

Grade 7 Natural Science Worksheet

Assessment Task: Physical Sciences: Chemistry, oxygen

Oxygen

Part One: The importance of oxygen

Complete the notes below by filling in the missing words.

Air is a (a)_____ of gases. Oxygen is the most important and the (b)_____ most abundant gas – it makes up about 20% of air. Oxygen gas has the (c)_____ O and is colourless, (d)_____ and (e)_____. So if we want to be sure if a gas is actually oxygen, we must have a positive test. How do we do this? A glowing splint (no flame) put into oxygen will (f)_____ (burn with a flame). Each oxygen (g)_____ consists of two (h)_____. We say it is a diatomic molecule.

Patients in hospital with (i)_____ (breathing) problems, deep sea divers, mountain climbers and (j)_____ all carry their own oxygen supply – without it they would die. (k)_____ use the oxygen dissolved in the (l)_____ to breathe. These examples all show us that oxygen is necessary for (m)_____. In order to supply enough energy to meet our demand for (n)_____, heating, (o)_____ and transportation, (p)_____ have to be burnt e.g. petrol, (q)_____, candles and (r)_____. Modern car engines (s)_____ the petrol inside the engine. This is called internal combustion. Oxygen is also important because it supports (t)_____.

tasteless	burn	water	fuels	combustion	astronauts	
wood	molecule	gas	cooking	respiratory	lighting	mixture
respiration	atoms	symbol	ignite	second	odourless	fish

[20 marks]

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Part Two: Investigating combustion

You will need:

- A soup plate
- A candle
- A clear glass jar
- Water
- Matches
- Prestik

What to do:

1. Fix the candle in the plate using Prestik.
2. Pour a little warm water into the plate.
3. Light the candle and cover it with the glass jar. Watch to see what happens.

Answer the following questions:

1. What happened to the burning candle after a while?
2. Why do you think the water did not go all the way up inside the jar?
3. Complete the following sentence:
The _____ of a substance in the presence of oxygen is called _____.

[10]

Your teacher will award up to 5 marks for the way in which you manipulated the apparatus and conducted the practical work, including cleaning up.

[5]

[15 marks]

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Part Three: Research on corrosion

You will need to do some research to complete this task.

1. What is corrosion and how can galvanisation prevent corrosion?

Write a paragraph explaining your answer.

[20 marks]

Rubric to assess paragraph

Criteria	4	3	2	1
Presentation	Exceptionally neat in all respects.	On a neat sheet of paper, handwriting is neat.	Not very neat, could be improved greatly.	Scrappy sheet of paper, messy handwriting.
Ability to use correct grammar and spelling	No grammatical and spelling errors.	Very few grammatical and spelling errors.	A few grammatical and spelling errors.	Many grammatical and spelling errors.
Ideas logically organised in cohesive sentences	Sentences have excellent structure and ideas logical.	Sentences mostly logically structured and ordered.	Some attempt at structuring logical sentences.	Sentences not logically structured or ordered.
Content	No errors, 8 – 10 facts.	1 error, 7 – 8 facts.	2 – 3 errors, 5 – 6 facts.	More than 4 errors, less than 5 facts.
Content answers the question	Complete and comprehensive answer.	Good answer.	Fair answer, with limitations.	Poor answer, much missing.

2. You are the owner of a new company which manufactures galvanised products for domestic buildings e.g. door handles, window and door frames, etc.

Design an advertisement which will encourage people building a new home, or doing renovations to their existing homes, to use your products. You should include the advantages of using galvanised products as well as explaining exactly what galvanisation is to your customers.

[30 marks]

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Rubric to assess an advertisement

Criteria	Level 4 [4]	Level 3 [3]	Level 2 [2]	Level 1 [1]
Accuracy and interest level of information	Factually correct and extremely interesting. [10 marks]	Generally correct and interesting. [7 marks]	Some errors, rather ordinary. [5 marks]	Many errors, boring. [2 marks]
Communication of ideas	Very logically organised, meaningful flow of ideas. [10 marks]	Mostly well organised, can follow progression of ideas. [7 marks]	Fairly well organised, flow of ideas not always meaningful. [5 marks]	Very little meaningful organisation of ideas. [2 marks]
Overall appearance	Very neat and attractively presented. [6 marks]	Neat and well presented. [4 marks]	Neat in places, not much thought given to presentation. [3 marks]	Untidy, little/no attention paid to presentation. [1]
Use of colour, lettering, diagrams, etc.	Excellent. [4 marks]	Good. [3 marks]	Mediocre. [2 marks]	Poor. [1 marks]

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Suggested Solutions

Question number	Possible marks	Solution
1	20	<p>Air is a mixture of gases. Oxygen is the most important and the second most abundant gas – it makes up about 20% of air. Oxygen gas has the symbol O and is colourless, tasteless and odourless. So if we want to be sure if a gas is actually oxygen, we must have a positive test. How do we do this? A glowing splint (no flame) put into oxygen will ignite (burn with a flame). Each oxygen molecule consists of two atoms. We say it is a diatomic molecule.</p> <p>Patients in hospital with respiratory (breathing) problems, deep sea divers, mountain climbers and astronauts all carry their own oxygen supply – without it they would die. Fish use the oxygen dissolved in the water to breathe. These examples all show us that oxygen is necessary for respiration. In order to supply enough energy to meet our demand for cooking, heating, lighting and transportation, fuels have to be burnt e.g. petrol, wood, candles and gas. Modern car engines burn the petrol inside the engine. This is called internal combustion. Oxygen is also important because it supports combustion.</p>
2	15	<ol style="list-style-type: none"> 1. After a while the flame went out. ✓✓ 2. The burning candle used up the oxygen in the air in the jar. ✓✓ The water takes up the space left by the oxygen in the water. ✓✓ The water will not go all the way to the top of the jar because the rest of the gases which make up the air will fill up the space inside. ✓✓ 3. The burning of a substance in oxygen is called combustion. ✓✓ <p>Award up to 5 marks for the way in which the learner manipulated the apparatus and conducted the practical work, including cleaning up.</p>
3.1	20	<p>Learner paragraphs will differ, but this is a guideline for marking: The reddish brown substance called rust, formed on metal objects left outside, is because of corrosion. The metal which corrodes most easily is iron. Steel is made from iron and most types of steel corrode just as easily as iron. Many of the objects we use every day are made of steel e.g. cutlery. Iron and other metals which combine with oxygen, especially in the presence of moisture, form iron oxide, or rust. Corrosion of iron and steel is called rusting. Once rust has formed, it remains on the object, making it flake off, exposing the layers of metal underneath which also become rusted. Millions of cars and other vehicles manufactured every year have an estimated average life of ten years – even less at the coast-</p>

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		<p>and have to be replaced because of corrosion. The cost of metal corroding like this is very expensive so we have had to find ways to keep metal out of contact with air and water. We need to try and stop objects from rusting. We do this by covering the metal with a layer of another material. Examples of this are painting e.g. drain pipes and ships; using a thin layer of oil or grease; coating with a different metal which will not corrode e.g. tin or zinc. Coating a metal with a thin layer of zinc is called galvanising.</p> <p>See rubric in Appendix of Assessment Tools.</p>
3.2	30	See rubric in Appendix of Assessment Tools.

Appendix of Assessment Tools

Rubric to assess paragraph

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