ENABLING ACCURATE TEACHER ASSESSMENT IN PRIMARY SCIENCE

Helping primary teachers to make sense of the *Teacher assessment frameworks* at the end of Key Stage 1 and 2

CENTRE *for* INDUSTRY EDUCATION COLLABORATION

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Salters' Institute

"I've been using them; they're really helpful to highlight where the key areas for assessment appear in each year group (not just in year 6!)

I've also handed them out to other subject leaders in the cluster groups I run/attend and teachers have been really glad to have them (and alarmed that they didn't know that so many end of interim performance statements need to be assessed in years other than year 2 and year 6!)"

Sarah Johnson, Primary Science Leader, Cheshire

"We found the process of looking at assessment at the end of each key stage very useful. We shared this information in a staff meeting as we felt that it was something that all staff needed to be aware of. The content cannot possibly be taught in year 2 and year 6 alone and the document gave a really good overview to teachers."

Helen Rose, Key Stage 2 Teacher, Teesside

"The document breaks down the performance descriptors and makes it clear which elements are covered in which year groups. It gives a good overview of the whole of the primary curriculum and allows staff to see the progression across the years."

Stuart Downing, Year 6 teacher, Middlesbrough

"I have used these when I did a staff meeting a couple of weeks ago. The year 6 teachers have found them VERY useful and have now devised a system to assess their current year 6's on all the end of KS2 objectives so that they can help fill the gaps.

The other teachers found it useful to see the progression of content throughout the key stages."

Hope Griffin, Primary Science Leader, Leighton Buzzard

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AN INTRODUCTION

When the new National Curriculum in England was made statutory in September 2014, the government declared freedom for schools to decide how best to teach and also assess pupil progress.

A year later, schools were issued with a set of interim performance descriptors and accompanying exemplification material, produced by the Standards and Testing Agency, to be used from the 2015-16 academic year onward. The purpose of this was to provide teachers with a comprehensive list of 'pupil can' statements to assess each child at the end of the relevant key stage, following the removal of levels.

The guidance specified that, in order to judge that a pupil has met the standard for primary science, teachers need to have evidence that demonstrates consistent attainment of all the statements within the standard; both for 'working scientifically' and for 'science content'.

The interim performance descriptors have been reviewed each year and, in September 2017, were renamed: *Teacher assessment frameworks*, to be revised and published again for use annually.

In response to this, CIEC have produced *Enabling Accurate Teacher Assessment in Primary Science*, which includes comprehensive guidance on how to make sense of the *Teacher assessment frameworks* at the end of Key Stage 1 and 2 with reference to the following resources:

- **Key Stage 1** science content assessment grid (p7)
- **Key Stage 2** science content assessment grid: Chemistry (p11)
- **Key Stage 2** science content assessment grid: Physics (p12–13)
- **Key Stage 2** science content assessment grid: Biology (p14–15)
- **Year 1-6** science assessment records – spreadsheets 1-6 (p16–27)

Also available as downloads from **www.ciec.org.uk**

The ethos behind CIEC's materials is that the assessment of primary science should not be the sole responsibility of the Year 2 and 6 teachers. Rather, it should be planned for and approached by the whole school, including all members of teaching staff at every stage of a child's learning. The statutory *Teacher assessment frameworks* include coverage of the full primary science curriculum, not just content taken from the Year 2 and 6 programmes of study. Therefore, our aim is to help teachers of all year groups carry out ongoing assessment in an accurate and manageable way as well as make useful contributions, where required, to end of key stage judgements.

ENABLING ACCURATE TEACHER ASSESSMENT IN PRIMARY SCIENCE: KEY STAGE 1 GUIDANCE

The Key Stage 1 science content assessment grid produced by **CIEC** (p7) is simple for teachers to use, and maps out every statutory requirement being assessed across Year 1 and 2 on one page.

STEP 1

Teachers should first look at the text found in the **third** column of the Key Stage 1 science content assessment grid – this contains all of the 'pupil can' statements for science content (knowledge and understanding) from the current *Teacher assessment framework* at the end of Key Stage 1.

Some statements have been divided in two, to help teachers assess more accurately where a large amount of science content has been presented in the framework document as one lengthy statement.

An example:

Teacher assessment framework for Key Stage 1:

name and locate parts of the human body, including those related to the senses, and describe the importance of exercise, a balanced diet and hygiene for humans

CIEC's Key Stage 1 science content assessment grid:

name and locate parts of the human body, including those related to the senses . . .
. . . describe the importance of exercise, a balanced diet and hygiene for humans

As shown in this example, wherever a 'pupil can' statement ends or begins with ellipsis (. . .) this denotes that the original framework statement has been divided into two separate parts relating to a similar content area.

