

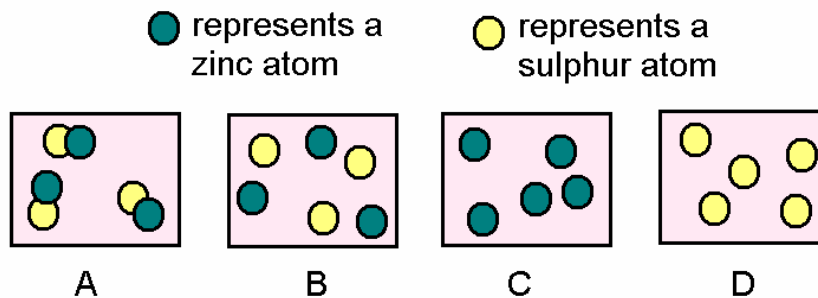
Grade 7 Natural Science Worksheet

Assessment Task: Physical sciences, elements

Mixtures

1. What is the difference between a mixture and a compound? Use examples to explain your answer. [6]

2.



With respect to the above diagram:

- a. What is an **element**?
 - b. Which diagram represents **pure** sulphur?
 - c. Which diagram represents a **mixture** of zinc and sulphur?
 - d. Which diagram represents a **compound** of zinc and sulphur?
 - e. Give a reason why you made the decisions you did in c and d. [6]
3. Imagine that you were marooned on a desert island without any fresh water. You have a gas cooker and a few pots and pans. How would you survive? Can you make fresh water out of salt water? Write up your plan for survival as a scientific investigation. [14]
4. Research and then describe some ways that mixtures can be separated. Give examples. [9]

[35 marks]

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Suggested Solutions

Question number	Possible marks	Solution
1	6	<p>When two or more elements bond together chemically, the resulting new substance is called a compound. ✓✓</p> <p>The elements can be separated apart again, but only by chemical, not physical means. We can also combine two or more substances together in such a way that they are only physically mixed and not chemically bonded. The result is called a mixture. ✓✓</p> <p>Examples:</p> <p>When you make yourself a cup of coffee, you mix together coffee powder, milk, water and sugar. Because the water is hot, the solids dissolve into the water and it appears that you have a new substance. But you don't. You have a mixture of all the substances you added together. The air around you is a mixture of gases: Nitrogen, oxygen and carbon dioxide being the main gases. These gases are not chemically bonded together; they are just mixed together.</p> <p>Accept any correct examples. ✓✓</p>
2	6	<p>a. Matter that made up of only one kind of atom. ✓</p> <p>b. C ✓</p> <p>c. B ✓</p> <p>d. A ✓</p> <p>e. In a mixture, the atoms do not bond with each other. ✓ In a compound, the atoms or molecules bond with each other. ✓</p>
3	14	<p>The activity should be written up as a scientific investigation. Some ideas are recorded here – although learners may have original ideas.</p> <p>Research question: Can I make fresh water out of salt water? ✓✓</p> <p>Hypothesis: If I boil salt water and capture the evaporated steam and allow it to condense, the salt will be left behind and I will have fresh water. ✓✓</p> <p>Apparatus: Gas cooker, source of fire, pots, pieces of plastic or lids of pots. ✓✓</p> <p>Method: (should be written up in point form)</p> <ul style="list-style-type: none"> • Boil some salt water. • As the water begins to boil, place a pot lid at an angle over the pot to allow the steam to condense on the lid. • Collect the condensate in another pot. ✓✓✓✓ <p>Result: The condensate should be fresh water; the salt should be left in the first pot. ✓✓</p> <p>Conclusion: You can make fresh water out of salt water. The mixture of salt and water can be separated by evaporation. ✓✓</p>
4	9	Because no chemical bonding has taken place and a mixture is only a

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	<p>physical combination of different substances, the substances can be separated.</p> <p>Suppose you had a mixture of sand, water and iron filings. How would you separate these three particles from each other?</p> <p>Firstly, you could filter off the majority of the water. You could then spread the mixture of mud and iron over a surface and allow the last of the water to evaporate. You could then use a magnet to pull the iron filings out of the sand.</p> <p>In the scrap metal business, huge electromagnets are used to extract magnetic metal like iron and nickel from non-magnetic metals such as copper and aluminium.</p> <p>In mining, rocks containing metal ores are crushed and then subjected to extremely high temperatures. The different metals in the ore have different melting point temperatures, and so they are able to extract the different metals and pour off unwanted rock and slag.</p> <p>Perfumes, alcoholic drinks such as whiskey and brandy and other liquid mixtures can be separated by distillation. The mixture consists of substances that boil at different temperatures. As the mixture is heated, the substances with the lowest boiling points are separated out first. The substances with higher boiling points are left behind.</p> <p>Award marks for descriptions which have research and depth.</p>
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