Criteria	Yes [1]	No [0]
Learner has used colours of jelly tots consistently to represent each element.		
Learner has created 3D models using jelly tots to represent elements and toothpicks to represent bonds.		
Learner's models are accurate and correct.	Allocate 2 marks per completely correct model; 1 mark if partially correct; 0 if wrong.	
	<b>Total: /18</b>	

## Part Four: Research on the names of the molecules

Find out the names of each of the molecules you have made models of.

[16 marks]

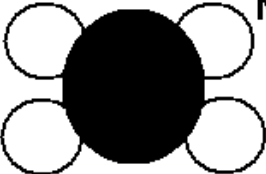


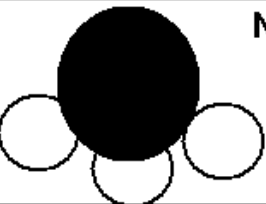

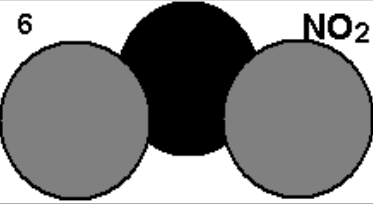
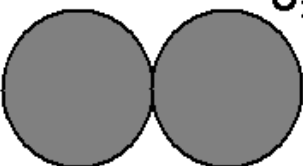
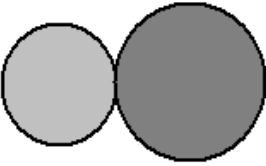
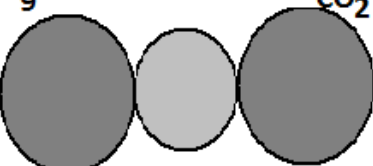
[Total: 50 marks]

### Suggested Solutions

Question number	Possible marks	Solution
1	16	2. CO 3. O <sub>2</sub> 4. NH <sub>3</sub> 5. NO 6. NO <sub>2</sub> 7. CO <sub>2</sub> 8. H <sub>2</sub> 9. NH <sub>4</sub>
2	18	See table in Appendix of Assessment Tools.
3	20	See checklist in Appendix of Assessment Tools – peer assessment.
4	16	1. H <sub>2</sub> O - water 2. CO – carbon monoxide 3. O <sub>2</sub> – oxygen 4. NH <sub>3</sub> – ammonia 5. NO – nitrogen oxide / Nitric oxide / Nitrogen monoxide 6. NO <sub>2</sub> – nitrogen dioxide 7. CO <sub>2</sub> – carbon dioxide 8. H <sub>2</sub> – hydrogen

## Appendix of Assessment Tools

Table for drawing the models of the formulae given

1  NH <sub>4</sub>	2  NO	3  H <sub>2</sub>
4  NH <sub>3</sub>	5  H <sub>2</sub> O	6  NO <sub>2</sub>
7  O <sub>2</sub>	8  CO	9  CO <sub>2</sub>

### Checklist for assessing jelly tot models

Criteria	Yes [1]	No [0]
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Learner has created 3D models using jelly tots to represent elements and toothpicks to represent bonds.		
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### Assessment task 3

#### Atoms

1. Look at the table below; indicate with a tick (✓) in the correct box if the substance

<b>Subject: Natural Sciences</b>		
<b>Strand: Matter and materials</b>		
<b>Topic: Atoms – building blocks of matter: CAPS p 40</b>		
<b>Grade: 8</b>		
Low order questions	Middle order questions	High order questions
1.1 – 1.6		

is made of a single atom or more than one atom.

Substance	Formula	Single atom	More than one atom
1.1 Oxygen	O <sub>2</sub>		
1.2 Carbon monoxide	CO		
1.3 Helium	He		
1.4 Water	H <sub>2</sub> O		
1.5 Carbon dioxide	CO <sub>2</sub>		
1.6 Sodium chloride	NaCl		

(6)

#### Answers

Substance	Formula	Single atom	More than one atom
1.1 Oxygen	O <sub>2</sub>	✓	
1.2 Carbon monoxide	CO		✓
1.3 Helium	He	✓	
1.4 Water	H <sub>2</sub> O		✓
1.5 Carbon dioxide	CO <sub>2</sub>		✓
1.6 Sodium chloride	NaCl		✓