STEP 2

By cross-referencing to columns **one** and **two** of the Key Stage 1 science content assessment grid, teachers can quickly locate when each aspect of the science curriculum would usually be taught.

YEAR 1 STATUTORY REQUIREMENTS	YEAR 2 STATUTORY REQUIREMENTS	END OF KS1 'PUPIL CAN' ASSESSMENT STATEMENTS
identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense		name and locate parts of the human body, including those related to the senses . . .
	describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	. . . describe the importance of exercise, a balanced diet and hygiene for humans

For the example above, it is clear that human body parts and senses are usually taught in Year 1 and aspects of a healthy lifestyle are usually taught in Year 2. The colour coding of statements also helps teachers to identify where each statement would be found within the National Curriculum (England) e.g. both of these component parts would be taught within the topic of 'Animals including humans' for their relevant year group.

It is particularly useful for all teachers to see that some of the statements from the *Teacher assessment framework* are not taught in the final year of Key Stage 1. Therefore, as advised in the statutory guidance, they should draw on assessments that have been made earlier in the key stage to make their judgement.

As a result of this, Year 1 teachers would know when it is their responsibility to collect assessment evidence for those areas indicated on the Key Stage 1 science content assessment grid. In the example shown, the Year 1 teacher would share assessment evidence regarding children's understanding of body parts and senses with the Year 2 teacher and this would contribute towards the end of Key Stage 1 judgements.

Note: for support with making ongoing assessment judgements relating to all aspects of working scientifically in the primary curriculum, please refer to CIEC's document: **Working Scientifically in the Primary Classroom**

STEP 3

Teachers may wish to collate and monitor assessment judgements by using some form of tracking system. The science assessment records (p16–27 and can be downloaded from **www.ciec.org.uk**) are spreadsheets to enable communication throughout the school and ensure that the assessment of primary science is the joint responsibility of all teaching staff at every stage of a child's learning.

An example:

The Year 1 science assessment record (spreadsheet 1) includes all of the National Curriculum (England) statutory requirements for working scientifically and science content for children in this year group. Year 1 teachers should collect evidence throughout the year to show that each child is working at the expected standard of attainment for each of these requirements – as part of their ongoing formative assessment.

The statements highlighted in yellow refer to end of Key Stage 1 'pupil can' assessment statements (from the *Teacher assessment framework*). This will enable teachers in Year 1 to identify which areas of their science curriculum will contribute towards a child's final Key Stage 1 judgement.

Note: Requirements for *working scientifically* have not been highlighted in yellow until the end of key stage *Year 2 science assessment record*, however, must always be taught and assessed through science content in the programme of study.

Another example:

As Year 2 is the final year of the key stage, the Year 2 science assessment record (spreadsheet 2) is different. It contains the full list of end of Key Stage 1 'pupil can' assessment statements from the *Teacher assessment framework* (instead of the National Curriculum statutory requirements for children in this year group). Year 2 teachers should aim to collect evidence throughout the year to show that each child is working at the expected standard of attainment for each of these statements.

The statements highlighted in yellow refer to those areas of science content usually taught during Year 2. This will enable teachers in Year 2 to identify which additional areas of science will need to be assessed through evidence gathered prior to this in Year 1. They might also plan to check for continued understanding during Year 2.

The ultimate aim is for teachers of Year 1 to input assessment judgements throughout the first year of the key stage so that the responsibility of the Year 2 teacher is to ensure that the remaining statements are taught and assessed thoroughly as well as to address any gaps in learning.

KEY STAGE 1 **SCIENCE CONTENT ASSESSMENT GRID**

Plants	Living Things & their Habitats	Animals Including Humans	Seasonal Changes	Materials

