



# Year 9 Science Sample Resources



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# Chemical Change Worksheet 1

Property of Prestige Tuition

1. **List** four examples of a physical change.

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2. **State** the fundamental difference between a physical and a chemical change.

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3. **List** four signs of chemical change.

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4. **List** the signs of chemical change you would observe when you strike a match.

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5. **Specify** what happens in:

- a) an exothermic reaction

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- b) an endothermic reaction

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- c) a spontaneous reaction

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- d) a non-spontaneous reaction

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6. **State** an example of each of the reactions in question 5.

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7. **Define** the term *solution*.

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8. **Explain** what is meant by *a solution is clear, but not always colourless*.

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9. **Describe** what happens when a precipitate forms.

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10. Burning methane (natural gas) is a spontaneous reaction but you need to light a match to make it burn. **Explain** why.

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11. **Identify** two common examples of a chemical change and two of a physical change.

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12. **Classify** the following as examples of chemical change or physical change.

a) cutting up cheese

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b) making toast

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c) burning gas

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d) melting chocolate

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e) freezing cordial

f) water evaporating

g) putting a soluble aspirin tablet in water

13. For each of the following reactions, **identify**:

a) the reactants

b) the products

c) whether the reaction is exothermic or endothermic

d) whether the reactants or products contain more energy

Reactions:

i. water + energy  $\rightarrow$  hydrogen + oxygen

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ii. methane + oxygen  $\rightarrow$  carbon dioxide + water + energy

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14. For each of the following, **identify** whether a chemical change has occurred and give a reason for each choice.

a) A student mixes two unknown solutions together and notices a cloudiness forming.

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b) Solid purple iodine crystals are heated slightly and a purple cloud of iodine gas is observed.

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c) When nitric acid is poured onto limestone, bubbling is seen.

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- d) Two colourless solutions at room temperature are mixed. After a minute, the temperature of the mixture is  $60^{\circ}\text{C}$ .

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- e) Ice is taken from the freezer and left on the bench. The temperature rises from  $0^{\circ}\text{C}$  to  $20^{\circ}\text{C}$  and the ice melts.

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- f) Yellow sulfur powder and iron filings are heated in a crucible. After heating, only a black solid remains.

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15. **Justify** why lighting a sparkler is considered a spontaneous reaction and **propose** other spontaneous reactions you might find in your everyday life.

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16. **Construct** word equations for the following reactions.

- a) When copper is added to nitric acid, copper nitrate, nitrogen monoxide and water are formed.

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- b) If sulfuric acid is poured onto solid sodium carbonate, bubbles of carbon dioxide are produced, as well as water and sodium sulfate.

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- c) Magnesium burns easily in oxygen, producing magnesium oxide.

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- d) During photosynthesis, the Sun's energy, carbon dioxide and water are used by green plants to produce glucose and oxygen.

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- e) An iron nail exposed to air and water will rust, forming hydrated iron oxide.

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- f) When solutions of lead nitrate and sodium iodide are mixed, a precipitate of yellow lead iodide is formed, as well as sodium nitrate in solution.

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# Earth's Fragile Crust Exam

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

Instructions: Write answers in the right hand column. Score: \_\_\_\_\_ / 104 marks

## Section A – Multiple choice (25 marks)

1	<p>Which combination is thought to have made up the ancient supercontinent Laurasia?</p> <p><b>A</b> Australia, Antarctica, South America, Africa and India <b>B</b> South America, North America and Europe <b>C</b> Europe, North America and most of Asia <b>D</b> North America, Africa and most of Asia</p>		1
2	<p>In 1915, Alfred Wegener proposed the idea of a supercontinent splitting to form the continents. His ideas were largely ignored because:</p> <p><b>A</b> there was no evidence to support them <b>B</b> little was known about the shapes of the continents at that time <b>C</b> the distribution of reptilian fossils could not be explained by shifting continents <b>D</b> it was thought that the Earth was solid rock.</p>		1
3	<p>Studies of the magnetic stripes of rocks on the ocean floor indicate that the:</p> <p><b>A</b> youngest rock is next to the ridges and the oldest is next to the trenches <b>B</b> youngest rock is next to the trenches and the oldest is next to the ridges <b>C</b> rocks are all approximately the same age <b>D</b> rocks are older than the rocks of the continents.</p>		1



