

APPENDIX 7 – ATTAINMENT TARGETS MAPPED TO SPOTLIGHT SCIENCE FOR SCOTLAND – 5 – 14 Edition

Attainment targets mapped for Levels C to F

Earth in space	Attainment targets	Spotlight Science for Scotland
Level C	<ul style="list-style-type: none"> ▪ Describe the Solar System in terms of the Earth, Sun and planets ▪ Link the temperature of the planets to their relative positions and atmospheres 	15c 15d
Level D	<ul style="list-style-type: none"> ▪ Relate the movements of planets around the Sun to gravitational forces ▪ Give some examples of the approaches taken to space exploration 	15a, 15c, 15d 15f
Level E	<ul style="list-style-type: none"> ▪ Explain day, month and year in terms of the relative motion of the Sun, the Earth and the Moon ▪ Describe the Universe in terms of stars, galaxies and black holes 	15a 15e
Level F	<ul style="list-style-type: none"> ▪ Describe some of the ideas used to explain the origin and evolution of the Universe 	15e

Materials from Earth	Attainment targets	Spotlight Science for Scotland
Level C	<ul style="list-style-type: none"> ▪ Describe the differences between solids, liquids and gases ▪ Give one everyday use of solids, liquids and gases 	7a, 7b 7a
Level D	<ul style="list-style-type: none"> ▪ Describe the internal structure of the Earth ▪ Describe the processes that led to the formation of the three main types of rock ▪ Give examples of useful materials that we obtain from the Earth's crust ▪ Describe how soils are formed ▪ Name the gases of the atmosphere and describe some of their uses 	13a 13b, 13c, 13d, 13e 13i 13f, 13g, 13h 13a
Level E	<ul style="list-style-type: none"> ▪ Describe the particulate nature of solids, liquids and gases and use this to explain their known properties ▪ Describe what is meant by an element ▪ Describe how physical properties of elements are used to classify them as metals or non-metals 	7b, 7e, 29 1b, 16a, 16d, 20b 16e
Level F	<ul style="list-style-type: none"> ▪ Describe some features of the structure of the atom ▪ Describe some of the characteristic features of the periodic table ▪ Explain the water cycle using the particulate model 	20a 20b 17f, 29d

Changing materials	Attainment targets	Spotlight Science for Scotland
Level C	<ul style="list-style-type: none"> ▪ Describe changes when materials are mixed ▪ Describe how solids of different sizes can be separated ▪ Distinguish between materials that are soluble and insoluble in water ▪ Describe in simple terms the changes that occur when water is heated or cooled 	<p>16b</p> <p>?</p> <p>29e, 29f</p> <p>7b</p>
Level D	<ul style="list-style-type: none"> ▪ Describe what happens when materials are burned ▪ Explain how evaporation and filtration can be used in the separation of solids from liquids ▪ Describe the effect of burning fossil fuels 	<p>21d, 22c, 31d</p> <p>16b, 16c</p> <p>17a</p>
Level E	<ul style="list-style-type: none"> ▪ Give examples of simple chemical reactions, explaining them in terms of elements and compounds ▪ Describe the effect of temperature on solubility ▪ Describe the use of pH to measure acidity ▪ Describe the process of neutralization and give some everyday applications ▪ Describe what happens when metals react with oxygen, water and acids ▪ Describe how metal elements can be 	<p>16a, 20c, 20d, 20e</p> <p>29f</p> <p>11a, 11b</p> <p>11c, 31d</p> <p>16f, 16g, 22e, 31b</p> <p>22b</p>

	extracted from compounds in the Earth's crust	
Level F	<ul style="list-style-type: none"> ▪ Give examples of the ways in which the rates of chemical reactions can be changed ▪ Distinguish between chemical and physical changes ▪ Give examples of chemical reactions using word equations 	<p>22g, 22h</p> <p>22a, 31a</p> <p>20, 31</p>