YEAR 1 STATUTORY REQUIREMENTS	YEAR 2 STATUTORY REQUIREMENTS	END OF KS1 'PUPIL CAN' ASSESSMENT STATEMENTS
identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense		name and locate parts of the human body, including those related to the senses . . .
	describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	. . . describe the importance of exercise, balanced diet and hygiene for humans
	find out about and describe the basic needs of animals, including humans, for survival (water, food and air)	describe the basic needs of animals for survival and . . .
	notice that animals, including humans, have offspring which grow into adults	. . . (describe) the main changes as young animals, including humans, grow into adults
	find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	describe the basic needs of plants for survival and the impact of changing these and . . .
	observe and describe how seeds and bulbs grow into mature plants	. . . (describe) the main changes as seeds and bulbs grow into mature plants
	explore and compare the differences between things that are living, dead, and things that have never been alive	identify whether things are alive, dead or have never lived
describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)		describe and compare the observable features of animals from a range of groups
identify and name a variety of common animals that are carnivores, herbivores and omnivores	describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food	group animals according to what they eat, describe how animals get their food from other animals and/or from plants, and use simple food chains to describe these relationships
observe changes across the four seasons		describe seasonal changes
observe and describe weather associated with the seasons and how day length varies		
identify and name a variety of wild and garden plants including deciduous and evergreen trees	identify and name a variety of plants and animals in their habitats, including micro-habitats	name different plants and animals and . . .
identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals		
	identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other	. . . describe how they are suited to different habitats
distinguish between an object and the material from which it is made		distinguish objects from materials, describe their properties . . .
describe the simple properties of a variety of everyday materials		
compare and group together a variety of everyday materials on the basis of their simple physical properties	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	. . . identify and group everyday materials, and compare their suitability for different uses

ENABLING ACCURATE TEACHER ASSESSMENT IN PRIMARY SCIENCE: KEY STAGE 2 GUIDANCE

The Key Stage 2 science content assessment grids (p11–15) work in the same way as those described previously for Key Stage 1. However, due to the high number of statements, they have been created separately for Biology, Chemistry and Physics, and map out every statutory requirement being assessed across Years 3–6 for each of these areas.

STEP 1

Teachers should look at the text found in the **third** column of each Key Stage 2 science content assessment grid – this contains all of the 'pupil can' statements for science content (knowledge and understanding) from the current *Teacher assessment framework* at the end of Key Stage 2.

Again, some lengthy statements from the original framework document have been separated.

An example:

Teacher assessment framework for Key Stage 2:

Name and describe the functions of the main parts of the digestive, musculoskeletal, and circulatory systems and describe and compare different reproductive processes and life cycles in animals

CIEC's Key Stage 2 science content assessment grid: Biology

Name and describe the functions of the main parts of the digestive, musculoskeletal, and circulatory systems . . .
. . . and describe and compare different reproductive processes and life cycles in animals

STEP 2

By cross-referencing to columns **one** and **two** of each Key Stage 2 science content assessment grid, teachers can quickly locate when aspects of the science curriculum would usually be taught.

<table>
<tr><th>Y3 STATUTORY REQUIREMENTS</th><th>Y4 STATUTORY REQUIREMENTS</th><th>Y5 STATUTORY REQUIREMENTS</th><th>Y6 STATUTORY REQUIREMENTS</th><th>END OF KS2 'PUPIL CAN' ASSESSMENT STATEMENTS</th></tr>
<tr><td rowspan="2">identify that humans and some other animals have skeletons and muscles for support, protection and movement</td><td>describe the simple functions of the basic parts of the digestive system in humans</td><td></td><td>identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</td><td rowspan="2">Name and describe the functions of the main parts of the digestive, musculoskeletal, and circulatory systems . . . .</td></tr>
<tr><td>identify the different types of teeth in humans and their simple functions</td><td></td><td>describe the ways in which nutrients and water are transported within animals including humans</td></tr>
<tr><td rowspan="3"></td><td rowspan="3"></td><td>describe the life process of reproduction in some plants and animals</td><td rowspan="3"></td><td rowspan="3">. . . describe and compare different reproductive processes and life cycles in animals</td></tr>
<tr><td>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</td></tr>
<tr><td>describe the changes as humans develop to old age</td></tr>
</table>

It is particularly useful for all teachers to see that some of the statements from the *Teacher assessment framework* are not taught in the final year of Key Stage 2. Therefore, as advised in the statutory guidance, they should draw on assessments that have been made earlier in the key stage to make their judgement.

As a result of this, Year 3, 4 and 5 teachers would know when it is their responsibility to collect assessment evidence for those areas indicated on the Key Stage 2 science content assessment grids. In the example shown, the Year 3 teacher would gather assessment evidence regarding the human skeleton and muscles, Year 4 for the digestive system and teeth, and Year 5 relating to children's understanding of reproduction and life cycles. The likelihood is that these areas of science content will not be taught again in Key Stage 2, therefore, evidence should be shared with the Year 6 teacher and contribute towards the end of Key Stage 2 judgements.