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4	<p>Which of the following boundaries between tectonic plates is also known as a conservative boundary?</p> <p>A spreading B collision C transform D constructive</p>		1
5	<p>When tectonic plates collide, a variety of things can happen. Which of the following is most likely when an ocean plate collides with another ocean plate?</p> <p>A Both plates crumple and fold. B The less dense plate is forced under the more dense plate. C A rift valley forms. D The faster-moving plate is forced under the slower-moving plate.</p>		1
6	<p>When tectonic plates collide, a variety of things can happen. Which of the following is most likely when two continental plates collide?</p> <p>A Both plates crumple and fold. B The less dense plate is forced under the more dense plate. C A rift valley forms. D The faster-moving plate is forced under the slower-moving plate.</p>		1
7	<p>A 'mountain root' is most likely to form when:</p> <p>A two ocean plates collide B two continental plates collide C an ocean plate collides with a continental plate D two plates scrape along each other.</p>		1
8	<p>Which of the following statements concerning earthquakes is <i>incorrect</i>?</p> <p>A The focus is the point where an earthquake begins. B Earthquakes occur on a fault line at the edges of tectonic plates. C The epicentre is the point on the Earth's surface above the focus. D Seismic waves spread from the epicentre to the focus and beyond.</p>		1
9	<p>For which of the following waves is the vibration of the particles in the same direction as the movement of the wave?</p> <p>A sound B water C seismic Love (L) waves D seismic secondary (S) waves</p>		1



<b>10</b>	Which of the following is a property of secondary (S) body waves? S waves: A travel through both solid and molten rock B are the fastest-moving body waves C are transverse waves D hit the surface with an up-and-down or push-pull motion.		<b>1</b>
<b>11</b>	Both primary and secondary body waves: A are transverse waves B are refracted when they pass through rocks of different density C travel faster when they move through less dense rock D travel around the surface of the Earth.		<b>1</b>
<b>12</b>	A scientist who studies earthquakes is a: A sizemologist B seismologist C seismometer D physicist.		<b>1</b>
<b>13</b>	An earthquake of magnitude 5 on the Richter scale has: A one-quarter more energy than a magnitude 4 quake B ten times the energy of a magnitude 4 quake C twenty times the energy of a magnitude 4 quake D thirty times the energy of a magnitude 4 quake.		<b>1</b>
<b>14</b>	How many active volcanoes are there in the world? A 100 B 600 C 1500 D more than 2000		<b>1</b>
<b>15</b>	How many active volcanoes are there in Australia? A zero B one C six D eleven		<b>1</b>

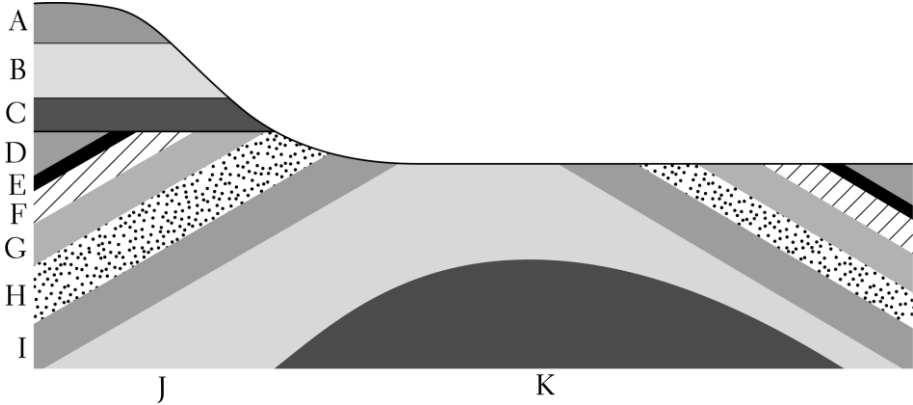


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<b>16</b>	Which part of an active volcano does the lava move through? A magma B central vent C volcanic ash D all of the above		1
<b>17</b>	If the rock of a fault scarp is very hard and weathering is slow, which landscape feature is most likely to form? A cliff B gentle rise C volcano D syncline		1
<b>18</b>	When continental plates collide, rock may be folded to build mountain ranges. Upward folds in the rock are called: A horsts B graben C synclines D anticlines.		1
<b>19</b>	How do the plates at a transcurrent fault move? A One plate slides over another. B Two plates collide and crumple. C Both plates move sideways. D One plate moves upwards, the other downwards.		1