Properties and uses of energy	Attainment targets	Spotlight Science for Scotland
Level C	<ul style="list-style-type: none"> ▪ Link light to shadow formation ▪ Give examples of light being reflected from surfaces ▪ Link sound to sources of vibration ▪ Construct simple battery-operated electrical circuits, identifying the main components ▪ Classify materials as electrical conductors or insulators and describe how these are related to safe use of electricity 	<p>8a</p> <p>8b</p> <p>9a</p> <p>6c</p> <p>6c, 6e</p>
Level D	<ul style="list-style-type: none"> ▪ Distinguish between ‘heat’ and ‘temperature’ ▪ Describe in simple terms how lenses work ▪ Give examples of simple applications of lenses ▪ Use the terms ‘pitch’ and ‘volume’ to describe sound ▪ Construct a series circuit following diagrams using conventional symbols ▪ Describe the effect of changing the number of components in a series circuit 	<p>23a</p> <p>8c, 26a</p> <p>26b</p> <p>9, 26d</p> <p>6c, 6d, 32a</p> <p>6d</p>
Level E	<ul style="list-style-type: none"> ▪ Describe the differences between the flow of heat by conduction and convection ▪ Give examples of everyday uses of good and poor conductors of heat 	<p>23a, 23b, 23c</p> <p>23</p>

	<ul style="list-style-type: none"> ▪ Explain the effect of a prism on white light ▪ Describe what happens when light passes through different materials ▪ Explain what happens when sound passes through different materials ▪ Construct a parallel circuit following diagrams ▪ Use the terms ‘voltage’, ‘current’ and ‘resistance’ in the context of simple series circuits 	<p>8d, 26c</p> <p>8c</p> <p>9c</p> <p>6d, 32b, 32c</p> <p>24a, 24b, 32a</p>
Level F	<ul style="list-style-type: none"> ▪ Describe how energy is transferred by radiation ▪ Explain the effect of colour filters on white light ▪ Describe the relationship between pitch and frequency and between loudness and amplitude ▪ Describe the structure and function of an electromagnet ▪ Analyze the functions of everyday electronics systems in terms of input and output conditions ▪ Using prefabricated subsystems, construct simple electronic systems to solve given problems 	<p>23c</p> <p>26c</p> <p>26d</p> <p>32d, 32e</p> <p>24c, 24d, 24e</p> <p>24f</p>

Conversion and transfer of energy	Attainment targets	Spotlight Science for Scotland
Level C	<ul style="list-style-type: none"> ▪ Give examples of energy being converted from one form into another ▪ Describe the energy conversions in the components of an electrical circuit 	<p>2a</p> <p>2a, 2b</p>
Level D	<ul style="list-style-type: none"> ▪ Give some examples of energy conversions involved in the generation of electricity ▪ Describe how electrical energy is distributed to our homes ▪ Name some energy sources 	<p>2a, 2b, 2c, 2d, 2e</p> <p>2e</p> <p>2a, 2b, 2c, 2d, 2e, 21b, 21c</p>
Level E	<ul style="list-style-type: none"> ▪ Describe some examples of the interconversion of potential and kinetic energy ▪ Give some examples of chemical energy changes ▪ Explain the difference between renewable and non-renewable energy resources 	<p>21a, 21b, 21d</p> <p>21b</p> <p>21</p>
Level F	<ul style="list-style-type: none"> ▪ Distinguish between gravitational potential and chemical potential energy 	<p>?</p>

Forces and their effects	Attainment targets	Spotlight Science for Scotland
Level C	<ul style="list-style-type: none"> ▪ Give some examples of friction ▪ Explain friction in simple terms ▪ Describe air resistance in terms of friction 	<p>4b</p> <p>4b</p> <p>4c</p>
Level D	<ul style="list-style-type: none"> ▪ Give examples of streamlining and explain how this lowers resistance ▪ Describe the relationship between the Earth's gravity and the weight of an object 	<p>4c</p> <p>4a</p>
Level E	<ul style="list-style-type: none"> ▪ Describe the effects of balanced and unbalanced forces ▪ Explain how gravity on other planets and the Moon affects the weight of an object 	<p>4a, 4e, 4f</p> <p>?</p>
Level F	<ul style="list-style-type: none"> ▪ Distinguish between mass and weight ▪ Name the newton as the unit of force and explain its relationship to mass ▪ Describe the relationship between force, area and pressure 	<p>4a</p> <p>4a</p> <p>28c, 28d</p>