Note: for support with making ongoing assessment judgements relating to all aspects of working scientifically in the primary curriculum, please refer to CIEC's document: **Working Scientifically in the Primary Classroom**

STEP 3

As with Key Stage 1, teachers may wish to collate and monitor assessment judgements by using some form of tracking system, such as the science assessment records (p16–27 and as downloads from **www.ciec.org.uk**).

An example:

The Year 3, 4 and 5 science assessment records (spreadsheets 3, 4 and 5) include all of the National Curriculum (England) statutory requirements for working scientifically and science content for children in the relevant year group. Year 3, 4 and 5 teachers should collect evidence throughout the year to show that each child is working at the expected standard of attainment for each of these requirements – as part of their ongoing formative assessment.

The statements highlighted in yellow refer to end of Key Stage 2 'pupil can' assessment statements (from the statutory *Teacher assessment framework*). This will enable teachers in Year 3, 4 and 5 to identify which areas of their science curriculum will contribute towards a child's final Key Stage 2 judgement.

Note: Requirements for *working scientifically* have not been highlighted in yellow until the end of Key Stage Year 6 science assessment record, however, must always be taught and assessed through science content taught in the programme of study.

Another example:

As Year 6 is the final year of the key stage, the Year 6 science assessment record (spreadsheet 6) is different. It contains the full list of end of Key Stage 2 'pupil can' assessment statements from the statutory framework (instead of the National Curriculum statutory requirements for children in this year group). Year 6 teachers should collect evidence throughout the year to show that each child is working at the expected standard of attainment for each of these statements.

The statements highlighted in yellow refer to those areas of science content usually taught during Year 6. This will enable teachers in Year 6 to identify which additional areas of science will need to be assessed through evidence gathered prior to this in Years 3–5. They might also plan to check for continued understanding during Year 6.

The ultimate aim is for teachers of Year 3, 4 and 5 to input assessment judgements throughout the key stage. A typical example taken from the Year 6 science assessment record at the beginning of Year 6 is shown in the example below whereby previous teachers have recorded assessment data as and when the relevant areas of science content have been taught. The responsibility of the Year 6 teacher now is to ensure that the remaining statements are taught and assessed thoroughly as well as any gaps in learning are addressed.

	name	name	name	name	name
Science Content: working at the expected standard (end of KS2 descriptors)					
name and describe the functions of the main parts of the musculoskeletal system in animals (Y3 Animals)					
name and describe the functions of the main parts of the digestive system in animals (Y4 Animals)					
describe and compare different reproductive processes and life cycles in animals (Y5 Living Things)					
name and describe the functions of the main parts of the circulatory system in animals (Y6 Animals)					
describe the effects of diet, exercise, drugs and lifestyle on how the body functions (Y6 Animals)					
name, locate and describe the functions of the main parts of plants, including those involved in reproduction and transporting water and nutrients (Y3 Plants / Y5 Living Things)					

KEY STAGE 2: **SCIENCE CONTENT ASSESSMENT GRID – CHEMISTRY**

Forces & Magnets*	Rocks	States of Matter	Electricity*	Properties & Changes of Materials

* both of these are taken from the programme of study for physics but are relevant in the examples given

Y3 STATUTORY REQUIREMENTS	Y4 STATUTORY REQUIREMENTS	Y5 STATUTORY REQUIREMENTS	Y6 STATUTORY REQUIREMENTS	END OF KS2 'PUPIL CAN' ASSESSMENT STATEMENTS
compare and group together different kinds of rocks on the basis of their appearance and simple physical properties	compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials	compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets		group and identify materials, including rocks, in different ways according to their properties, based on first-hand observation; and justify the use of different everyday materials for different uses, based on their properties
	recognise some common conductors and insulators, and associate metals with being good conductors	give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic		
	compare and group materials together according to whether they are solids, liquids or gases			describe the characteristics of different states of matter and group materials on this basis; and can describe how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle
	observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius			
	identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature			
		know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution		identify, and describe what happens when dissolving occurs in everyday situations; and describe how to separate mixtures and solutions into their components
		use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating		
		demonstrate that dissolving, mixing and changes of state are reversible changes		identify, with reasons, whether changes in materials are reversible or not
		explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda		