<p><b>20</b></p>	<p>This question concerns the landform shown in the diagram below.</p>  <p>Which of the following statements is correct?</p> <p><b>A</b> K represents a syncline.  <b>B</b> C represents an unconformity.  <b>C</b> Rock in E is older than rock in H.  <b>D</b> J shows no signs of erosion.</p>	<p>1</p>
<p><b>21</b></p>	<p>Which type of volcano is the biggest?</p> <p><b>A</b> shield cones  <b>B</b> composite cones  <b>C</b> cinder cones  <b>D</b> batholiths</p>	<p>1</p>
<p><b>22</b></p>	<p>Which of the following statements concerning fossil fuels is <i>incorrect</i>?</p> <p>Fossil fuels:</p> <p><b>A</b> form from decomposed plant and animal matter  <b>B</b> take millions of years to form  <b>C</b> are usually found near weaknesses in the Earth's crust  <b>D</b> require low pressures and high temperatures to form.</p>	<p>1</p>
<p><b>23</b></p>	<p>A fossil is:</p> <p><b>A</b> the preserved remains of an animal  <b>B</b> evidence of past life found in a rock  <b>C</b> a past life form buried in the sea bed  <b>D</b> a skeleton embedded in rock.</p>	<p>1</p>





24	Radioactive dating of rocks works by: A measuring the amount of uranium in a rock that has turned into lead B finding the depth to which gamma rays penetrate within a rock C bombarding a rock with radiation and measuring the amount of rock that disintegrates D using X-rays to measure the space between atoms within rock.		1
25	Which of the following is a period of geological time? A Zirconic B Cretaceous C Rhombic D Dichotomous		1

Section B – Written answers (79 marks)

26	<b>Describe</b> four pieces of evidence Alfred Wegener used to support his theory of the splitting of an ancient supercontinent to form the continents.		4
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27	<b>Recall</b> three important pieces of information obtained when the ocean floor was mapped during World War II.		3
28	The theory of plate tectonics may be explained using an analogy with pieces of toast floating on very thick, hot soup. By <b>applying</b> this analogy: <b>a</b> <b>state</b> what the soup represents <b>b</b> <b>state</b> what the pieces of toast represent. <b>c</b> If the soup is stirred the toast moves. <b>Explain</b> what is widely thought to cause the 'soup' to be stirred.		3
29	<b>Explain:</b> <b>a</b> why spreading boundaries are also called constructive boundaries <b>b</b> why collision boundaries are also called destructive boundaries.		2



30	<p><b>Identify</b> which type of tectonic plate boundaries form, or formed, the:</p> <ul style="list-style-type: none"> <li><b>a</b> earthquake activity around the San Andreas fault in California</li> <li><b>b</b> East African rift valley</li> <li><b>c</b> islands of Japan</li> <li><b>d</b> Andes mountains and the Peru-Chile ocean trench which runs parallel to them.</li> </ul>		4
31	<p><b>Apply</b> your knowledge of what happens when an oceanic plate collides with a continental plate to answer the following questions.</p> <ul style="list-style-type: none"> <li><b>a Explain</b> why the oceanic plate is forced under the continental plate.</li> <li><b>b Outline</b> a 'subduction zone'.</li> <li><b>c Explain</b> why volcanoes often form on the continental plate after the collision.</li> </ul>		5
32	<p><b>Clarify</b> the difference between the focus and the epicentre of an earthquake.</p>		2
33	<p>When an earthquake occurs, <b>identify</b> where the worst damage occurs.</p>		1
34	<p><b>Explain</b> why no S waves are recorded on the Earth directly opposite the epicentre of the earthquake.</p>		2