Variety and characteristic features	Attainment targets	Spotlight Science for Scotland
Level C	<ul style="list-style-type: none"> ▪ Give some of the more obvious distinguishing features of the five vertebrate groups ▪ Name some common members of the vertebrate groups ▪ Name some common animals and plants using simple keys 	<p>3b</p> <p>3c</p> <p>3f</p>
Level D	<ul style="list-style-type: none"> ▪ Give the main distinguishing features of the major groups of flowering and non-flowering plants 	3d
Level E	<ul style="list-style-type: none"> ▪ Give the main distinguishing features of microorganisms ▪ Create and use keys to identify living things ▪ Give examples of inherited and environmental causes of variation 	<p>27a</p> <p>3f</p> <p>30a</p>
Level F	<ul style="list-style-type: none"> ▪ Describe the harmful and beneficial roles of microorganisms ▪ Outline the principles of modern biotechnology and explain its significance now and for the future ▪ Explain the role of chromosomes and genes in inheritance 	<p>14d, 14e, 25d, 27a, 27b, 27c</p> <p>27e</p> <p>30b, 30c, 30d, 30e</p>

The processes of life	Attainment targets	Spotlight Science for Scotland
Level C	<ul style="list-style-type: none"> ▪ Name the life processes common to humans and other animals ▪ Identify the main organs of the human body ▪ Describe the broad functions of the organs of the human body ▪ Describe the broad functions of the main parts of flowering plants 	<p>3g</p> <p>3g</p> <p>3g</p> <p>3h</p>
Level D	<ul style="list-style-type: none"> ▪ Describe the role of lungs in breathing ▪ Outline the process of digestion ▪ Describe the main changes that occur during puberty ▪ Describe the main stages in human production ▪ Describe the main stages in flowering plant reproduction 	<p>12a, 12b</p> <p>10a, 10b, 10c, 10d</p> <p>5a, 5b, 5c, 5d, 5e</p> <p>5a, 5b, 5c, 5d, 5e</p> <p>25c, 25d</p>
Level E	<ul style="list-style-type: none"> ▪ Identify and give the functions of the main structures found in plant and animal cells ▪ Identify, name and give the functions of the main organs of the human reproductive system ▪ Identify the raw materials, conditions and products of photosynthesis 	<p>3e</p> <p>5a</p> <p>25a, 25b</p>
Level F	<ul style="list-style-type: none"> ▪ Describe how different cells are adapted to their functions ▪ Describe the process of respiration ▪ Describe the function of 	<p>3e</p> <p>3a</p> <p>27d</p>

	<p>enzymes in the control of cellular reactions</p> <ul style="list-style-type: none">▪ Describe the effect of pH and temperature on enzyme activity	27d
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Interaction of living things with their environment	Attainment targets	Spotlight Science for Scotland
Level C	<ul style="list-style-type: none"> ▪ Give examples of living things that are rare or extinct ▪ Explain how living things and the environment can be protected and give examples 	<p>18a</p> <p>18a</p>
Level D	<ul style="list-style-type: none"> ▪ Describe examples of human impact on the environment that have brought about beneficial changes and examples that have detrimental effects ▪ Give examples of how plants and animals are suited to their environment ▪ Explain how responses to changes in the environment might increase the chances of survival 	<p>17a, 17c, 17e</p> <p>14a, 14b</p> <p>18d</p>
Level E	<ul style="list-style-type: none"> ▪ Construct and interpret simple food webs and make predictions of the consequences of change ▪ Describe examples of competition between plants and between animals ▪ Give examples of physical factors that affect the distribution of living things 	<p>14c</p> <p>18c, 18d</p> <p>18b, 18e</p>
Level F	<ul style="list-style-type: none"> ▪ Construct and explain food pyramids ▪ Give a simple description of the theory of evolution and explain how species survive or become extinct 	<p>17b</p> <p>18f</p>

	<ul style="list-style-type: none">▪ Describe what is meant by an abiotic factor and give some examples of how these can be measured	18e
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