KEY STAGE 2: **SCIENCE CONTENT ASSESSMENT GRID – PHYSICS**

Forces & Magnets	Electricity	Earth & Space	Light	Sound	Forces

Y3 STATUTORY REQUIREMENTS	Y4 STATUTORY REQUIREMENTS	Y5 STATUTORY REQUIREMENTS	Y6 STATUTORY REQUIREMENTS	END OF KS2 'PUPIL CAN' ASSESSMENT STATEMENTS
recognise that they need light in order to see things and that dark is the absence of light			recognise that light appears to travel in straight lines	use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects . . .
notice that light is reflected from surfaces			use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye	
			explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes	
recognise that shadows are formed when the light from a light source is blocked by a solid object			use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	. . . and the formation, shape and size of shadows
find patterns in the way that the size of shadows change				
	identify how sounds are made, associating some of them with something vibrating			use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard
	recognise that vibrations from sounds travel through a medium to the ear			
	find patterns between the pitch of a sound and features of the object that produced it			describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source
	find patterns between the volume of a sound and the strength of the vibrations that produced it			
	recognise that sounds get fainter as the distance from the sound source increases			

Y3	Y4	Y5	Y6	END OF KS2
compare how things move on different surfaces notice that some forces need contact between two objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing		explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object identify the effects of air resistance, water resistance and friction, that act between moving surfaces		describe the effects of simple forces that involve contact (air and water resistance, friction), that act at a distance (magnetic forces, including those between like and unlike magnetic poles) and gravity
		recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect		identify simple mechanisms, including levers, gears and pulleys that increase the effect of a force
	construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit		associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches	use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it . . . .
			use recognised symbols when representing a simple circuit in a diagram	. . . . and use recognised symbols to represent simple series circuit diagrams
		describe the movement of the Earth, and other planets, relative to the Sun in the solar system describe the movement of the Moon relative to the Earth describe the Sun, Earth and Moon as approximately spherical bodies use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky		describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system; and explain the apparent movement of the Sun across the sky in terms of the Earth's rotation and that this results in day and night

KEY STAGE 2: **SCIENCE CONTENT ASSESSMENT GRID – BIOLOGY**

Plants	Living Things & Their Habitats	Animals Including Humans	Evolution & Inheritance	Rocks*

* taken from the programme of study for chemistry but relevant in the examples given

Y3 STATUTORY REQUIREMENTS	Y4 STATUTORY REQUIREMENTS	Y5 STATUTORY REQUIREMENTS	Y6 STATUTORY REQUIREMENTS	END OF KS2 'PUPIL CAN' ASSESSMENT STATEMENTS
identify that humans and some other animals have skeletons and muscles for support, protection and movement	describe the simple functions of the basic parts of the digestive system in humans		identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood	name and describe the functions of the main parts of the digestive, musculoskeletal, and circulatory systems . . .
	identify the different types of teeth in humans and their simple functions		describe the ways in which nutrients and water are transported within animals including humans	
		describe the life process of reproduction in some plants and **animals** (1)		. . . and can describe and compare different reproductive processes and life cycles in animals
		describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird		
		describe the changes as humans develop to old age		
identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat			recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function	describe the effects of diet, exercise, drugs and lifestyle on how the body functions
identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers		describe the life process of reproduction in some **plants** and animals (2)		name, locate and describe the functions of the main parts of plants, including those involved in reproduction and transporting water and nutrients
investigate the way in which water is transported within plants				
explore the part that flowers play in the life cycle of flowering plants including pollination, seed formation and seed dispersal				

	recognise that living things can be grouped in a variety of ways		describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals	use the observable features of plants, animals and micro-organisms to group, classify and identify them into broad groups, using keys or other methods
	explore and use classification keys to help group, identify and name a variety of living things in their local environment		give reasons for classifying plants and animals based on specific characteristics	
	construct and interpret a variety of food chains, identifying producers, predators and prey			construct and interpret food chains
	recognise that environments can change and that this can sometimes pose dangers to living things			explain how environmental changes may have an impact on living things
			recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents	use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved . . . .
			identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	
describe in simple terms how fossils are formed when things that have lived are trapped within rock			recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	. . . . and describe how fossils are formed and provide evidence for evolution
Y3	**Y4**	**Y5**	**Y6**	**END OF KS2**

YEAR 1 SCIENCE ASSESSMENT RECORD															
To judge that a pupil is working at the expected standard in science, teachers need to have evidence which demonstrates that the pupil meets all of the 'working scientifically' statements and all of the 'science content' taught in the final year of the key stage. Where possible, teachers should draw on assessments that have been made earlier in the key stage to make their judgement against this framework.	name	name	name	name	name	name	name	name	name	name	name	name	name	name	name
Working Scientifically: working at the expected standard (KS1 NC requirements)															
asking simple questions and recognising that they can be answered in different ways															
observing closely, using simple equipment															
performing simple tests															
identifying and classifying															
using their observations and ideas to suggest answers to questions															
gathering and recording data to help in answering questions															