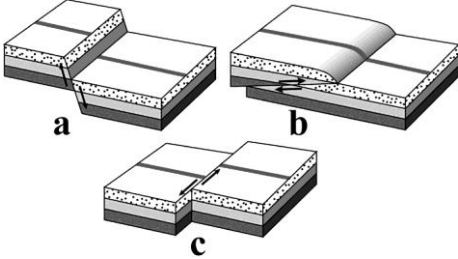
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<b>35</b>	<p>The four types of seismic waves are: primary (P), secondary (S), Rayleigh (R) and Love (L). Use the letters P, S, R and L when answering the questions that follow. <b>Identify</b> the waves that:</p> <ul style="list-style-type: none"><li><b>a</b> travel through the body of the Earth</li><li><b>b</b> are recorded first by a seismometer</li><li><b>c</b> are recorded last by a seismometer</li><li><b>d</b> travel around the Earth's surface</li><li><b>e</b> are rolling waves, like surf at a beach.</li></ul>		<b>7</b>
<b>36</b>	<p><b>Identify</b> whether each of the following waves are transverse or longitudinal waves.</p> <ul style="list-style-type: none"><li><b>a</b> sound waves</li><li><b>b</b> P waves</li><li><b>c</b> S waves</li><li><b>d</b> waves that push and pull</li><li><b>e</b> waves that have an up-down motion like water waves</li></ul>		<b>5</b>
<b>37</b>	<p><b>Explain</b> how aftershocks can be just as dangerous as the original earthquake, even though they are usually much smaller.</p>		<b>2</b>

<p><b>38</b></p>	<p><b>Identify:</b></p> <p><b>a</b> an alternative scale to the Richter scale.</p> <p><b>Explain:</b></p> <p><b>b</b> how the scale works</p> <p><b>c</b> when it is used.</p>		<p>3</p>
<p><b>39</b></p>	<p><b>Identify</b> the factors that affect how many lives are lost due to an earthquake.</p>		<p>2</p>
<p><b>40</b></p>	<p>Complete the labels on the volcano diagram below.</p>		<p>6</p>
<p><b>41</b></p>	<p><b>Explain</b> why many volcanic eruptions are not noticed.</p>		<p>2</p>
<p><b>42</b></p>	<p><b>Identify</b> the problems that volcanic dust may cause.</p>		<p>2</p>

<p><b>43</b></p>	<p>Three types of faults are shown in the diagram below. <b>Identify</b> each as either a transcurrent, normal or reverse fault.</p> 		<p>3</p>
<p><b>44</b></p>	<p><b>Define</b> the term 'plastic behaviour'.</p>		<p>1</p>
<p><b>45</b></p>	<p><b>Explain</b> how an unconformity is created. Include a diagram in your answer.</p>		<p>4</p>
<p><b>46</b></p>	<p><b>Explain</b> how a volcano could form away from the edge of a tectonic plate.</p>		<p>2</p>
<p><b>47</b></p>	<p><b>Explain</b> why igneous rock will not contain fossils of plant material.</p>		<p>2</p>



<p><b>48</b></p>	<p><b>Classify</b> the following steps of fossil formation in the correct order from start to finish.</p> <p><b>A</b> Movement in the Earth's crust thrusts a layer of rock upwards.</p> <p><b>B</b> Animal dies and falls to the sea floor.</p> <p><b>C</b> Soft parts of body decay, leaving the shell.</p> <p><b>D</b> Rock weathered.</p> <p><b>E</b> Fossil exposed.</p> <p><b>F</b> Shell covered by layers of sediment.</p>		<p>2</p>
<p><b>49</b></p>	<p>True or false?</p> <p><b>a</b> A dinosaur footprint is a fossil.</p> <p><b>b</b> An ammonite is a fossil animal.</p> <p><b>c</b> More primitive fossils are likely to be found in layers of igneous rock.</p> <p><b>d</b> Carbon may be used to date fossils.</p>		<p>4</p>
<p><b>50</b></p>	<p>Match one of the terms below to each of the following.</p> <p><i>primitive life, no life, middle life, recent life</i></p> <p><b>a</b> Cenozoic</p> <p><b>b</b> Azoic</p> <p><b>c</b> Mesozoic</p> <p><b>d</b> Archaeozoic</p>		<p>4</p>
<p><b>51</b></p>	<p><b>a Explain</b> the connection between an era and a period.</p> <p><b>b Recall</b> a period when dinosaurs existed.</p>		<p>2</p>



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