YEAR 1 SCIENCE ASSESSMENT RECORD CONTINUED															
Science Content: working at the expected standard (Y1 NC requirements)															
identify and name a variety of common wild and garden plants, including deciduous and evergreen trees (Y1 Plants)															
identify and describe the basic structure of a variety of common flowering plants, including trees (Y1 Plants)															
identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals (Y1 Animals)															
identify and name a variety of common animals that are carnivores, herbivores and omnivores (Y1 Animals)															
describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) (Y1 Animals)															
identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense (Y1 Animals)															
distinguish between an object and the material from which it is made (Y1 Materials)															
identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock (Y1 Materials)															
describe the simple physical properties of a variety of everyday materials (Y1 Materials)															
compare and group together a variety of everyday materials on the basis of their simple physical properties (Y1 Materials)															
observe changes across the four seasons (Y1 Seasonal Changes)															
observe and describe weather associated with the seasons and how day length varies (Y1 Seasonal Changes)															
% target met															

YEAR 2 SCIENCE ASSESSMENT RECORD

To judge that a pupil is working at the expected standard in science, teachers need to have evidence which demonstrates that the pupil meets all of the 'working scientifically' statements and all of the 'science content' taught in the final year of the key stage. Where possible, teachers should draw on assessments that have been made earlier in the key stage to make their judgement against this framework.	name	name	name	name	name	name	name	name	name	name	name	name	name	name	name
Working Scientifically: working at the expected standard (end of KS1 descriptors)															
ask their own questions about what they notice															
use different types of scientific enquiry to gather and record data, using simple equipment where appropriate to answer questions including:															
• observing changes over time															
• noticing similarities, differences and patterns															
• grouping and classifying things															
• carrying out simple comparative tests															
• finding things out using secondary sources of information															
communicate their ideas, what they do and what they find out in a variety of ways															

YEAR 2 SCIENCE ASSESSMENT RECORD CONTINUED

Science Content: working at the expected standard (end of KS1 descriptors)

name and locate parts of the human body, including those related to the senses (Y1 Animals)															
describe the importance of exercise, balanced diet and hygiene for humans (Y2 Animals)															
describe the basic needs of animals for survival (Y2 Animals)															
describe the main changes as young animals, including humans, grow into adults (Y2 Animals)															
describe basic needs of plants for survival and the impact of changing these (Y2 Plants)															
describe the main changes as seeds and bulbs grow into mature plants (Y2 Plants)															
identify whether things are alive, dead or have never lived (Y2 Living Things)															
describe and compare the observable features of animals from a range of groups (Y1 Animals)															
group animals according to what they eat (Y1 Animals)															
describe how animals get their food from other animals and/or from plants, and use simple food chains to describe these relationships (Y2 Living Things)															
describe seasonal changes (Y1 Seasonal Changes)															
name different plants and animals (Y2 Plants / Y2 Living Things)															
describe how different plants and animals are suited to different habitats (Y2 Living Things)															
distinguish objects from materials, describe their properties (Y1 Materials)															
identify and group everyday materials, and compare their suitability for different uses (Y2 Materials)															
% target met															

YEAR 3 SCIENCE ASSESSMENT RECORD

To judge that a pupil is working at the expected standard in science, teachers need to have evidence which demonstrates that the pupil meets all of the 'working scientifically' statements and all of the 'science content' taught in the final year of the key stage. Where possible, teachers should draw on assessments that have been made earlier in the key stage to make their judgement against this framework.	name	name	name	name	name	name	name	name	name	name	name	name	name
Working Scientifically: working at the expected standard (LKS2 NC requirements)													
asking relevant questions and using different types of scientific enquiries to answer them													
setting up simple practical enquiries, comparative and fair tests													
making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers													
gathering, recording, classifying and presenting data in a variety of ways to help in answering questions													
recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables													
reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions													
using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions													
identifying differences, similarities or changes related to simple scientific ideas and processes													
using straightforward scientific evidence to answer questions or to support their findings													
Science Content: working at the expected standard (Y3 NC requirements)													
identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers (Y3 Plants)													
explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant (Y3 Plants)													
investigate the way in which water is transported within plants (Y3 Plants)													
explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal (Y3 Plants)													

YEAR 3 SCIENCE ASSESSMENT RECORD CONTINUED

Science Content: working at the expected standard (Y3 NC requirements)

identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat (Y3 Animals)													
identify that humans and some other animals have skeletons and muscles for support, protection and movement (Y3 Animals)													
compare and group together different kinds of rocks on the basis of their appearance and simple physical properties (Y3 Rocks)													
describe in simple terms how fossils are formed when things that have lived are trapped within rock (Y3 Rocks)													
recognise that soils are made from rocks and organic matter (Y3 Rocks)													
recognise that they need light in order to see things and that dark is the absence of light (Y3 Light)													
notice that light is reflected from surfaces (Y3 Light)													
recognise that light from the sun can be dangerous and that there are ways to protect their eyes (Y3 Light)													
recognise that shadows are formed when the light from a light source is blocked by a solid object (Y3 Light)													
find patterns in the way that the size of shadows change (Y3 Light)													
compare how things move on different surfaces (Y3 Forces & Magnets)													
notice that some forces need contact between two objects, but magnetic forces can act at a distance (Y3 Forces & Magnets)													
observe how magnets attract or repel each other and attract some materials and not others (Y3 Forces & Magnets)													
compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials (Y3 Forces & Magnets)													
describe magnets as having two poles (Y3 Forces & Magnets)													
predict whether two magnets will attract or repel each other, depending on which poles are facing (Y3 Forces & Magnets)													
% target met													

YEAR 4 SCIENCE ASSESSMENT RECORD

To judge that a pupil is working at the expected standard in science, teachers need to have evidence which demonstrates that the pupil meets all of the 'working scientifically' statements and all of the 'science content' taught in the final year of the key stage. Where possible, teachers should draw on assessments that have been made earlier in the key stage to make their judgement against this framework.	name	name	name	name	name	name	name	name	name	name	name	name	name	name	name
Working Scientifically: working at the expected standard (Y4 NC requirements)															
asking relevant questions and using different types of scientific enquiries to answer them															
setting up simple practical enquiries, comparative and fair tests															
making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers															
gathering, recording, classifying and presenting data in a variety of ways to help in answering questions															
recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables															
reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions															
using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions															
identifying differences, similarities or changes related to simple scientific ideas and processes															
using straightforward scientific evidence to answer questions or to support their findings															
Science Content: working at the expected standard (Y4 NC requirements)															
recognise that living things can be grouped in a variety of ways (Y4 Living Things)															
explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment (Y4 Living Things)															

YEAR 4 SCIENCE ASSESSMENT RECORD CONTINUED															
recognise that environments can change and that this can sometimes pose dangers to living things (Y4 Living Things)															
describe the simple functions of the basic parts of the digestive system in humans (Y4 Animals)															
identify the different types of teeth in humans and their simple functions (Y4 Animals)															
construct and interpret a variety of food chains, identifying producers, predators and prey (Y4 Animals)															
compare and group materials together, according to whether they are solids, liquids or gases (Y4 States of Matter)															
observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) (Y4 States of Matter)															
identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature (Y4 States of Matter)															
identify how sounds are made, associating some of them with something vibrating (Y4 Sound)															
recognise that vibrations from sounds travel through a medium to the ear (Y4 Sound)															
find patterns between the pitch of a sound and features of the object that produced it (Y4 Sound)															
find patterns between the volume of a sound and the strength of the vibrations that produced it (Y4 Sound)															
recognise that sounds get fainter as the distance from the sound source increases (Y4 Sound)															
identify common appliances that run on electricity (Y4 Electricity)															
construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers (Y4 Electricity)															
identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery (Y4 Electricity)															
recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit (Y4 Electricity)															
recognise some common conductors and insulators, and associate metals with being good conductors (Y4 Electricity)															
% target met															

YEAR 5 SCIENCE ASSESSMENT RECORD

To judge that a pupil is working at the expected standard in science, teachers need to have evidence which demonstrates that the pupil meets all of the 'working scientifically' statements and all of the 'science content' taught in the final year of the key stage. Where possible, teachers should draw on assessments that have been made earlier in the key stage to make their judgement against this framework.	name	name	name	name	name	name	name	name	name	name	name	name	name	name	name
Working Scientifically: working at the expected standard (UKS2 NC requirements)															
planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary															
taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate															
recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs															
using test results to make predictions to set up further comparative and fair tests															
reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations															
identifying scientific evidence that has been used to support or refute ideas or arguments															
Science Content: working at the expected standard (Y5 NC requirements)															
describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird (Y5 Living Things)															
describe the life process of reproduction in some plants and animals (Y5 Living Things)															
describe the changes as humans develop to old age (Y5 Animals)															
compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets (Y5 Materials)															

YEAR 5 SCIENCE ASSESSMENT RECORD CONTINUED															
know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution (Y5 Materials)															
use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating (Y5 Materials)															
give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic (Y5 Materials)															
demonstrate that dissolving, mixing and changes of state are reversible changes (Y5 Materials)															
explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda (Y5 Materials)															
describe the movement of the Earth, and other planets, relative to the Sun in the solar system (Y5 Earth & Space)															
describe the movement of the Moon relative to the Earth (Y5 Earth & Space)															
describe the Sun, Earth and Moon as approximately spherical bodies (Y5 Earth & Space)															
use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky (Y5 Earth & Space)															
explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object (Y5 Forces)															
identify the effects of air resistance, water resistance and friction, that act between moving surfaces (Y5 Forces)															
recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect (Y5 Forces)															
% target met															

YEAR 6 SCIENCE ASSESSMENT RECORD

To judge that a pupil is working at the expected standard in science, teachers need to have evidence which demonstrates that the pupil meets all of the 'working scientifically' statements and all of the 'science content' taught in the final year of the key stage. Where possible, teachers should draw on assessments that have been made earlier in the key stage to make their judgement against this framework.	name	name	name	name	name	name	name	name	name
Working Scientifically: working at the expected standard (end of KS2 descriptors)									
describe and evaluate their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources									
ask their own questions about the scientific phenomena they are studying, and select and plan the most appropriate ways to answer these questions, or those of others, recognising and controlling variables where necessary - including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, and finding things out using a wide range of secondary sources of information.									
use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate									
record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs									
draw conclusions in different forms, and raise further questions that could be investigated, based on their data and observations									
raise further questions that could be investigated, based on their data and observations									
Science Content: working at the expected standard (end of KS2 descriptors)									
name and describe the functions of the main parts of the musculoskeletal system in animals (Y3 Animals)									
name and describe the functions of the main parts of the digestive system in animals (Y4 Animals)									
describe and compare different reproductive processes and life cycles in animals (Y5 Living Things)									
name and describe the functions of the main parts of the circulatory system in animals (Y6 Animals)									
describe the effects of diet, exercise, drugs and lifestyle on how the body functions (Y6 Animals)									
name, locate and describe the functions of the main parts of plants, including those involved in reproduction and transporting water and nutrients (Y3 Plants / Y5 Living Things)									

YEAR 6 SCIENCE ASSESSMENT RECORD CONTINUED									
use the observable features of plants, animals and micro-organisms to group, classify and identify them into broad groups, using keys or other methods (Y6 Living Things)									
construct and interpret food chains (Y4 Animals)									
explain how environmental changes may have an impact on living things (Y4 Living Things)									
use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved; and describe how fossils are formed and provide evidence for evolution (Y6 Evolution)									
group and identify materials, including rocks, in different ways according to their properties, based on first-hand observation; and justify the use of different everyday materials for different uses, based on their properties (Y3 Rocks / Y5 Materials)									
describe the characteristics of different states of matter and group materials on this basis; and can describe how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle (Y4 States of Matter)									
identify, and describe what happens when dissolving occurs in everyday situations; and describe how to separate mixtures and solutions into their components (Y5 Materials)									
identify, with reasons, whether changes in materials are reversible or not (Y5 Materials)									
use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects, and the formation, shape and size of shadows (Y6 Light)									
use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard (Y4 Sound)									
describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source (Y4 Sound)									
describe the effects of simple forces that involve contact (air and water resistance, friction), that act at a distance (magnetic forces, including those between like and unlike magnetic poles; and gravity) (Y3 Forces and Magnets / Y5 Forces)									
identify simple mechanisms, including levers, gears and pulleys that increase the effect of a force (Y5 Forces)									
use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it; and use recognised symbols to represent simple series circuit diagrams (Y6 Electricity)									
describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system; and explain the apparent movement of the Sun across the sky in terms of the Earth's rotation and that this results in day and night (Y5 Earth & Space)									
% target met									

CIEC offers support for the teaching of science across the primary age range and beyond. This support includes CPD programmes, bespoke in-school CPD, interactive websites for teachers to use with their pupils, and a wide range of downloadable resources which encourage collaborative, practical problem solving. For more information, please visit our website:

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